JSS CONSULTING
Environmental Consulting Services

Prepared by:
JSS Consulting
Prepared for:
Bahamas Marine Construction (BMC)/Naveen Gupta
for the submission to the Department of
Environmental Planning and Protection

Re:
Ship Ahoy Environmental Management Plan
April 2023

EXECUTIVE SUMMARY

The Ship Ahoy project is located at the Northern end of New Providence, Bahamas at latitude 25.0808418° and -77.3655771° longitude. The site is approximately 190,000 ft^2, on the coastline and is completely altered, with existing buildings on the property.

The Owner proposes to undertake the construction of a 48-slip marina on the property. The area will require dredging to allow for larger boats to dock within the marina. The area to be dredged is approximately one hundred and ninety-eight thousand, one hundred and twenty-four square feet (198,124sq. ft) and approximately forty thousand, three hundred and seventy-three cubic yard (40,373 CY) of material will be removed. Dredge material will be transported to Arawak Cay to be re-used in the community. No upland work is scheduled for this phase of the project, only construction of the marina.

This Environmental Management Plan (EMP) has been designed to assist with achieving the Health, Safety, Social and Environmental (HSSE) Policy for the project and to ensure that all its activities during the construction phase are conducted in a manner that results in minimal adverse impacts to the environment. The EMP outlines the impacts expected to occur during construction and details the mitigation measures that will be developed and implemented by the contractor, management, staff and subcontractors during construction, with the specific objective of eliminating or reducing any adverse environmental impacts.

Table of Contents

List of Figures

List of Tables

1.0 Introduction

1.1 Purpose and Objective

The Ship Ahoy Marina Environmental Management Plan (EMP) defines the Environmental and Social Management System measures, work practices and procedures that will be developed and implemented during the execution of the project with the specific objective of eliminating or ensuring the minimization of environmental impacts during the Contractor's works.

The following document was prepared at the request of Bahamas Marine Construction (BMC)/Naveen Gupta, hereafter referred to as The Owner, for assistance in fulfilling the requirements of an application for a Certificate of Environmental Compliance approval. This EMP is a project specific document developed to ensure that appropriate environmental management measures are followed during the construction of the Ship Ahoy Marina, hereafter referred to as The Project. Furthermore, this EMP outlines the specific mitigation measures that will be implemented in order to eliminate or reduce any adverse environmental impacts associated with the Contractor´s and Sub-contractor's activities. The overall purpose of the EMP is to:

- Ensure Contractor and Subcontractor(s) commitment to minimize environmental and social effects.
- Document environmental and social concerns and implement appropriate protection measures.
- Provide guidance to the Project Management Team regarding procedures for protecting the natural and social environment and minimizing social and environmental impacts.
- Provide relevant information and training regarding environmental and social issues, as and when required.
- Provide a reference to applicable legislative requirements.

To achieve the outlined purpose, the following subjects are detailed:

- Applicable legislative requirements
- Environmental impacts
- Mitigation measures
- Management plans
- Environmental management framework
- Site-specific method statements
- Training requirements

Specific objectives include:

- Maintain public communication and relationships with the surrounding community and businesses by informing the general public of the works program and schedule, employing residents as well as handling all complaints in a timely manner.
- Prevent harm, damage and loss to personnel, the environment and community assets including:
    - Reduce to impact to surrounding marine environments, wetlands, other

vegetation types and wildlife,
    - Prevention and mitigation of noise, dust and vibration impacts,
    - Protection of groundwater resources,
    - Minimize waste production and ensure correct waste management on site,
- Adhering to all environmental laws and regulations,
- Actively promote an environmentally responsible approach to the Project activities amongst the entire workforce,
- Maintain health and safety standards on site,
- Ensure Subcontractors/Suppliers/Visitors apply the same or equivalent environmental practices as those defined by Owner and Contractor, and
- Ensure all workers use personal protective equipment to prevent on-the-job injuries.

Throughout the performance of the activities, the Contractor will comply and ensure compliance of its Subcontractors to these requirements as indicated in the following:

- Environmental Codes and regulations applicable to The Bahamas,
- Contract environmental requirements,
- Contractor internal environmental requirements, and,
- Other industry standards such ISO, OSHA and good practices where appropriate.

1.2 Scope of Works

The Project is located on the Northern End of New Providence at the GPS coordinates of 25.0808418° latitude and -77.3655771° longitude (See Figure 1). Project activities include the construction of a 46-slip timber dock marina on the property. The area will require dredging to allow for larger boats to dock within the marina. The area to be dredged is approximately one hundred and ninety-eight thousand, one hundred and twenty-four square feet (198,124sq. ft) and approximately forty thousand, three hundred and seventy-three cubic yard (40,373 CY) of material will be removed. Dredge material will be stored on-site then transported via dump truck to Arawak Cay where it will be used in the community. No Upland works are scheduled to occur. The marina is scheduled to be built in two phases however, this EMP only covers activities proposed for Phase 1. See Appendix A for the outline of the conceptual plan.

A marine assessment for the Ship Ahoy Marina was conducted in June 2022, and examined the benthic environment and identify all flora and fauna that inhabit the proposed area.

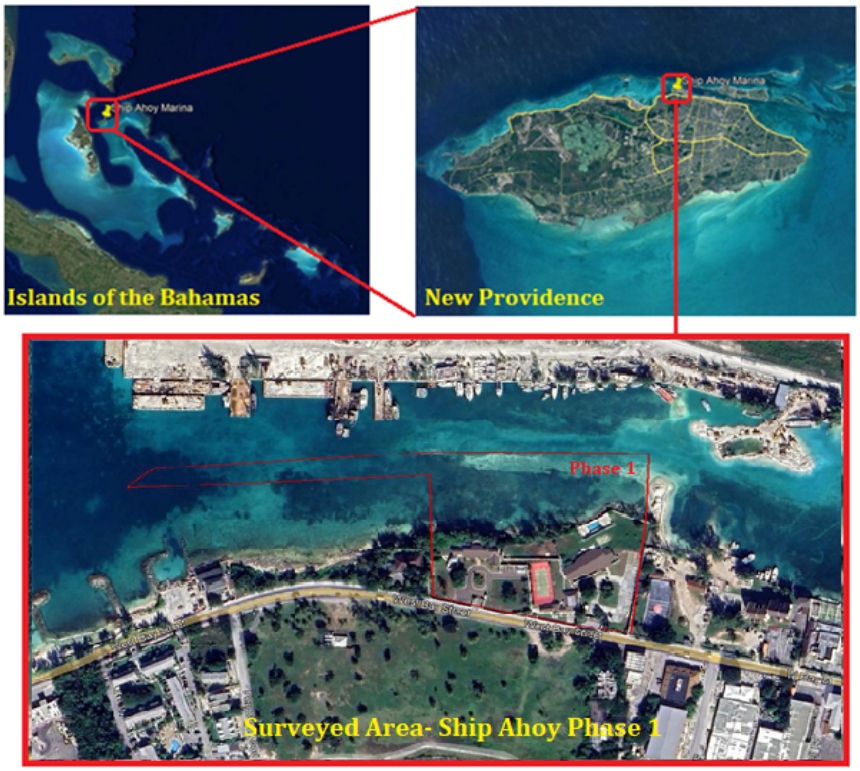


Figure 1. Ship Ahoy Marina Location Map.

2.0 Environmental Laws, Regulations and Requirements

The Owner and Contractor will be required to utilize accepted regulatory standards as a minimum to the protect the environment, the health and safety of all personnel (Contractor, Subcontractors and third parties) working on the project, and any others who may be affected by the project activities.

2.1 National Environmental Codes and Regulations Applicable to The Bahamas

Construction of The Project must comply with a range of national legislation, regulations, strategies and policies in order to provide for the management of environmental effects. There are seventeen (17) Legislations that are relevant and applicable to the management of the physical and natural environment of the proposed Project as outlined in Table 1.

Table 1: National Environmental Laws in The Bahamas

Act Title	Year Enacted	Comments
Water & Sewerage Corporation Act	1976	Provides regulatory framework for the management of water resources in The Bahamas.

Environmental Health Services Act	1987	Provides the framework for environmental regulations that will ensure compliance for the Project. The Act authorized the Department of Environmental and Health Services (DEHS) to develop regulations that prevent and control air pollution, soil contamination and preserve water quality.
Wild Animals Protection Act	1968	Prohibits the taking, capturing or hunting of any animal without a permit.
Wild Birds Protection Act	1952	Prohibits the taking, capturing or hunting of any animal without a permit. Protects birds and eggs during closed season.
Plants Protection Act	1916	Relates to plant disease and controls importation of plants to prevent outbreaks of exotic disease and establishment of unwanted species.
Conservation and Protection of the Physical Landscape of The Bahamas Act	1997	Protects physical landscape from environmental degradation, flooding and removal of hills; regulates filling of wetlands, drainage basins or ponds; prohibits digging or removing sand from beaches and sand dunes; prevents harvesting or removing protected trees. In order to perform activities that may affect the physical landscape of The Bahamas, permits must be obtained for these activities. The Department of Physical Planning issues the permits and enforces the regulations.
Planning and Subdivision Act	2010	This Act provides for: A land use planning-based development control system led by policy, land use designations and zoning. Prevention of indiscriminate division and development of land. Promotion of sustainable development in a healthy natural environment. Maintenance and improvement of the quality of the physical and natural environment. Protection and conservation of the natural and cultural heritage of The Bahamas. Planning for the development and maintenance of safe and viable communities.

The Forestry Act	2010	Protects wetlands, water reserves, endemic flora and fauna and protected trees. It establishes a legal framework for the long-term sustainable management of forests, a governmental forestry agency and a permanent forest estate. It requires a license for timber cutting and other activities in the Forest Reserves. The Act mandates that a National Forest Plan be developed every five years to govern management activities, such as harvesting and reforestation measures, prescriptions for fire prevention, wildfire suppression and prescribed burning and soil and water conservation.
The Merchant Shipping (Oil Pollution) Act	1976	The Act provides for the proper registration of ships, the control, regulation and orderly development of merchant shipping in The Bahamas, proper qualification of seamen and regulation of employment conditions for seamen. These provisions Advocate ship safety and competency which prevent shipping accidents that can be detrimental to the marine environment as well in human casualties.
The Private Roads and Subdivision Act	1961	This Act enables the Department of Physical Planning to regulate road construction and subdivision development.
Disaster Preparedness Response Act	2006	This Act provides for a more effective organization of the mitigation of, preparedness for, response to and recovery from emergencies and disasters.
Derelict Motor Vehicles Act	1967	This Act provides for the removal and disposal of abandoned and disused motor vehicles and for other purposes connected therewith.
Ministry of the Environment Act	2019	This Act establishes the Ministry of the Environment to oversee the integrity of the environment of The Bahamas, to make the minister responsible therefore a corporation sole, to establish the environmental administration fund and the environmental trust fund and for matters connected thereto.
The Environmental Planning and Protection Bill	2019	The Act provides for the prevention or control of pollution, the regulation of activities and the administration, conservation and sustainable use of the environment and for connected purposes. The Bill has been enacted by the Parliament of The Bahamas and if sent to the Gazette during the time of this project the legislation will be enforced.
Environmental Impact Assessment Regulations,	2020	To provide procedures for a Certificate of Environmental Clearance (CEC). The Regulations provide procedures for the review proposed projects inclusive of monitoring and compliance requirements. The Regulations dictate the requirements for a Certificate of Environmental Compliance (CEC).

The Environmental Protection (control of plastic pollution) Act	2019	This Act prohibits single use plastic food ware and non-biodegradable and biodegradable single use plastic bags. Prohibit the release of balloons; regulate the use of compostable single use plastic bags and for connected matters.
Health and Safety at Work Act	2002	This Act makes provisions relating to health and safety at work and for connected purposes. It details the general duties of employers and employees at work.

2.2 National Environmental Policies of The Bahamas

Table 2: National Environmental Policies of The Bahamas.

Relevant National	**Subject**	**Summary**
National Policy for the Adaptation to Climate Change 2005	Climate change assessment for the immediate and project adaptation techniques for The Bahamas.	The National Policy for the Adaptation to Climate Change outlines a national framework to meet the goals and objectives of the United Nations Framework Convention on Climate Change (UNFCC). The Bahamas is committed to reduce greenhouse gases and address climate change impacts.
National Invasive Species Strategy for The Bahamas, 2013	Identifies and recommends a management framework for the control and eradication of invasive species.	The National Invasive Species Strategy for The Bahamas originally published in 2003, was updated in 2013 as part of the Global Environment Facility funded project, Mitigating the Threats of Invasive Alien Species in the Insular Caribbean (MITIASIC). It sets forth a management framework for the control and eradication of invasive species.

National Biodiversity Strategy and Action Plan, 1999	A plan to maintain biodiversity through sustainable development for a small island developing nation.	The Bahamas Government is committed to conserve biodiversity and to pursue sustainable development. This document highlights the role of biodiversity in the Bahamian social and environmental context and recommends measures to ensure its compatibility with future development.

2.3 ISO 1400

The ISO 14000 is a set of industry standards that provide practical tools for companies and organizations of all kinds looking to manage their environmental responsibilities.

ISO 14001:2015 and its supporting standards such as ISO 14006:2011 focus on environmental systems to achieve this. The other standards in the family focus on specific approaches such as audits, communications, labeling and life cycle analysis, as well as environmental challenges such as climate change.

2.4 Occupational Safety and Health Administration (OSHA)

In the absence of specific health and safety construction regulations, contractors should adhere to the Occupational Safety and Health Administration (OSHA) regulations. OSHA is an agency of the United States Department of Labor. OSHA's mission is to "assure safe and healthy working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance". The agency is also charged with enforcing a variety of whistleblower statutes and regulations. OSHA's workplace safety inspections have been shown to reduce injury rates and injury costs without adverse effects to employment, sales, credit ratings, or firm survival. Regulations such as the use of Personal Protective Equipment, housekeeping, safety training and education, fall protection and working in confined space etc.

2.5 Government Departments

Department of Environmental Planning and Protection DEPP

The Department of Environmental Planning and Protection will review and approve the Environmental Management Plan (EMP) for the project. Monthly environmental reports will be submitted to DEPP.

Ministry of Public Works

The Ministry of Public Works will authorize and provide permits for activities and maintain physical infrastructure in the country.

Department of Physical Planning

The Department of Physical Planning will authorize and provide permits for activities

such as excavation, filling, roadworks, and all construction activities.

Port Department

The Port Department is responsible for inspection and licensing of boats and boat masters as well as collection of all revenue from commercial and private docks, mooring, groins, causeway, etc. The Port department will authorize any permits and/or registration requirements needed for operation of a marina and docking facilities.

3.0 Environmental Management Framework

This EMP and associated environmental documentation will be maintained and updated throughout the duration of The Project. The Project Environmental Manager (EM) is responsible for incorporating the Department of Environmental Planning and Protection (DEPP) and Owner's comments on this document as well as updating it to reflect new project information. Revisions to this document will be performed if:

- New project design parameters or construction methodologies are introduced that could change the environmental impact or mitigation measures, and
- Changing environmental requirements, commitments or conditions by Local Authorities as a result of incidents and deviations.

