Construction Environmental Management Plan

Lighthouse Point

Eleuthera, The Bahamas

DCL ISLAND DEVELOPMENT, LTD.

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Table of Contents

Appendices

List of Tables

List of Figures

List of Photos

Executive Summary

DCL Island Development, Ltd., is a company incorporated under the laws of the Commonwealth of The Bahamas and having its Registered Office in the City of Nassau (herein after called "the Developer"). The Developer has completed a Construction Environmental Management Plan (EMP) for the proposed development of Lighthouse Point, a parcel of land at the south end of Eleuthera. During the construction of the Lighthouse Point project, the Developer will follow the high level of environmental and conservation stewardship and sensitivity that the Developer and its Disney affiliates have brought to other Disney projects around the world, as evidenced on the Disney Conservation and Environmental website at www.disney.com/environment. An Operational EMP will be completed prior to project opening and will include the same commitment to environmental stewardship as followed during the construction of the Project. Details on operational commitments and requirements for environmental monitoring, compliance, mitigation and management of the Lighthouse Point project will be addressed in the Operational EMP.

The planned cruise port will host up to 150 jobs once complete. A small vessel marina will be located near the ship pier and will provide facilities to accommodate small boats for third party tours and island operations and maintenance. Currently, the site is not developed and does not have utility service. The new development will require power generation, a desalination plant for fresh water, and a sewage treatment plant. Fuel storage will be required for operation of the utility plant. Final design and arrangements for utilities are pending discussion with Government of Bahamas and local utility providers.

The Developer's planning and design teams have given the highest level of attention to environmental quality and enhancement for the Lighthouse Point development. The project team is committed to the development of Lighthouse Point utilizing the most comprehensive and state-of-the-art environmental technologies and management methodologies. Careful consideration has been given to the environmental impacts and sequence of development activity to minimize long-term and short-term adverse impacts to the terrestrial and marine ecology, local infrastructure and cultural resources. In support of this goal, the following project components and methodologies will be implemented.

The planned development will be used for day visits only, and activities will include sunbathing, nature walks, snorkeling, boating and other water sports. The Developer intends to maintain more than 80 percent of the project site in its present vegetative communities, with limited clearing of uplands for construction of refreshment and convenience areas, water sport facilities, paths and nature walks, roadways, staff accommodations and utilities.

Environmental stewardship is a standard component of Disney's business. Unique approaches to sustainable development are a hallmark of Disney projects. Thoughtful planning demonstrates their commitment to an integrated and sustainable approach to designing new projects. Their approach includes partnering with governments, community and conservation leaders, other stakeholders and non-governmental organizations. They develop and manage their assets based on a long-term strategic vision, creating unique places that add value to guests, community, cast and the company. This project will become part of the Disney legacy and an enduring asset to The Bahamas. As part of this project, the following activities will be conducted to ensure minimal impacts to the environment during construction of the Project:

- Clearing for all required areas will be limited to the immediate area necessary for construction and amenities. Adjacent area clearing will be restricted to thinning the underbrush, selective removal of poisonous plants from within public use areas, and clearing areas with invasive or low resource value.
- Landscaping around public and common areas will make extensive use of the diverse selection of native trees representative of Lighthouse Point. In addition, the project's landscape architects will emphasize planting native, aesthetically appealing trees (e.g., gum elemi (*Bursera simaruba*)) and species listed in the Conservation and Protection of The Physical Landscape Act, Protected Trees Act, including *Guaiacum sanctum* (lignum vitae),and *Guapira discolor* (beefwood), and all three of which were found on Lighthouse Point.
- The development of the small vessel marina and ship berthing area will utilize state-of-the-art best management practices (BMPs) to minimize impacts. A detailed summary of BMPs to be implemented during construction is provided in this document.
- The marina is for the exclusive use of Disney vessels and their third party tour operators and not open to the public. For these boats using the marina, a comprehensive marina management program will be established within the currently unregulated Lighthouse

Point marine waters. This will include a no-discharge policy and provide state-of-the-art pump-out facilities and associated wastewater treatment for Disney vessels. The marina will be designed and operated under strict environmental protection guidelines.

- Similarly, a comprehensive beach management program will be established to provide information, environmental management, and appropriate safety for the guests.
- A comprehensive cleanup of the existing beach and coastal areas will be conducted.
- Pending final negotiations with the Government of The Bahamas and local utilities, all water and wastewater infrastructure will be constructed onsite, providing for minimal impacts to adjacent community water and wastewater infrastructure. Food waste will either be placed in a digester or incinerated onsite, and all landscape clippings will be mulched or incinerated in the air burner. The design of the incinerator will be in full compliance with either U.S. Environmental Protection Agency (EPA) in Table 1 to Subpart EEEE of CFR Part 60 or current IMO regulations, MEPC 224(66). The remaining solid waste will be removed from the site and appropriately disposed. Waste transported by the contractor includes metals and plastic. During construction, waste wood products will be burned, and waste concrete products will be recycled to the extent possible. No waste will be disposed of through a landfill.
- Every effort will be made to ensure that construction impacts to water quality in the ship berthing area and adjacent waters of the site will be short-term and limited by using site-specific controls and turbidity reduction measures.
- Impacts to existing water and wastewater infrastructure in the immediate area will not occur since these services will be provided fully within the development.
- Impacts to cultural and historic resources in the area will be minimized through a continued comprehensive study of the resources on the project site and immediate areas in cooperation with the government.

This EMP addresses the methods and protocol to achieve these goals and ensure minimal impacts on the Island and surrounding areas.

1.0 Introduction and Objectives

This document presents the proposed Environmental Management Plan (EMP) for the proposed development on Lighthouse Point, located in South Eleuthera. As outlined in the previously submitted Environmental Impact Assessment (EIA):

- Approximately 137 acres of upland habitat will be impacted due to clearing for the island development, approximately 16 percent of the site.
- Modification of beach areas along the shoreline will be done by shaping the upland/above water areas, including removal of casuarina trees and other non-native vegetation that has been established in the backdune community.
- All of the lagoons/ponds on the project site will remain intact; no development or disturbance to these areas will occur other than nature trails or viewing areas.
- No dredging will occur. The cruise ship berth will consist of an open trestle design that extends to water that is sufficient for cruise ship docking (approximately 38 feet depth).

The EMP is presented as a "working document" that is adapted to incorporate changes during the progression of the project due to increased available information, including items such as the selection of the utility components associated with the project and the final design and plans for infrastructure. The EMP includes a mitigation plan, which will be updated on a regular basis as short- and long-term monitoring events occur.

2.0 Scope and Purpose

2.1 Project Description

The planned development will include items such as:

- Day-use cabanas along the beaches
- Cruise ship berthing area
- Small vessel service and excursion marina
- Beach swimming areas
- Dining locations and retail shops
- Snorkeling areas and water activities area
- Outdoor entertainment and recreation areas
- Back-of-house (BOH) (staff housing and dining, support buildings, storage, and utilities)
- Vehicular roadways and pedestrian walkways

The development includes items such as the following components:

- Marine
  - Ship's berth and pier
  - Small vessel marina
  - Roll-On/Roll-Off (Ro-Ro) dock
  - Protected swimming and snorkeling areas
- Back-of-House (BOH)
  - Staff Housing
  - Pump House
  - Administration and Maintenance Buildings
  - Electrical Building
  - Sanitation Building
  - Power Generator
  - Solar Power Generation Arrays
  - Diesel Tank
  - Gasoline Tank
  - Reverse Osmosis (RO) Units
  - Wastewater Treatment Plant
  - Potable Water Tank
  - Re-Use Water Tank
  - Incinerator

2.2 Scope of the Environmental Management Plan

This EMP describes how the potential impacts described in the Environmental Impact Assessment will be managed to either avoid, minimize or mitigate those impacts in a manner that is environmentally acceptable. The contents and commitments that comprise the EMP are the responsibility of DCL Island Development, Ltd. (DCL) together with their consultants, sub-consultants and the Design-Build Contractor that has been awarded the project, American Bridge Bahamas, Ltd.

3.0 Legislation

Lighthouse Point is within the constituency of Central and South Eleuthera, which is represented by Member of Parliament Hank Johnson.

3.1 Environmental Laws of The Bahamas

Environmental Law, Regulation, Policy	Subject	Summary
Antiquities, Monuments, and Museum Corporation Act 1998, Chapter 51	To protect antiquities	An Act to provide for the preservation, conservation, restoration, documentation, study and presentation of sites and objects of historical, anthropological, archaeological and paleontological interest, to establish a National Museum, and for matters ancillary thereto or connected therewith.
Archipelagic Waters and Maritime Jurisdiction Act, 1993	To establish the waters of The Bahamas and its exclusive economic zone	An Act respecting the territorial sea, archipelagic waters, and internal waters and the exclusive economic zone of The Bahamas.
Bahamas Maritime Authority Act 1995, Chapter 238	To enact The Bahamas Maritime Authority	The purpose of the Authority is to promote ship registration and maritime administration in The Bahamas, regulate shipping per the Merchant Shipping Act, represent The Bahamas in international organizations and to assist the development of the maritime industry in The Bahamas.
Bahamas National Trust Act, 1959 Bahamas National Trust Amendment, 2013 Bahamas National Trust Amendment, 2019	Designation and management responsibility for National Parks	This Act and Amendment founded The Bahamas National Trust and grant it authority for the provision and oversight of National Parks in The Bahamas. 2019 Amendment: To Amend the Bahamas National Trust Act to expand the duties of the Bahamas National Trust; to revise the constitution of the council; to expand authorized capital investments; and for connected purposes.
Bahamas Protected Areas	A Notice of MPA Maps	A notice by the Ministry of Environment and Housing to the public advising the following maps depict Marine Protected Areas within The Bahamas under the Global Environment Facility (GEF) Full Size Project (FSP).
Bahamas Public Parks and Beaches Authority Act, 2014	To establish the parks and beaches authority and its responsibilities	An Act to establish the Public Parks and Beaches Authority, to provide for the property rights and liabilities of the Authority and to identify, regulate, maintain, develop, and conserve public parks and beaches and for connected purposes.

Environmental Law, Regulation, Policy	Subject	Summary
The Biological Resources and Traditional Knowledge Protection and Sustainable Use Act, 2020* *Passed in February 2021	To provide for the regulation and access to biological resources and associated traditional knowledge.	An Act to provide for the regulation and access to biological resources, and associated traditional knowledge, sustainable use of its components, prohibiting unlawful genetic and bio-prospecting and gathering and for search for The Bahamas and its people fair and equitable sharing of the benefits arising out of the use of biological resources, traditional knowledge, and to establish the necessary administrative structures and processes for the implementation and enforcement of such principles and for matters connected therewith or incidental thereto.
Coast Protection Act, 1968 Chapter 204	To protect the coast	An Act to make provision for the protection of the coast against erosion and encroachment by the sea and for the purposes connected therewith. Coast protection work means any work or construction alteration, protection, repair, maintenance, demolition or removal for the purpose of the protection of any land and includes the sowing or planting of vegetation for said purpose. Protection means protection against erosion or encroachment by the sea. The Coast Protection Act stipulates in Section 3(1) that the Minister may carry out coast protection work as appears to be necessary or expedient.
Conservation and Protection of the Physical Landscape of The Bahamas, 1997 Chapter 260	Excavation, Landfill, Quarrying, Mining, Protected Trees Listing	This Act makes provisions for the regulation of activities including excavation, landfill, quarrying, mining, and harvesting of protected trees in The Bahamas for the purpose of conservation of maintenance of the environment. The Regulations include a list of protected tree species in The Bahamas.
Environmental Health Services (Collection and Disposal of Wastes) Regulations 2004	To administer and outline waste collection and management facilities	Environmental Health Services (Collection and Disposal of Wastes) Regulations 2004 establish the collection and control of waste including waste facilities and other matters relating to wastes.
Environmental Health Services (Fees and Services) Regulations 2000	To establish fees and services performed by the Department of Environmental Health Services	The Fees and Services regulations outline services and associated fee rates performed by the Department of Environmental Health Services. The Department may provide testing for air quality, water quality, and radioactive materials.
Environmental Health Services Act 1987	To promote and protect the public health and to provide for the conservation and maintenance of the environment	An Act to promote the conservation and maintenance of the environment in the interest of health for proper sanitation in matters of food and drinks, and generally for the provision and control of services, activities, and other matters connected therewith or incidental thereto.

Environmental Law, Regulation, Policy	Subject	Summary
Environmental Planning and Protection Act 2019	To establish the Department of Environmental Planning and Protection	An Act to establish the Department of Environmental Planning and Protection; and to provide for the prevention and control of pollution; the regulation of activities, and the administration, conservation and sustainable use of the environment and for connected purposes. The Act defines procedures for environmental reporting requirements for protection of natural resources.
Environmental Impact Assessment Regulations 2020	To provide procedures for a Certificate of Environmental Clearance	The Regulations provide procedures for the review of proposed projects inclusive of monitoring and compliance requirements. The Regulations dictate the requirements for a Certificate of Environmental Clearance (CEC).
Fisheries Resources (Jurisdiction and Conservation) Act 1977	To protect fisheries and provide regulation for marine reserves/protected areas	An Act to make provision with respect to the conservation and management of the fishery resources of The Bahamas and to extend the limits of the jurisdiction of The Bahamas over such fishery resources and for matters connected therewith and incidental thereto. The Act establishes the economic fishery zone of The Bahamas.
Fisheries Resources (Jurisdiction and Conservation) Regulations (1986) Chapter 244	To protect fisheries and provide regulation for commercial and recreational activities	Regulations to permit activities related to fisheries. These regulations guide catch methods, size requirements, and to establish specific species regulations related to closed seasons. The regulations provide specific remarks for crawfish, conch, turtle, scale fish, stone crab, marine mammals, and sponge with limitations placed on export.
Amendment (2015)		No person shall within the exclusive fishery zone, fish for, molest, or otherwise interfere with any marine mammal without authorized permission of the Minister. In 2009, it became illegal to buy, sell, or possess marine turtles, marine turtle parts, or turtle eggs, or to disturb a turtle nest. The 2015 amendment established an annual duration for the closed season of grouper commencing 1 December in any year to 28 February of the immediate succeeding year.
Forestry Act of 2010	To protect the forests and make declarations to use	The Act provides for utilization of forest products and non-timber forest products from the forest estate. It sets forth the management and conservation of the Forest estate and associated industries.

Environmental Law, Regulation, Policy	Subject	Summary
Forestry (Declaration of Protected Trees), Order, 2021	To declare protected trees	A declaration of protected trees under the Forestry Act for Part I endemic or endangered or threaten protected trees, and Part II cultural or historical and economic protected trees.
Health and Safety at Work Act 2002	To protect human health and safety at work	The purpose of the Act is to: secure the health, safety and welfare of persons at work- protect persons other than persons at work against risks to health or safety arising out of or in connection with the activities of persons at work- control the storage and use of explosive or highly flammable or otherwise dangerous substances, and generally preventing the unlawful acquisition, possession and use of such substances.
Marine Mammal Protection Act 2005 & Regulations 2005	To protect marine mammals	To make provision and regulation for the protection of marine mammals.
Merchant Shipping (Oil Pollution) Act, Chapter 275	To address oil pollution by ship and to effect to International Conventions relating to pollution of the sea	An Act to make provision concerning oil pollution of navigable waters by ship; to provide for the civil liability for oil pollution by merchant ships; to give effect to certain International Conventions relating to pollution of the sea; and for matters connected with and incidental to the foregoing.
Planning and Subdivision Act, 2010 Planning and Subdivision Regulations (Application Requirements), 2011	To regulate the built environment	This Act regulates the development of the built environment though physical planning protocols across the archipelago of The Bahamas. The Act stipulates the process for subdivision approval subject to specific conditions with respect to the features of the proposed development or project including the preparation of an Environmental Impact Assessment/Statement.
Port Authorities Act 1962	To provide regulation for the management and control of navigational areas	An Act to provide for the constitution and appointment of port authorities for New Providence and the Out Islands whereby the various ports and harbours of The Bahamas and the pilots and pilotage thereof and therein may be better regulated and controlled. A letter of notification for coastal activity must be sent to the Port Department for any activity occurring in the sea.
Public Works Act 1963	To provide for the physical development of The Bahamas	An Act to provide for the construction, management and development of public works, buildings, and road.
Water and Sewerage Act 1976	To establish the Water and Sewerage Corporation and to control water resources	An Act to establish a Water and Sewerage Corporation for the grant and control of water rights, the protection of water resources, regulating the extraction, use and supply of water, the disposal of sewage and for connected purposes.
Wild Animals Protection Act 1968	To protect wild animals of The Bahamas	The Act provides a listing of protected animal species in The Bahamas.

Environmental Law, Regulation, Policy	Subject	Summary
Wild Birds Protection Act 1987 Wild Bird Protection Act (Reserves),	To protect wild birds of The Bahamas	The Act protects the wild birds of The Bahamas and makes provision for the dedication of time periods for the hunting of specific species.
Wildlife Conservation and Trade Act	To implement CITES	An Act to implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) with a view to the protection of wild species from harm through unsustainable exploitation.

3.2 National Environmental Policies

Relevant National Policies	Subject	Summary
Bahamas National Maritime Policy, 2015	The National Maritime Policy provides a guidance to expand the maritime sector through safe and sustainable practices.	The Objectives of The Bahamas National Maritime Policy are: 1) to expand the maritime sector for future economic development 2) to provide employment opportunities for Bahamians both nationally and internationally 3) to facilitate the training of mariners consistent with international norms 4) to establish programmed and protocols that enhance the safety of mariners and vessels 5) to upgrade port infrastructure and port services throughout the country
National Energy Policy 2013-2033	The National Energy Policy 2013 – 2033 outlines a plan for a modern diversified and efficient energy system that is affordable and secure while ensuring sustainability prosperity.	The National Energy Policy acknowledges the influence of atmospheric greenhouse gas emissions as contributors to global climate change. Reducing dependence on fossil fuels while increasing investment for renewable energy sources show commitment by The Bahamas to adapt to climate change.
National Policy for the Adaptation to Climate Change 2005/2014	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. The Bahamas prepared its Second National Climate Change Communication to UNFCC in September 2014.
The Bahamas National Wetland Policy	The goal of the National Wetlands policy is to conserve, manage, and restore wetland wisely in conjunction with sustainable development practices.	The Bahamas National Wetland Policy outlines a national framework to meet the goals and objectives of the Ramsar Convention, which The Bahamas signed on June 7, 1997. This policy paper provides direction to the Government for the management of wetlands and to identify wetlands of national importance.

Relevant National Policies	Subject	Summary
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).
National Biodiversity Strategy and Action Plan, 1999	A plan to maintain biodiversity through sustainable development for a small island developing nation.	The Government of The Bahamas 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.

3.3 International Conventions of Relevance

International Convention/Organization	Subject	Summary
Cartagena Convention Ratified: June 24, 2010	An agreement for the protection and development of the marine environment in the wider-Caribbean region	The Convention provides a legal framework for cooperation in the wider Caribbean region. Contracting parties must adopt measures to prevent, reduce, and control pollution from: ships, dumping, sea-bed activities, airborne pollution, and pollution from land-based sources and activities.
Convention on Biological DiversitySigned: June 12, 1992	To preserve species diversity	The Bahamas is a signatory to the Convention on Biological Diversity which came into force December 1993. It has three main goals: a) The conservation of biological diversityb) The sustainable use of components of biological diversityc) The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Signed: March 20, 1979	To protect species through the regulation of wildlife trade	CITES regulates the trade of wildlife through a classification system that restricts movement of endangered species. Trading of species may require permits as dictated by the Convention.
Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Signed: June 7, 1983	To prevent the pollution of the sea by maritime traffic	MARPOL 73/78 outlines measure for the prevention of pollution of the marine environment by ships from operational or accidental.

International Convention/Organization	Subject	Summary
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) Signed: June 7, 1997	This convention provides a framework for the international protection of wetlands as contributors for human resources and moreover, for avifauna which do not adhere to international boundaries.	The Bahamas is a signatory to the Convention on Wetlands of International Importance, also known as the Ramsar Convention. Ramsar defines wetlands as 'areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters. The Bahamas has 1 site, Great Inagua National Park, designated as Wetlands of International Importance (Ramsar Sites).
United Nations Convention on the Law of the Sea Signed: July 29, 1983	To govern the sea with delineation of national boundaries and rights	The Bahamas ratified the Law of the Sea in 1983 and the Convention came into force in 1994. The premise of UNCLOS is to provide for good ocean governance, define the exclusive economic zone (EEZ), and establish innocent passage and the rights of States to limit the rights of innocent passage related to marine resources conservation and pollution control.
United Nations Convention to Combat Desertification and Drought Signed: November 10, 2000	To combat desertification and to mitigate the effects of drought	The Convention is a proponent for sustainable development by addressing social and economic issues that directly impact land degradation.
United Nations Framework on Climate Change Signed: June 1992 Kyoto Protocol Signed: April 9, 1999 Paris Agreement Ratified: August 22, 2016	To stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with climate systems	The Bahamas is a signatory to UNFCC which entered into force in March 1994. The UNFCC was the culmination of climate negotiation at the Rio Earth Summit in 1992. This summit established a framework with an aim to stabilize atmospheric greenhouse gas. The Paris Agreement as put forth at the Conference of the Parties (COP21) in December 2015. The agreement sets forth a global action plan to combat climate change by limiting global temperature rise to below 2 degrees Celsius.
Hamilton Declaration on Collaboration for the Conservation of the Sargasso Sea Signed: September 2016 Not yet in force	To conserve the Sargasso Sea	The Hamilton Declaration is currently signed by seven (7) nations, including The Bahamas. The Sargasso Sea covers nearly 5 million square kilometers and is so named for the seaweed, Sargassum. Sargassum mats and windrows act as major nursery and spawning areas. Of note, it is the only place where the European and American eel are known to spawn.