3.1 Construction Management

The overall responsibility of environmental management lies with the Contractor. The Contractor shall ensure that all environmental management requirements are brought to the attention of all personnel including sub-contractors, as applicable to their work, and ensure that there is compliance with requirements.

Descriptions and titles may vary based on the Contractor's designations, but the overall role and responsibilities should be similar. The key individuals with environmental responsibilities are described in the following paragraphs:

The Owner

The Owner has overall responsibility for environmental issues and ensuring all measures are implemented by the Contractor.

Contractor representative:

- Main point of contact for contract negotiations/ discussions
- Manages overall Project
- Oversees that project remains within budget and on schedule
- Updates schedule as necessary

Project Manager - TBD (will be updated prior to commencement of works)

The Project Manager (PM) will ensure that all environmental management requirements are implemented and brought to the attention of all personnel including the sub-contractors and ensure that the requirements are complied with.

The PM will be responsible for the following:

- The PM is the main point of contact for contract negotiations/ discussions.

- The PM manages the overall project.
- The PM ensures that the project remains within budget and on schedule.
- The Project Manager (PM) has prime responsibility for Quality on the project.
- The PM will ensure that in cooperation with the Quality Manager (QM), only materials compliant with the contract specifications and which have been approved by the owner will be used within the permanent works.
- The PM will ensure that the works are overseen by enough suitably experienced site supervisors, so that the works proceed at a satisfactory pace.
- The PM will nominate a member of his team who will attend the final inspection of the works as required.
- The PM – or his nominee – will submit copies of materials test reports to the Engineer.
- The PM will arrange for copies of all test reports and related documents to be kept at the site office and stored securely.
- The PM will ensure that materials are placed, compacted, and finished using equipment appropriate for the purpose, and that relevant methods are used in order to achieve the specified density, grade, fall and finish for each material type.
- The PM will nominate a responsible person who will notify the QM in a timely manner of the day-to-day testing requirement at site so that the necessary number of tests of each material type is carried out.

Environmental Manager - Janeen Bullard (357-9262)

The Environmental Manager (EM) has responsibility for all environmental issues and will track all environmental inspections and potential hazards. The EM will enforce all hold points and has the authority to stop works because of environmental issues. The EM will liaise daily with the Environmental Monitor (EMO) and ensure that environmental measures are implemented prior to commencement of works. Monthly site visits will be conducted with special oversight of construction in sensitive areas

The EM will be responsible for the following:

- The EM will report to and liaise with the Department of Environmental Planning and Protection (DEPP).
- The EM will liaise with all other managers on the project for environmental compliance.
- The EM will identify environmental competence requirements for all staff working on the project and ensure delivery of environmental training to personnel within the project team provision.
- The EM will provide advice and liaise with the construction teams to ensure that environmental risks are identified, and appropriate controls are developed and included within method statements.
- The EM will monitor and provide reporting based on the EMP criteria and liaise with all parties on any matters arising from non-compliance.
- The EM will manage the environmental monitoring programme, including noise, vibration and dust, review of the routine reports etc.
- The EM will conduct site inspections.
- The EM will provide reports, updates, and any infractions to DEPP.
- The EM will include Health and Safety matters in monthly report.

- The EM will include the comment and relative responses associated with the public grievance mechanism in the monthly report

Environmental Monitor- TBD (will be updated prior to commencement of works)

- The Environmental Monitor (EMO) will report to the EM and will perform daily environmental inspections and ensuring that all environmental measures are implemented.

Resumes for the Environmental Manager and Environmental Monitor are to be submitted to DEPP for approval prior to the start of construction.

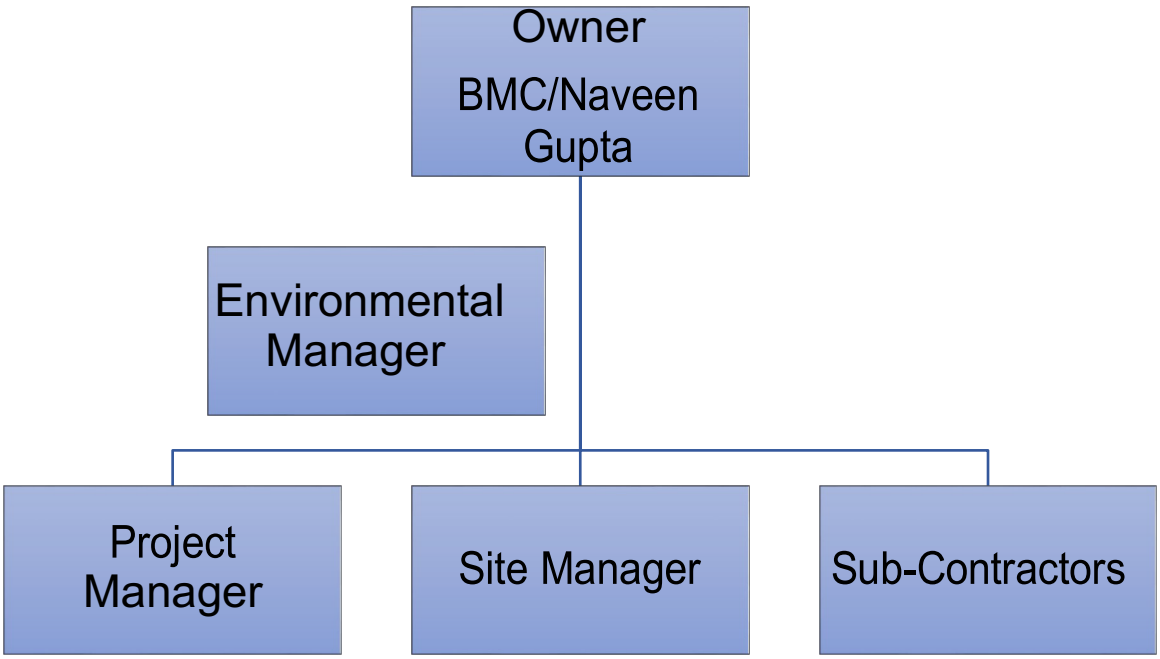


Figure 2: Environmental Management Structure

3.2 Environmental Training for Personnel

Training of site workers will be conducted by the Contractor and the Owner to include Site Induction and Toolbox Talks. All workers are to undergo the Site Induction, and Toolbox Talks should be conducted on at least a weekly basis. The training should ensure that all employees understand their obligation to exercise due diligence for environmental matters including:

- Familiarization with the requirements of the EMP (summary of the EMP and all associated management plans).
- Environmental emergency response training (outlining potential environmental emergencies and relevant contacts and response procedures), including spill management/response procedures.
- Familiarization with site environmental controls (bunded areas, spill kit locations etc.).
- Monitoring programs.
- Site signage will be erected as needed to display messages on site to alert personnel of surrounding works and/or hazards.

4.0 Environmental Management Tools

The following environmental management tools will be implemented to ensure environmental compliance on the project:

4.1 Site Inspections

Site Inspections are a review of crucial parts of the works ensuring that the works progress as intended, both in terms of quality and compliance. The site inspections may include the following:

- Site Safety and Health Materials
- Solid Waste Management
- Dust & Air pollution
- Noise
- Environmental Control Measures – checks of items such as silt fencing, safety, turbidity curtain maintenance, and noise pollution.

These are to be performed daily. The inspections will be conducted by the EMO using the site monitoring checklist and in compliance with the monitoring plan. The EM will perform site inspections monthly or as needed for emergencies or works within sensitive areas. For example, the commencement dredging activities in the marine environment. DEPP are invited to attend inspections and inspections may be conducted upon their request. Records of inspections will be available to all parties. Inspections will also be done after intense or prolonged inclement weather. Any issues identified during the regular monitoring are to be addressed by the PM and if needed, to be addressed with staff immediately or at daily toolbox talks. There is to be continued monitoring of the implementation of action items.

4.2 Reports and Communication

The following reports should be submitted to the client for review (See Appendix B for templates.):

- Site Reports - prepared regularly during the construction phase and issued to the client.
- Incident Reports - reports accidents and dangerous occurrences during that month.
- Monthly Environmental Reports – reports the environmental standards on site and addresses any environmental concerns,
- Daily environmental checklists - electronic daily reports will be provided to the Environmental Manager and included in the monthly reports for the duration of construction.

4.3 Incident Reports

In the case of incidents, all aspects of the incident are to be addressed and entered to the relevant logs for appropriate review. The EMO shall be notified of any incident with actual or potential site impacts on the community or the biophysical environment immediately.

The PM will inform the Environmental Manager and Owner who will make an assessment followed by a detailed report and measures to mitigate against any further occurrence (See Appendix B-1: Incident Report Form).

4.4 Checklist for Environmental Stipulations

The Contractor, further to the above items will use the following as a guide for general execution of the works:

- There shall be clear demarcation of the extent of Contractor's work site(s) including the limit of works especially near sensitive environments, material storage and laydown yard.
- Health and safety equipment (including protective clothing, boots, glasses, hardhat, and life vest) shall be available and in use. First aid kits will be mandatory.
- Refueling sites shall be at least 100 ft away from the any wetlands and open water bodies, lined and bunded to confine and mitigate the effects of spillage and will be protected from rainwater.
- Discharge of dust and fumes shall be minimized by constant wetting of loose material and there will be no burning on site.
- Noise abatement on construction sites shall minimize avoidable inconvenience to local populations.
- Dump trucks shall be equipped with tarpaulins or similar devices to prevent material spillage and roads will be kept clean of mud and construction debris.
- There will be no disposal of non-biodegradable materials on site and all spoils will be removed to the New Providence Ecological Park.
- Used oils shall be containerized and transported with other scrap equipment to an approved facility.
- There shall be NO burning of waste on site.
- The contractor shall remove all construction equipment and scrap waste from the site on completion.

4.5 Documentation

All method statements (step-by-step procedure detailing how the contract work may be carried out) and other relevant documents are to be reviewed by the EM prior to the execution of works to ensure that all environmental mitigation measures are considered.

All documentation relative to and including this EMP will be maintained at the site office for the duration of the project. Reference documentation which includes contract documents, Contractor's plans, listed and associated records, reports, permits, procedures, and site instructions to be maintained for viewing by all parties of the Project. Any relative documentation will be available electronically.

4.6 Meetings

Periodic meetings should be held, that includes necessary parties, to discuss ongoing, upcoming works, or any issues incurred during works to ensure proper communication.

4.7 Environmental and Safety Training

Training of ALL site workers will include:

- Site Induction – prior to a crew member being allowed on site, information regarding the Health, Safety and Environmental requirements are administered.
- Toolbox Talks – weekly meetings to reinforce the topics covered during the site induction.
- Site Signage – messages displayed on site to alert personnel and community of surrounding works and/or hazards.

4.8 Construction Work Methodology

Commencement of construction activities is To Be Determined (TBD). Dredging of the marina and timber dock construction are anticipated to take approximately four (4) months to complete. The contractor will be required to provide method statements for construction works prior to commencement of works. Construction methods will also be employed to minimize or mitigate impacts on the environment.

5.0 Ship Ahoy Method Statement

The scope of the proposed works includes:

- Mobilization of all equipment to site.
- Installation of turbidity curtains to contain any siltation.
- Dredging of material by excavator.
- Storage and transport of dredge material
- Timber dock construction.

Mechanical dredging is the proposed method of dredging and the area is anticipated to be dredged -6.5 ft below the mean low tide mark. Works will be executed using an excavator mounted on a barge. Dredge material will be stored on site in a designated area (See Figure 3) and transported via trucks to an identified area at Arawak Cay where the material will be available for reuse by the community.

Type II turbidity curtains will be deployed during dredging, bulkhead and breakwater construction and pile driving. Turbidity curtains will be installed and maintained according to manufacturer specifications (See Appendix E). Turbidity reading will be taken twice per day at two designated points. Turbidity monitoring should be conducted upstream (500m from work area) and downstream (500m from work area) or visible turbidity plume area.

The timber dock piles will be driven using a hammer drill and crane mounted on a barge. Post will be installed in the socket within the line and level of the dock. A carpenter crew will be used to install the wooden beam to the timber post using the permanent bolts.

The full method statement for The Project can be found in Apppendix F.

6.0 Register of Significant Aspects and Impacts

Environmental impacts of the project are impacts to the natural communities and wildlife in the area that can be reasonably inferred, considering the footprint of impacts and known habitats on-site. Other expected impacts are those related to normal construction and operation such as waste generation and disposal, fueling, use of potentially hazardous materials as well as other accidents or malfunctions, which may entail an environmental component. The Register of Significant Aspects and Impacts (The Register) considers potential impacts that may be due to construction activities. The Register will be used in the development of method statements to proactively manage and mitigate potential impacts pertaining to the project. The Register evaluates the potential impacts identified in the Environmental Impact Assessment and assigns risk and magnitude scores. Risk Scores are measuring the likelihood of the impact occurring and is measured on a scale of 1-10 with 1 being unlikely to occur and 10 being highly likely to occur. Magnitude scores measures the scale of the impact if it occurs. Magnitude ranges are parameters are Low, Medium and High. Low Impact refers to short-term localized impact reversible in 1 year. Medium Impact refers to moderate term implications reversible in a 5-year period. High Impact refers to long term impacts that are not reversible within 5 to 10 years or are irreversible.

Table 3: Register of Significant Aspects and Impacts.

Significant Aspect and Impact	**Activity**	**Potential Impact**	**Environmental Management Strategy**	**Risk Score**	**Magnitude Score**
CONSTRUCTION PHASE					
Ground Water and Open Water Quality	Stockpile Erosion	Turbidity	*Stockpiles to be stored away from open trenches with exposed ground water and open water bodies. *Existing wall on around the storage areas will remain inacts and will act as containment.	5	Medium
Ground Water Quality	Heavy equipment	Oil spills	*See Fuel Spill Prevention Plan (Appendix C).	10	High

Significant Aspect and Impact	Activity	Potential Impact	Environmental Management Strategy	Risk Score	Magnitude Score
Open Water Quality	Dredging	Turbidity	*Type II Turbidity curtains will be deployed and maintained during dredging activities (See Appendix E for Turbidity Curtain specifications). * Turbidity Monitoring will be done during dredging activities. Works will be halted if readings exceed 29 NTU.	10	Low
Air and Noise Quality	Earthworks and Dredge material Stockpile	Dust pollution	*Water spraying the site *Fencing/Install barriers (to shield from dust and aggregates. *Avoid usage of machines/equipment with extra noise. *Do not accumulate and burn waste at the site. *The contractor will inform the surrounding offices and community in prior to operations that bear the risk	10	High

Significant Aspect and Impact	Activity	Potential Impact	Environmental Management Strategy	Risk Score	Magnitude Score
			of nuisance and accidents.		
Solid Waste	Construction Activities	Construction waste	* Materials to be disposed of at the New Providence Ecological Park (NPEP).	10	Low
Wastewater Management	Construction Activities	Leaching of wastewater into the ground water or open water body.	*Any portable toilet(s) that are on-site should be secured to avoid vandalism. Toilets must be located more than 150ft from the edge of the open water	1	Low
Hazardous Waste	Heavy Equipment Operation	Equipment Fuel spills	*Proper usage and disposal of oil spill material. *Pollution prevention practices. * Creation of a concrete washout station. *See Fuel Spill Prevention Plan (Appendix C).	5	Medium
Traffic and Transport	Transportation and Disposal	Traffic accidents and Increased traffic on main thoroughfare	*Signage erected to inform traffic, pedestrians, and adjacent offices about the activities. *Flagmen to manage the movement of traffic to and	5	Low

Significant Aspect and Impact	Activity	Potential Impact	Environmental Management Strategy	Risk Score	Magnitude Score
			from site. *The transportation of dredge material and other materials should be in safe manner considering road traffic regulations.		
Safety for Workers	Dredging and Construction activities	Accidents and Injuries	*The mandatory use of PPE (helmets, safety belts, masks, gloves, life vest and boot) by workers depending on nature of work. *All workers familiar with site emergency response plan and safety procedures (See Appendix D).	5	High

7.0 Environmental Impacts and Mitigations

Long-term negative impacts to the natural resources in the area are not expected to occur as a result of the proposed construction work. Construction will be closely monitored to prevent contamination of the adjacent marine habitats. The contractor is required to adhere to the guidelines established in this document, as listed in the sections of the EMP below. Generally, the potential environmental issues associated with The Project include the following:

- Increased turbidity and sedimentation due to activities associated with piling and dredging;
- Fuel, oil or chemical spills;
- Waste management;
- Air and Dust pollution
- Noise pollution
- Traffic Management

The contractor will take particular care to avoid unnecessary disturbance or damage to the environment and will correct any actions which has resulted from the contractor's operations, and which constitutes, or which could result in, unnecessary damage or disturbance to property and the environment.

7.1 Physical Environmental Impacts

7.1.1 Groundwater Contamination

Mitigating any potential harmful effects to the ground water quality is extremely important for the scope of construction. Implementing the following measures will assist with preservation of site and reduce the risk of potential leaching into groundwater supply:

- The implementation of an effective erosion and sediment control plan during activities. It will include the use of silt curtains during dredging and containment of stored dredge material on site.
- Proper Fuel Management to prevent spills (See Appendix C: Fuel Spill Prevention Plan).

To help mitigate these concerns identifying the main source of potential releases during the construction phase is important. There are to be no storage of large quantities of fuel or hazardous wastes on site. The construction heavy equipment vehicles being used on and around the site should be given special attention. Oil spill kits should always be kept nearby or within heavy equipment.

During the construction phase the maintenance laydown should be located away from any open water bodies and not positioned on a hill or slope. The maintenance laydown area is located to the eastern end of site and already consists of a paved surface away from open water bodies. A maintenance schedule and log will be used to ensure that if any leaks develop, the use of that vehicle is discontinued and fixed before a large volume release occurs into the environment. The Fuel Spill Prevention plan will be implemented for any spills that arise (See Appendix C).

As construction progresses the negative impact on groundwater and open water quality increases from stockpile erosion. Turbidity from stockpile erosion is a major concern. The Dredge material storage area will be located on the existing basketball court. There is an existing wall around the court that will remain in place during construction activities and will act as containment to help prevent runoff. The maintenance laydown and dredge material storage are shown Figure 3 below:

Figure 3: Maintenance Laydown and Dredge Material Storage Area

7.1.2 Open Water Quality

The major impact to open water/the marine environment would be turbidity caused by dredging activities and installation of the timber dock pilings. Mitigating any potential harmful effects to the open water quality is extremely important for the scope of construction. Implementing the following measures will assist with preservation of site:

- Installation of Type II turbidity curtains (See Appendix E for Turbidity Curtain specifications),
- Monitoring of curtains to ensure they are effective and,
- Turbidity reading documentation– Turbidity reading should not exceed 29NTU. If threshold is meet or exceeded, works should immediately halt unlevel levels return to acceptable (See Appendix B-5 for Turbidity Report Form).

No hazardous substances will be allowed to escape into the open water at the work site.

To help mitigate these concerns identifying the main source of potential releases during the construction phase is important. The following measure will assist is prevention of water contamination (See Appendix C: Fuel Spill Prevention Plan for more details).

- Use biodegradable (non-mineral) drilling fluids and hydraulic oils when working over water
- Spill Kits will be placed on all operating machinery, boats and barges.
- All vehicles, boats and equipment used on-site must be well maintained.
- Idling must be kept to a minimum. Any equipment not in use for extended periods of time must be switched off.
- Fuel should not be stored on site.
- Equipment shall be inspected, and repaired, if necessary, by the contractor prior to mobilizing to site.
- Maintenance laydown will be located away from open water bodies

Should a concern with water quality arise, work will stop. The contractor will take corrective action if water quality parameters are not in compliance with allowable levels. Work may be suspended until adequate corrective measures have been implemented.

7.1.3 Soild Waste

The site is located on New Providence, which has an organized and managed waste management system at the New Providence Ecological Park (NPEP). The project should seek to reduce the production of waste and recycle material as much as possible. Waste bins should be provided and secured on site and emptied on at least a weekly basis.

There is the potential for hazardous waste impacts associated with the construction and operational phases. All equipment and hazardous material will be stored in designated locations to reduce the risk of spills and pollution events. All hazardous waste should be disposed of by licensed contractors and according to DEHS protocol. Waste tickets should be collected when hazardous waste is disposed of (See Appendix B-2: Hazardous Waste Report Form).

The improper disposal or treatment of human waste can result in a breathing ground for diseases. To prevent leaching of wastewater into the ground water or open water bodies, any portable toilet(s) that are on-site should be secured to avoid vandalism and prevent tipping in windy conditions. Toilets must be located more than 150ft from the edge of open water. Portable toilets should be serviced at least twice a week by a licensed contractor.

7.1.4 Air and Noise Pollution

Air Pollution and Dust abatement

Stockpiling and transportation of dredging material can result in dust accumulate on site. This dust will be a hazard to human health and can cause eye irritation and respiratory issues. The surrounding community can be affected as well, if dust is not properly managed. To reduce the impact of dust the following activities should be implemented:

- Water is to be used as a dust retardant as needed,
- Screening and fencing should be used to reduce wind, improve aesthetics, and mark the limit of works.

- The use of Proper Protective Equipment including dust masks and eye wear/safety glasses.
- Dump trucks moving loose material are to be covered with tarpaulins.

Noise Pollution

The project construction activities will increase the level of noise that will affect nearby businesses and residences. The general rule shall be that construction operations be restricted to daylight hours between 0700 hrs. and 1900 hrs. Any reason to work outside these hours to speed up the progress of works, local communities will be given advance notice and specific requests will be reasonably accommodated.

Special care should be taken during pile driving activities as they can affect nearby residents and business communities. Pile driving should be limited to daylight hours. Any complaints by the community should be brought to the attention of the PM and EM immediately.

7.1.5 Marine Life and Habitat

Emphasis will be placed on observing the presence and management of all wildlife on site and the identified epifauna populations. Prior to dredging and timber dock construction activities, the area will be assessed to ensure that there are no epifauna present within the footprint. Any identified epifauna will be removed from the area and relocated to a similar habitat. Turbidity curtains will be monitored for any mobile species that may have entered the area and will be given access to escape the curtains.

7.1.6 Traffic Impacts

Project activities have the potential to negatively affect traffic flow due to entry and exiting of vehicles onto West Bay Street. The increase in vehicular traffic, movement of heavy machinery and change in traffic patterns due to road closures (if necessary) can cause impacts to the safety of road users (vehicular and pedestrian) and cause discomfort to the community due to increased noise, and increased emissions.

To mitigate the traffic impacts, the following strategies should be employed:

- Notice should be given to the community of the commencement of work and possible traffic inconveniences.
- Signage will need to be placed at the site entrance/exit and the main thoroughfare.
- Heavy machinery should have a banksman to assist in maneuvering on and off site.
- Flagmen should be placed strategically at the site's entrance, exit, and onto the main thoroughfares to direct activities.

8.0 Environmental Protection and Mitigation Plans

The Contractor must avoid unnecessary disturbance or damage to the environment and must correct any damage caused. Mitigation to reduce the risk of impacting the surrounding environment is as follows:

8.1 Construction Management Plans

8.1.1 Sediment Control Plan

During construction, protecting existing water bodies and ground water quality is a high priority. It requires a group effort to ensure that the control measures laid out in this sediment plan are adhered to diligently for the remainder of the project.

The overall goal is to ensure that the site is free from the risk of non-point source pollutants. Control measures to mitigate this is extremely important during the construction phase as the risk of leaching increases due to stockpile erosion, movement of construction material and equipment, and human travel. The main construction activity that poses the greatest risk is stockpile erosion.

All employees including subcontractors should be trained and given instructions on their role in this control plan.

Site Preparation

Prior to erosion and sediment control measures being implemented, careful examination of the project site and surrounding area should be documented. This should identify any noticeable drainage patterns, and any potential problems that may arise due to slope differences on site.

Boundaries of the site should be defined, clearly marked and communicated to heavy equipment operators. Ensure that the site will have stable access points and that areas are mapped out for adequate staging of materials as well as containment areas. Minimize disturbed areas by delineating construction zones from surrounding areas that will remain intact.

Control measures are to be in place prior to dredging activities. The existing wall around the dredge material storage area (See Figure 3) is to remain intact to contain any erosion into the environment. Dust control should be monitored daily and remediated with water truck when necessary.

1 Control Measures

The following control measures will be implemented to help mitigate the potential hazard due to sediment during construction. Daily monitoring of the controls mentioned below is important to ensure an efficient process. The following measures should be practiced:

For Transporting Materials:

- Any truck used to transport/haul dredge material on or from site should be fitted with a cover/ tarpaulin.
- Speed Control restrictions of the site should be strictly followed.
- All routes where truck will be travelling while accessing or exiting the site should be inspected before movement.

- To ensure stability, travel routes should be monitored and maintained when necessary.
- For large cargo transport, traffic control flaggers and in some cases, spotters should be used.
- An established access point for materials should be designated.

Stockpile Erosion

- Stockpiles should be stored away from open water sources.
- They should be protected with anchored down polyethylene sheeting during dry seasons.
- The existing wall around the court area is to remain in place for containment
- During wet seasons they should be secured.

General Erosion control and construction impact minimization techniques will include:

- Inspect and maintain sediment erosion controls.
- No hazardous substances will be allowed to escape into open water at the work site. Should a concern with water quality arise work will stop, and the Environmental Manager will be contacted immediately.

If deemed necessary, water quality testing maybe conducted. The Environmental Manager retains the right and responsibility to suspend site work and to require the Contractor to take corrective action if water quality parameters are not in compliance with allowable levels. Work may be suspended until adequate corrective measures have been implemented to the satisfaction of the Owner.

8.1.1.1 Turbidity Control Plan

Turbidity is a major impact during marine construction. All efforts should be made to keep turbidity at a minimum. Control measures to reduce turbidity in the marine environment is extremely important as suspended sediments that cause turbidity can block light to aquatic plants such as seagrass, smother aquatic organisms, and carry contaminants and pollutants and pathogens, such as lead and bacteria.

To minimize impairment of water quality during dredging and pile driving activities, the following mitigation measures will be implemented:

- Sedimentation control methodologies will be employed around active dredging to contain suspended solids within the dredge area.
- Sedimentation control equipment (Type II Turbidity Curtains) will be maintained during all activities causing turbidity.
- Turbidity levels will be monitored on a daily basis during active dredging. If turbidity exceeds 29 NTU above natural levels, dredging will be stopped until sediments have settled before dredging can commence again.
- Excess material will be cleaned from the decks and of barges before the vessel is moved.
- Adequate freeboard should be maintained on barges to reduce the likelihood of decks being washed by wave action.
- Spill kits will be kept on the barge for absorbing any fuel/chemical spill.
- All chemical spills caused by maintenance work on the barge will be cleaned up immediately, properly and safely.

The works are expected to take approximately four (4) months to complete. Any incidents will be reported to the DEPP within 24hours using the incident report form in Appendix B-1.

8.1.1.1.1 Containment

Turbidity curtains will be installed for containment. The type of turbidity curtains used must meet specifications for conditions experienced on site. Specifically, Type II curtains will be installed for the duration of the activities. The turbidity curtains will be installed in one thousand feet (1,000ft) increments and moved along as the dredging is moved (See Figure 4). They will be installed to the manufacturer's specification (See Appendix E). Anchors have been provided with the curtain assemblages, but additional concrete blocks will be used to anchor curtain corners to ensure stability. Monitoring will be conducted to ensure effective containment. Special care should be taken when placing curtains as the area has active boating traffic.

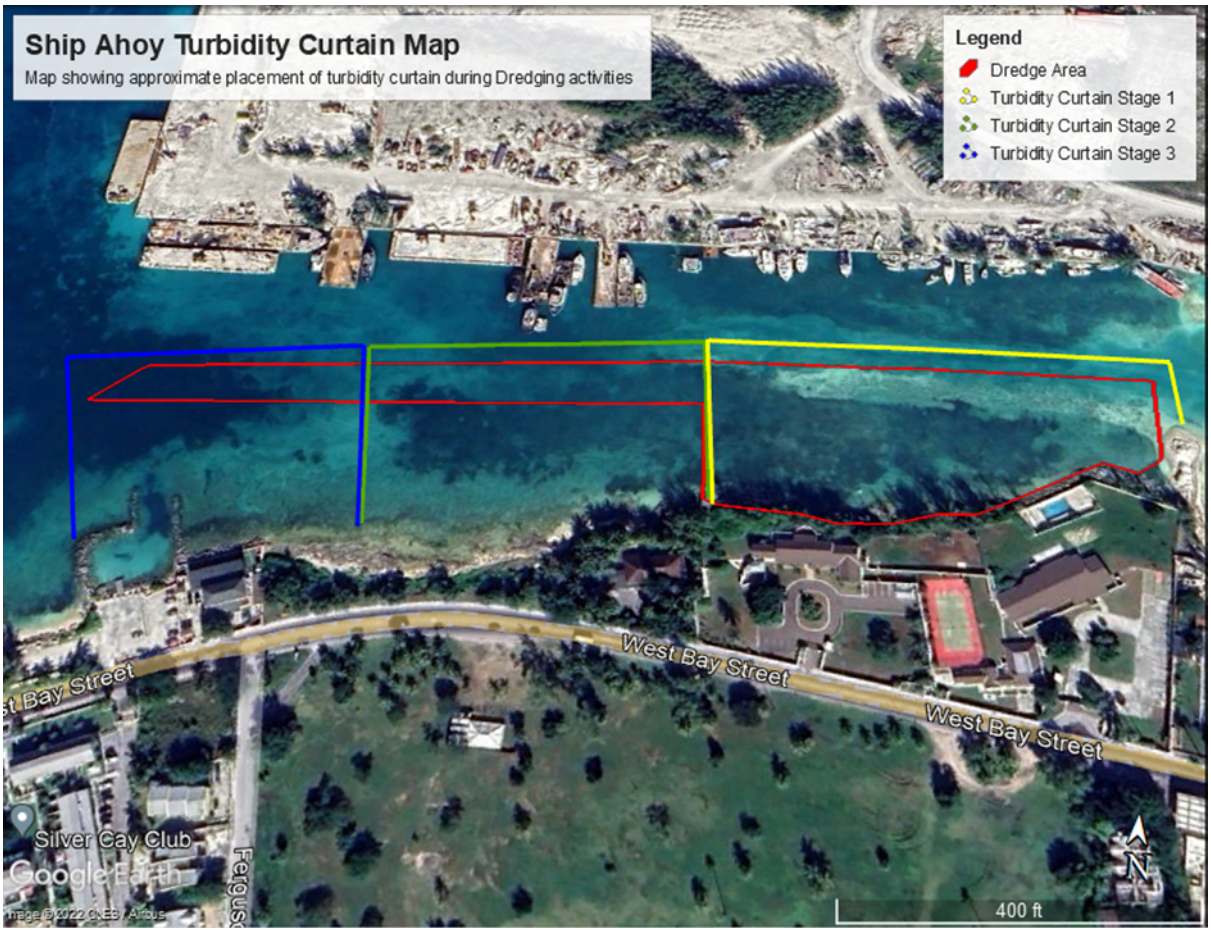


Figure 4: Turbidity curtain placement map.