3.4 Government Departments and Local Non-Governmental Organizations

- Ministry of Public Works
- Ministry of the Environment and Housing
- Department of Environmental Planning and Protection
- Port Department

- Department of Physical Planning
- Department of Environmental Health
- Water and Sewerage Corporation
- Bahamas Power and Light
- Local Government of the district of South Eleuthera
- Department of Marine Resources

4.0 Mitigation Plan

4.1 Pre-Construction Species Relocation

Prior to commencement of construction, species will be identified and relocated as discussed in the following sections with greater detail contained within Appendix C: Marine Mitigation and Coral Relocation Plan.

4.1.1 Relocation of Notable Sedentary Marine Life

Prior to construction work on the property, mitigation for hardbottom habitats directly impacted by the proposed development will focus on transplanting sessile invertebrates that are of highest biological function given the essential role they play in the hardbottom ecosystem. These include the framework-building scleratinian corals that have slower growth and low levels of natural recruitment with the potential to provide structural habitat over time, rather than coral species that provide comparatively lower ecological function (e.g., *Porites*, *Agaricia*, and *Siderastrea*), all of which are characterized by rapid growth, limited accretion rate, and relatively short lifespans. A baseline coral disease and bleaching survey will be conducted prior to any coral relocation. If Stony Coral Tissue Loss Disease (SCTLD) is observed, Disney will work with the Department of Environmental Planning and Protection (DEPP) on addressing any issues related to the disease and will coordinate with DEPP prior to taking any action. Corals exceeding 10 cm (3.9 inches) in diameter within any areas of impact will be relocated to similar, matched habitat in the Lighthouse Point vicinity. Species will be strategically grouped to account for maximum reproductive success while minimizing potential disease spread. Relocated corals will be monitored for a minimum of 3 years to assess the success rate of relocation and natural recruitment onto artificial reef and piling substrates. Operator will continue to collaborate and consult with Perry Institute around Lighthouse Point and the Greater Bahamas to propagate and grow coral specimens prior to establishing them in the ocean to help rehabilitate Bahamian reefs.

Other species considered for translocation include giant barrel sponges (*Xestospongia muta*) which occurs primarily on offshore hardbottom habitat. These sponges may do fine under the berth area, but this is not guaranteed. As an exploratory/experimental commitment, the Operator will relocate a portion of all the larger barrel sponges (25 cm or greater in diameter) within the development footprint and berthing area. Monitoring of both the relocated sponge portion and left-in place base will be conducted over a 3-year period to determine survivorship and rates of growth. If successful, this technique has the potential to maintain existing barrel sponge structure while also increasing overall sponge biomass.

The remainder of the coral and sponge population that fall within the impact area will be left in place, as they are primarily species that have comparatively lower functional values and/or demonstrate high levels of natural recruitment in the area. With the single pile design, chances for impact are reduced. For any residual sessile invertebrates that are not moved in the development area, Operator will examine feasibility of reattaching or stabilizing any damaged corals or sponges that may been dislodged during the piling installation process. Monitoring of all sessile invertebrates within and outside impact areas will occur during construction and for at least three years after construction is completed to evaluate actual impacts and effectiveness of proposed mitigation efforts.

4.1.2 Relocation of Minimally Motile Species

Minimally motile species such as conch, crayfish, sea cucumber, sea stars, and urchins that occur within the projected impact area will be relocated to suitable areas not impacted by construction activities on the island 48 hours prior to each operation directly impacting the sea floor.

4.1.3 Relocation of Terrestrial Life

4.1.3.1 Protected Tree Relocations

Development of some components of the project will require the removal of trees that are designated by the Government of The Bahamas as Protected. Detailed tree inventories will be conducted within the footprint of proposed development to identify the locations of protected trees. The operator will work with the Forestry Unit within the Ministry of the Environment and Housing to develop an appropriate tree mitigation program, which will include 1) recognizing the approximately 193 acres

of the privately owned forest that will form the Disney Donated Public Lands, 2) avoiding removal of protected trees, as transplanting success and feasibility decrease as tree size increases, 3) transplanting protected trees on property where possible, 4) donating trees that cannot be preserved on-property for transplanting off-site, and 5) planting 1:1 replacements (either on- or off-property) for protected trees >5cm diameter at breast height that cannot be preserved in place or transplanted. To facilitate translocations, if appropriate resources allow, a temporary nursery may be designated in an area of the property to be developed or at a nearby, off-property location. Because transplantation locations may not always be known or available at the time of tree removal, trees likely to be transplanted would be temporarily relocated to the nursery until the target planting locations are available.

4.1.3.2 Plant Relocations

Where feasible, plants in areas to be developed will be transplanted either on- or off-property. The landscaping palette for the property will focus on native plants to conserve the property's flora. Where feasible, plants of interest will be removed and taken to an access point where local Native Plant Societies will have 48 hours to retrieve for local community use.

Of particular interest are populations of native orchids that are protected by international treaties and are present within areas that are to be cleared for development. The Environmental Management Team (EMT) will work with local experts to relocate transplantable species that have a high likelihood of survival. Relocatable individuals may be moved onto other areas of the property that are not to be impacted, moved onto adjacent Crown Lands or the future Disney Donated Public Lands with the permission of the Government, or moved offsite to enhance populations at Leon Levy or other Government-owned properties.

4.1.3.3 Relocation of Terrestrial Wildlife during Site Development

Within a week of ground disturbance, the area to be developed will be inspected for terrestrial wildlife by the EMT. If target species are found (e.g., minimally mobile fauna, fossorial species, nesting birds), animals will be relocated to nearby suitable habitat on the property not impacted by development.

Minimally motile fauna [i.e., seagrape snails (*Hemitrochus* sp.)] are locally abundant on upland vegetation in the herbaceous and shrub-dominated dunes and sand strand areas near the east-

facing beach. Although this species is not currently protected by The Bahamas or international treaties, the Operator will collect listed species and notable sedentary and/or other minimally mobile fauna prior to land clearing and relocate them to adjacent suitable habitat that will not be impacted by site development.

Fossorial species utilize underground burrows and rock crevices as habitat. Species of particular interest at Lighthouse Point include the Bahamian boa and burrowing owls, which nest underground. During pre-ground clearing inspections, any snakes or owls found will be relocated by the EMT. In addition, as part of their Environmental Training, contractors will be educated to recognize snakes and burrowing owls and required to report any sightings in construction areas to the Environmental Manager for relocation.

During site development work, if burrowing owls are encountered, activity will be halted while the EMT investigates and manages the animals if necessary so work can resume. Where possible, burrowing owls should be left undisturbed and their burrow staked off in a no disturbance zone of at least 10x10 feet (preferably 33x33 feet). If impacts to the burrow location are unavoidable, the Environmental Manager will notify the Government and determine if a burrow is likely to contain eggs or chicks according to the Florida Fish and Wildlife Conservation Commission's Species Conservation Measures and Permitting Guidelines for Florida Burrowing Owls (https://myfwc.com/media/2028/floridaburrowingowlguidelines-2018.pdf). If eggs or chicks are present, the burrow must be staked off in a 33x33 foot no disturbance zone and avoided until the chicks have left the burrow. If eggs or chicks are absent, the burrow must be excavated and collapsed following the guidelines referenced above to ensure adult owls are not injured in the process. Artificial burrows will be installed to provide alternative nesting habitat.

During site development work, if Bahamian boas are encountered, activity will be halted while the EMT investigates and relocates the animals so work can resume. As part of preclearance surveys, 4ft x 4ft cover boards will be placed at a density of 4 per acre at least one week before clearing begins; the day before ground clearing, any snakes found under the boards will be moved. Whether during site development or pre-construction surveys, snakes will be relocated to similar habitat as near to 100 m from the capture location as possible, as survival rates decline when individuals are moved beyond their home range. Each relocated snake will be marked with a PIT tag (a

subcutaneous identification microchip) to allow for future identification if an individual is recaptured. A subset of relocated snakes will be outfitted with Motus tracking devices to assess post-release movements (see monitoring for further details). Data from recaptures and tracking devices will be used to modify relocation protocols throughout the project to improve their effectiveness (i.e., reduce return rates to modified habitats while maximizing survival or relocated animals).

If any bird nests are found during pre-ground clearing inspections, each nest will be checked to determine if the nest is active (i.e., eggs or chicks present). Where possible, active nests will be staked off in a no disturbance zone of at least 10x10 feet, and larger if feasible. If impacts are unavoidable, the EMT will transfer nests to similar habitat adjacent to the area under development. During site development, if active nests are encountered, activity will be halted while the Environmental Manager relocates nests so work can resume. Nests that are relocated or staked off with a no disturbance zone will be monitored weekly to assess the outcome of the nesting attempt. Results will be used to modify nest relocation procedures if necessary to improve the likelihood of successful nesting.

Buildings will be constructed to minimize opportunities for bat roosting or bird roosting/nesting on the structures themselves (see Section 4.8.17). However, if bats are found roosting in buildings, once bats vacate the structure at night to forage, any gaps used by bats will be covered or filled once it has been confirmed no bats are still within the structure. If birds are found nesting on buildings, nesting material will be removed when birds are not present prior to egg laying. Once eggs have been laid or if chicks are present, nests will not be disturbed until after young have left the nest, at which point the nest will be removed.

4.1.4 Construction and Mitigation Measures

Operator will work with the Government of The Bahamas and the local community to determine the appropriateness of installing and maintaining mooring buoys and/or aids to navigation during the

relocation and monitoring of the corals around the nearshore coastal environment to reduce groundings or indiscriminate anchoring on reefs and other sensitive benthic habitats.

4.2 Creation of Appropriate Habitat

4.2.1 Nearshore Fish Thruways

The trestle and berth have a 21ft span and should not create a significant barrier to fish migrating along the hardbottom environment. The revetment around the small vessel marina will include openings to allow flushing and facilitate fish movement. Nearshore areas of the trestle (~located approximately within 200 m of shore) are where bonefish (and other nearshore species) are most likely to migrate along-shore during spawning or other periods. Efforts will be made to keep these areas as open sandy habitat with minimal artificial structures. Trestle design features will include the use of artificial lighting under nearshore spans to minimize shading affects during daylight hours. The goal will be to maintain nearshore areas as fish thruways and minimizing the potential for attracting predators that may target migrating prey species. Lionfish and other predators will be removed from these nearshore areas after construction and on an on-going basis if they are found to accumulate here as part of the Lighthouse Point operational maintenance management plan.

4.2.2 Mid-Channel Trestle Habitat Creation

Mid-channel and offshore areas of the trestle have been proposed as potential areas for environmentally friendly habitat creation. Two areas of the trestle that span shallow sand habitat and are within 75' of the trestle have been identified for possible structural enhancement after construction is complete as compensatory mitigation for limestone structural relief that may be lost during construction. Details of this process will be provided following consultations with the Department of Marine Resources and DEPP.

4.3 Invasive Species Management Plan

4.3.1 Biosecurity

Invasive species are non-native, introduced species that establish in a new environment, and spread in ways that cause harm to native ecosystems, agricultural areas, or human welfare. Islands such as those of The Bahamas are particularly vulnerable to the introduction of invasive species, and care must be taken to prevent the introduction of new species, and manage populations of invasive species once established. The following measures will be used to prevent the establishment of

invasive species, in the following order: 1) Prevention, 2) Early Detection and Response, 3) Eradication, and 4) Control.

Prevention: Environmental Manager will have access to a picture book of flora and fauna considered invasive in The Bahamas. Strict adherence to the local regulations regarding importation will be followed (linked directly below). Landscaping plans will focus on species native to The Bahamas. If a pattern is determined that multiple invasive species are being introduced, then the source vendor may be visited by the Environmental Manager/Team to determine the cause of the issue. The source vendor should resolve the issue, or the vendor could be removed from service until the issue is resolved. http://extwprlegs1.fao.org/docs/pdf/bha175843.pdf

Early Detection and Response: Spot-checks will be performed on incoming shipments. Crew will be trained on the identification of invasive species using the Department of Marine Resources' Bahamas Invasive Species Field Guide (linked directly below). If invasive species are found, they will be reported and dealt with in a manner to reduce risk of their colonization in The Bahamas. Crew will also be asked to report anything that looks new or out of the ordinary. Each container will be inspected and if it appears there is any signs of infestation the container will be sent off for fumigation. All plant material, soil and wood require an import permit thus further allowing determination if fumigation will be required. http://caribbeaninvasives.org/wp-content/uploads/2014/05/Bahamas-IS-Field-Guide-print-version.pdf.

Eradication: Eradication of invasive species at time of detection will be achieved whenever possible. The methods of eradication will be as humane as possible. If invasive species are found, the use of the items may be delayed until the eradication is complete and the items approved for introduction to the site by the Environmental Manager.

Control: When eradication is not possible, feasible, or reasonably cost-effective, long-term control measures will be implemented (for examples see Sections 4.1.2 and 4.1.3).

4.3.2 Integrated Pest Management

Disney's Lighthouse Point is home to a variety of flora and fauna, according to multiple environmental surveys. This diversity indicates a strong and healthy environment. There are a few animals,

however, which can affect the health of the humans in the area and potentially damage the ecosystem in place currently (http://extwprlegs1.fao.org/docs/pdf/bha175843.pdf).

An Integrated Pest Management (IPM) methodology will be utilized to identify and "solve" such issues.

The steps of an IPM program are as follows:

- Inspection – Inspections, logged into a system of record, should be performed on a regular basis. Early identification of a problem can lead to a faster resolution with less extreme measures being taken and reduced impact.
- Cultural Control – Once a problem is identified, surrounding factors (environmental, human behaviors, building construction, etc.) should be examined to determine if the issue can be mitigated by making changes to the environment.
- Mechanical Control – Physical traps, when possible, should be considered as an initial way to remove the problem from the location.
- Biological Control – A pest problem should be researched to determine if there is a biological way to control the issue.
- Chemical Control – If a problem is identified earlier, often the least toxic chemical at the lowest rate can resolve the issue. If a problem is more advanced or having a sever effect, higher rates or stronger chemicals may be needed.

Example of IPM methodology being applied to a pest problem:

Rodents

- Inspection – identification of small number of droppings or signs of chewing identified.
- Cultural Control – emptying trash cans they may be feeding on, securing food in rodent-proof containers, or ensuring the doors close completely with no gaps.
- Mechanical Control – snap traps.
- Biological Control – identifying and/or encouraging predators in the area that feed on rodents.
- Chemical Control – applying rodenticide in bait stations.

4.3.3 Marine Invasive Species

4.3.3.1 Lionfish

Lionfishes are venomous species of scorpionfishes that are native to the IndoPacific region and are classified as invasive alien species (http://extwprlegs1.fao.org/docs/pdf/bha175843.pdf). In the 1990s, these fishes became popular as an aquarium fish due to their vibrant colors. Through release into warm Atlantic waters, they have proliferated to become a highly problematic invasive species that poses a serious threat to the Atlantic coral reef ecosystem. Lionfish will be opportunistically removed through trapping and spearfishing activities with an emphasis placed on nearshore areas that have artificial novel habitat (small vessel marina, trestle).

4.3.3.2 Invasive Microbes – Stoney Coral Tissue Loss Disease

Recently SCTLD has been identified in Grand Bahama, Nassau, San Salvador, and Northern Eleuthera. If it tracks like in other countries, it will likely spread throughout The Bahamas. While not yet proven, the epidemiology trends suggest that it the disease is spread by boats and possibly scuba gear. The Disney cruise ships do not exchange ballast waters within Bahamian waters. Small boat operational protocols will instruct that bilge be discharged in deep water when crossing between islands and never adjacent to the Lighthouse Point property. If SCTLD is detected in the region, small-boat bilge and SCUBA gear will be disinfected with chemicals that are approved by The Bahamian government when moving beyond 1 mile of current location. Disney is committing to conducting baseline and quarterly surveys by trained divers and will work with DEPP on addressing any issues related to the disease and will coordinate with DEPP prior to taking any action to treat diseased corals.

4.3.4 Terrestrial Invasive Species

4.3.4.1 Cats

Feral cats can impact wildlife populations by preying upon them and have had particularly negative effects on birds and small reptiles on islands like The Bahamas without native mammalian predators. Equally important, cats can pose a safety risk to people through bites, scratches, and pathogen or parasite transfer. Feeding feral cats, either intentionally or unintentionally, can attract more cats or support population growth. To avoid this, as part of their Environmental Training, contractors and Disney staff will be educated to not feed cats, manage food waste so cats or prey like mice or rats do not have access to it, and report sightings of cats to the Environmental Manager. Cat sightings and signs, i.e. scat or prints, will also be noted during terrestrial wildlife surveys.

4.3.4.2 Dogs

Feral/unrestrained dogs can impact wildlife populations directly by preying upon them or indirectly by disrupting foraging (e.g., chasing shorebirds on beaches). Equally important, dogs can pose a safety risk to people through bites, scratches, and pathogen or parasite transfer. Feeding feral dogs, either intentionally or unintentionally, can attract more dogs or support population growth. To avoid this, as part of their Environmental Training, contractors and operators will be educated to not feed dogs, manage food waste so dogs do not have access to it, and report sightings of dogs to the Environmental Manager. Dog sightings and signs, i.e. scat or prints, will also be noted during terrestrial wildlife surveys.

4.3.4.3 Rats

Rats can impact wildlife populations by preying upon them and have had particularly negative effects on nesting birds and small animals like reptiles and invertebrates. Equally important, rats can pose a safety risk to people through bites, scratches, and pathogen or parasite transfer.

Because of their impacts on human and wildlife health, rats will be lethally trapped by snap traps that prevents unintended impacts on other wildlife species (specifically birds, lizards, and crabs). Rat collars on ship lines will be deployed to prevent rats arriving from ships. As part of their Environmental Training, contractors and Disney staff will be educated to manage food waste so rats do not have access to it and report sightings of rats or their feces to the Environmental Manager. Traps will be placed in the sea containers and bait stations in the surrounding areas to monitor for activity for rats to prevent colonization.

4.3.4.4 Raccoons

Raccoons can impact wildlife populations by preying upon them and pose a safety risk to people through bites, scratches, and pathogen or parasite transfer. Feeding raccoons, either intentionally or unintentionally, can attract more raccoons or support population growth. To avoid this, as part of their Environmental Training, contractors and operators will be educated to not feed raccoons, manage food waste so raccoons do not have access to it, and report sightings of raccoons to the Environmental Manager. Raccoon sightings and signs, i.e. scat or prints, will also be noted during terrestrial wildlife surveys. .

4.3.4.5 Honeybee

For bees located in areas with potential human conflict, if hives are deemed to be a safety hazard, local certified beekeepers will be contracted to remove and domesticate any hives found on property for commercial use. Africanized colonies can be converted to European hives by replacing the queens. If beekeepers are not able to remove the hive/swarm in a timely or safe manner the hive will be humanly eliminated in a safe manner.

4.3.4.6 Invasive mosquitos (*Aedes aegypti*)

Human-generated standing water associated with historic or newly constructed structures will be discouraged. A BIC (Biting Insect Control) CO2 Barrier System will be installed at Lighthouse Point to control mosquitos and other pests. The system will be installed above grade to allow for ease of inspection and repair. The system will be routed throughout the site to protect the guest or Front of House (FOH) areas and living or Back of House (BOH) areas from biting insects. Placement of the CO2 source and system controls will be in an area that limits visual and auditory impacts. A site survey will be conducted to identify the exact locations and specific requirements needed to optimize the effectiveness of the system. The outer color of the polyethylene tubing used for the system should be black as it has been the most effective color in attracting biting insects.

4.3.4.7 *Casuarina equisetifolia*

The EMT will develop and implement a plan wherein *Casuarina equisetifolia* is gradually removed. When saplings are found, they will be removed. In areas that are easily accessible (e.g., along road edges and areas impacted by the project), *Casuarina* will be mechanically removed. Where *Casuarina* are removed, a more diverse community of native palms and plants will be planted to replace them, such as *Cocos nucifera*, *Conocarpus erectus*, *Coccothinax argentata*, Sabal palmetto and *Laguncularia racemosa*.