8.1.1.1.2 Curtain Maintenance

Curtains are to be inspected prior to and during 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, the turbidity curtain should be approximately 1 ft above the bottom.
- Marine growth or accumulated debris on connectors and buoys will be cleaned if necessary.
- Damage or tears to the sediment curtain itself.
- Signs that the weather is changing. Turbidity Curtain should not be left out during extreme weather conditions or hurricanes.

8.1.1.1.3 Turbidity Monitoring

The major impact to the marine environment would be turbidity caused by dredging activities and installation of the timber dock pilings. During construction, necessary mitigation measures will be implemented around the project site and near the shoreline to reduce turbidity. The baseline turbidity reading will be taken closer to project commencement. The construction activities are not expected to exceed 29NTU which is a holding point for activities. Daily environmental management and monitoring will be conducted by Janeen Bullard. Turbidity monitoring will be conducted during activities to ensure that turbidity does not exceed 29NTUs (see Appendix B-6 for Turbidity Report Form). Turbidity monitoring should be conducted upstream (500m from work area) and downstream (500m from work area) or visible turbidity plume area. Turbidity reading should be conducted daily, twice per day.

Although turbidity is not expected to reach or exceed the 29 NTU mark, all in-water activities, will be measured. Monitoring should also be done at any signs of turbidity, regardless of activity. The first effort will be to limit the amount of turbidity generated due to the activity as much as possible. Contractor will monitor weather conditions to ensure that work cease during unfavorable weather conditions.

8.1.2 Waste Management Plan

The purpose of the waste management plan is to clearly define the controls that will be used to manage all waste generated on the Ship Ahoy Marina project site. Implementing this plan will help to ensure protection for human and environmental health and protect ground water supply which is of great concern on this project site.

This plan will detail the management process for the various waste streams associated with the construction phase. The goal is to ensure that the site employs waste reduction and recycling practices to reduce, re-use where possible and recycle where feasible. The plan requires cooperation of all employees and visitors on site. Details of this plan will be communicated to all persons entering the site.

Waste Materials should be classified into waste streams and considered for reuse or recycling before being removed and disposed of at local dump site. Communication with the public is important to reduce the construction debris going into dumpsite as materials such as scrap wood, concrete and glass etc., can be repurposed.

Site Preparation

During the initial stages of the site prior to construction, designated locations for storage of materials should be laid out. All material, if possible, should be stored in an area free from obstruction and with means to cover the material from the elements and to reduce any potential runoff pollution.

Types of Waste

The construction phase will create a wide range of waste some more harmful to the environment than others. It's important that all subcontractors are aware of the different types of waste and disposal methods on site. Some examples of the waste generated due to construction are:

- Non-Hazardous Waste – Wood, Glass, Plastic, Paper, Food etc.
- Hazardous Waste – Adhesive, Aerosol Cans, Paint and Paint Thinners, Solvents, Concrete, Lightbulbs, Batteries, etc.

Waste Management Controls

Efforts to control any risks associated with the waste should start at the site to ensure protection for human and environmental health. This will be of huge benefit when transporting to NPEP and managing the types of waste created.

Storage Collection and Disposal

Waste bins should be strategically positioned around the site and designated for different waste generated. This will ensure that waste material that can be recycled remains clean and will reduce the need for sorting. Each bin should be numbered to help with identifying each bin's purpose and monitored to ensure compliance from subcontractors.

Contractors and subcontractors are responsible for collecting and disposal of the waste generated from their work activities. They should be made aware of the disposal policies and procedures on site as well as location of bins for appropriate waste material. Once containers are full, they should be handled based on their contents and promptly transported to NPEP to prevent over filling and returned to location. Bins should be checked for any leaks or damages before being utilized again.

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, that is secure and protected from weather until waste bin 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 by a licensed contractor. Toilets must be located more than 150ft from the edge of the open water.
- 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.

The Construction phase will create a lot of debris that will then be directed to the dumpsite/landfill. This will include general waste, construction debris, as well as hazardous waste. Reducing the debris deposited into the landfill is of high priority. Table 4 below will show proposed handling procedures for the various waste.

Table 4: Handling procedure for various waste on The Project *site.*

Material	Waste Form	End of life option	Handling Procedure
Clean Wood scrap	Solid	Recycled	Reused on site.
Concrete	Solid	Recycled	Crushed and used as fill.
Scrap Metal	Solid	Recycled	Responsibility of subcontractor. Stored in separate area covered until disposed.
Other wastes (Human generated, office generated)		Landfill	Stored in appropriate containers until disposed of in landfill.

Residual waste

Waste that cannot be disposed of by usual means (e.g., old tires or contaminated waste). Unused Equipment, spare parts or discarded parts should be identified, dated, logged, and stored away in a safe location away from the public. The future need for these materials should be assessed and if not necessary for future work, arrangements for removal from site.

Hazardous Waste

All work must be completed in a manner that ensures water quality standards are maintained. Hazardous materials such as concrete, paint, solvents and other chemicals may be high in pH and are considered harmful; therefore, there shall be no contact with open water through spillage, hosing off surfaces, rain, cleaning of tools or concrete washout. Hazardous materials will be kept in a covered storage location to prevent the potential for mixing with water and substances being released into the environment. A concrete and equipment washing site will be bunded, lined to contain any concrete and chemicals. All accepted washing locations must be cleaned up prior to demobilization. Any excess material shall be removed upon project completion and disposed of at NPEP.

Any waste that falls into the category of hazardous should be collected immediately after being generated and stored safely in a designated area until removal and disposal is arranged. That area should be free from obstruction, structural defects, and only used to store hazardous waste. Appropriate signage should also be used to depict hazards in the area as well as a no smoking sign. All hazardous liquid waste should be in approved containers and stored on spill containment pallets. This area should be monitored, and

access limited.

For all waste that will be referenced as e-waste ex. electronic devices, careful consideration will be given to prevent any potential toxic materials from being released into any nearby bodies of water, soil and air. E-waste is hazardous and should also be stored in the hazardous waste area until disposal methods are arranged.

See the Hazardous Waste Management Plan (Section 9.2) for more details.

Site Inspections

Weekly routine inspections by the contractor should occur to assist with the management of waste on site. It's important to track and plan, if possible, for the creation of construction debris. This can help mitigate any potential fire hazards or environmental risks on the site. Monitoring of the bins and the hazardous waste disposal area should be given special attention.

8.1.3 Noise and Light Control Plan

Noise and light disturbances due to construction activities need to be managed to reduce the impacts to the surrounding areas and wildlife. Contractors should be aware of and identify any sources of noise or light disturbances and train all on-site workers to be aware of noise or light issues and how to minimize disturbances where possible. The level of noise, light and dust from construction plant operation shall be periodically assessed by the Contractor and the Owner in relation to the significance of potential disturbance.

Noise

The Contractor will maintain equipment in good order so as to minimize extraneous noise. The general rule shall be that construction operations shall be restricted to daylight hours between 0700 hrs and 1900 hrs. Where there is a reason to work outside these hours to speed up the progress of works, local communities will be given advance notice and specific requests will be reasonably accommodated. Any complaints from local communities concerning noise shall be reported to the Owner and steps taken wherever possible to conform to local wishes, for instance in relation to the specific timing of activities.

To manage noise impacts during construction hours, contractors shall utilize accepted noise control techniques, such as:

- Maintaining equipment in good working order.
- Implement the use of best available control technologies to reduce noise such as mufflers and silencers.
- Implement a speed limit to slow vehicles and limit noise generation
- Turn off idling equipment when not in use.

Light:

If construction is to occur during hours when enough daylight is not available, and lighting of the work area is required, the Contractor is expected to manage excess lighting and glare by:

- Strategic placement of lights away from residential areas,
- Tilting lights downwards, and
- Using shielding to restrict the glare of lights.

8.1.4 Air Pollution Plan

Dust control is detailed in the sediment control plan. Minimization techniques to be implemented include:

- Spray stockpiles, roads and other surfaces as necessary with water to reduce dust generation.
- A water truck will be employed, as required, to dampen work areas, exposed debris and stockpiles to prevent the emission of excessive dust from the site.
- The access road will be periodically maintained to ensure they are free of debris.

Air-borne pollution

The minimization of air-borne pollution is a key component for environment management of the site. Construction phase air quality impacts shall be minimized or avoided by incorporation of air quality control measures. The installation and application of air quality controls during the construction phase shall be in accordance with the following principles:

- All equipment used and all facilities erected on site are to be designed and operated to control the excessive emission of dust, fumes and any other air impurity into the atmosphere;
- Contractor/subcontractors will maintain all construction equipment to reduce exhaust emissions;
- The Engineer will visually monitor levels of dust deposition and air quality, the effectiveness of dust emission controls and the construction site and the impacts of any nuisance on adjoining properties.

8.1.5 Traffic Management

Development of the Ship Ahoy Marina will result in an increase in commercial traffic (mainly large trucks) to and from The Project site. This traffic management plan objectives are to minimize the impact on the public road system and establish protocols for vehicle and pedestrian movement within the site boundary. This will be achieved by identifying clear control parameters on site, such as flagman and signage, and establishing/maintaining routes for personnel and vehicles. The Contractor is responsible for the execution of this plan.

To prevent roadway obstructions, trucks hauling materials will be covered and the Contractor will be responsible for inspecting all vehicles for dirt prior to their leaving the construction site. Dirt, soil and rubble likely to be dislodged during transit will be removed from trucks and other vehicles prior to leaving site either through construction of a wheel wash or vehicle wash down area near the site exit.

Traffic management on the site will include:

- Designated haul routes for commercial vehicles;
- Maintenance of low speeds for driving on site;
- Only authorized personnel should operate heavy construction machinery;

- Traffic control/signage on site and on the road directly in front of the project site during times of heavy commercial vehicle and/or heavy equipment traffic to prevent accidents with private vehicles;
- Wheel wash or vehicle wash down are near/at site exit;
- Regular cleaning of roads;
- Securing the site (e.g., fencing) to prevent pedestrians from traversing the site and to protect adjacent vegetation from damage;
- Ensuring all workers wear high visibility vests so that drivers of commercial vehicles and heavy equipment can see them; and
- Training all workers in traffic hazards on site in an effort to avoid injury and loss of life.

It will not be necessary to close major lanes as the activities are not occurring on or within roadways. However, due to transporting dredge material from site there will be frequent entering and exiting of trucks to the main road there will be impacts to the flow and speed of traffic. Traffic cones and a flag man will always be used to ensure the safety of drivers, pedestrians, and construction employees alike.

Due to The Project site being relatively small and the lack of upland works, there is no need for pedestrian-only routes and vehicle-only routes. Workers should remain vigilant around moving vehicles and when walking throughout the site. All heavy moving equipment should have a flagman or banksman to help prevent accidents and injuries on site.

Once construction commences, the public will be advised of instances of inconvenience or disturbance, such as changes to traffic routes and times of excessive noise. Signage will also be utilized on and near the site to advise of traffic diversions and active construction areas. At least one sign needs to include information about the onsite contractor inclusive of a telephone number and email address for contacting them. Contact information will also be provided for DEHS, DEPP and Ministry of Works.

9.0 Emergency Response Plans

9.1 Fuel Spill Plan

The Spill Response Plan was developed for the use of all contractors and sub-contractors, to prevent and control any spillage associated with project in accordance with Environmental, and Health and Safety regulations. The Fuel Prevention plan is located in Appendix C.

9.2 Hazardous Waste Management Plan

This plan outlines best management practices for handling hazardous materials that may be found or generated on site. Protection of ground water, open water and any other sensitive environments is of most importance.

All hazardous materials brought to the project site should be accompanied by material safety data sheets (MSDS). These sheets detail proper handling, storage and disposal techniques for use of hazardous materials as well as proper treatment if persons are

exposed to the materials. All MSDS should be accessible to staff who will be in contact with or using the hazardous materials, so they understand how to safely use them.

Good Housekeeping

- Only necessary material required to do the job will be stored on site.
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used before disposing of the container.
- Manufacturers' recommendations for proper use and disposal will be followed.
- The Site Superintendent will inspect the site daily to ensure proper use and disposal of materials onsite.

Hazardous Products

The guidelines below should be followed when handling hazardous material:

- Products will be kept in original containers unless they are not resealable.
- All hazardous material will be stored with the original labels and material safety data sheets for important product information.
- The manufacturer or local recommended methods will be followed if surplus product must be disposed of.
- All containers for chemicals and lubricants used on site shall be stored in trays of steel or other approved materials of appropriate volume to reduce the chance of a spill.
- All hazardous products should be disposed of by a licensed contractor. A receipt should be produced and attached to the hazardous waste reporting
- form (Appendix B-2).

Petroleum Products.
All vehicles will be monitored for leaks before being brought on site and receive regular preventive maintenance to reduce the chances of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

Paints, thinners, solvents etc.
All containers will be tightly sealed and stored when not required for use. Excess paint and other chemicals will not be discharged to the storm sewer system, the sea, the ground or any natural water body, but will be properly disposed of according to manufacturer's instructions or local regulations. The contents of used chemicals will be transferred to a sealable plastic bin if the can cannot be resealed to avoid spills.

Concrete Washout
Concrete trucks and equipment used during concrete works (like concrete bucket or

tremie and tremie pipe) will be required to wash out or discharge surplus concrete or drum wash water into a wash out pit. The construction and maintenance of the pit overseen by the Site Superintendent. The wash out pit should be enclosed and lined and will be designated in an area that does not receive significant runoff and does not drain directly into a storm water network. Upon the completion of the project, this area will be cleared of the concrete and the site restored. All accepted washing locations must be cleaned up prior to demobilization. Any excess material shall be removed upon project completion and disposed of at NPEP.

Emergency Contact

If there is a major Spill of hazardous materials, call the following agencies:

- Fire Department (should fire be possible) 911
- Department of Environmental Health Services 322-8037 or 322-2295
- Department of Environmental Planning and Protection 322-454

9.3 Health and Safety Plan

The Site Engineer (SE) will be designated as the site Health and Safety Officer (HSO) and the Foreman as acting Health and Safety Officer in SE absence. Basic first aid training of these persons shall be required. There shall always be a fully equipped first aid box at all work sites and a list of local emergency telephone numbers in case of accident (See Appendix D: Emergency Response Plan). Minor and major accidents shall be recorded (See Appendix B-1: Incident Report Form).

All construction personnel involved in the work will observe the following basic working rules, amongst others:

- Relevant Personnel Protective Equipment (PPE) will be issued and used prior to the commencement of the work;
- PPE shall be worn at all times on site with exception of the dedicated safe area(s) and welfare facilities;
- Proper training and induction in the various roles for the type of activity will be performed;
- Experienced and active supervision will be in place at all work times.

The contractor shall ensure that all staff, including subcontractors, undergo safety training and inductions. These training events will educate workers on the best practices for working (to include but not limited to):

- Working near water
- With hazardous materials
- In confined spaces
- With heavy equipment
- Emergency Procedures
- Lifting operation and lifting equipment
- Plant, vehicle and equipment – checking procedures
- Site / road traffic rules and requirements
- Site security arrangements
- Vehicles – safe driving practices and checklists

Tool Box Talks

At the HSO's discretion regular "Tool Box Talks" will be conducted after the initial site induction. The toolbox talks will include information on some or all of the topics listed above depending upon the site-specific conditions: -

A tool box talks form / site induction register form shall be completed for each talk and shall contain the following information: -

- Supervisors Printed Name & Signature
- Date
- Site/Project Name
- Topics of Talk
- Printed name and signature of each operative attending

Site Rules

Site-specific rules will be posted within the canteen / office and copies will be given to all personnel working on the site. They will contain, for example, details of No Smoking requirements, dress code, PPE requirements, emergency arrangements etc.

Use of Personal Protective Equipment (PPE)

Personal protective equipment (PPE) shall be worn in areas designated for their use. At least the following PPE should be worn to execute the works:

- Hi-Viz Vest
- Safety Shoes
- Hard Hat
- Googles/safety glasses
- Gloves
- Life Jacket

The indicated PPE must be always worn. Certain exclusions to be made only when sitting inside equipment.

Life Jackets must be worn when working within six (6) feet of open water where no sufficient handrail or edge protection is present. When accessing/egressing a vessel the use of life jackets, lifelines/rings, and a safety boat is required. At all times work sites shall be maintained in an orderly, safe, and tidy state. Precautions against fire accidents shall be taken and appropriate fire safety equipment supplied and clearly indicated at work sites.

Site Inspections

The Site Engineer/Safety officer will inspect sites for compliance with approved working methods and contractual requirements. The Bahamas labour laws, and occupational health and safety policies shall always be applied.

The emergency assembly site should be identified before works begin and relayed to workers on site during induction and toolbox talks. In case of any emergency the staff will meet in this area, away from any buildings and near the site exit for easy evacuation.

9.4 Emergency Response Plan

Emergencies associated with the project may include fires, explosions, storms, accidents and malfunctions. The Emergency Response Plan is detailed in Appendix D.

9.5 Hurricane Preparedness Plan

The Hurricane Preparedness Plan serves the purpose of a guideline for contactors before, during and after the hurricane, while providing background information, it is detailed to ensure minimum damage and shutdown time. Hurricane season runs from June 1st to November 30th each year.

The following notifications determines the actions to be implemented:

- Hurricane/Tropical Storm watches mean that a hurricane or tropical storm is possible in the specified area.
- Hurricane/Tropical Storm warnings mean that a hurricane or tropical storm is expect to reach the area, typically within 24 hours.

The Project Manager (PM) will stay tuned to weather alerts via radio, TV or social media and evacuate as soon as local authorities give the word. Before storm season the PM needs to learn your community's, emergency plans and the location of nearby shelters so employees have a safe place to go if they cannot leave the island.

The contractor is required to prepare before a severe weather event. The PM and Healthy and Safety Officer (HSO) will ensure all equipment are secure and cover incomplete structures, stockpiles or loose material before a storm.

Some or all the following hurricane preparation materials and equipment be made available if required:

- Concrete Anchors
- Duct Tape
- Garbage Bags
- Generators
- Ground Anchors
- Fuel
- Misc. Hardware and Fasteners
- Netting
- Plastic Sheeting
- Plywood
- Pumps
- Rope
- Sandbags
- Shoring and Bracing
- Water
- Wire

There are to be hard copies of contact lists, plans and other important documents kept in a safe place. These documents should include:

- Emergency contact information for all employees.

- List of hurricane preparation materials, equipment, and their sources.
    - The Ministry of Social Services and Urban Development Department of Social Services Islands of the Bahamas 2022 Official Hurricane Shelters Document include:
        - Epworth Hall, Ebenezer Methodist Church (use of Homeless and People with Physical Disabilities) - Shirley Street
        - Grants town Seven-Day Adventist Church-Wellington Street
        - Pilgrim Baptist Temple- St. James Road
        - Rev. Dr. O. A. Pratt Educational Building - Augusta and Meeting Street
        - St. John's Native Baptist Church - Augusta and Meeting Street Samuel and Cornella Williams Community Centre – Meadow Street
        - The Salvation Army - Meadow Street
        - The Salvation Army- Mackey Street
    - The Hurricane shelter list will be updated once of 2023 Official Hurricane Shelter list is made available.
- Procedures to follow in the event of exposed electrical wires, hazardous material leaks or structural damage.

The PM, HSO/Site Engineer (SE) are to monitor the weather closely once a Tropical Storm Watch is issued. Both local and international weather services should be monitored for accurate information and provide updates to staff.

Once the National Weather Service issues a Hurricane Watch, it is time to secure structures, material and equipment on the job site for the storm by implementing the following actions:

- Use rope, sandbags, ground anchors and other items to weigh down materials that could easily fly away.
- Cover materials with plastic sheeting, netting, or garbage bags to prevent water damage.
- Stack loose materials together and secure them with rope or duct tape to keep them from dispersing.
- Complete work on partially completed structures to minimize damage if time allows.

After a Hurricane Warning is announced the following actions should be implemented:

- Loose materials or expensive equipment should be moved or secured.
- Construction dumpsters should be picked up or covered with tarp.
- Remove or tie down portable bathrooms.
- Remove hazardous chemicals to prevent them from being released into the environment.
- Remove materials, tools or equipment that can be damaged by rising water.
- Move heavy equipment and machinery to a garage or other covered structure.
- Tear down and store light-weight fence screens and job site signage.
- Move any portable electronics, job site plans and other important documents from the construction trailer to a safe location offsite.
- Turn off power to the site and make sure fuel is available for power generators.
- Board up door and window openings.

- Tarp or board up any other large openings.
- Place sandbags around the perimeter of structures as reinforcement.
- There will be no staff left on site during hurricane events.

Once all clear has been given after a storm the PM and SE may return to the site to assess damages and determine cleanup efforts. Upon returning to site the following steps are to be taken:

- Be careful when walking in standing water, which may contain sharp or jagged objects.
- Use caution when entering any buildings because structural elements may be weakened.
- Rent a dumpster to safely dispose of materials that were damaged by the storm.
- Plan to remove water. During a hurricane, water will inevitably flood your work site. Removing it is important for the safety of your property and neighboring structures. Standing water can soften the ground, compromising structural stability.
- Have dehumidifiers and fans available to dry out the space.
- Discharge water to the storm water system or into the deep wells.

The construction hurricane plan should be communicated to staff prior to the start of hurricane season and a at the briefing held by the PM once it is determined that severe weather is eminent. Hurricane preparedness is essential for a safe construction site.

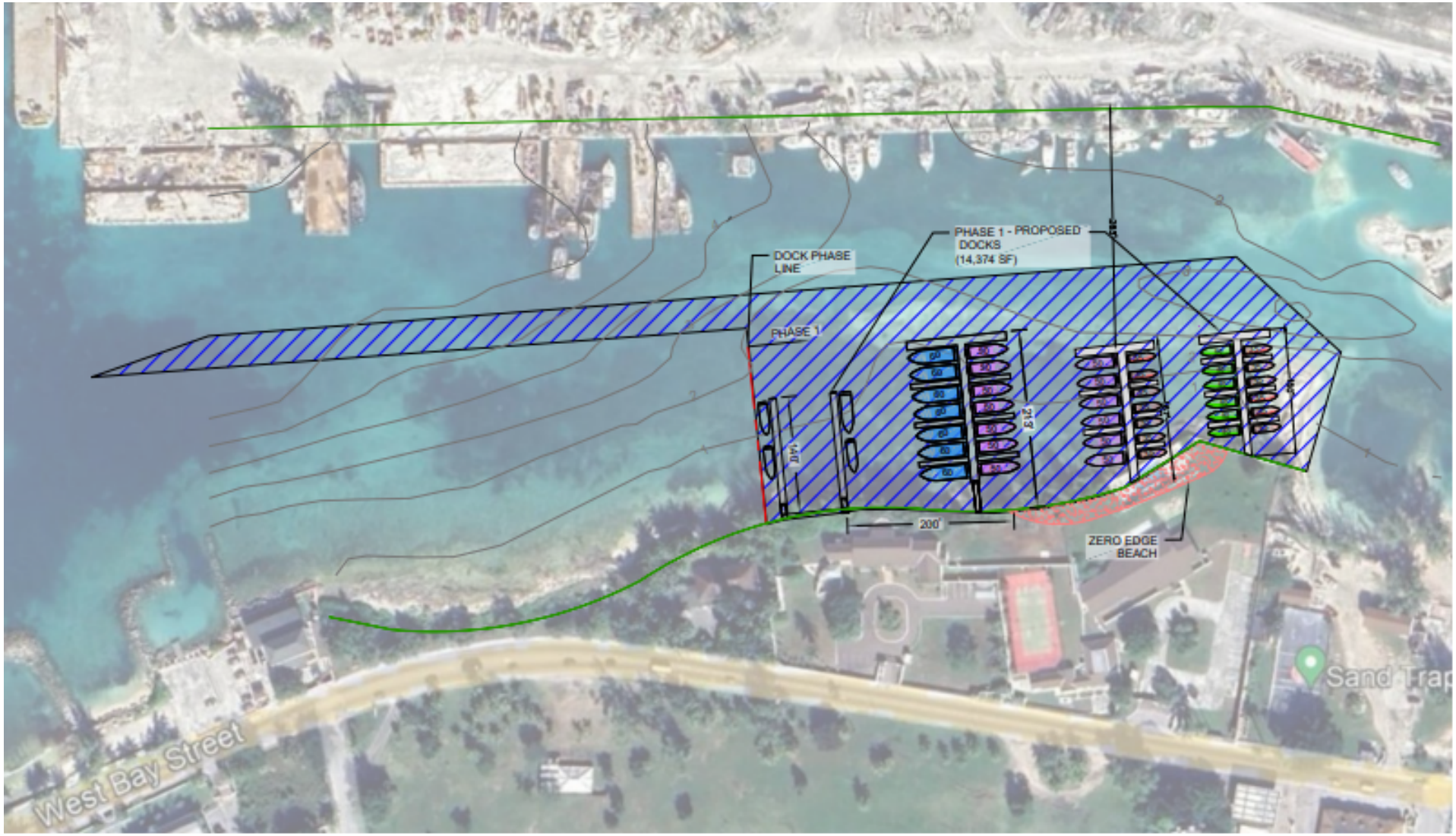
The weather will be monitored by the PM and SE/HSO on a regular basis to determine site conditions. During heavy rain events site works will be stopped and commenced once weather conditions remain favorable. This includes the presence of lightening within five (5) miles of the site.

10.0 References

Ship Ahoy Marina Marine Assessment, JSS Consulting. (2022).

APPENDICES

Appendix A: Project Conceptual Plan



Appendix B: Draft Monitoring Documents

Appendix B-1: Incident Report Form

JSS CONSULTING Environmental Consulting Services	**Incident Report Form**		
Date of Incident:		**Time of Incident:**	
Type of Incident (mark 'X' next to appropriate option below)			
Chemical Spill	Excessive air emission	Sediment	Health & Safety
Sanitary Spill	Vegetation Damage	Flood	Excessive Noise
Excessive Odor	Waste Management	Fire	Fauna Injury
Details of Incident:			
Response to Incident:			
Measures to prevent reoccurrence:			
Name:		Position:	
Signature:		Date:	

Appendix B-2: Hazardous Waste Report Form

JSS CONSULTING Environmental Consulting Services **Hazardous Waste Report Form**	
Date of Incident:	**Time of Incident:**
Reporting's Party Name:	
Position:	
Address/Island:	
Phone:	
Description of Hazardous Material (including name and any unique formulas identifiers (UFI's for the containers):	
Weight or volume of material disposed of:	
Location where material was collected:	
Location where material was disposed of:	
Summary of disposal methods:	
Name of Licensed Contractor:	**Position of Licensed Contractor:**
Signature of Licensed Contractor:	**Date of Disposal:**

Appendix B-3: Environmental Monitoring Checklist

Environmental Monitoring Checklist

Site description:	Location:	Weather Conditions:
	GPS Coordinates:	

1	Site Safety and Health	YES	NO	Comments/ Prescribed Corrective Actions
a	Is personal protective equipment used appropriately?			
b	Are there proper safety requirements for work sites near water?			
c	Are there proper safety requirements for works at heights?			
d	Are open pits secured with caution tapes and or cones?			
e	Is there adequate fresh drinking water available?			
2	**Waste Management**			
a	Are appropriate waste storage containers being used and properly labelled?			
b	Are litter bins conveniently placed throughout the site?			
c	Is waste collection needed?			
d	Is hazardous waste separated in laydown area?			

e	Are there solid waste ticket receipts for landfill disposal of onsite waste?			
3	**Air Quality Management**			
a	Are speed restrictions of 15mph adhered to?			
b	Are equipment properly maintained to reduce emissions?			
c	Are dust suppression mechanisms implemented?			
4	**Material Storage**	**YES**	**NO**	**Comments/ Prescribed Corrective Actions**
a	Are material in storage area secured to prevent airborne debris?			
b	Are fill stockpiles located more than 100 feet from open water?			
c	Is silt fencing installed around the perimeter of fill stockpiles?			
5	**Groundwater Management**			
a	Is refuelling on concrete apron or lined fuel pad in case of spillage?			
b	Are fuel and oil storage on concrete apron or lined containment pad in case of spillage?			
c	Are fuel and oil storage containers free from leaks or signs of corrosion?			
d	Is there adequate secondary containment for fuel and oil storage units?			

e	Are secondary containment covered to prevent ingress of rainwater?			
f	Are mobile machine repairs and maintenance on concrete apron or lined containment pad in case of spillage?			
g	Are all mobile machinery in use free from engine lubrication and oil leaks?			
	Is spill response equipment on site and easily accessible?			
h	Is cement storage on concrete apron or lined containment pad?			
i	Is concrete washout established and appropriate with liner installed?			
j	Are there any excavations with exposed groundwater?			
k	Is fuel and oil storage a minimum of 100 feet from any excavations with exposed groundwater?			
l	Is refuelling operations a minimum of 100 feet from any excavations with exposed groundwater?			
6	Portable Potties/Restroom facilities	YES	NO	Comments/ Prescribed Corrective Actions
a	Are facilities conveniently located?			
b	Are units clean and stocked with supplies?			

c	Are there proper disposal bins for feminine sanitary waste?			
d	Are the units on concrete apron or lined containment pad in case of spillage?			
e	Are units a minimum of 100 feet from any excavations with exposed groundwater?			
f	Are units a minimum of 100 feet from waterbody?			
7	Protection of Waterbodies & Sediment Control			
a	Is silt fencing adequately placed, properly installed and maintained?			
b	Are turbidity curtains adequately placed, properly installed and maintained?			
c	Is there any turbidity observed outside turbidity curtain containment area?			
d	Is there any oil or grease observed?			
e	Are there poor water quality indicators, i.e. algae growth, dead marine life?			
f	Is fuel and oil storage, a minimum of 100 feet from waterbody?			
g	Is refuelling operations a minimum of 100 feet from waterbody?			
h	Is there any plastic or other solid waste in water?			
i	Is marine organism spotter in place prior to marine work?			