In locations where *Casuarina* are present in low numbers amid high-quality natural communities, a cost/benefit analysis will be performed by the Environmental Manager to determine whether more damage will occur by removal. If determined it is more beneficial, invasive trees will either 1) have their trunks cut at/near ground level, stumps will be treated with herbicide, and trunks will left to decompose naturally, or 2) be treated by a basal-bark herbicide and left to die in place as standing dead-wood.

4.4 Seagrass Transplanting

Some of the construction will impact seagrass beds, mostly around the proposed nearshore Service Ramp (0.01 acres directly impacted by placement of structures). These beds are dominated by Thallassia testidium with occaisional shoots of Syringodium filiforme. According to the IUCN, both species are abundant throughout their range, and the overall population is stable. This species is listed as Least Concern. Observations over the past three years indicate that seagrass coverage can be variable in nearshore wave influenced areas where sand movement is highest. Any damage to seagrass beds will be identified as part of the daily construction related benthic resources assessment (see Appendix B: Marine Benthic Resources Monitoring Plan). Seagrass coverage will be assessed just prior to any in-water or upland construction and again after construction along shore parallel transects. If any losses to seagrass coverage is documented beyond what has been projected in the EIA, a separate Seagrass Rehabilitation Plan will be submitted to the Department of Marine Resources and DEPP.

4.5 Debris Clean-up

The onsite construction team will survey the water surrounding the construction area on a regular basis and collect and dispose of any debris as it is found. Reusable material will deposited in a designed public- access area with for use within the community. Recyclable debris will be appropriately processed depending on type and shipped back to the United States for processing. Non-recyclable materials will be fed into the waste stream where it will be appropriately incinerated or transported back to the United States. Marine debris after hurricanes will also be addressed by scouting and removal.

4.6 Education and Environmental Awareness

To encourage construction worker teams to follow wildlife and environmental best practices from the EMP, construction teams will be engaged through training, social marketing, and educational tools. The following recommended strategies are based on past evidence of success from Disney's culture of Safety, construction training evaluations, and social marketing to promote beneficial behavior change.

The EMT will be responsible for training, implementation, and evaluation of this program. The EMT is comprised of representatives from the American Bridge Environmental Management team, WDI

Construction Management team, Disney Environmental Integration team and Disney Wildlife Conservation team. The EMT will be responsible for monitoring adherence to the EMP, correcting deficiencies, and communicating compliance. Environmental and Construction Status reports will be completed on a daily basis and kept in the project files.

On-boarding Training: The EMT will provide environmental best management training during onboarding for all construction workers and contractors. In advance of this training, a pre-survey will gauge workers' knowledge, attitudes and behaviors (KAB) toward proactive environmental behaviors aligned with EIA recommendations. A post-survey will be administered immediately following training to evaluate changes in KAB. This training and evaluation will be repeated every 6-months to one year, aligned with the Safety Training schedule. Content adjustments may occur based on information gained from surveys. Training will also be provided to on-site biologists for quarterly and daily construction related monitoring including coral identification, SCTLD identification, underwater imaging, and turbidity and other water quality measurements.

Ongoing Reinforcement: Following initial training, the EMT team will reinforce environmental best practices by leading daily, 5-10-minute environmental training presentations as a part of mandatory scheduled safety meetings for construction teams. Topics will vary based on relevancy to environmental conditions, wildlife or situations the team may encounter at planned worksites. The EMT will visit planned worksites in advance of hosting trainings to ensure content relevancy. Content will be developed by the EMT, Disney Conservation and Disney's Animals, Science and Environment teams.

Training will promote positive environmental behaviors through a reporting and acknowledgment program. Proactive environmental actions will be reported with worker or team's name and date through the Near-Miss Reporting Platform. Reported environmental behaviors will be reviewed by the EMT monthly. Teams will receive recognition for participation in environmental observations. Reported actions that do not qualify will be discussed during a future training meeting to ensure understanding around alternative actions that could have been taken in each scenario. Acknowledgements will recognize the presence of successes (i.e., avoided corals to protect them) rather than the absence of issues (i.e., no corals destroyed) to encourage true environmental actions taken as well as transparent communication. Acknowledgements will be evaluated and adapted to determine the frequency and structure that best engages construction worker teams.

Communication: This program will be supported through various communications opportunities and platforms to ensure culturally-appropriate, relevant messaging promoting environmental behaviors is shared with construction teams frequently and consistently. Communication tools will include a decision-tree of wildlife scenarios and best practices for the EMP and establishment of an interaction between construction teams and the EMT. Communication will highlight cultural relevance and positive economic impact of taking actions aligned with the EMP. Engagement and reporting of positive environmental activities will be promoted as an opportunity for construction workers to interact with the EMT to evaluate construction worker behaviors and progress toward the completion of Lighthouse Point. Leadership and executives will also be engaged to regularly promote pride in the program through communications.

4.7 Enhancements from Project

In addition to direct mitigation activities, the project itself will provide indirect environmental enhancements within the project footprint.

4.7.1 Revetment Infrastructure

To assure fish migration, revetment infrastructure around the small vessel marina will be designed to allow fish and sand transport. Further offshore along mid-channel areas of the trestle that span sandy hardbottom habitats, the Operator has proposed placing limestone boulders onto this sandy-bottom area to create the hard substrate onto which corals can settle and groupers can find shelter. All of these proposed features will incorporate science-based ecological and biological design principles into the engineering plans. Collectively, this hybrid ecological-engineering approach should provide added benefits that would be secondary to the primary purpose of the artificial structure. A longer-term coral rehabilitation program will be part of the overall mitigation plan for impacted hardbottom habitats. It is proposed that rehabilitation efforts be focused on enhancing many species of coral populations on degraded reefs, building on Disney's existing efforts at Castaway Cay, which includes using coral nurseries to rehabilitate elkhorn and staghorn corals. Disney has substantial experience working with corals and reef systems in The Bahamas, having successfully transplanted approximately 2000 coral colonies, with more than 90 percent survival rates on the main reef that is being rehabilitated. Disney teams are part of the greater Reef Rescue Project by Perry Institute for Marine Science and have been rehabilitating patch reefs in Southern

Abaco for the past 14 years as a dedicated coral conservation project and were the first to start coral nurseries in The Bahamas. Disney is also a key partner in the AZA-Florida Reef Tract Rescue Project, addressing SCTLD off the Florida coast and across the Caribbean.

4.8 Other Mitigation Plans

4.8.1 Prevention of Reef Destruction

Coral reefs occur in abundance in the Lighthouse Point area and are regionally significant supporting many hundreds of fish and invertebrate species. The Operator has committed to the Lighthouse Point development having a net positive impact on the Lighthouse Point marine environment with particular emphasis on the coral reefs. All phases from the design, construction, and operation include measures to meet this goal. The Lighthouse Point design avoids dredging and the placement of structures on the seafloor avoids coral reefs. The beach area development will be limited to about 25% of the total Disney Lighthouse Point property coast with the remaining beaches and rocky shorelines to be managed as natural areas with limited access. In developed areas, access to sensitive inshore areas will be limited and controlled to avoid potential impacts and will require the use of reef safe sunscreen.

For the construction phase, direct impacts will occur to hardbottom habitats and will be mitigated by relocating large significant corals and barrel sponges and mobile invertebrates out of the development/berthing area footprint before construction (see Appendix C: Marine Mitigation and Coral Relocation Plan). The proposed coral translocation design for mid-channel high density sites is to group relocated corals by species in a high-density arrangement that may increase reproductive output compared to their original low-density hardbottom arrangement (see Appendix C: Marine Mitigation and Coral Relocation Plan). Other adverse secondary impacts associated with construction to adjacent coral reef areas are possible given their close proximity to where construction will take place. To prevent or minimize these secondary impacts and guide construction activities, the Project will utilize best practices as outlined in Section 5 and 6 along with extensive daily construction related monitoring of water quality and other biotic indicators (see Appendix B: Marine Benthic Resources Monitoring Plan, Appendix G: Water Quality Monitoring Protocol and Appendix Q: Daily Construction Related Monitoring Locations and Protocol). Fishing for grouper, conch, and lobster on the Lighthouse Point reefs will not be permitted by any of the construction crews or on-site technicians. Moreover, long-term fixed site Before-After Control Impact monitoring

of coral reefs of the Lighthouse Point area will be used to help distinguish natural variation and identify any project-related secondary impacts (see Appendix B: Marine Benthic Resources Monitoring Plan). Any significant changes that are outside of anticipated impact areas and related to development will be quantified and a response plan developed to address causes of stress. This may include adapting construction methods, limiting construction periods, and/or adjusting development plans.

Boating activity around the Lighthouse Point area also has the potential to damage coral reefs through anchoring and propeller dredging in shallow areas. The Developer will install temporary mooring buoys around any reef areas for monitoring during the construction phase of the project in selected areas to help prevent damage from anchoring on reefs and other sensitive benthic habitats. These buoys may become part of a longer-term permanent network of mooring buoys and/or navigational aids for the Lighthouse Point area after further Consultations with the Government of The Bahamas and the local community.

After construction, remediation of impacted seafloor areas will be undertaken to fill holes, remove debris, and stabilize areas designed to speed up recovery and natural coral colonization. Other measures include proposed structural enhancement of selected impacted hardbottom areas using natural limestone to increase long-term coral reproduction and survivorship. A longer-term coral rehabilitation program is also being considered for Eleuthera building on Disney's existing efforts at Castaway Cay, which includes using coral nurseries to restore elkhorn and staghorn corals.

4.8.2 Sharks

Sharks are protected in The Bahamas and become a safety issue if they become habituated to humans. There will be no feeding of sharks in the waters surrounding Lighthouse Point property. Drilling and any driving will utilize an underwater speaker system to warn animals of impending noise to allow them to move out of the impacted area.

4.8.3 Bonefish/Grouper

To assure fish migration, revetment infrastructure around the small vessel marina will be designed to allow fish and sand transport. Nearshore areas of the trestle may use an artificial light source to minimize shading and to facilitate bonefish migration and minimize predation. Further offshore along

mid-channel areas of the trestle that span sandy hardbottom habitats, the Operator has proposed placing limestone boulders onto this sandy-bottom area to create the hard substrate onto which corals can settle and groupers can find shelter. All of these proposed features will incorporate science-based ecological and biological design principles into the engineering plans. Collectively, this hybrid ecological-engineering approach should provide added benefits that would be secondary to the primary purpose of the artificial structure. Any efforts to design and build environmentally-friendly artificial structures would proceed with careful consideration of materials and location and with consideration of potential unintended adverse consequences. Small-scale pilot projects to test these various elements and locations would be necessary before any larger-scale efforts are undertaken. Bonefish Tarpon Trust/Operator will continue to monitor behavior of bonefish as a proxy to other migrating fish. See Appendix D: Bonefish Monitoring Plan.

4.8.4 Sea Turtles

While no evidence of sea turtle nesting has been observed to date, sea turtle nest monitoring will be performed along the east-facing beach, Lighthouse Bay Beach, and Bottle Bay Beach prior to, during, and following development; and when in operation during nesting season. This monitoring will be performed the EMT. If turtles are determined to nest on the resident beaches, the EMT will apply protocols used in its current sea turtle monitoring program in Vero Beach, Florida. In addition to a rigorous monitoring program, Operator will aim to 1) Design, construct, and operate onsite facilities with sea turtle conservation in mind, by 1) Installing sea turtle-friendly lighting for any evening lighting needs, 2) Maintaining healthy and intact dunes (with guidance from Indian River County's Habitat Conservation Plan in Florida), and; 3) Actively promoting sea turtle conservation through habitat protection and guest/community engagement. The protection plan will consider the effects of increased human activity on nesting beaches and turtle's photopic sensitivity to artificial beachfront lighting. To design a sea turtle-friendly lighting plan, recommendations will be used from the Florida Fish and Wildlife Conservation Commission, the agency that oversees management of the largest nesting population of loggerhead sea turtles in the world. These recommendations include outfitting ocean-facing infrastructure with lighting fixtures that satisfy three basic principles; 1) Keep it low (mount fixtures low to the ground); 2) Keep it shielded (add shields to fixtures to prevent exposure to the beach), and; 3) Keep it long (referring to long wavelength light, such as red or amber-colored LED bulbs). In the event that sea turtle nesting activity is documented onsite,

protocols for conducting nighttime research or wildlife tourism programs with nesting turtles will be guided by new research published by Disney's Animals, Science, and Environment (Smith et al. 2021). See Appendix E: Sea Turtle Nesting Survey Protocol.

Monitoring for sea turtle nesting activity will be informed by Disney's sea turtle conservation program activities in Vero Beach, Florida; a program permitted by the Florida Fish and Wildlife Conservation Commission. Daily (April-Oct) sea turtle nesting surveys will be conducted pre- and post-construction to ensure any potential nesting activity is documented and not affected by construction.

A trained surveyor will begin the survey at first light and continue until all beaches have been assessed. The surveyor will use an All-Terrain-Vehicle (ATV) whenever possible, and survey on foot in narrow areas where the ATV cannot pass. The surveyor will ride/walk as low on the beach as safely possible in order to avoid disturbance of nesting sea turtles or shorebirds along the wrack line and on the upper beach. New turtle crawls will be recorded, and the following values will be assigned to each crawl: Date, time, Trimble GPS location, species, crawl fate (nest or false crawl), obstructed nesting attempts (if applicable), and a series of measurements triangulating the location of the nest on the beach in relation to the dune toe.

The determination of crawl fate should be made from a visual assessment of the crawl characteristics. However, until the surveyor has gained sufficient experience and expertise to make this designation, digging to confirm presence of a clutch of eggs is an acceptable practice. Digging should only be conducted with one's hands (not with a shovel or any other equipment) and should stop once the first egg is felt. The clutch should not be removed from the sand unless it is being transferred to an onsite hatchery for protection.

Nest sites will be monitored throughout incubation for potential disturbance events, which could include poaching, vandalism, predation, tidal inundation, and impacts from other nesting turtles. All such events will be added to a nest's record. In the event eggs were removed from the nest as the result of a disturbance, intact eggs should be replaced in the nest and reburied. Broken eggs should be buried away from the original nest site to prevent further predation.

A nest's initial emergence event (and subsequent emergence events if applicable) will be recorded, and the nest will be revisited after three days to conduct a nest inventory. The surveyor will dig up the nest and record its contents using the following categories: hatched eggshell, whole egg, damaged (broken) egg, live hatchling, dead hatchling, live pipped hatchling, and dead pipped hatchling. The surveyor will release any live hatchlings, allowing them to crawl to the ocean on their own, and the remainder of the nest contents will be reburied to provide sustenance to the dune plant community. Hatchlings deemed too weak for release (live pipped hatchlings, and some live hatchlings) may be held until nighttime in a bucket with damp sand stored in the dark at room temperature.

4.8.5 Marine Mammals

It is recognized that cetaceans can be impacted by noise from construction activities. Noise levels and duration are considerations when developing sustainable construction techniques for marine facilities. The Operator recognizes that the shortest possible length of construction is best to minimize long-term disturbances and has committed to expedite the components of construction that generate underwater noise and the construction with the least amount of pilings was chosen during the bidding process. That being said, SMRU Consulting [leading expertise in underwater noise, marine mammals, and construction mitigation (http://www.smruconsulting.com/)] has used computer modeling (based on technique, size, number and placement of pilings) to determine the noise dynamics resulting in Level A and Level B zones. From there, a plan has been developed to warn animals in both Level A and B zones through a gradually increasing noise generation system played during the observation periods with passive listening throughout construction to alert Marine Mammal Observers to determine whether animals are within Level A zone and temporarily halt construction when practical if marine mammals are in the zone. See Appendix F: Marine Mammal and Construction Noise Management Plan for more details. Documentation of any zone incursion by marine mammals would be included within the daily report and DEPP would be notified of the occurrence.

Additionally, the Operator will develop and implement an education program that addresses BMPs and protocols for appropriate behavior around whales, dolphins and other marine wildlife during construction of the port facility. These BMPs will be provided to construction crews, guests, vendors, and others who operate watercraft or provide excursions and other services associated with the port facility.

4.8.6 Entanglement

Entanglement is a risk to any animal but particularly marine animals. If an animal becomes entangled in any human-made objects, the Environmental Manager should be notified immediately to address the situation and disentangle the animal if it is safe to do so. Lines and other potential entanglement objects will be limited and either removed or under Environmental Manager observation during use. In the case of endangered or listed animals including marine mammals the Environmental Manager must document and contact the Department of Marine Resources and DEPP.

4.8.7 Terrestrial Foraging Habitat

Utilizing wildlife-friendly plants as ornamentals in Lighthouse Point's landscape design increases the likelihood that wildlife will be drawn to visitor areas, increasing their visibility and enhancing the visitor experience. Landscaping throughout developed portions of Lighthouse Point will focus on use of native flora, but species that provide food for wildlife will be particularly valuable for both wildlife and the guest experience. Flowering plants and their fruits attract insect pollinators, Caribbean endemics like the Buffy Flower Bat (*Erophylla sezekorni*) and the Bahama Woodstar (*Nesophlox evelynae*), and rare species like the Kirtland's Warbler (*Setophaga kirtlandii*). Many butterfly species also forage on a single or small number of host plants at the caterpillar stage. A wildlife friendly plant list of native species will be developed in coordination with local partners that details how different wildlife species utilize native plants and the availability of these plants from local suppliers. Where target plant species are not currently available commercially, preorders will be placed to incentivize their propagation and future availability for Lighthouse Point, while serving the secondary purpose of increasing availability of native plants for landscaping projects at other locations throughout Eleuthera.

4.8.8 Avian Nesting Habitat

In addition to utilizing wildlife friendly plants, providing nesting habitat can be an ideal means of benefitting birds. While most bird species at Lighthouse Point build nest in shrubs and trees that are widely available throughout the property, certain species have more restricted nesting requirements that offer an opportunity to create nesting habitat. Burrowing Owls (*Athene cunicularia*) nest in rock crevices or burrows excavated in loose or sandy soils by other animals

and enlarged by the owls themselves. To create additional nesting habitat, an artificial burrow system will be installed (see Florida Fish and Wildlife Conservation Commission's Species Conservation Measures and Permitting Guidelines for Florida Burrowing Owls; https://myfwc.com/media/2028/floridaburrowingowlguidelines-2018.pdf).

4.8.9 Terrestrial Birds

Lighthouse Point supports a wide diversity of birdlife. Many of these species are year-round residents of the property, while others migrate to Eleuthera as a stopover or overwintering site. Regardless of how long they are present, these species rely on the high-quality habitats of Lighthouse Point for food, shelter, and in some cases, nesting habitat. The monthly Terrestrial Wildlife Surveys were designed particularly with birds in mind to document habitat use, distribution, and abundance of birds at Lighthouse Point before, during, and after construction and the launch of operations (see Appendix A: Terrestrial Wildlife Monitoring Protocol). Data from these surveys will allow for adaptive management of the property for the benefit of birds and guests alike. To complement diversity surveys, a movement study will be conducted to assess how individual birds respond to construction activities using an automated telemetry system (see Section 4.9.3 for more details). The system will be used to document seasonal habitat use, movement patterns, and home ranges for one to two target species (e.g., great lizard cuckoo, Kirtland's warbler). In addition to avian community monitoring and general management actions like landscaping with native plants and relocating bird nests impacted by site development, additional actions will be taken for several target species. Great lizard cuckoos are year-round residents on the property and are found only on Cuba and The Bahamas. The principal area of development is located in the southern portion of the property while lizard cuckoos are most abundant in the northern portion. In addition, according to the Bahamas National Trust, lizard cuckoos will likely move out of areas impacted by construction but return once the disturbance ceases. Surveys and a movement study would document seasonal distributions and habitat use and track any changes associated with project activities. Based on these data, management practices will be developed if needed to maintain the population of great lizard cuckoos on the property and/or south Eleuthera.

Burrowing owls are also present year-round and both nest and roost in burrows. Adults have been observed at Lighthouse Point, so specific mitigation measures have been developed to minimize construction related impacts to any burrowing owls present (see Section 4.1.3.3) and additional nesting habitat for this species will be provided through the installation of an artificial burrow system.

Kirtland's warblers are present during the winter season in The Bahamas, including at Lighthouse Point. This species utilizes both mature and disturbed habitats but preferentially forages on the fruits of native shrubs, including *Chiococcoa alba*, *Erithalis fruticosa* and *Lantana involucrata*. These plant species will be incorporated into the landscaping palette for the property to benefit Kirtland's warblers. Terrestrial wildlife surveys will track general habitat use and changes in Kirtland's warbler numbers before and after construction activities and habitat enhancements, while a movement study will document any changes in fine-scale habitat use and duration of stay at Lighthouse Point. Warblers have been outfitted with tracking devices on nearby islands as part of research led by other organizations and will be recorded by the Lighthouse Point automated telemetry if tagged birds fly over or visit the property (see Section 4.9.3 for more details). These data could be supplemented by deploying additional tracking devices on birds at Lighthouse Point.

Osprey are migratory throughout much of their range but are year-round residents of The Bahamas. These fish specialists are routinely observed hunting in the waters adjacent to beaches and an inactive nest is present in the northeastern portion of the property.

4.8.10 Shorebirds

A diverse community of shorebirds utilizes Lighthouse Point for breeding and overwintering habitat. Foraging habitat will be protected throughout the year by leaving the wrack line in place on over 50% of the property's beaches during the site development period.

Locations of breeding shorebirds will be identified through monthly terrestrial wildlife surveys (see Appendix A: Terrestrial Wildlife Monitoring Protocol). Nests on beaches frequented by people will be protected by staking off nests in a 10x10 foot or larger area if possible to prevent disturbance. Disruption to nests on pond shorelines and rocky outcrops will be minimized because these locations will not be developed. Nests will be monitored monthly using the Breeding Bird Protocol for Florida's Shorebirds and Seabirds (https://flshorebirdalliance.org/resources/instructions-resources/).

Wintering habitat use will also be monitored through the monthly terrestrial wildlife surveys. One species of particular interest is the piping plover. To reduce the possibility that increased human activity will cause piping plovers to abandon what appears to be an established wintering site, a portion of the point on Bottle Bay Beach where these plovers have been consistently observed will

be protected with a 75m buffer to either side of the point. Human activity will not be permitted in the buffer zone and the wrack line will be left in place for a food source in this area. Signage and any facilities within line of site will be modified to not allow predatory birds to perch. In addition to documenting any changes in the spatial use of the property by piping plovers through the monthly terrestrial surveys, the EMT will participate in winter piping plover censuses, which are conducted internationally every five years.

4.8.11 Seabirds

The small cays situated just offshore of the southern end of Lighthouse Point provide nesting habitat for a colony of terns as well as other shorebirds and Antillean nighthawks. In 2007, over 100 pairs of sooty and bridled terns were observed. The Project does not propose any activity on these cays as they are publicly owned. In addition, contractor boat traffic will be prohibited within 50 m of the cays to minimize disturbance to the nesting colony.

4.8.12 Dune Plants

Operator will pursue a strategy to assure the dune plant community will remain intact to protect the dune's integrity and mitigate coastal erosion. This strategy will include raised boardwalks, protective barriers and strategic planting and maintenance of the dune plant community.

4.8.13 Native Snakes

Snakes play a vital role in the environment by maintaining healthy populations of their prey and controlling numbers of invasive species such as rats; however, they are often feared and persecuted. Eleuthera has no venomous snakes and four species of nonvenomous snakes [Bahamian Brown Blind Snake, Bahamian Racer, Bahamian Striped Boa, Northern Bahamas Trope (pygmy Boa)]. Tolerance will be encouraged at Lighthouse Point by incorporating targeted environmental education about the importance of native snake populations into the Environmental Training delivered to all contractors. Snake sightings will be reported to the Environmental Manager, whose team will oversee the capture and relocation of snakes when necessary. As part of preclearance surveys, 4ft x 4ft cover boards will be placed at a density of 4 per acre at least one week before clearing begins; the day before ground clearing, any snakes found under the boards will be moved. Relocations, whether in response to a sighting report or a pre-clearance survey, will be made to similar habitat as

near to 100m from the capture location as possible as survival rates decline when individuals are moved beyond their home range.

4.8.14 Land Crabs

Land Crabs are important predators, scavengers, and are culturally-important food for Bahamians. Crab densities on roads will be studied to determine if there are biologically-significant areas where the crabs cross the roads in high numbers. Road signs will be placed in areas with seasonal high-crab density. Crew and Contractors should make every effort to safely avoid crabs crossing the roads as vehicular traffic is a source of extirpation of land crabs where roads are built. Crabs replenishment areas will be set up to sustain populations. Crabs should only be hunted in designated areas by Bahamians to allow for the appropriate management.

4.8.15 Extractive Industry Policies

South Eleuthera has a long and rich cultural tradition of relying on the land for both food and medicine. In support of this valued connection with the land, collection of medicinal plants and land crabs will be allowed at particular times of year by Bahamians in designated portions of the Lighthouse Point property. Land crab populations will be monitored to ensure harvests are sustainable. If population levels decline, additional collection policies will be developed in collaboration with the local community to establish collection limits and monitoring procedures to ensure these limits are respected.

4.8.16 Bats

Bats provide incredible insect control and should be encouraged in appropriate areas. A number of bat species make use of buildings for roosting habitat on Eleuthera, including the Big-eared Bat (*Macrotus waterhousii*), the Buffy Flower Bat (*Erophylla sezekorni*), the Mexican Free-tailed Bat (*Tadarida braziliensis*), and the Big Brown Bat (*Eptesicus fuscus*). Lighthouse Point buildings will be designed to minimize bat use of these structures (see Building Design Considerations), but bat houses will be installed to provide roosting and potential breeding habitat for these species. If the bat house is colonized, a movement study using an automated telemetry system (see 4.9.3 for more details) could be conducted to monitor foraging habitat use and site fidelity throughout the construction project. If bat houses are occupied, they will also offer an outreach opportunity to address misconceptions and fear of bats on the part of contractors and he local community.

4.8.17 Building Design Considerations

Structures throughout the property will be designed and constructed to avoid wildlife-related issues. Bats are important components of the ecosystem, and while bat houses will be provided as roosting habitat to support local bat populations, these will be located away from human areas and structures intended for human use will be designed to minimize human-bat interactions. Bats roost in buildings in vertical crevices as narrow as 0.5 in, so no gaps larger than 0.25 in will be permitted on the exterior of enclosed structures or anywhere on open-air structures. Eliminating such openings also prevents cavity-nesting birds from constructing nests in buildings. Some avian species may also build nests on elevated horizontal surfaces that are covered (e.g., exposed beams). Avoiding horizontal surfaces near ceilings or roofs will minimize bird nesting on buildings. To minimize bird-window collisions, bird-safe glass will be used or post-construction window treatments will be applied on windows where collisions occur.

4.8.18 Dark Skies Initiative

Because many species of wildlife exhibit phototaxis or are otherwise disoriented by artificial light pollution, a site-specific lighting plan will be developed and maintained in order to minimize impacts to wildlife due to artificial light. The International Dark Sky Association (IDA) recommends that outdoor lighting is used only when necessary, is not brighter than necessary, minimizes blue light emissions, and is fully shielded and facing downwards. The lighting plan will be designed with sea turtles in mind, though it will reduce impacts to other wildlife as well, such as bats, birds, and moths. Ocean-facing buildings or structures will be outfitted with sea turtle-friendly lighting fixtures and bulbs, as recommended by the Florida Fish and Wildlife Conservation Commission (FWC) (FWC Sea Turtle Lighting Guidelines (myfwc.com)).

4.8.19 Feeding of Wildlife

No animals will be fed under any circumstances. Feeding is unhealthy to wildlife and encourages human/wildlife conflicts. Construction sites should be kept clean as to not attract wildlife. These rules will be introduced during on-boarding of construction workers and contractor and Environmental Manager will enforce.

4.8.20 Injury or Death of an Animal

If an animal is injured due to construction activities, the Environmental Manager should be contacted immediately so they can address the situation and contact the appropriate authorities, if warranted, as well as document the situation. If the animal is a listed species under ICUN or Bahamian law, the Environmental Manager will notify DEPP immediately.

4.8.21 Wildlife-Related Human Injury

If a crew member or contractor is injured during a wildlife incident, the Safety Manager will be notified and will direct appropriate medical attention. According to the CDC dog rabies is not present in The Bahamas. That being said, bat rabies (which can cross over to other mammals) is found in low levels when compared to other Caribbean islands (Morgan et al., 2020). Any mammal-related bites will be seen by the appropriate medical authorities.

4.9 Monitoring Programs

To guide sustainable development of the Lighthouse Point Site, comprehensive biological monitoring programs for a wide range of terrestrial and marine wildlife will be implemented on a regular basis before, during, and after construction activities. These long-term monitoring programs are intended to increase knowledge of species and their use of habitats (including invasive species) while also providing critical supplemental environmental information to the daily construction-related environmental monitoring (See Section 6.0). During the construction phase, long-term environmental monitoring results will be reported to the Lighthouse Point EMT every 6 months during planned 1-day meetings where monitoring results will be shared between the wildlife monitoring teams. The Lighthouse Point EMT will summarize results and any recommendations to the Lighthouse Point Environmental Manager. It will be the responsibility of the Environmental Manager to meet with the Project Manager to review recommendations and identify any necessary contingency adjustments, including stoppage of construction activities. In cases where secondary impacts outside of the construction footprint are likely and significant, the Project Manager will need to determine if construction activities causing stress can be changed (avoidable) or not (unavoidable). In cases where additional impacts are unavoidable, a meeting will be held with DEPP to discuss findings and determine if changes to the development plan are needed or if additional compensatory mitigation will be required. A summary of the supplemental wildlife monitoring is provided below with details of individual methods and protocols outlined in Appendices A-G.

4.9.1 Marine Wildlife Monitoring

Marine wildlife monitoring at the Lighthouse Point Site will be used to increase knowledge of the patterns of spatio-temporal usage of the area for selected species including bonefish, sea turtles, and marine mammals before, during, and after construction. Bonefish populations and behavior will be monitored by Bonefish Tarpon Trust (BTT) using acoustic telemetry, mark and recapture, and visual observation (see Appendix D: Bonefish Monitoring Plan for complete protocols). Sea turtles will be monitored visually and for any nesting activity on the Lighthouse Point beaches during nesting season (March-October) using protocols detailed in Appendix E: Sea Turtle Nesting Survey Protocol. Marine mammal activity will be monitored visually and by using Passive Acoustic Monitoring (PAM) to detect calling and echolocating marine mammals that may move through the area (see Appendix F: Marine Mammal and Construction Noise Management Plan). Other species of marine wildlife including a broad array of reef fishes and mobile invertebrates of commercial significance (conch, lobster) will be monitored using AGRRA visual surveys as part of the benthic habitat monitoring protocols (see Appendix B: Marine Benthic Resources Monitoring Plan).

4.9.2 Benthic Habitat Monitoring

A long-term marine habitat and coral monitoring program will also be developed for the Lighthouse Point site to augment the DCL daily construction monitoring and further guide development and management actions of the facility. A primary goal of the benthic monitoring is to distinguish natural regional variations from Site Specific influences that may be caused by development activities. A before-after-control-impact/treatment (BACI) design will be performed at 36 fixed sites that include areas of high, moderate, and low impact as well as control similar habitat type that are more than 5 km away from the highest impacted areas. Each site will include collecting resolution high landscape photo mosaics of fixed 10x10m plots and applying the standardized AGRRA protocol for benthic cover and fish populations. For coral reef and hardbottom habitats, all sessile organisms that are 4 cm or greater will be identified and tracked over time to provide high resolution species-specific trends in survivorship and growth. At least 4 of the sites will include seagrass habitats where seagrass coverage and shoot density will be tracked. Baseline before construction monitoring has already been carried out on 32 of the 36 proposed sites. During construction, monitoring of these sites will occur every six months using a rotating panel design with at least 12 of the sites resurveyed each time and statistically analyzed for any significant

changes to provide supplemental information to the Environmental Manager's daily construction assessments (see Appendix Q: Daily Construction Related Monitoring Locations and Protocol). Any significant changes that are outside of anticipated impact areas and related to development will be quantified and a response plan developed to address causes of stress. This may include adapting construction methods, limiting construction periods, and/or adjusting development plans. In cases where no adjustments can be made to reduce the causes of stress, the Operator will consult with the Government of the Bahamas to either change the development plan or develop acceptable additional mitigation actions to compensate for these additional unavoidable impacts. Additional details of the Lighthouse Point benthic monitoring plan are provided in Appendix B: Marine Benthic Resources Monitoring Plan.

4.9.3 Bird and Upland Species Monitoring

Continuous monitoring of terrestrial wildlife will be conducted at Lighthouse Point (see Appendix A: Terrestrial Wildlife Monitoring Protocol). Once per month, two biologists will traverse six transects throughout the property and record sightings and sign of terrestrial wildlife, including but not limited to: snake sightings, evidence of sea turtle nests (daily beach monitoring March-October), and sign of invasive mammals (e.g., cat, dog, or raccoon scat or prints), and/or butterflies and avian species. Transects will include the shoreline of the property (split into eastern and western/southern transects), the eastern edge of Big Pond, and three roadways of the property. On the pond and roadway transects, an avian point count will be conducted approximately every 300m and all birds seen and heard will be recorded. Call playbacks will be used to increase detection of species of interest and cryptic species (e.g., great lizard cuckoo and Kirtland's warbler). On roadway transects, butterfly counts will also be carried out. Additional point counts will be conducted outside of transects to ensure comprehensive monitoring of the property's habitats and include the smaller ponds, the southern point of the property, and within the forest interior. Motion detection cameras will be deployed on an as needed basis to determine wildlife use of specific areas. Locations of detections for species of interest will be noted, including piping plover, great lizard cuckoo, and Kirtland's warbler and will be used to assess changes in distribution and habitat use throughout the project. Prior to construction beginning, automated monitoring systems will be installed to complement the terrestrial wildlife surveys. An acoustic monitor will be installed on site to document seasonal and species-specific variation in bat use of Lighthouse Point. An automated telemetry system, the Motus Wildlife Tracking System, will also be added to document movement of target species throughout the property (see Mitigation Plan for a description of target

species). The Motus Wildlife Tracking System consists of a central tower surrounded by a network of nodes and Motus tags that continually transmit a unique signal. When an animal carrying a Motus tag is within the read range of the system, the tower records directionality and strength of a signal while individual nodes record the presence of signals within their immediate vicinity. Together, these data provide information on behavior and location. Tags can be deployed on any animal large enough to carry the 0.5 g device.

5.0 Environmental Compliance Requirements

5.1 Site Safety and Health

A Health and Safety Precautions and Response Plan has been developed by the Contractor to address personal safety at the work site (see Appendix T: Health and Safety Precautions and Response Plan). This plan includes relevant safety standards, emergency contact information, location of local medical facilities, evacuation procedures, and severe weather protocol. This plan will be directed, taught, overseen, and enforced on-site by the Contractor's Safety Professionals and Leaders throughout the duration of the Project.

A site safety training program has also been developed by the Contractor for training all construction team members prior to beginning work onsite. This program uses best practices in safety training, educational tools, and social marketing techniques to promote safety for all workers, the environment, and all wildlife at the Project location. In addition to the introductory training, program materials promote safe practices throughout the site and clear communications from all levels of the team. The basis for all training was developed under the guidelines provided by Occupational Safety and Health Administration (OSHA) 1926 and is executed prior to personnel beginning work on the jobsite. Training specific to the project will be provided to all workforce entering the site, e.g. management, craft workers, vendors, etc. As a whole, supervisory staff will be trained in CPR and first aid and will be retrained as necessary. Details on this training program, onboarding of craft workers, and management and supervision can be found in Appendix T: Health and Safety Precautions and Response Plan.

5.2 Construction Accommodations, Equipment and Materials

The Contractor, in coordination with the DCL management team have developed a proposed map for laydown and construction areas as presented in Appendix H: Site Plan with Lay Down and Construction Areas.

5.2.1 Accommodations for Contractor Employees

During the construction there will need to be accommodations for approximately 350 contractor employees on site. Permanent housing will not be constructed for this staff. Instead, the contractor will provide their own modular housing units.

During the construction phase temporary housing will be constructed for approximately 350 people. The temporary housing will be located near the permanent staff housing quarters in the BOH and be phased out as work completes. The workers will be housed in stackable units with each unit having two (2) beds. Foremen will have separate units that house one worker per unit. Additional units will be established near the first aid station to be used for quarantine housing if needed. Figures 5.2-1 and 5.2-2 show a typical layout for stackable units.

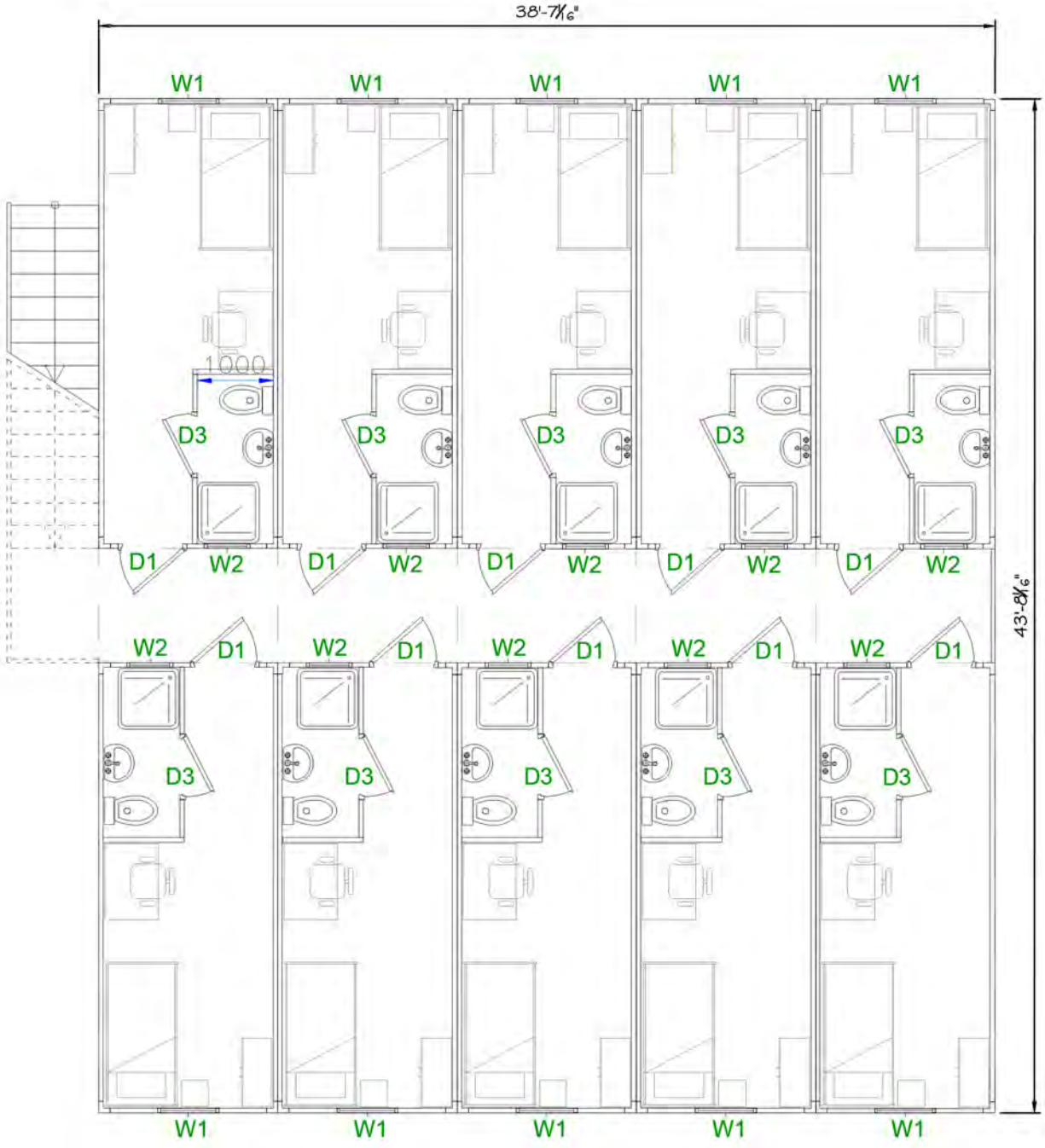

Figure 5.2-1: Foremen Living Areas

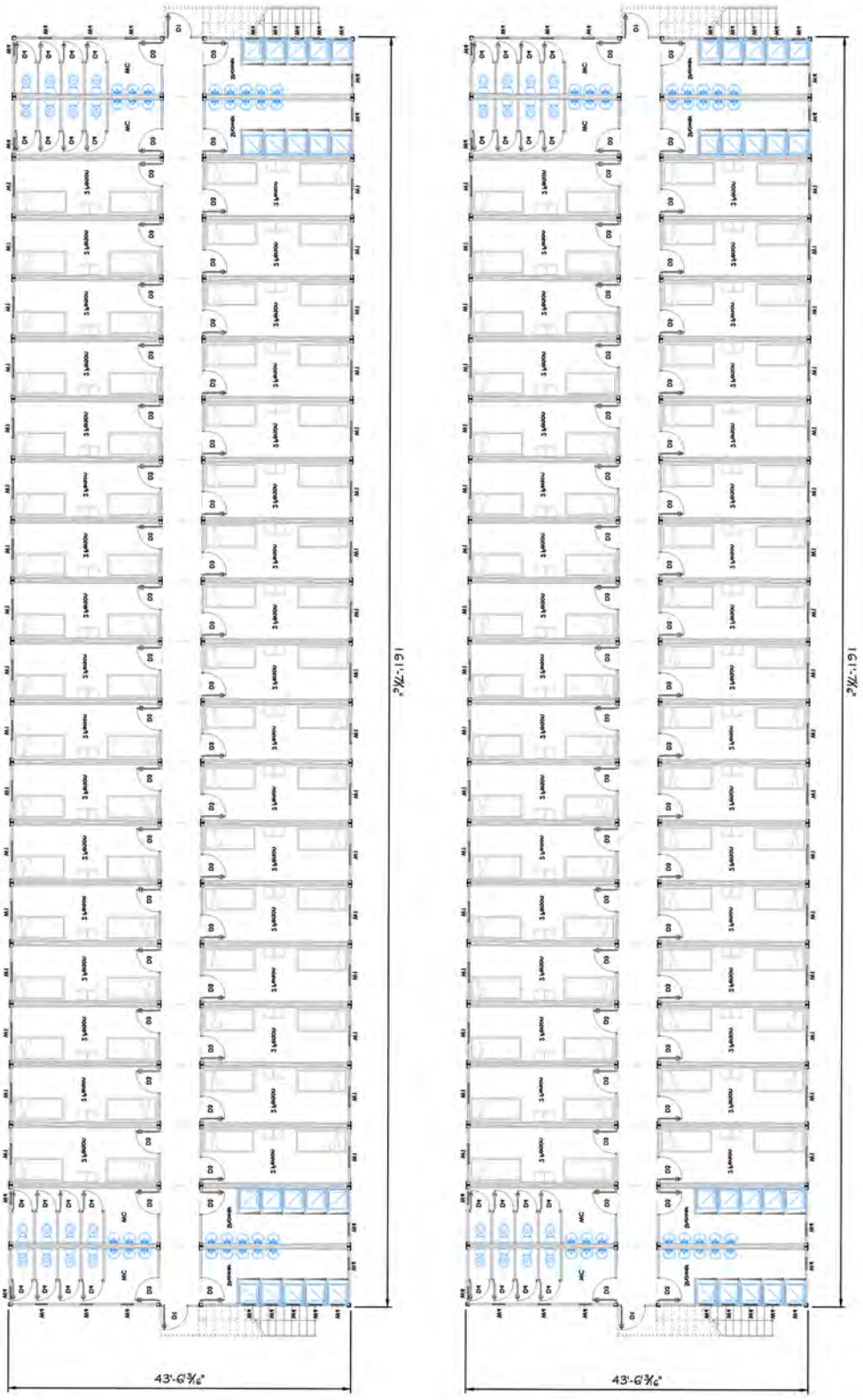

Figure 5.2-2: Worker Living Areas

Additional trailers will be used for temporary housing support activities such as cooking, entertainment, and fitness. The cafeteria will be a large, air-conditioned structure complete with preparation areas and cooking facilities along with a larger common area for dining. Additional entertainment areas will be provided for extracurricular activities such as games, television, pool, and cards/ gaming. Another structure will be outfitted with gym equipment for downtime fitness. Figures 5.2-3 through 5.2-5 depict the kitchen and dining room, recreation rooms, and the laundry facilities.