8	Vegetation	YES	NO	Comments/ Prescribed Corrective Actions		
a	Has protected trees been maintained or relocated?					
b	Are invasive species removed?					
c	Is native vegetation used in landscaping?					
d	Is there build-up of dust on vegetation?					
9	**Noise**					
a	Is there excessive noise on site?					
Inspected by:			**Signature:**			
Date:						
I, the Contractor's Representative, have read, understood, and affirm to the conditions and remarks cited by the above Environmental Manager.						
Name:			**Signature:**			
Date:						

Appendix B-4: Monthly Environmental Report Template

MONTHLY ENVIRONMENTAL REPORT TEMPLATE

- **1.0 OVERVIEW**

Indicate report period and construction activities during period.

- ***2.0 SITE INSPECTION***

Summarize observations made during site inspections for each monitoring parameter indicated on the site inspection sheet. Include site inspection sheets for the period as an appendix to this report.

- ***3.0 REPORTS &COMMUNICATION***

Provide details on reports submitted during this period including and NCR, Incident Report, Fuel Spill Report, Turbidity and Grievance Monitoring Reports. Attach copies of reports as an appendix to this report.

Summarize communication with relevant agencies including Department of Environmental Planning & Protection, Department of Environmental Health, Department of Marine Resources and Incidents logged into the BESTPROTECT242 APP.

- ***4.0 MEETINGS***

Record any meeting during this period where environmental management matters were discussed including construction progress meetings, meetings with the contractor to address specific environmental matters and meetings with government officials. Minutes of meeting should be included as an appendix to this report.

- ***5.0 TRAINING***

Provide details on all training exercises conducted during this period including site inductions and toolbox talks. Register of individuals undergoing training should be included as an appendix to this report.

6.0 STAKEHOLDER ENGAGEMENT

All stakeholder engagement activities during the period should be included and the update stakeholder engagement log attached as an appendix to this report.

Appendix B-5: Noncompliance Report Form

Non-Compliance Report Form

SECTION 1: COMPLETED BY THE ENVIRONMENTAL MANAGER

NCR No.	**Specific:**
Contractor:	
Activity:	☐ Site Safety
Non-Compliance: ☐ Environment ☐ Health &Safety	☐ Groundwater Management
Details:	☐ Sediment Control
	☐ Vegetation
Details of Nonconformance observation (Attach photos on separate page)	☐ Marine Environment
	☐ Waste Management
	☐ Air Quality
	☐ Other

Recorded by:	
Signature:	Date:

SECTION 2: COMPLETED BY THE CONTRACTOR (*returned to Environmental Manager)*

Contractor's response, intended method and date of repair

SECTION 3: CLOSE OUT

Correction Completed and Report Closed Out:

Environmental Manager		Date:	
Contractor's Representative		Date:	

Appendix B-6: Turbidity Report Form

Turbidity Report Form

Project:							
Date:			**Recorder:**				
Sample 1							
NTU Reading:					Time		
GPS Coordinates:		Latitude			Longitude		
Weather Condition							
Clear	Y/N	Partly Cloudy	Y/N	Cloudy	Y/N	Rain	Y/N
Tide	High Time:				Low Time:		
Wind Speed (mph):			Direction				
Project Activity:							
Sample 2							
NTU Reading:					Time		
GPS Coordinates:		Latitude			Longitude		
Weather Condition							
Clear	Y/N	Partly Cloudy	Y/N	Cloudy	Y/N	Rain	Y/N
Tide	High Time:				Low Time:		
Wind Speed (mph):			Direction				
Project Activity:							
Sample 3							
NTU Reading:					Time		
GPS Coordinates:		Latitude			Longitude		
Weather Condition							
Clear	Y/N	Partly Cloudy	Y/N	Cloudy	Y/N	Rain	Y/N
Tide	High Time:				Low Time:		
Wind Speed (mph):			Direction				
Project Activity:							
Environmental Manager Name:							
Environmental Manager Signature:							

Appendix C: Fuel Spill Prevention Plan

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 to prevent the likelihood of spill event:

- The Health and Safety Officer (HSO) will provide training to 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/oil absorption 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. No fuel will be stored on site.
- Provision of secondary containment, drip trays or other overflow and drip 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 workers to identify preliminary hazards.
- SOPs will be adhered to for chemical transportation, unloading, transfer, storage if required, and 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 kit's 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 can handle 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 workers on site.
- All spills will be reported to appropriate management workers.

SPILL RESPONSE PROCEDURE & COMMUNICATIONS

The Spill Response Procedure describes what to do when you see a spillage occur (See Appendix C-1: Spill Report Form Below.)

The Project Manager (PM) is responsible for notifying the Environmental Manager (EM) immediately on the discovery or notification of a spill, then Emergency arrangements are made, and communication lines are established with relevant agencies and authorities.

The PM is to ensure that employees on the project are aware of the emergency telephone numbers, addresses, and response procedures. Furthermore, the PM ensures, either via the local agent or direct, that Department of Environmental Planning and Protection (DEPP) and the local authorities are made aware of the existence of the project. ALL spills are to be reported to the DEPP.

WHEN YOU SEE A SPILLAGE OCCUR

1) Check
   a. type of spillage (fluid / solid)
   b. estimate quantity
   c. spillage continues (If Yes, Take 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 Yes, ask for assistance / if No proceed)
2) Ask for assistance
   a. when possible, start spillage recovery
3) nform 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 / 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 workers-**immediately**
   a. To stop and / or take over activities
   b. To start spillage recovery
4. Inform Project manager, Environmental Manager **Within 1 hr.**
5. Tactic Meeting with key workers

Project Manager or Project Environmental Manager:

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

EMERGENCY RESPONSE EQUIPMENT

In the event 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):

- 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 facility or to a location approved by the Department of Environmental Health Service (DEHS) and/or New Providence Ecological Park (NPEP).

SPILL REPORTING PROTOCOL

Step 1: All workers on the work site and assigned to the project will be responsible for implementation with the PM and EM providing coordination of efforts. A report will be generated by the Contractor and disseminated to relevant parties including DEPP.

<u>Emergency Contacts:</u>

Project Manager
TBD

Environmental Manager
Janeen Bullard
357-9262

Director of DEPP
Rhianna Neely-Murphy,
322-4546

Department of Environmental Health Services
Anthony Ryan
557-0379

Step 2: When contact is made with the above individuals, report the following information (See Appendix C-1: Spill Report Form):

- 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 Project Manager, the reporter will communicate the above information to him/her as soon as possible. From that point forward, the Site 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 Contractor will contract with (or consult) a private company to conduct any clean-up. Disposal of the pollutant and/or pollutant contaminated material will be in a manner and location as approved by the DEHS and/or NPEP.

Appendix C-1: Spill Report Form

Spill Report Form

Reporting Party's Name			
Address/City/State:			
Phone:			
Responsible Party's Name:			
Address/City/State:			
Phone:			
Date of Spill		Time of Spill:	
Location:		Product spilled:	
Estimated Quantity		Discharge stopped or contained?	Y/N
Source or cause of Spill:			
Action Take:			
Injuries/fatalities/evacuation			
Environmental Damage:			
List of equipment used:			
Disposal site/facility for used absorben			

Spill Notifications

Organization	Phone Number	Time Contacted	Case Number
Fire Department			
Spill Response Contractor			
Department of Environmental Planning and Protection			
Department of Health Services			

Preventative actions taken

**Note: Please attach a map of spill location

Appendix D: Emergency Response Plan

This Plan is designed to address the most likely emergencies which will occur on site due to construction activities**.**

1.0 Purpose

The purpose of this Plan is to coordinate the response of the workers to a situation that may risk the safety of workers, the general public, the community and the environment. It should be noted that, where applicable, any National Emergency Response Plan will supersede this plan. The Contractor should anticipate and prepare in general for the following scenario:

- Serious personal injury/fatality,
- Road traffic accident,
- Fire or explosion,
- Bomb threats,
- Spillage of fuel or hazardous substance,
- Severe weather conditions (Hurricanes, Tropical Storms, Tornadoes, Floods),
- Loss of utilities,
- 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.

2.0 Roles and Responsibility

A select group of individuals will form an Incident team, which will respond to all emergency and disaster situations. This team should comprise of the Project Manager (PM), Site Engineer (SE), Foreman, Health and Safety Officer (HSO), Environmental Manager (EM)/Environmental Monitor (EMO) and if necessary, relevant Government Agencies.

The Incident commander (IC) is the highest-level administrator and will report to all emergencies. In the event of an emergency requiring the assistance of Government agencies, the Government representatives will assume the responsibility of the IC. For situations which do not require Government agency involvement, the IC will be the Contractor's representative for the project or the PM. The IC is also responsible authorizing reentry into a site in the event of an evacuation and for ensuring that an incident reporting form (See Appendix B-1) is completed for every incident on site as described in this Emergency Response Plan. Copies of completed incident reporting forms should be kept on site and made available to Government officers if requested

during an inspection. Any incident reporting forms should be submitted along with monthly environmental monitoring reports submitted to the Department of Environmental Planning and Protection (DEPP).

Site managers/supervisors will maintain a current list of workers and their contact information. Site managers are responsible for evacuating staff of any affected areas as necessary and to account for all staff.

3.0 Incident Procedures

The Contractor and all Subcontractors shall maintain a current list of personnel and their contact information on site. This list will be made available to the IC upon request.

The following terms and corresponding emergency contact numbers must be used to report or declare an incident.

Emergency Agencies

Fire Department – Tel. 911
Ambulance Department – Tel. 919
Police Department – Tel. 911
Princess Margaret Hospital – Tel. (242) 322-2861
Doctor's Hospital – Tel. (242) 302-4600

Administrative Agencies

Port Department – Tel. (242) 326-7354
Bahamas Power and Light – Tel. (242) 302-1000 or (242) 323-5561 thru 4
Bahamas Power and Light – Tel. (242) 325-0505 or (242) 325-4504 (24 hours)
BTC Telephone Repairs – Tel. (242) 225-5282
Water and Sewage Corporation – Tel. (242) 302-5500
Department of Environmental Planning & Protection – Tel. (242) 322-4546
Department of Environmental Health Services – Tel. (242) 322-8037 or (242)322-2295
Department of Meteorology – Tel. (242) 356-3734 or (242) 356-3736
Hurricane Forecast Section – Tel. (242) 377-7178 or (242) 377-7040
Royal Bahamas Police Force – Tel. 919 or 911
Water and Sewerage Corporation – Tel. (242) 302-5599
Ministry of Works, Director – Tel. (242) 322-4830/1
Ministry of Health (COVID-19 Surveillance Unit) – Tel. (242) 502-7382

Incident Team will be comprised of the following:

- Incident Commander (IC): Project Manager – TBD
- Alternative Incident Commander: Site Engineer – TBD
- Health and Safety Officer/Site Engineer – TBD
- Environmental Manager – Janeen Bullard Tel. (242) 357-9262

4.0 Hurricanes

Please follow the Hurricane Preparedness and Response Plan in section 9.5.

5.0 Environmental Emergencies.

All environmental emergencies such as fuel spills and wildlife encounters should be brought to the attention of the EM/EMO. Environmental drills, including drills for spill response, will be planned and conducted with construction staff on site as needed. Any incident reporting forms should be submitted along with monthly environmental monitoring reports submitted to DEPP.

6.0 Fuel Spill

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to stormwater runoff or into environmentally sensitive areas. Please follow the Fuel Spill Prevention Plan in Appendix C.

7.0 Fire Control Measures

There will be no burning or smoking on the construction site and fire extinguishers will be kept at the fueling location, in proximity of all generators, near all hot works and in the site managers' trailer. Signs will be posted identifying the location of all extinguishers.

All employees will immediately report any fires occurring in or near the site. A phone will be available to all employees for emergencies which might occur on site. All emergency numbers will be posted in the office and near the fueling areas or other hazardous areas.

If there is a fire, call the **Fire Department at 911**.

8.0 Electrical Power Loss or Damage

All issues relating to loss or damage to power lines, poles or junction boxes whether in the ground or overhead must be deferred to BPL. The PM will ensure that all staff are removed from the area and that the area is secured. BPL will be notified and the site will await the arrival of the **BPL technicians (Telephone (242)302-1000 or (242) 323-5561 thru 4, or (242) 325-4504 (24 hours)).**

9.0 Water Line Damage

All issues relating to loss or damage to water lines or junction boxes will be the responsibility of the Contractor. The Project Manager will ensure that all staff is

removed from the area, that the area is secured and that the **Water and Sewerage Corporation is notified (Telephone 302-5500).**

10.0 Accident Involving the General Public

In the event of an accident involving members of the public, whether by vehicle or pedestrian, the Police, Fire Department and/or Ambulance will be notified as required. The Project Manager will ensure, as much as is possible, that the area is secured and that the accident site poses no additional safety risk to the public or staff. Once the Government agents have arrived on the scene, these agents will assume responsibility of the site of the accident.

11.0 Summary of Potential Emergencies and Responses

In the event of any emergency the Project Manager and Site Engineer must be contacted to ensure the appropriate action is taken. For each of the incidents outlined, an incident report (See Appendix B-1) should be filled out and included in the monthly report. A list of potential emergencies and responses are outlined in Table 1 below.