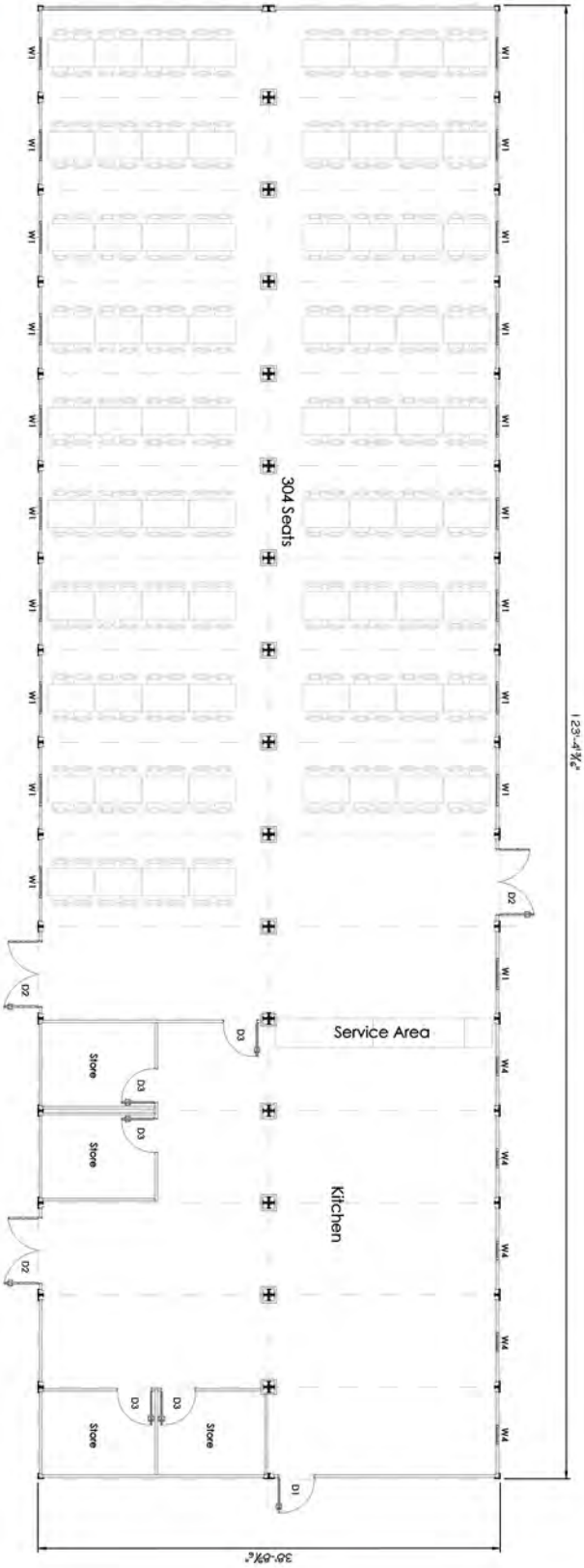

Figure 5.2-3: Kitchen and Dining Facilities

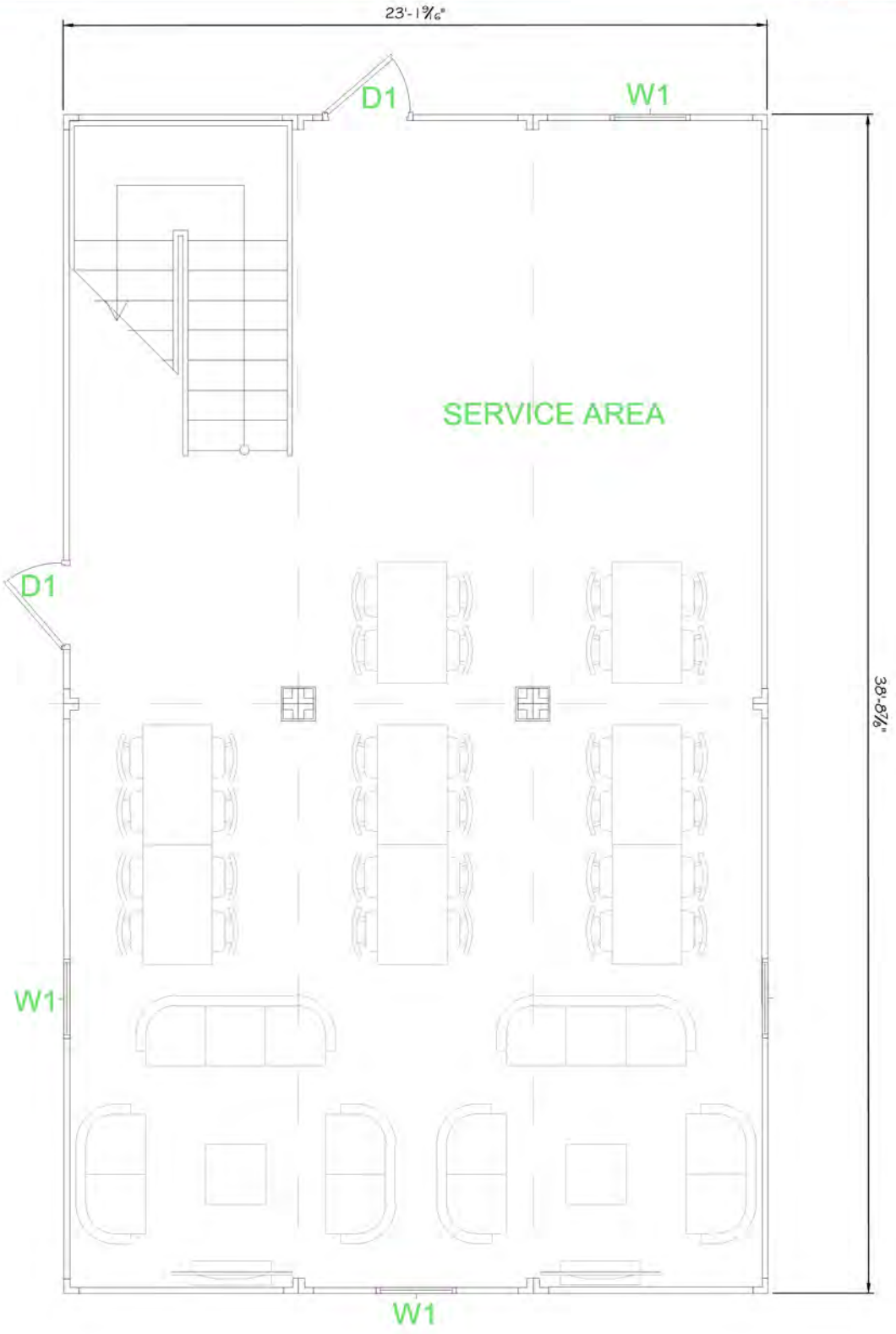

Figure 5.2-4: Recreation Facilities

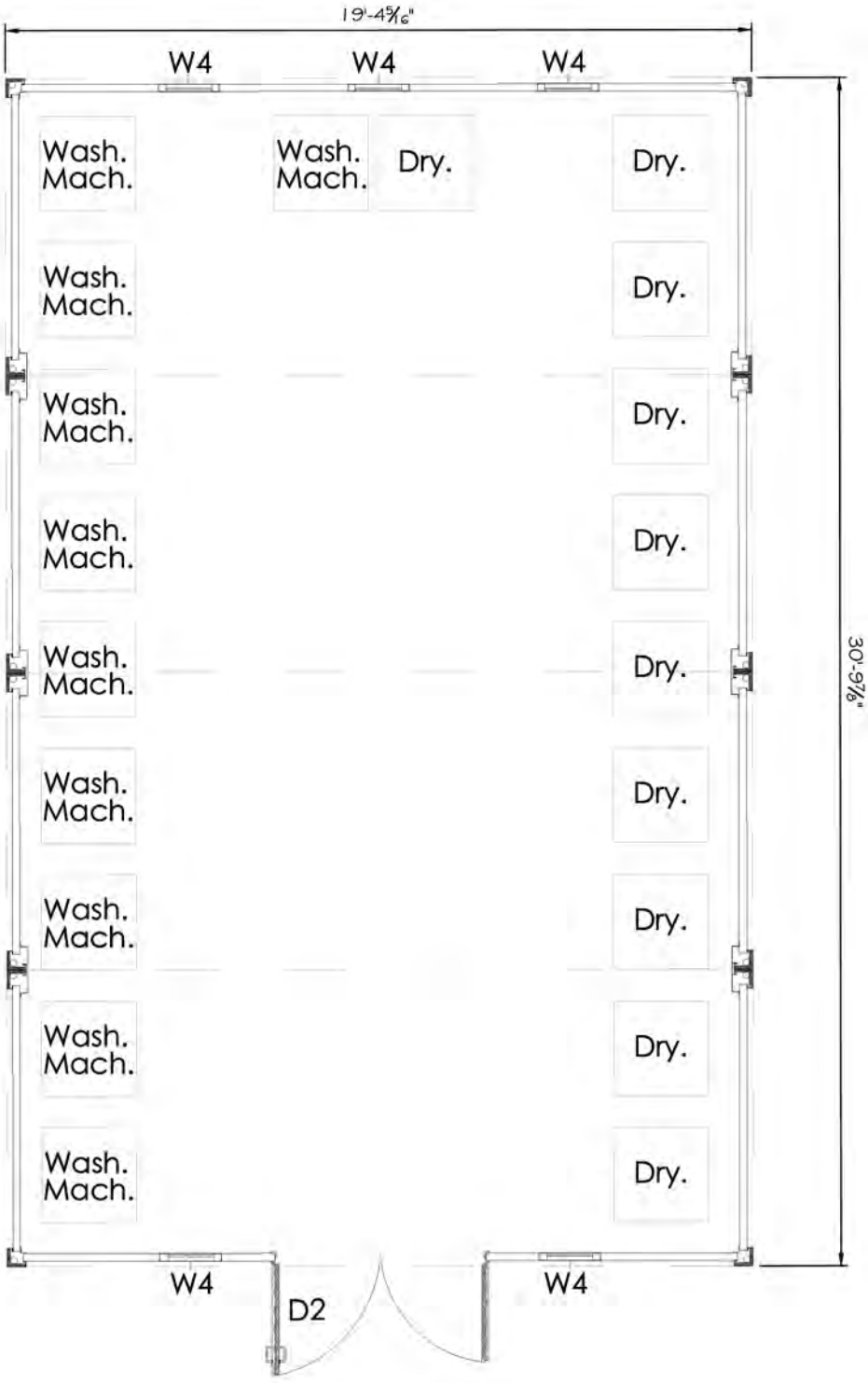

Figure 5.2-5: Laundry Facilities

The Contractor will provide their own power, water, and wastewater feeds to the designated area, which will be capped when the project is completed, and the Contractor demobilizes the temporary structures, removing these from the Bahamas and returning them to the USA.

The structures intended for the Contractor accommodations have been designed to withstand 175 MPH winds in the case of a weather event. Further detail on weather preparedness and how the Contractor will proceed under different category rated storms can be found in Appendix V: Inclement Weather Policy and Hurricane Preparedness Plan. Recognizing that the workers are away from their homes and families, workers will be encouraged to take care of any personal needs. For Category 1 and 2 storms, the work camp will be available for workers to stay as they see fit. For Category 3 storms and higher, workers will be evacuated and sent back to their home base until it can be determined the bad weather has cleared.

5.2.2 Construction Material Laydown Area

The Contractor's material will encompass many types of material, including non-hazardous through hazardous material. Most all Items will be offloaded and stored on shore in the allowed designated laydown areas. Material storage will be located at least 100 ft. away from the coastline and secured to prevent airborne debris. A corridor of approximately 10 ft. should be between the laydown area and surrounding vegetation. See Appendix H: Site Plan with Lay Down and Construction Areas.

5.2.2.1 Non-Hazardous Materials

Staging areas for construction equipment will be identified by the contractor but is subject to change depending upon the needs of the contractor. These locations will minimize disturbance to local protected vegetation as much as possible. See Section 5.4 for the Site Waste Management Plan and Appendix H: Site Plan with Lay Down and Construction Areas.

5.2.2.2 Hazardous Materials

All hazardous material will be properly labeled and stored in a secure area that does not allow for unauthorized access. Furthermore, the materials will be held in proper storage to contain the hazard of accidental releases. Usage of VOC's is extremely limited. A potential VOC is paint coatings. These items will be stored in a locked container. Empty containers and unused materials will be properly disposed of in accordance with requirements for disposal of hazardous materials. Hazardous materials such as fuels will be stored in protected areas on level ground and in double walled tanks

within the guidelines for EPA standards 40 CFR 264.193 specifically "Containment and Detection Releases". The tanks have been designed to meet the secondary containment requirements listed in the following standards:

- 264.193 (a)
- 264.193 (d)(3)
- 264.193 (e)(1)(i)
- 264.193 (e)(3)(i, ii, iii)

Otherwise, different types of hazardous materials will be stored and protected using best management practices as determined by the most stringent guidelines adhered to by the U.S. or The Bahamas for spill containment, storage, and use. Further details on handling of hazardous materials can be found in the Site Waste Management Plan included in Section 5.4.

5.2.3 Construction Equipment

The Lighthouse Point Project will require a significant fleet of equipment to complete the work in the prescribed period of time. The required equipment will come from various sources including local Bahamian contractors (both Eleuthera-based and sourced from New Providence and Grand Bahamas), owned equipment coming from the United States, and leased equipment from the United States. Construction Equipment can be divided into four main groups based on the work it is primarily supporting. The usage planned for the equipment and the various means and methods of its arrival to the Project site based on its intended usage is outlined below:

1. **Support and Logistics:** The support and logistics equipment will be used throughout the entire Project where and when it is needed. The fleet will consist of material handling and hauling equipment and will be a combination of owned and leased equipment coming from the States. The equipment will arrive via ocean freight from the U.S. through a chartered landing craft that will arrive in Rock Sound. Equipment will be inspected prior to loading for any issues and repaired or replaced before setting sail. The ship will arrive at the Rock Sound

government dock and be unloaded by trained operators from a local contractor. The equipment will then be stored near the landing dock and transported by haulers to the project.

2. **Earthwork and Utilities:** This equipment will consist of a fleet of primarily yellow iron, much of which will be sourced directly from the Bahamas though Bahamian partners and subcontractors. In most cases this equipment is owned by these firms and readily available. Earthwork and utility installation support equipment will be delivered from Nassau by landing craft to Rock Sound government dock and then stored and hauled similarly to support and logistics equipment. To further support these needs, owned and leased equipment can be imported from Florida.

3. **Pier and Marine:** This equipment will be predominately leased equipment from the States. The American Bridge Team has longstanding relationships with several equipment suppliers. This equipment will be American Bureau of Shipping (ABS) rated and in top condition to meet the stringent requirements of ABS. Additionally, the Contractor can further support this fleet with owned equipment that already resides in the Bahamas. The pier and marine equipment will be loaded on barges in the U.S. and towed to Lighthouse Point. Since much of the equipment will be marine related, it will remain on the barges and be prepared for work.

4. **Buildings and Structures:** The equipment for the buildings and structures will consist primarily of small equipment capable of localized material handling and hoisting, along with specialty equipment required for each of the various building trades. This equipment will either arrive to the site via U.S. deliveries to Rock Sound and hauled to the project or barged to Lighthouse Point and unloaded at the temporary unloading area at the Ro-Ro dock.

5.2.3.1 Equipment Types

Table 5.2 below shows the American Bridge Team's list of anticipated equipment fleet including quantity and capacity. This will vary throughout the course of the Project dependent upon demand and schedule.

Description	Capacity	Estimated Quantity
ABS Spud Barge	54' x 180'	7

Description	Capacity	Estimated Quantity
Material Barge	30' x 120'	2
Tugboat	1000 HP	1
Tugboat	600 HP	1
Safety Skiff	-	5
Manitowoc 2250 Crawler Crane	300T	2
Manitowoc 4100 S2 Crawler Crane	230T	3
Hains 450k Crane Mounted Drill	-	1
Hains 165k Crane Mounted Drill	-	2
80ft Telescopic Kelly Bar for Drill	-	3
30" Diameter Drill Tools	-	1
36" Diameter Drill Tools	-	1
48" Diameter Drill Tools	-	1
D80-23 Diesel Impact Hammer	-	1
Guides for D80-23 Hammer	-	1
D62 Diesel Impact Hammer	-	2
Guides for D62 Impact Hammer	-	2
HPSI 500 Exciter Vibratory Hammer	-	3
HPSI 500 Power Pack Hyd. Unit for Vibratory Hammer	-	3
JLG 860SJ Manlift	80ft Articulating Boom Manlift	3
Lincoln 300D Classic Welder w/ Leads	300 Amp	9
Conex Box	20’	17
Air Compressor with Hoses	185cfm	9
Roll Off Dumpster	40 CY	9
Tremmie Hopper	9" Outlet Tremie Pipe	3
Heavy Wall 9" ID Pipe	200’ HD Pipe	3
Concrete Bucket	4 CY Laydown w/Air	6
Concrete Bucket	4 CY Laydown Mechanical	4
Concrete Bucket	2 CY Garbro	4
Allen Screed	-	2
RT Extended Boom Forks	10k Rough Terrain	2
Ice Machine	600 lb/day	3
Filtration System - Double Filters	-	1
Bulldozer	Caterpillar D8R	1
Bulldozer	Caterpillar D5N	1
Excavator	Doosan 500	1

Description	Capacity	Estimated Quantity
Excavator	Doosan 300	1
Excavator	Doosan 225	1
Excavator	Doosan 140	3
Excavator	Doosan 35	5
Wheel Loader	Doosan Mega 500	2
Wheel Loader	Doosan Mega 400	1
Wheel Loader	Doosan Mega 200	2
Skid-Steer Loader	Bobcat S650	3
Dump Trucks	Various	5
Grader	CAT 120G	1
Roller Compactor	Ham 84"	1
Roller Compactor	Ham 48"	2
Telehandler	6K to 12K capacity	6
Rough Terrain Crane	50T-80T	4
Water Truck	2,000 gallon	1
Concrete Batch Plant	40 CY/hour	1
Concrete Trucks	Various	6
Mule	TBD	2
Tractor Head	International or Freightliner	1
Low-Boy Trailer	50T	1
Crew Trucks	Ford F-450	2
Air Compressors	Atlas Copco 185CFM	4
Light Plants	Atlas Copco	6
Generators	5.5 to 15 KW	As needed
Welding Units	n/a	As needed
Storage Containers	40’ Containers	6-10

Table 5.2: Anticipated Equipment Fleet

5.2.3.2 Equipment Maintenance, Repairs and Operation

This amount of equipment must also have a robust preventative maintenance program to ensure it is always in operable condition. The equipment will be of late model condition or in some cases older equipment that is best for this work environment, but recently refurbished to like-new mechanical condition. This preventative maintenance program will be managed by the full-time onsite master mechanic and staff consisting of heavy equipment and small equipment mechanics.