Table 1: Summary of Potential Emergencies and Responses.

Table 1 Key:

SE = Site Engineer
HSO = Health and Safety Officer
PM = Project Manager
EM = Environmental Manager
EMO = Environmental Monitor
DEHS = Department of Health Services
DEPP = Department of Environmental Planning and Protection

Potential Emergency	What To Do?	Relevant Authority and Persons
Injury caused by: Fire Explosion Machinery accidents	*For serious injuries call an ambulance. You should also have the contact details of the nearest doctor, Medical Center or Hospital.	• Foreman • SE • PM • HSO
Minor Injuries	*Immediately inform the site First Aid Officer. (All Foramens and the and Site Engineers are First Aid Trained). *For major injuries contact the 911, hospital, SE and PM	• PM • SE • Police Station • Hospital
Fires • Fire at the diesel tank • Fire at any of the machineries	*Evacuate all workers to a safe area immediately. *Call the Fire Department (Emergency Services). *If the fire is likely to damage	• Foreman • SE • PM • Fire Department (911)

• Fire caused by vandalism	neighboring property inform the adjacent residents. *For major fire emergencies, contact the SE or PM (Note: Fire Extinguishers are available).	• Adjacent resident
Explosion	*Evacuate all workers to a safe area immediately. *Call the Emergency Services immediately. *Contact the neighboring residents. *If utilities related, call the relevant service provider (e.g., BPL) *Contact the SE or PM	• Foreman • SE PM • Police Station and/or Fire Department (911) • Adjacent Residents
Spills Management, Contaminated Soils & Major Spills: • Spill or release of diesel fuel or oil • Spill or release of other hazardous chemicals or material	* For major spills, (defined as a spill that is likely to have direct environmental consequences.) refer to Fuel Spill Prevention Plan (Appendix C). *Immediately call the Fire Department and notify SE. *Identify the source of the spill. If the material is dangerous or unknown, evacuate the site immediately and notify all neighbors. *If it is safe, halt the source of the spill immediately. *Contain the spill and control its flow. Block storm water drains downstream of the spill. Divert spill away from any water bodies (the ocean, wetland, groundwater etc.) *DEHS and DEPP must be notified about any spills that are likely to threaten the environment.	• EM/EMO • Foreman • SE • PM • Police station and/or Fire Department (911) • DEPP • DEHS • Adjacent Residents
Minor Spills	*Minor spills (defined as spills which can be contained and rectified correctly without the need of external services), shall be contained and	• Foreman • SE • PM • EM/EMO

	rectified with the site spill kit and disposed of correctly. *PM and HSO to be notified via incident report. * See Appendix C: Fuel Spill Prevention Plan	
Heavy rainstorm, flood or and hurricane	*Contain/minimize the flow of water. *Contact PM and/or SE immediately. *Investigate reasons for failure and prepare an incident report. *See the Hurricane Preparedness Plan in section 9.5.	• Foreman • SE • PM • Police Station (911) • Adjacent • residents
Rupture of Utility pipelines (Telecommunication lines, Water and sewerage pipes, electrical lines and cable pipes)	* Contact Relevant Agency or Utility company *Ensure all spilled materials are contained onsite or if running off site, are directed through sediment control measures (See section 8.1.1: Sediment Control Plan). *Block storm water drains downstream of the spill. Spills or ruptures that are likely to threaten the environment.	• Foreman • SE • PM • Police Station (911) • Adjacent • residents
Site security, breach or public safety issue	*Notify security and/or police immediately. *Where public safety issue exists, barricade to restrict egress and address issue immediately.	• SE • PM • Foreman • Police Station (911)

Appendix E: Turbidity Curtain Manufacturer's Specifications

Triton Type II DOT

Silt and Turbidity Barrier

Triton DOT SILT BARRIER

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

GEI WORKS

Triton Type II DOT
Silt and Turbidity Barrier

Constructed using robust and reliable components, these barriers actively work to contain silt, turbidity and displaced particles around your site. Type 2 DOT 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
- DOT Roadwork and Construction Projects
- Dock Repair, Demolition and Maintenance
- Boat Ramp Creation
- Pile Driving
- Shoreline Construction
- Rip Rap Installation
- Remediation Projects

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

Turbidity Curtain Accessories:

- Anchor Kits
- Buoys
- Marker Lights
- Tow Bridles

Importance of Anchoring:

Anchoring and anchor kits are one of the most important accessories for sites dealing with moving currents, waves, tides or other site factors. Having the right anchor pattern, installation design and anchors can significantly influence, reduce and redistribute loads placed on your barrier.

Contact our technical team (+1 772.646.0597) for more information regarding anchor placement and use.

Triton Type II DOT
Silt and Turbidity Barrier

How a Turbidity Curtain Works:

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

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

Product Considerations:

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

Turbidity Curtains and Salt Water

When using the Type II Silt 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?

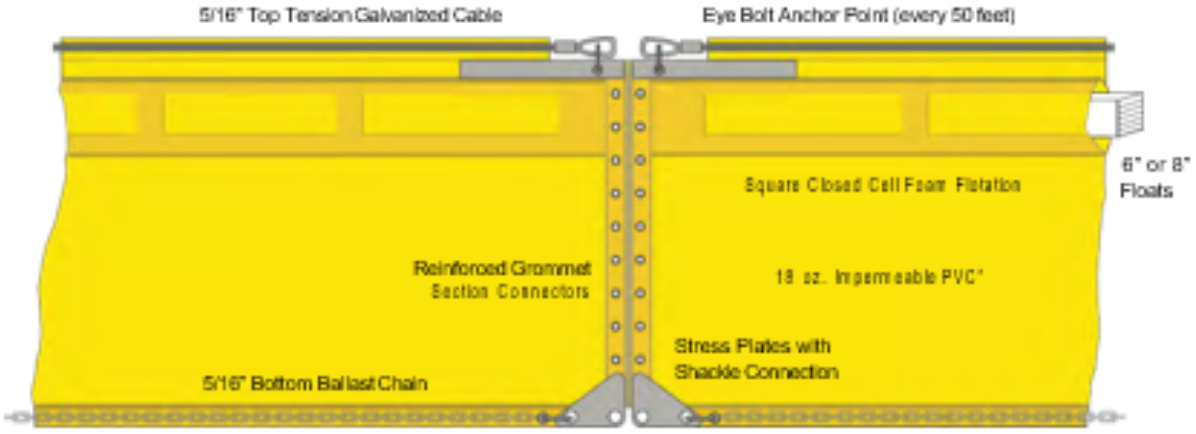
Permeable Type II Silt Barriers are most commonly used when they are either specified in a site project or when the curtain will be dealing with a significant amount of water pressure. Use of the bottom filter panel can help reduce pressure on the curtain by allowing water to continue to the flow through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

Triton Type II DOT
Silt and Turbidity Barrier



SPECIFICATIONS

Length	50' or 100'
Depth	5' (3' - 25' Available on Request)
Fabric	18 oz. PVC
Flotation	Square Foam Filled Flotation
Flotation Size	6" or 8"
Tension Cable	5/16" Tension Cable Below Float
Bottom Ballast Chain	5/16" Galvanized Chain
Section Connectors	Grommets, Top & Bottom Stress Plates
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.

*22 oz. PVC available upon request to meet your state's requirement.

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

All photos are representative only. Actual products may differ.

Materials and specifications are subject to change without notice. Featured products in photos may include additional equipment or accessories.

GEI WORKS

Appendix F: Method Statement

Dredge Method Statement

Title The Ship Ahoy Marina Dredge Method Statements		**M.S. No.**	01
		Rev:	00
Project:	**The Ship Ahoy Marina**	**Copy No.**	

Revision	Date	By	Approved
00	12/04/2023	B.M.C	

DISTRIBUTION

1. Owner
2. Owner's Representative
3. Project Manager
4. Construction Manager
5. Site Engineer
6. Surveyor
7. Board of Representatives
8. QA
9. File
10. Testing

NOTES

1.0 Project Description & Scope of Works

The intent of this project is to develop a timber dock marina on West Bay Street.
The following are the primary scope of works identified in the project documents:

- Construction of timber docks.
- Construction of the bulkhead and breakwater
- Dredging of new marina extension.

2.0 Contract References

Contract Drawings & Contract Technical Specifications.

3.0 Contract Specification

All work is to be completed in accordance with related items within the Specification of the Contract Documents.

4.0 Methods

4.1. Pre-commencement

- Coordinate with Bahamas Marine Construction to confirm level datum and any information necessary for the works.
- Setup project office and material storage yard for any imported material.
- Site shall be cleared as required, and unsuitable material will be disposed of. The Employer's representative should instruct Contractor if certain items are not to be removed.
- Other legislative requirements as per the contract documents.
- The area in which the works are proposed will be assessed to ensure that there are no epifauna present within the dredge footprint. If there are any epifauna present, they will be relocated away from the dock area.
- Installation of type II turbidity curtains.

4.2. Construction Compound

The location of the Contractor's temporary construction compound will be as per the drawings and agreed with Employer's representative. The compound will comprise:

- A laydown area for materials
- Temporary office trailer for site office and welfare facilities including toilets (with provision for sealed waste storage and removal). The office will have two rooms, four cubicles and a meeting room for 6 people.
- Workshop and tool trailer
- Parking for cars and construction vehicles
- Area for the dredge material

The construction compound area will be identified by surveyors and clearly pegged. Facilities for waste management, refueling, power, and water supply will be provided. All welfare facilities will be provided for the duration of the contract.
Site security will be on site to protect the works from theft or vandalism. Lighting will be used around the compound to assist with the overall security of the facility.

4.3. Temporary navigational lights

The provision of temporary navigational hazard lights demarking the limits of

construction is allowed. An inspection system will be developed from Contractor's QA/QC procedures to ensure marina areas are left secure and safe at the end of all shifts. All marine crane barges will be left within the marina construction area with navigational hazard lights.

4.4. Waterways Traffic Control

Tugboat captain will contact Harbour Patrol at channel 16 during movement of the crane barges to and from the site.

All crane barge to maintain safe distance per harbour patrol at all times during waterway movement.

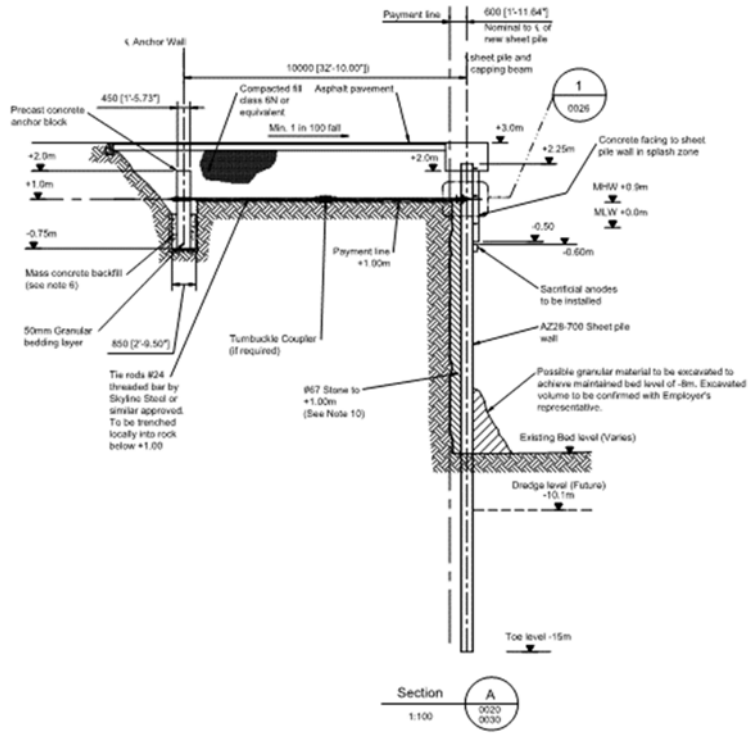
4.5. Bulkhead & Breakwater Works

Construction of Bulkhead comprises sheet pile wall and fill placement within the sheet pile cofferdam. Works to be completed include:

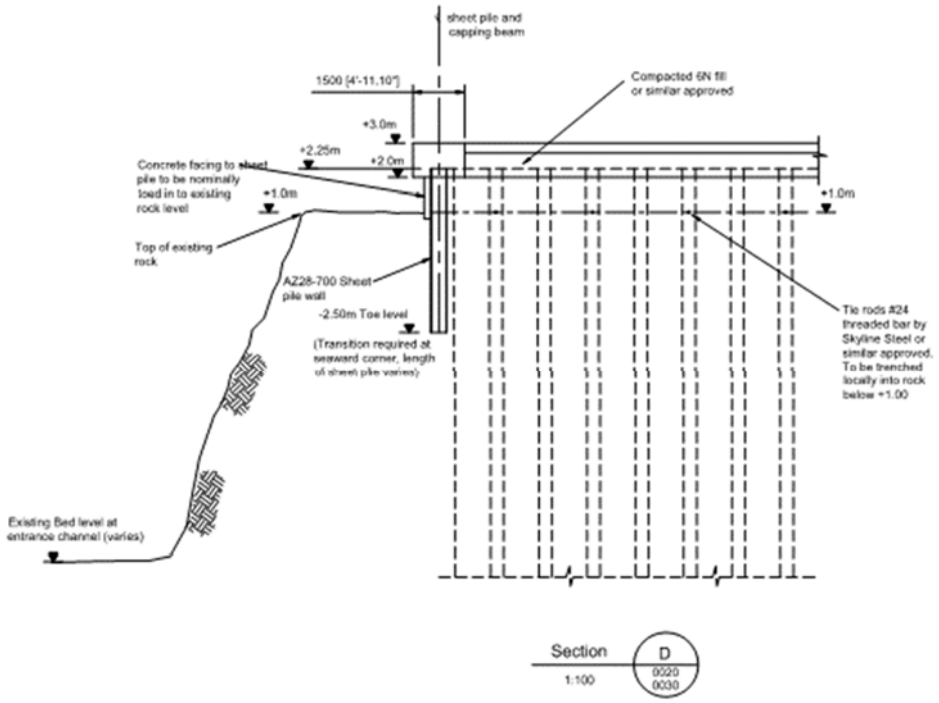
- Drive the temporary template pile.
- Temporary positioning the sheet pile template at required level
- Pitch the sheet pile into the template.
- Confirm verticality, and adjustments as needed.
- Drive the sheet pile to template level using the vibratory hammer.
- Pitch the next pair into the template and drive the pile and continue until the template is full.
- Remove the sheet pile template and set up next template; continue until all sheet piles for the QW is driven.
- Install the walers, anchor wall and tie-rods. Tension the tie-rods to achieve the correct wall alignment if required.
- Fill the space between the sheet pile walls with granular fill.
- Cast concrete cap and concrete slab post compaction of the fill.

Steel sheet piles will be AZ Sections, by Skyline Steel, and shall be as per sizes specified on the contract drawings. The steel will also meet ASTM standards and meet the required grade. All material will be handled accordingly and with caution and be stored appropriately by knowledgeable personnel.