In addition, properly trained and qualified operators will be provided to run this equipment. They will have the necessary experience and current certifications for the equipment they operate. The on-site Construction Team will also strive to train new equipment operators throughout the Project's lifecycle with a specific focus on Bahamian employees with the desire to learn a new skillset that will be with them long after this project is complete.

All maintenance will be conducted on land areas, offsite or areas of ongoing works. Most repairs may be conducted on site depending on the requirements. For repairs or maintenance on floating equipment, the contractor will use spill prevention measures to reduce the risk of petroleum products leaking into the water. See Appendix U: Emergency Response Plan for additional information regarding spill prevention and mitigation as it relates to marine construction activities.

5.3 Construction Phases, Methodology and Schedule

The cruise pier structure consists of a pile supported access trestle, approximately 2,200 ft. long connecting a single berth, 590 ft. Berthing Pier. The ships breast against the Berthing Pier and are secured with additional lines to 6 ea. 33 ft. x 33 ft. pile supported mooring dolphins. The length of the access trestle is based on the existing water depths which require approximately 38 ft. of water to accommodate a cruise ship. The intent is to not dredge any areas to enable the cruise ship to berth, thus protecting the surrounding natural areas from the hazards dredging creates. Figure 5.3-1 below shows a general overview of how the structure will look once complete.

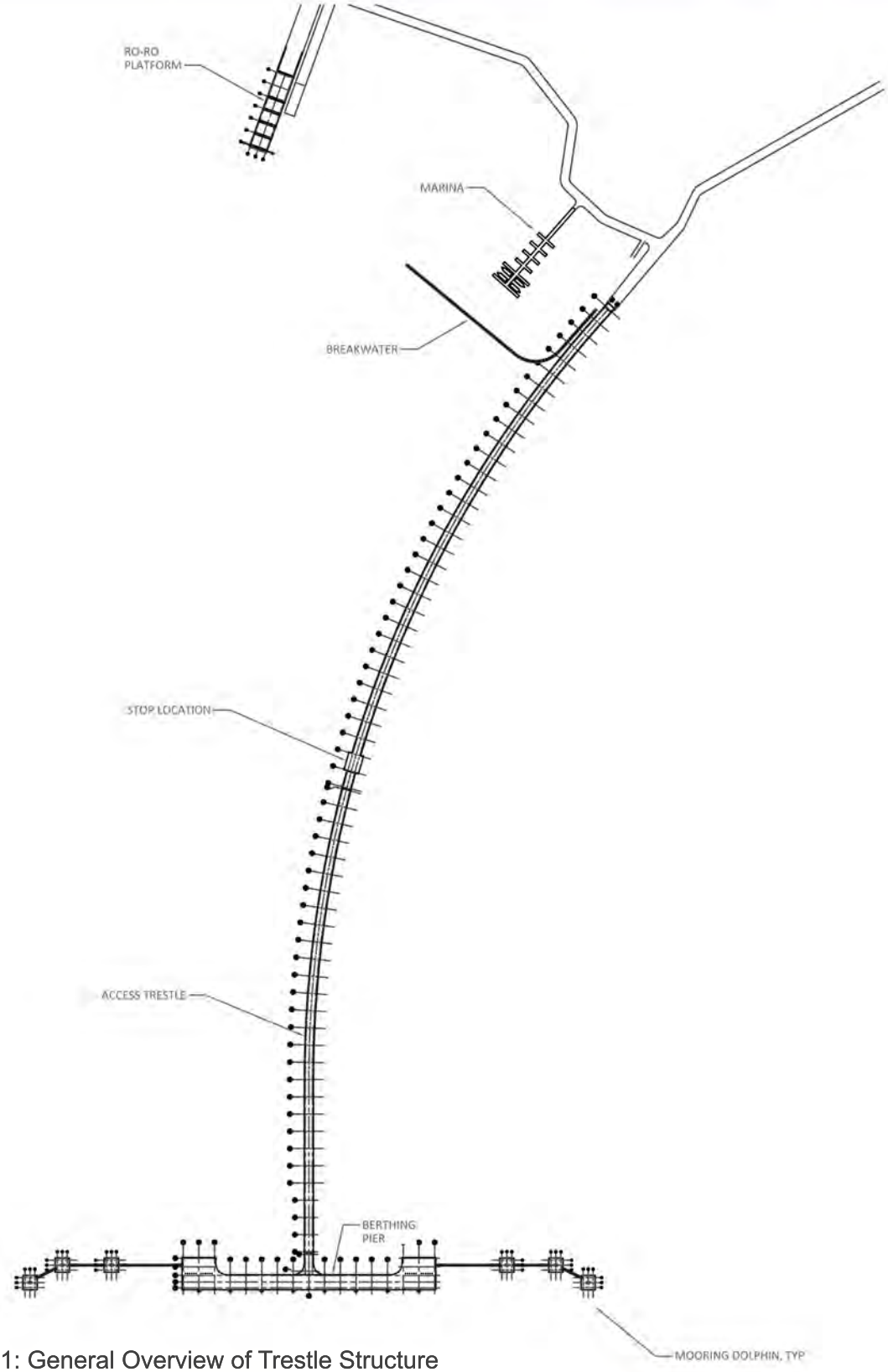

Figure 5.3-1: General Overview of Trestle Structure

5.3.1 Trestle Construction

Trestle construction will begin with a 2-crane front that will start from land and progress out from the abutment towards the Berthing Pier, constructing one bent at a time and using the previous bents as support to construct forward. Details are as follows:

Lead Crane: The lead crane will start the construction process. Typically, the crane will work 1 span (40 ft.) back and reach out to the next bent location to install the pipe piles. The sequence of activities will follow accordingly:

1. Set template for the correct plan location of the Bent pipe piles.
2. Pick piles and set in location letting the pile rest in the correct position with the template.
3. Set vibratory hammer on each pile and vibrate into place, monitoring the elevation and coordinates to ensure the pile does not wander off line and to ensure the pile tip is at the correct elevation.
4. If there is hard material and the vibratory hammer can't get the pile to depth, an impact hammer will be placed on the pile and the driven to final tip elevation.
5. The hammer will be set down and the Hain's Drill installed on the crane.
6. The drill will then drill out the interior of the pile to a plan elevation, some amount below the tip of the pile.
7. Material will be spoiled to sealed dumpsters that will hold the material, to be later loaded on a truck/barge and sent to a disposal area on the project and later used for fill in low areas. During the drilling of the piles, turbidity barrier will be installed to control any plumes from the bucket as it is raised and lowered. Care will be taken to minimize any spillage of material by slowing down the raising and lowering of the bucket into the pile. The bucket will also be allowed to drain over the pile to reduce the water content of the material and dripping into the water as the bucket is swung to the spoil container.
8. Once the pile has been drilled out, a rebar cage will be set at the bottom and concrete placed using a tremie method.
9. Concrete will be placed using a bucket and hopper and the pile filled to a design elevation from the bottom up (rock socket). While the drilled shaft in the pile is being filled, the turbidity curtain will remain in place to control any cloudiness from concrete drips into the water. Although sealed buckets are used along with a hopper and tremie to catch the material, the operation will be monitored for excessive spillage. If there is a problem with spilling, then the issue will be addressed, and the problem rectified to ensure spillage is minimized.

10. After concrete has been placed, the tremie and assorted placing equipment will be placed on a service barge and unloaded at the Ro-Ro, to be cleaned out at a pre-determined location on site and stored for the next set of piles.

Figure 5.3-2 shows the permanent piles in place and the temporary trestle structure from just above Elevation 0 up to the crane platform. The pile will have temporary “caps” which will rest 2 sets of W36 cross beams at El 6.28 and El 12.44. On top of the cross beams will span the W36 track beams and the mat support beams that span from bent to bent and support the crane to work from

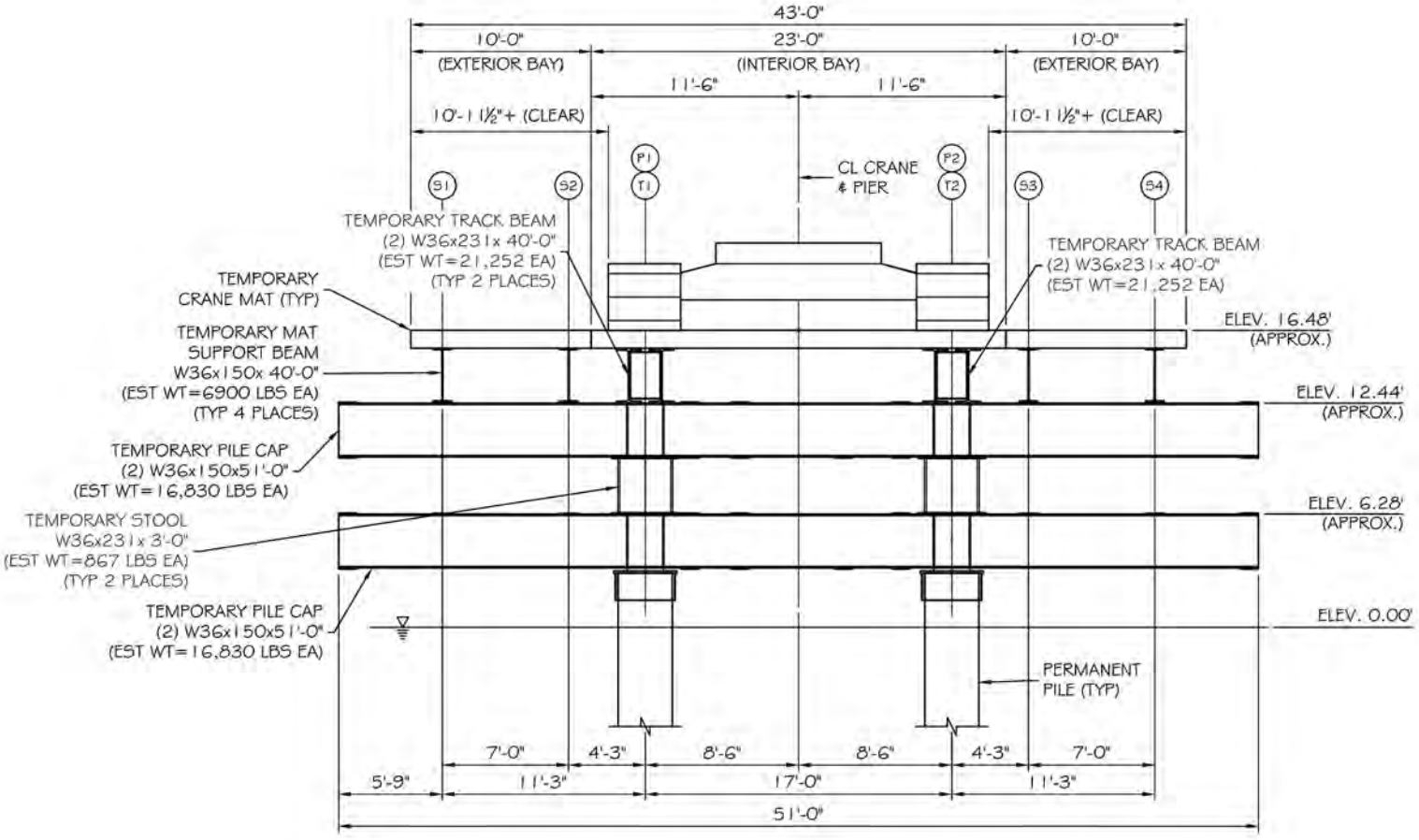

Figure 5.3-2: Permanent Trestle Piles In-Place

After the concrete at the bottom of the pile (Rock Socket) has reached proper strength (determined by breaking concrete cylinders taken at the time of placement), the temporary structure and beam and mat platform will be set and the crane will be able to walk out onto the new platform which was relocated from the rear of the trestle set up for the lead crane. Figure 5.3-3 shows the final structure cross section which includes permanent structure installed by the trailing crane not yet discussed.

In total at any given time, there will be 7 spans of temporary trestle and as the pile are installed and progressed, the farthest most span of track beams, support beams and mats will be removed and jumped up to the new location. This process will continue in this manner until the lead crane meets the berthing pier.

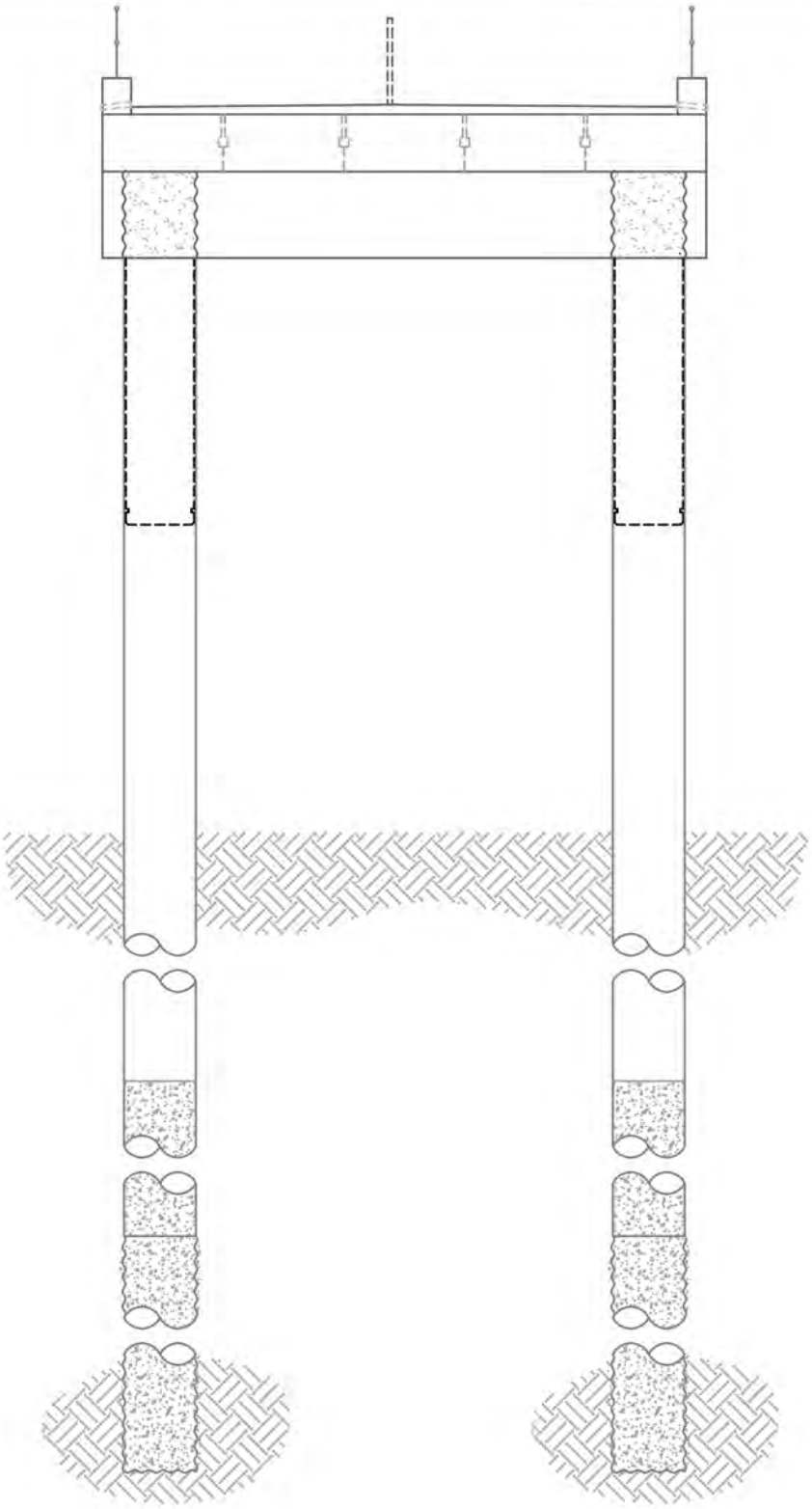

Figure 5.3-3: Final Trestle Structure Cross-Section

See Photos 5.3-1, 5.3-2 and 5.3-3 below showing the pile driving process and the drilling and concreting of the rock sockets:

Photo 5.3-1: Crane-Mounted Hain's Drill for drilling rock sockets below pile tip elevation.

Photo 5.3-2: Final Clean-out of Pile and Rebar Cage Installation

Photo 5.3-3: Tremie pipe with hopper being used to place concrete.

Once the pair of bent piles are completed and the drilled shaft concrete has reached strength (approximately 24 hrs.), the temporary trestle can be moved forward and the process repeated. See Figure 5.3-4 through Figure 5.3-7 for a general layout of the leading crane and the 7 spans of temporary trestle with the equipment required to perform this portion of the work along with additional detail.