Section View:



Elevation View:



4.6. Concrete Works

Concrete works include the sheet pile wall coping and concrete slab for the breakwater. Works to be completed includes:

- Submit the detailed form work for the concrete coping.
- Submit the detailed reinforcement shop drawings for approval.
- Install the false works (50' section) as per the approved form work details necessary for the concrete skirt.
- Install the prefabricated reinforcement as per the approved shop drawings.
- Pressure clean the sheet pile surface before installation of the vertical outside formwork.
- Install the formwork and necessary bracing and ties.
- Place the concrete in 12" layers until required concrete elevation is achieved. Vibrate the concrete using concrete vibrator above water to eliminate the air bubbles.
- Move to next setup until the concrete coping is completed for entire sheet pile wall.
- Place concrete as per approved mix design. Curing compound to be sprayed after finishing of the coping concrete on all exposed surfaces.
- Construction and expansion joints placement to be as per the contract drawings and approved shop drawings.

4.7. Excavation & Dredging Works

Excavation works, dredging of marina and channel to marina design depths as per plan. This plan is developed considering the following EMP requirements:

- Minimize Turbidity and maintain water quality.
- Turbidity Curtain to be installed around active excavation to minimize adverse impact to the benthic communities adjacent to the project site.
- Turbidity curtains are to inspected and maintained daily as the area has high boating and jetski traffic.
- Turbidity measurements shall be conducted for the duration of excavation daily. Turbidity monitoring should be conducted upstream (500m from work area) and downstream (500m from work area) or visible turbidity plume area. Turbidity reading should be conducted daily, twice per day. Turbidity to be recorded in NTU and contractor will be responsible for assuring the turbidity monitoring in following the proper protocols. The Contractor shall keep daily turbidity monitoring logs and have them available for inspection by any regulatory agency during construction. All excavation will immediately cease if average compliance sample reding exceed average background reading by more than 29 NTU. Work will not recommence until turbidity has returned to an acceptable level.

4.8. Testing and Hand-over

Contractor shall test materials as per the specifications and Employer's requirements. A certified materials facility/ engineer will be utilized (reference Contractor's QMP).

Contractor shall submit results of testing to the Employer's representative within 48hrs after they have become available.

Contractor shall notify Employer's representative of any completed works to be inspected and submit a request for inspection with 24hr notice.

After successful inspections, all parties shall be notified of approval/ sign-off. Once all necessary inspections have been carried out and works completed to Employer's satisfaction, hand-over process will commence with Employer.

4.9. Management and control of works operations

Supervisory staff
At all times of working, an experienced competent supervisor will be present at each work area on-site. A site engineer/surveyor will control levels and ensure works are being carried out in accordance with the design.

Operations
All equipment to be operated as per Site Safety Procedures.

All marine equipment to be kept within the marked construction area.

Fuel trucks and trained personnel will fuel equipment in the morning and evening during operations at approved locations only.

Hours of work to be as outlined in the Specification. There shall be no work on Sundays or designated Public Holidays unless agreed with the Employer.

5.0 Materials

All material used in the permanent construction should be as per the approved material submittal.

6.0 Plant and Equipment

Earth Works:

- 500 Excavators
- 300 Excavator
- Articulate Dump Trucks
- 200 Loaders
- Spud Barge 120'x45'

Sheet Piling with cop beam:

- Floating Spud Barge 120'x45' (Company Asset)
- American Crane- 7260 or 5299(Company Asset)
- Drill Rig- to predrill the sheet pile line (Company Asset)
- Hydraulic Vibrator Hammer- ICE 44 (Company Asset)
- Power Pack for above hammer- ICE 580T (Company Asset)
- Sheet Piling Template

- Clamshell Bucket
- Carpenter Barge- 40'x12' with 200HP Engine

Concrete Works

- 55 Ton Mobile Crane
- Carpenter Barge- 40'x12' with 200HP Engine
- Tremie Pipe with concrete bucket
- Forklifts
- Formwork, Shoring & Scaffold
- Concrete Vibrators
- Concrete Pumps
- Small Tool- Concrete vibrator, generator, air-compressor etc.

General

- Light Towers
- Generators
- Water Trucks
- GPS Equipment
- Small Tools

7.0 Storage

- All storage of evaluated material will be in designated areas as agreed with the Employer and/or Employer's representative.
- All storage of unsuitable material will be in designated areas as agreed with the Employer or Employer's representative.
- All imported or national material to be stored at the approved safe location.

8.0 Personal Protective Equipment

All personnel shall be provided with appropriate P.P.E, particularly hi-vis clothing, hard hats, safety footwear and life vest; and will be expected to wear then at all times.

9.0 Personnel

- Contractor Representative
- Construction Manager
- Project Engineer
- Site Supervisors/ Superintendents
- Site Surveyor
- Operators, Pile Driver, Deck Hand, Steel fixers, Boat Crew, Divers, Skilled Labour and General Labour

10.0 Environment

All necessary precautions in accordance with the contract requirements shall be adopted for the successful completion of this item of work. Turbidity Curtain to be installed during Armor stone placement or any other marine works which create turbidity. Turbidity monitoring should be conducted during these works. Upstream (500m from work area) and downstream (500m from work area) turbidity reading should be conducted daily

twice the day. Turbidity reading up/s and down/s should be <29NTU. All works should cease immediately if the reading difference is >29NTU.

11.0 Inspection and Testing

Inspection and testing to comply with Contract Specifications and quality control/quality assurance procedures. Reports to be provided as scheduled by Contract or on request from the Employer's Representative.

12.0 Document Control

The Contractor's appointed Document Controller will be responsible for management of the site document control process. The Document Controller reports to the Project Manager and will have overall responsibility for Document Control.

12.1. Procedures

A designated document control and site records area will be allocated within the site office layout. Incoming correspondence is checked and distributed to the relevant persons. Outgoing correspondence will be documented.

12.2. Progress Monitoring Procedures

The methods and systems to be used in monitoring of the production progress for the works will be in accordance with Contractor Management System and Employer's Contract Requirements.

12.3. Progress Monitoring Schedule

Internal progress monitoring will be performed on a weekly basis in accordance with Contractor's standard procedures. The Project Engineer will be responsible for the collection of data for analysis. The Project Manager will be responsible for analysis of the data and implementing recovery measures if required.

12.4. Progress Monitoring Phases

Five sequential phases to Progress Monitoring will be implemented for the works.

- Phase 1 – Progress Records
- Phase 2 – Progress Updates
- Phase 3 – Progress Analysis & Reports
- Phase 4 – Progress Reviews
- Phase 5 – Post – Review Actions

12.5. Progress Records

The following progress records will be produced for the works.

- Daily site diaries
- Weekly progress sheets
- Labour/ Equipment allocation sheets
- Photographs (with date time references)
- Phasing Diagrams/ Progress Updates

12.6. Progress Reviews

Internal Progress reviews will be held on weekly basis for project, attended by Contractor's key personnel. The objective of the meeting is to confirm current status, identification of critical remaining works and determination of production improvement/ time saving measures.

12.7. Post-Review Actions – Measures to expedite schedule.

The Project Manager will be responsible for implementing the post-review actions. Examples of these measures include the following:

- Changes to the sequence of the works
- Additional working hours
- Additional resources
- Establish production improvement incentives/ targets
- Early warning mechanisms to prevent future slippage

12.8. Monthly Progress Reports

A monthly progress report will be issued by Contractor to Employer as agreed. This will include the following information:

a) New electronic copy of the schedule to be created in the database each month.
b) Each monthly update process will start with the entry of actual start/ finish dates, works completed and remaining durations for all activities worked in the month. The resulting schedule to be re-calculated and graphically compared to the approved Contractor Schedule.

A written report identifying major changes to the schedule, identifying problems and remedial actions to be included. Photographs and daily log of labour by subcontract and major equipment also to be included.

13.0 Reference to Other Document

- Environmental Management Plan
- Health and Safety Plan (including Hurricane Preparedness) Quality Management Plan
- Risk Assessment
- Site Safety Procedures

14.0 Drawings / Sketches

Contract Construction Drawings.

15.0 Hold Points

- All crane barges to be kept with in the marina construction area.
- All navigational hazard lights should be checked daily.
- Ensure goal posts and warning signs have been erected in appropriate areas prior to commencement of works.
- Check setting out prior to commencement of works.
- Evaluation of ancillary works prior to installation.
- Ensure Turbidity Curtain installed prior to excavation.

- Ensure Turbidity reading log maintained daily.
- Material testing and inspection at each stage of the works.

Turbidity Curtain Method Statement

Title	Ship Ahoy Marina Method Statements Turbidity Curtain Installation	**M.S. No.**	02
		Rev:	00
Project:	**Hurricane Hole Marina Project**	**Copy No.**	

Revision	**Date**	**By**	**Approved**
00	17/09/2020	B.M.C	

DISTRIBUTION

1. Owner
2. Owner's Representative
3. Project Manager
4. Construction Manager
5. Site Engineer
6. Surveyor
7. Environmental Manager
8. QA
9. File
10. Testing

NOTES

1.0 Project Description & Scope of Works

The intent of this document is to install turbidity curtains at the Ship Ahoy Marina Project. The following are the primary scope of works identified in the project documents:

- Installation off Type II turbidity curtains

2.0 Contract Reference

Contract Drawings & Contract Technical Specifications.

3.0 Specification Requirements

All work is to be completed in accordance with related items within the Specification of the Contract Documents.

4.0 Method

4.1. Curtain Installation

- Turbidity curtains will be installed for containment.
- Type II curtains will be used for the duration off the activities. They will be installed to the manufacture's specification (Appendix E).
- Loaders and manual handling will be used to move curtains into place. Anchors have been provided with the curtain assemblages, but additional concrete blocks will be used to anchor curtains to ensure stability.
- Curtains will be in 100ft lengths and 10 ft in depths.

Turbidity Curtain connections will include a slide mechanism to alleviate the need for overlap and use of strings to secure.

Solar lights will be installed on the curtains to ensure they are visible to boaters at night.

Once installed the environmental officer will conduct an in-water inspections to ensure that the connections are secure, anchors have been installed and there is no mobile marine life within the curtains. The curtains will be inspected daily and include:

- Confirm the curtain skirt has no marine growth, sediment or debris that might cause reduced freeboard.
- Check buoys for damage.
- Confirm that the curtain is maintaining its anchored profile. If the curtain or a portion thereof appears out of place, inspect the anchoring system and placement of the anchors. Adjust and/or repair the anchoring system as required.
- Ensure the turbidity curtain has not moved into shallower water whereby the bottom of the curtain is resting on bottom.
- While inspecting, look for areas where turbid water is escaping into the larger water body.

5.0 Management and Control of Operations

5.1. Supervisory staff

At all times of working, an experienced competent supervisor will be present at each work area on-site. An environmental manager will ensure the installations are being carried out

in accordance with the manufacturing specifications.

6.0 Plant and Equipment

- Turbidity Curtains
- Concrete Blocks
- Loaders

7.0 Storage

All storage of evaluated material will be on the barge.

8.0 Personal Protective Equipment

All personnel shall be provided with appropriate P.P.E., particularly hi-vis clothing, hard hats, safety footwear and life vest; and will always be expected to wear them.

9.0 Personnel

- Project Manager
- Site Engineer
- Environmental Manager
- Environmental Officer
- Site Surveyor
- Operators
- General Workers

10.0 Environment

All necessary precautions in accordance with the contract requirements and Environment Management Plan shall be adopted for the successful completion of this item of work.

Timber Dock Method Statement

1.0 Project Description & Scope of Works

The intent of this document is to provide the method statement for the construction of a 46-slip marina. The following are the primary scope of works identified in the project documents:

- Construction of Timber Docks

2.0 Specifications Requirement

All work is to be completed in accordance with related items within the Specification of the Contract Documents.

3.0 Methods

3.1. Pre-commencement

The area in which the works are proposed will be assessed to ensure that there are no epifauna present within the anchor footprint. If there are any epifauna present, they will be relocated away from the dock area.

3.2. Timber dock construction

For installation, the timber piles and compost dock will be completed by using a hammer drill from a barge to make a hole for the post installation. Posts will be installed in a socket that is in line and level with the dock. A carpenter crew will be used to install a wooden beam to the timber post with permanent bolts. All timber will be inspected before construction of each dock structure. After inspection is completed, timber deck planks should be nailed to the pre-approved joist. Special care is to be used to ensure that the deck planks are placed grain down for each dock structure.

3.3. Concrete works

Concrete works will be necessary for bulkhead and breakwater construction. See sections 4.5 and 4.6 in the Ship Ahoy Marina Dredge Method Statement above.

4.0 Management and Control of Dock Installation Operations

Supervisory staff

At all times of working, an experienced competent supervisor will be present at each work area on-site. A site engineer/surveyor will control levels and ensure works are being carried out in accordance with the design.

Operations

- All equipment to be operated as per Site Safety Procedures.
- All marine equipment to be kept within the marked construction area.
- Fuel trucks and trained personnel will fuel equipment in the morning and evening during operations at approved locations only.
- Hours of work to be as outlined in the Specification. There shall be no work on Sundays or designated Public Holidays unless agreed with the Employer

5.0 Material

- All timber and hardware material being used in permanent works shall be

classified according to the project specification.
- Material to be pre-approved through material submittal prior to commencement of the works.
- Only materials complying with the specified criteria will be used in the permanent works.

6.0 Storage

- All timber material to be properly stored (per manufacturer recommendation) on site in the laydown area until required (see Figure 3 in Sediment Control Plan).
- Fuel will not be stored off site.

7.0 Plant and Equipment

The equipment to be used during this phase will depend on the maximization of the efficiency of works.

- Pile Barge
- Dump Trucks
- Crawler crane 100 tons
- Hammer drill

8.0 Personnel Protective

All personnel shall be provided with appropriate PPE, particularly Hi-Viz clothing, safety footwear, and life vest at all times.

9.0 Personnel

- Site Supervisor
- Carpenters
- Skilled Laborers
- Surveyors
- Environmental Monitor

10.0 Environment

All necessary precautions in accordance with the contract requirements and approved EMP shall be adopted for the successful completion of this item of work.

Turbidity Curtain to be installed during pile placement or any other marine works which create turbidity. Turbidity monitoring should be conducted upstream (500m from work area) and downstream (500m from work area) or visible turbidity plume area. Turbidity reading should be conducted daily, twice per day. Turbidity reading up/s and down/s should be <29NTU. All works should cease immediately if the reading difference is >29NTU

11.0 Hold Points

- Site engineer to ensure that pre-inspection of dock center line is approved before commencement of works.
- All elements of boardwalk construction in accordance with the specification and

contract drawings.

- Check setting out prior to commencement of boardwalk construction operations.
- Ensure works is signed off as per Specification requirements.
- Ensure Turbidity Curtain installed prior to excavation.
- Ensure Turbidity reading log maintained daily.
- Other recommended hold points may be advised by the Employer.