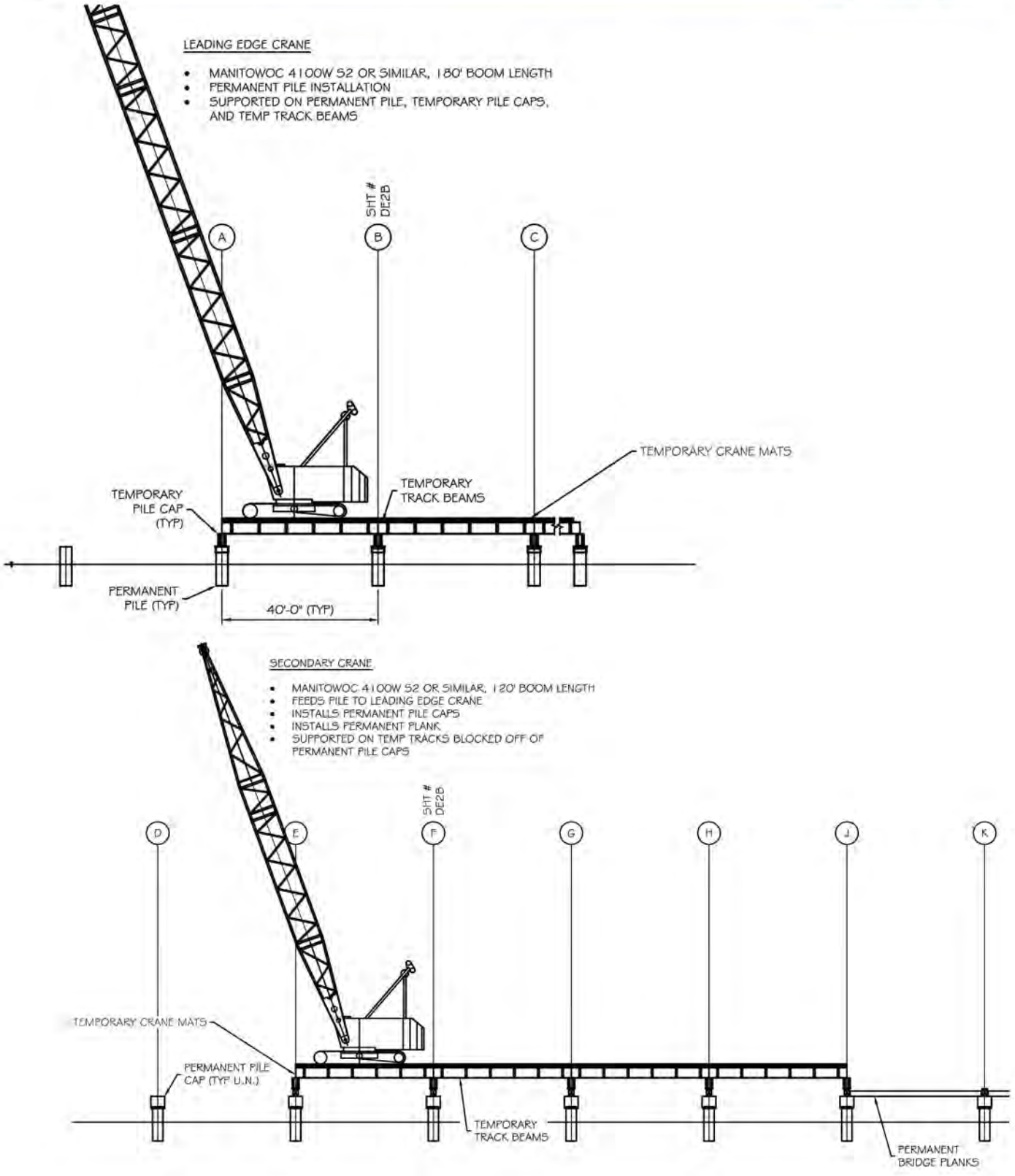

Figure 5.3-4: General Layout of Leading Crane

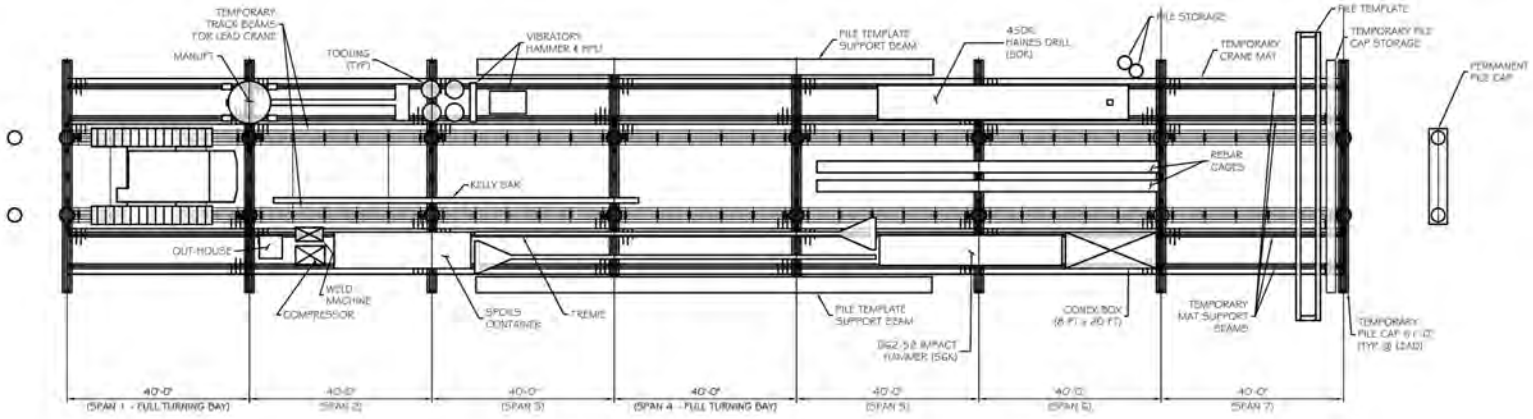

Figure 5.3-5: Plan View of Leading Crane on Access Trestle

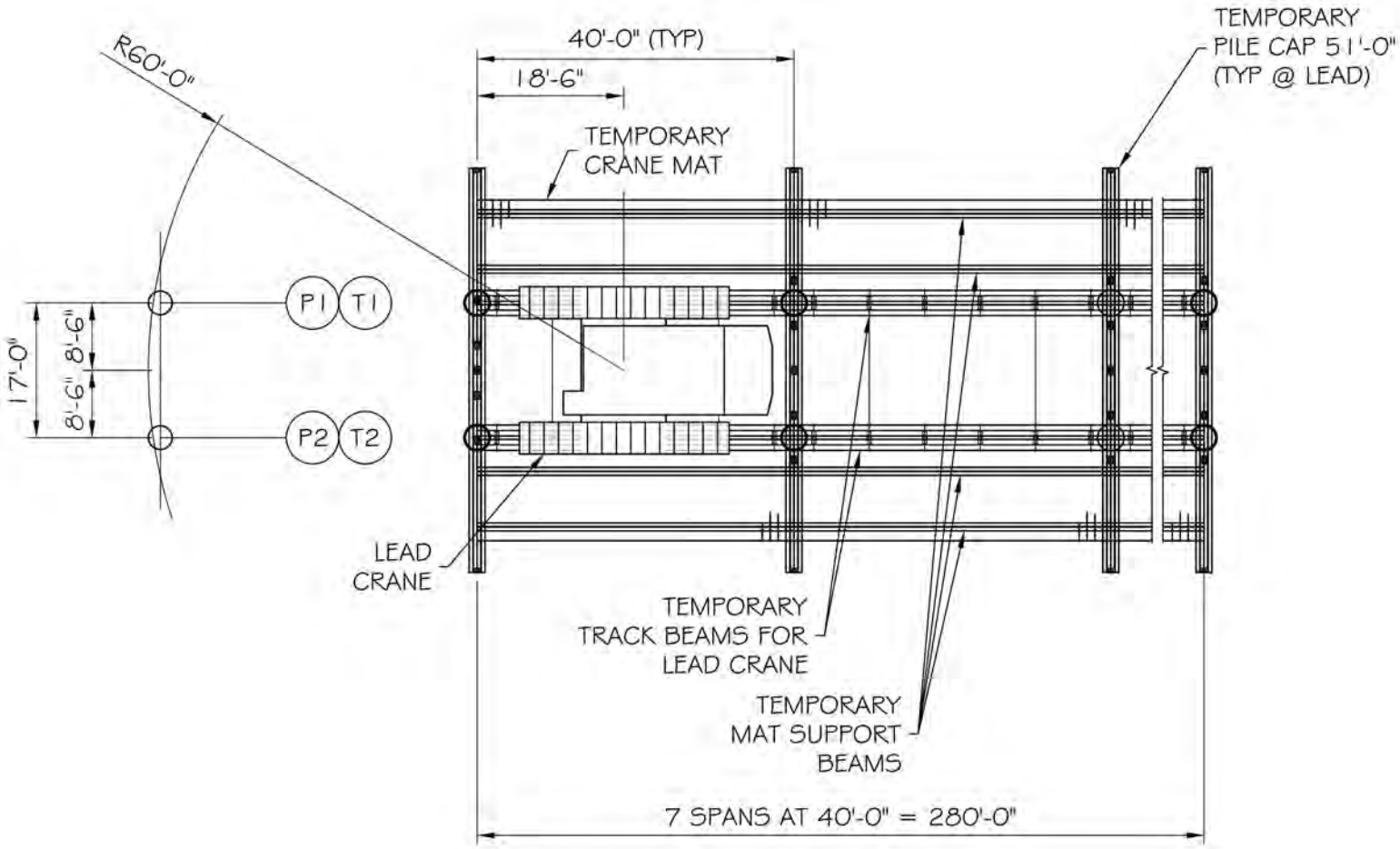

Figure 5.3-6: Partial Drawing of Leading Crane at span where piles are being installed.

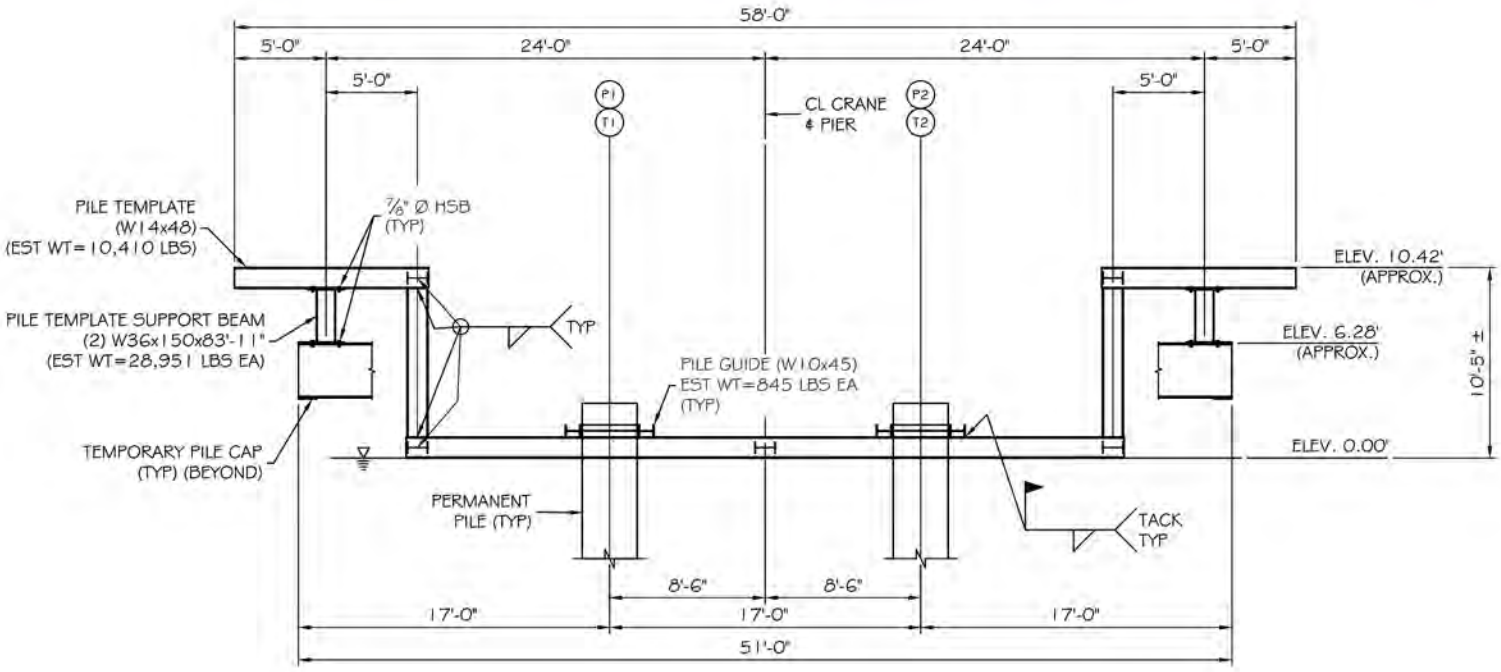

Figure 5.3-7: Cross Section showing template for installing piles. Piles are in place for this cross section.

All the diesel equipment will be inspected prior to being placed on the trestle and any leaks will be fixed. Oil absorbent material will be placed under any potential areas of leaking and spill kits will be stored in the conex box in case of an emergency. Diesel and gas tanks will be double walled to ensure containment in the event there is a leak. Vibratory hammer will have environmentally friendly hydraulic oil in case there is a hose burst or another event. Garbage will be collected and kept in containers to be hauled back to land and disposed of properly. Drill material will be containerized in roll off dumpsters and hauled back to land for stockpiling and re-use.

Second Crane for Access Trestle Construction: As the leading crane advances the second crane will maintain a separation of 2 spans behind it. The work platform for the second crane will consist of similar temporary access trestle supported by the permanent concrete cap at each bent location. The second crane will support the leading crane by placing any materials required for the leading crane to progress. (rebar cages, cast in place concrete during placements, removal and replacement of drilling spoil roll off containers). The primary function of the second crane other than support of the first crane will be the following:

- Installation of rebar cage for the moment connection at the top of pile (see Figure 5.3-8).
- Installation of pre-cast concrete cap on top of installed piles (see Photo 5.3-4).
- Placement of concrete for moment connection at top of pile and pre-cast bent cap.
- Placement of pre-cast deck planks (see Photo 5.3-5).
- Placement of secondary concrete above pre-cast cap and between adjacent Pre-cast deck plank ends.
- Support for ancillary activities and any grouting of longitudinal joints between pre-cast deck planks.

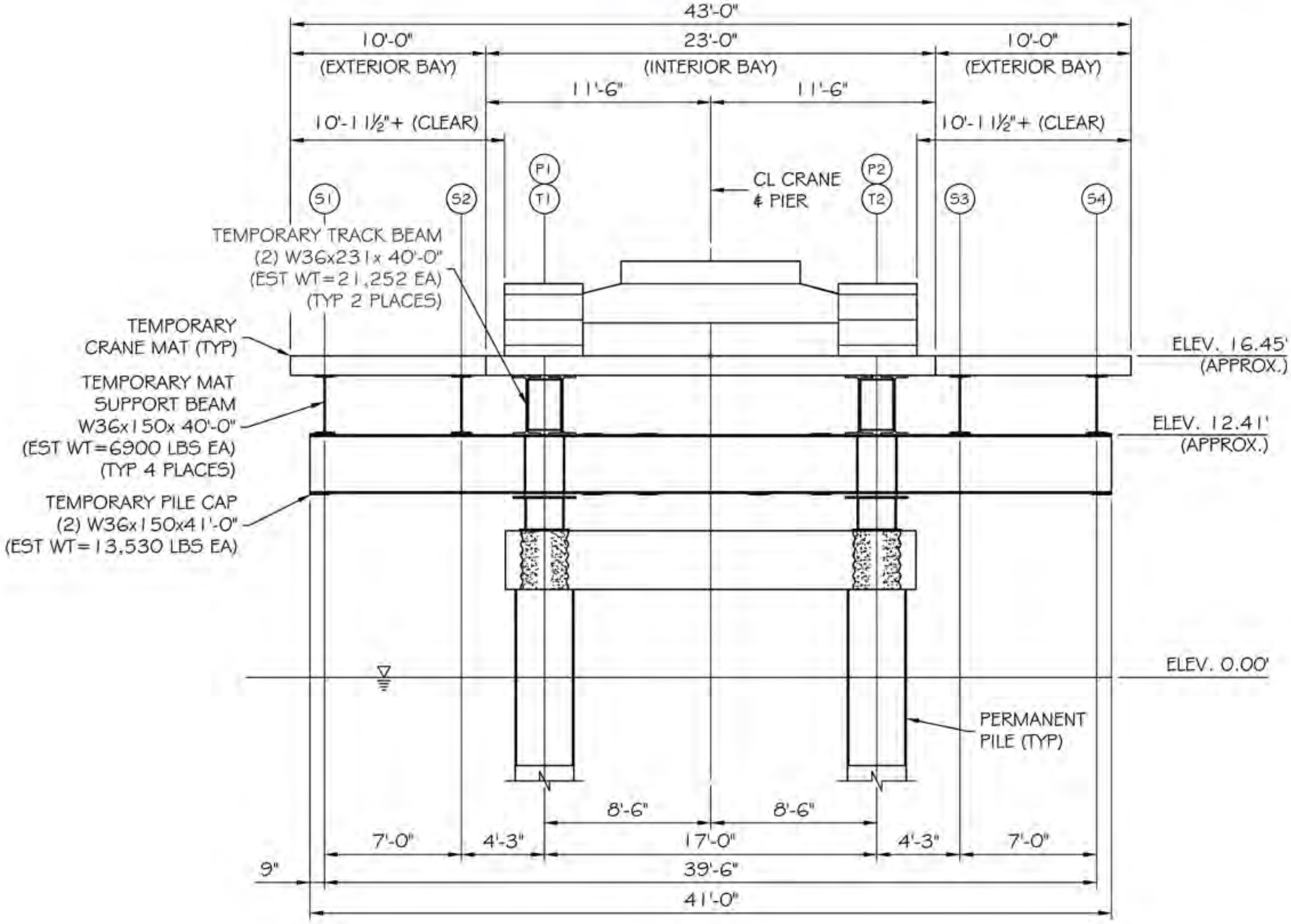

Figure 5.3-8: Installation of Rebar Cage

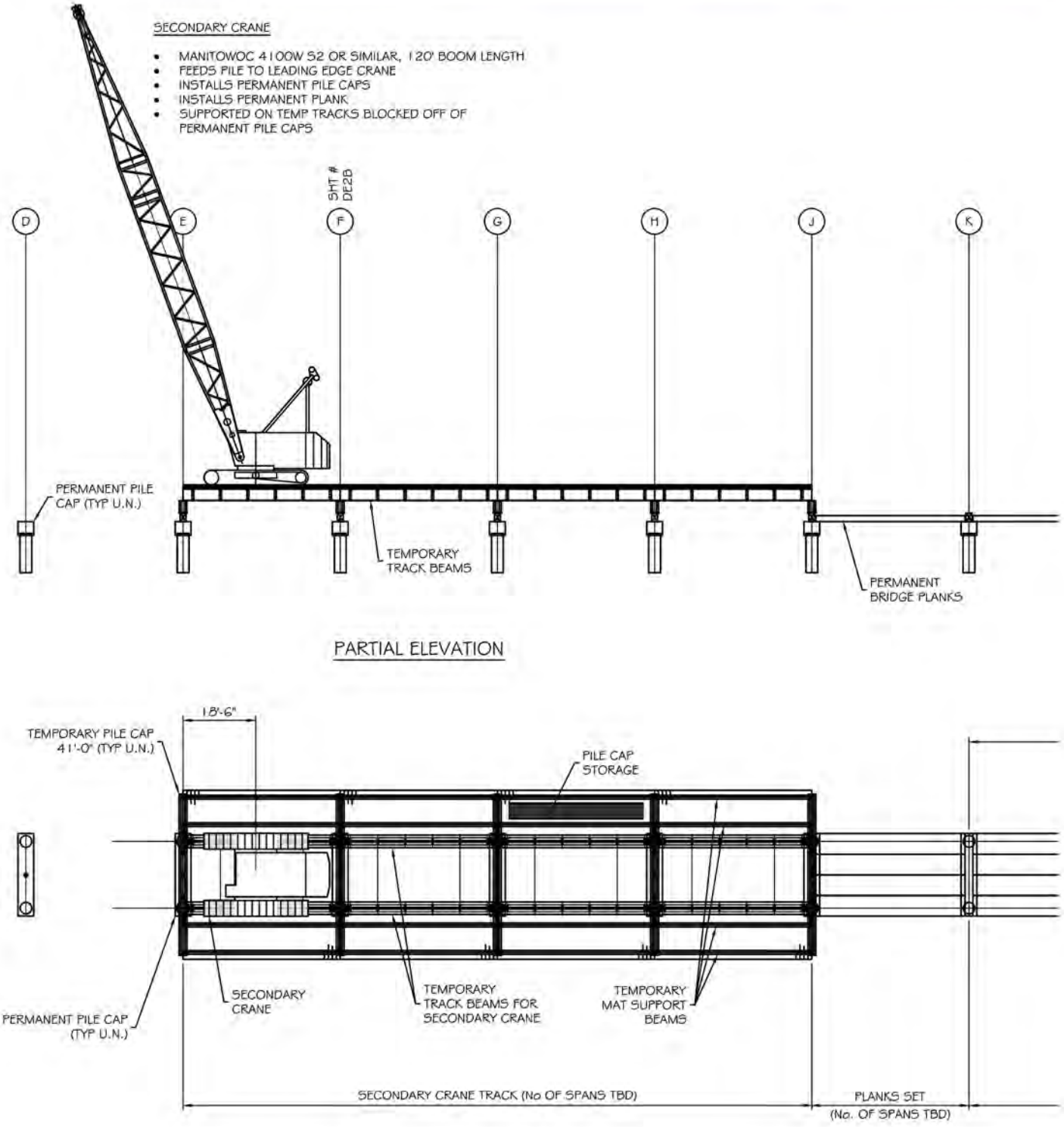

Figure 5.3-9: Secondary Crane Elevation

Typical operations of the second crane:

Photo 5.3-4: Setting Pre-Cast Cap on Piles

Photo 5.3-5: Setting Deck Planks

Berthing Pier: The Berthing Pier will have a separate operation but like the Access Trestle in construction but only 1 each crane to perform the construction. The Berthing Pier will initially be a stand-alone structure until the Access Trestle is built out to connect the two structures, but a similar temporary trestle supported on permanent piles for the crane to work from and install the piles and precast elements. Initially the crane will be working from a floating spud barge until 5 bents are constructed and then the crane will be transferred to the temporary trestle. From then it mirrors the construction process of the Access Trestle. All materials sent to the Berthing Pier (piles, rebar, concrete, precast and supply's) will be loaded on a supply barge at the Ro-Ro and pushed out to service the construction and anything going back to land (drill spoils, garbage etc.) will be containerized and placed on the supply barge and unloaded at the Ro-Ro.

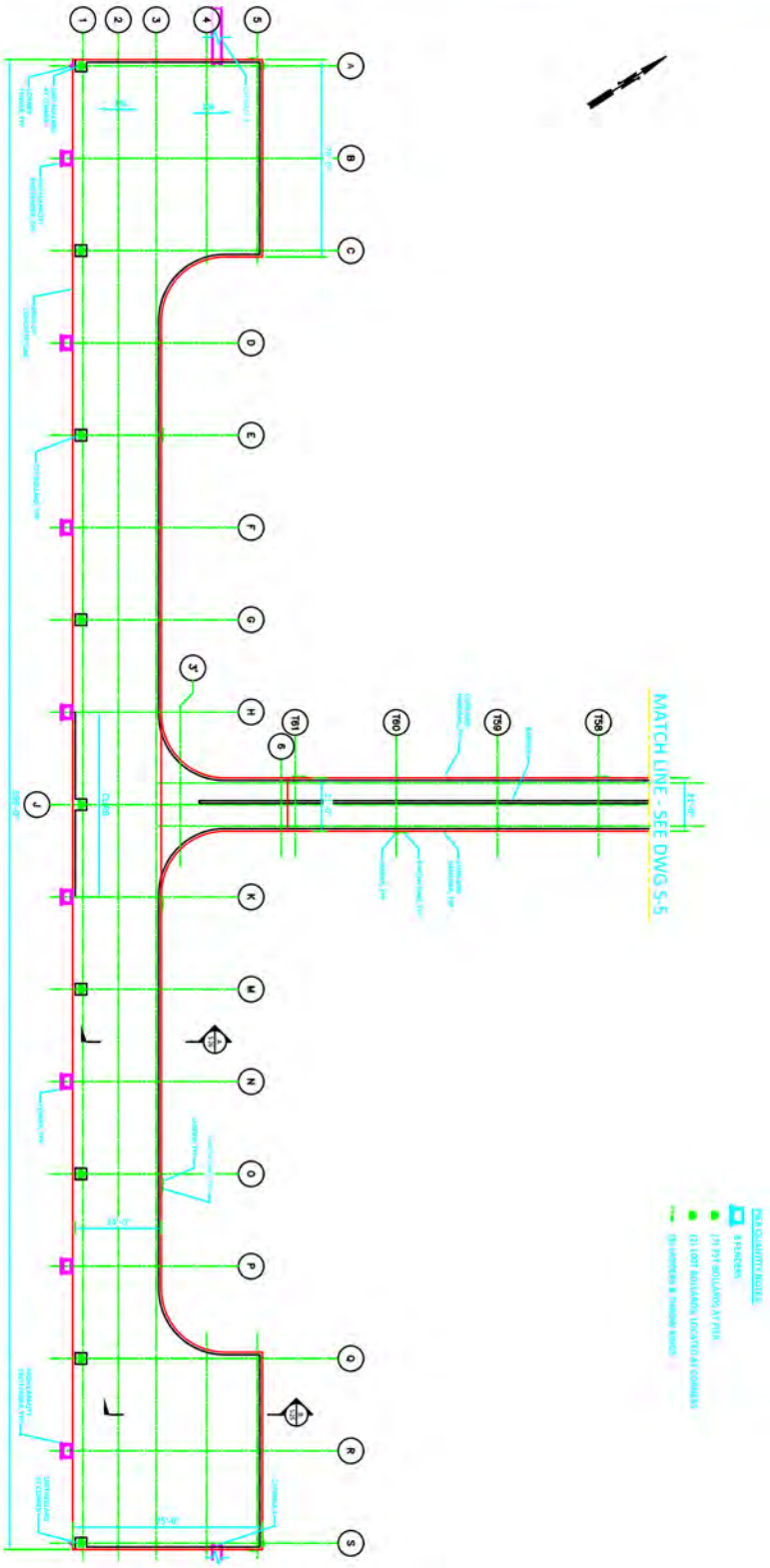

Figure 5.3-10: Plan View of Berthing Pier

Mooring Dolphins: Construction of the Mooring Dolphins will be entirely from spud barges with cranes. The piles will be installed in a similar process as the Access Trestle and Berthing Pier by driving, drilling and filling with concrete. A stay in place forming system will be installed as a soffit for the concrete that makes up the 33 ft. x 33 ft. concrete structure and side forms attached for concrete placement. There is a total of 6 each identical structure.

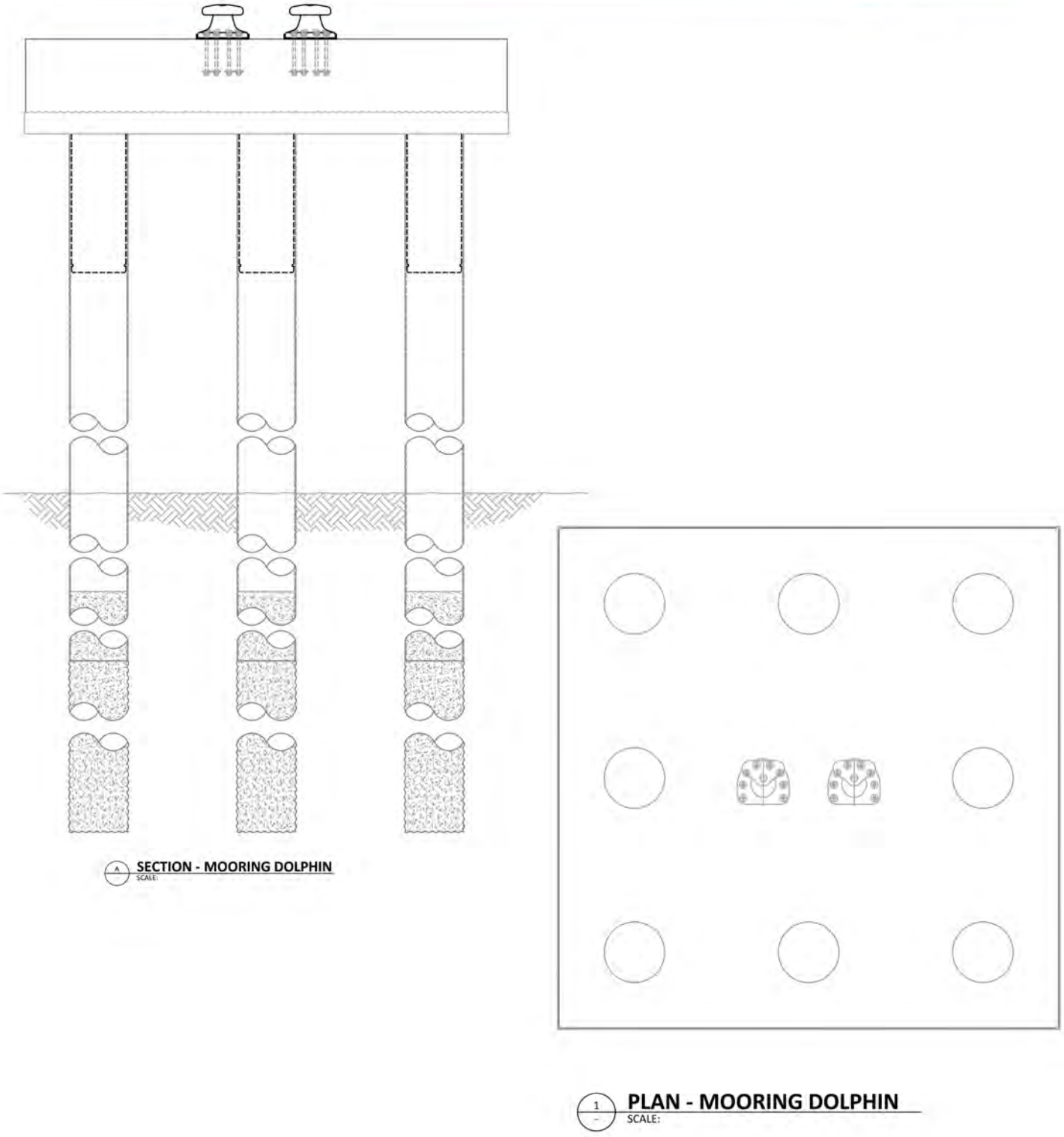

Figure 5.3-11: Cross Section and Plan View of Mooring Dolphin

5.3.1.1 Pile Driving Methodology

The pier will be supported on steel pipe piles. To ensure the piles are in the correct location, a temporary template of steel beams, to act as guides for the piles, will be surveyed into place. The piles will then be driven to the correct elevation using the template for location and a vibratory or impact hammer, depending on the Geotech conditions. The Surveyor will check and re-check the pile for correct location, plumbness and elevation. Once the pile has been driven, the final elevation of the top of pile will be marked on the pile and it will be cut to grade with a track torch.

5.3.1.2 Borehole Material Disposition

The Trestle Pier will use 30" and 36" steel pipe pile that will be placed at a depth of approximately -60 ft. into the seabed (see Section 5.3.1). The seabed is predominately rock that may, or may not be, covered by a thin to thick layer of ocean sand. Once the piles are driven to depth a drill will then be lowered into the pile and the material in the pile will be removed. As the material is brought out of the pile, the material is deposited into a sealed container and stored until the full container is brought to land and emptied. Material will be stockpiled and used for fill as needed.

5.3.1.3 Vibratory Impacts in Submerged Areas

As part of marine mammal mitigation, a hydrophone will be used to clear areas of marine mammals prior to the start of any specific activity under water. In addition, there will be marine mammal observers looking for any indication of marine life in the vicinity before and during operations. If mammals are spotted, then work will stop until we are sure the area is clear of any impact. See Appendix F: Marine Mammal and Construction Noise Management Plan for more details.

Turbidity will be limited to drill operations. While drilling, a turbidity curtain will be used to minimize the spread of sediment.

5.3.2 Wharf and Landing Construction

5.3.2.1 Abutment

Access to the pier will start with a pile supported abutment which transitions from land to the marine structure. Backfill and concrete slab will be placed up to the abutment where the precast concrete slabs will then be supported by the abutment and the first bent constructed.

5.3.2.2 Installation Pier Landing Area

The landing area will be a combination of poured concrete on the upland interface directly connected to the trestle pier. The base, or internal portions of the landing area, will utilize compacted fill material as necessary to achieve the final grade to match the height of the pier trestle. Fill material will be sourced from the onsite cut and fill operation that will be required for the usable areas foundation preparation. The design is on-going so quantities are unknown but are estimated to be between the ranges of 500 CY to 1,000 CY. There will be a minimal amount required. During the placing operations (fill and concrete) the landing areas will have silt fence around the perimeter to protect spillage into surrounding water. As with any filling operation, if material is witnessed spilling into the water, the operation will be stopped and modified.

5.3.3 Aids to Navigation

Prior to the inaugural call, the aids to navigation (AtoNs) will be installed. AtoNs serve to protect the vessels calling the port as well as other areas of concern. Each proposed AtoN will be comprised of a pile supported foundation with a daymark and a solar navigational light. They are located at pre-designated areas as determined by the Port Department.

In addition, there will be navigational edge lighting along the trestle on both sides and 2 nautical mile range solar lights. This lighting plan ensures that the pier will be visible to any vessels navigating in the area in times of reduced visibility.

5.3.4 Project Schedule

It is estimated that the construction of the wharf and landing areas, and upland facilities will take between 24 and 36 months (see Appendix I: Project Construction Schedule).

5.3.5 Best Management Practices

5.3.5.1 Pile Driving

The contractor shall employ the following Best Management Practices while working in an aquatic environment:

- All equipment will be inspected daily prior to the commencement of work and maintained in good proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel fuel, gasoline, and other petroleum products.

- The Contractor will use biodegradable hydraulic fluid in the vibrating hammer drill.
- Storage of fuels and petroleum products will comply with safe operating procedures, including spill containment facilities in case of a mishap.
- Pile cut offs, waste or any miscellaneous unused materials will be recovered to be recycled in another location, or to be placed in storage, or recycled as scrap steel for value. Under no circumstances will materials be deliberately thrown or discarded overboard or allowed to remain permanently in the sea.
- Contractors will have emergency spill and containment equipment available whenever working on, or near, the water.
- Contractors where possible will position their water borne equipment in a manner that will minimize damage to identified fish habitat. Where possible, alternative methods will be employed (e.g. use of anchors instead of spuds). In the event that circumstances will not allow an alternative, contractors will minimize the damage and where required restore habitat to its original state at the completion of the project.

5.3.5.2 Drilling Pipe Clean-out

When cleaning the drill and transporting and moving drill spoils, the spoils will be loaded into a closed nearly watertight container and removed from location via crane and truck. The drill spoils will be emptied in a designated storage area. The spoil material will be bermed and surrounded by silt fence to ensure water from the material is ponded and allowed to evaporate without bleeding into adjacent areas. Best management practices will be employed to prevent impacts to waters or wetlands resulting from run-off from designated spoil storage areas. The material will be sand and limestone in composition and will be mixed with other materials generated from the grading plan. Once dried, this will be good material to use as fill and road base within the project site.

5.3.5.3 Concrete Production

Concrete used on the site will be from a local supplier or from other means provided by the contractor. Other means may include 3,000 lb. bulk bags shipped directly from the U.S. or the contractor may erect its own concrete batch plant on the project site. Concrete mixer trucks will transport the mixed concrete to the placement location needed and return to the batching/loading area on a continual basis.

All concrete work must be completed in a manner that ensures water quality standards are maintained. Runoff from uncured concrete, concrete wash water or other chemicals may be high in pH and are considered harmful to fish and marine life; therefore, there shall be no contact with open water through spillage, hosing off surfaces, rain, or cleaning of tools. Cement and other materials will be kept in a covered storage location to prevent the potential for mixing with water and substances being released into the environment. Any excess concrete material shall be removed upon project completion and recycled or disposed of according to the Site Waste Management Plan (see Section 5.4). An equipment washing site will be bermed and lined to contain any concrete and chemicals. All accepted equipment washing locations must be cleaned up prior to demobilization.

5.3.5.4 Placing Concrete

When placing concrete, spills of fresh concrete must be prevented as much as possible. As concrete is discharged from the transit mixer directly to the form work or placed by other methods, proper sealed chutes must be constructed to avoid spillage. If the concrete is being placed with a concrete pump, all hose and pipe connections must be sealed and locked properly to ensure the lines will not leak or uncouple. Crews will ensure that concrete forms are not filled to overflowing. Any concrete spilled on land outside of the formwork will be allowed to harden and will then be picked-up and disposed of.

All concrete forms will be constructed in a manner that will prevent fresh concrete or cement laden water from leaking into the surrounding water.

All tools, pumps, pipes, hoses, and trucks used for finishing, placing or transporting fresh concrete must be washed off in such a way as to prevent the wash off water from entering the marine environment. The wash water will be contained and disposed of upland in a designated concrete wash area.

5.3.5.5 Containment of Concrete Residue and Water Run-off

When placing concrete in form work over or in water, the concrete formwork will be near watertight so no concrete slurry will seep from the forms. Some forms may be overfilled, and the excess concrete will be caught on the walk-board the surround the forms. Other small quantities of wet concrete may fall into the water. When this happens, the water will separate the sand and stones

from the cement. The sand and stone will sink to the sea floor. The small quantities cement will dissipate throughout and lost within the water column.

5.3.5.6 Site Maintenance and Inspection

To ensure a safe workplace, the worksite and equipment will be maintained and kept clear of rubbish and debris. The work areas will be cleaned per the requirements outlined in the Health and Safety Precautions and Response Plan (see Appendix T: Health and Safety Precautions and Response Plan). Areas of work on or near the water must be kept clean to prevent any construction debris from accidentally falling into the water. The Contractor will adhere to the procedures of the Site Waste Management Plan (see Section 5.4). The proper materials handling practices will be implemented to prevent injury and property damage. Materials will be sorted, secured and stored in stacks and containers. Structural steel, piles, pipes, lumber and other cylindrical materials will be stacked and blocked to prevent spreading and tilting.

The Environmental Manager will liaise with the Site Manager to ensure physical implementation of this EMP. The implementation will be supported by the Foreman and other managers through the performance of periodical inspections and Health Safety and Environmental meetings.

Environmental inspections will occur daily and logs will be kept of the inspections. Inspections will be conducted by the Environmental Manager and Site Manager using the Environmental Monitoring Checklist (see Appendix P: Reporting Templates). Inspections will also be conducted after intense or prolonged inclement weather. The inspections will address the follow monitoring requirements as a basis:

- Site Safety and Health;
- Materials;
- Groundwater Quality;
- Waste Management;
- Dust and Air Pollution;
- Noise;
- Turbidity Management;
- Traffic Management; and
- Management of Natural Habitat.

Any issues identified during the regular monitoring are to be addressed by the Site Manager and if necessary are to be addressed with staff immediately or at daily on-site meetings. There is to be continued monitoring of the implementation of action items.

5.4 Site Waste Management Plan

5.4.1 Plan Overview and Responsibilities

The Site Waste Management Plan (SWMP) was developed to detail the management process for all waste streams generated on site during the construction process and adopt the most efficient processes thereby generating less waste. The SWMP details waste streams that will be generated during the project, responsibilities for proper waste management, and any special requirements. It also describes the proposed handling of the waste streams. For all wastes anticipated to be generated as a result of the Scope of Work, the Contractor has determined the classification (hazardous, non-hazardous, and special waste) and the disposal methodology. The plan provides guidelines for the proper management, handling, clean-up and disposal of waste materials, liquids and/ or chemicals in accordance with the safety and environmental policies, procedures and safe work practices as well as laws and regulations.

The SWMP will be communicated to the entire site during safety briefings and used to promote efficient housekeeping practices and encourage safe and proper disposal of waste. The SWMP will be updated as necessary to include any new material and waste stream being introduced to the site.

The SWMP is designed to accommodate the remote location of the Project and ensure there is no strain on the Island's local dumpsites. It was developed in line with commitments made in Section 3.1.3.6 of the EIA detailing the generation and disposal of solid waste in an appropriate manner during the development of the Project in consultation with Government of The Bahamas and the Department of Environmental Health Services.

Contractors: Ensures that the SWMP is in accordance with the best environmental management practices available at Lighthouse Point project site. Communicate to necessary personnel the principles, procedures and management process of various waste streams generated on site as well as ensure compliance by all employees.

Employees: Cooperate with SWMP best practices at Lighthouse Point project site and also in housing quarters.

Vendors: Abide by SWMP best practices when accessing Lighthouse Point project site.

This waste management plan has been developed to manage the collection, storage and disposal process for waste created on site. Control measures are created to track data and monitor waste streams. Sub-Contractors must also follow the plan laid out.

5.4.2 Non-Hazardous Waste

Non-Hazardous Waste is waste that is not classified as Special, does not violate any criteria of a reasonable probability of adverse effects on health or the environment, and is inert and does not fall within the hazardous waste classification. The following are the most common types of solid and/or non-hazardous wastes generated on the island:

- Aerosol cans depressurized to atmospheric pressure
- Metal (including aluminum, steel and tin cans)
- Cooking oil/grease
- Copy machine and printer toner cartridges
- Food waste and/or wet garbage – could include any food substance raw or cooked which is discarded or any waste which is contaminated with a raw or cooked food.
- Recycled waste – i.e., glass, paper, cardboard, packing materials, plastics, donations (Materials from refurbishment or other replacement projects as furniture, equipment, linens, china, mattresses etc.).
- Incinerator ash (only with non-hazardous certificate)
- Construction and debris
- Empty paint cans
- Furniture
- Filters (3M cartridges)
- Mattresses
- Packing materials
- Potable water filter cartridges

5.4.3 Hazardous Waste

Hazardous Waste is a waste that poses substantial or potential threats to public health or the environment and generally exhibits one or more of these characteristics: flammable, ignitable, carcinogenic, oxidizer, corrosive, toxic, reactivity, radioactive, explosive. Examples of hazardous wastes include the following:

- Perchloroethylene (PERC)
- Biomedical waste
- Aerosol liquid
- Empty chemical containers (as per Bahamian Authorities)
- Expired chemicals
- Paint waste (liquid)
- Batteries (lead acid and alkaline)
- Butane lighters
- Oily residuals
- Propane cylinders
- Refrigeration oil (used with CFC and HCFC refrigerants)
- Fluorescent bulb

5.4.4 Special Waste

Special Waste is a solid waste other than a Hazardous Waste that due to its quantity, concentration, characteristics, or properties requires special handling, management and disposal to protect the public health and the environment. Special Waste will be collected at its sources to the extent practicable and stored only in designated areas until removal by barge. Examples of special wastes include the following:

- Cement kiln dust
- Petroleum-contaminated soil
- Asbestos
- Dried paint fillers
- Biosolids
- Ash
- Grease and/or scum

- Tank bottoms and sludge

The only Special Waste anticipated to be produced on site will be the ash produced from the burn boxes used for disposing of vegetative waste.

5.4.5 Waste Identification and Handling

The identification of Non-Hazardous, Hazardous and Special Wastes is based on information obtained from Analytical data, Safety Data Sheets (SDS), Technical Data Sheets (TDS), and local regulations. The EMT is responsible for providing technical assistance to all personnel and contractors including their sub-contractors, on the appropriate identification, and classification of the wastes.

Waste will be collected at its sources to the extent practicable and stored only in designated areas depending on its identification until removal by barge. All Hazardous Waste must be stored in appropriate containers or accommodated in pallets. All Special Waste must be disposed of per its specific handling and disposal requirements. A designated area shall be designated only for waste of these categories and must be protected from leaks, have no apparent structural defect and be maintained in good condition. This area must be locked and accessed only for authorized personnel.

Due to the environmental effects of the potential toxic materials from electronic devices released into bodies of water, groundwater, soil, and air, affecting both land and sea animals, electronic waste (e-waste) is considered hazardous, and shall be stored in the hazardous storage area.

5.4.6 Waste Monitoring

The site will be inspected daily to help track the debris stored on site and help mitigate any potential fire hazards or risks to the environment by determining what needs special attention. During the inspections, the identification and determination of which materials can be salvaged and which materials must be recycled will be documented. All hazardous wastes on site will be separated and stored in a safe manner while awaiting disposal. Bins will be inspected for signage and to ensure proper waste is being disposed in the correct bin. The volume of the waste in each bin will also be tracked.

All team members will be committed to reducing the risks associated with the generation and management of the waste streams. As the Project enters new phases of construction, the type and quantity of waste will be recorded in a logbook that will be kept easily accessible on site. The log will be made available for regular review and will be updated as necessary. If there are any materials that cause concern due to generation of excess waste, there will be consideration for replacement with materials and/or products that offer a better environmental solution.

All areas, containments or containers where waste is stored should be inspected to ensure they are being properly maintained in the condition appropriate for that specific waste. Careful consideration should be given to waste areas to ensure that cross contamination does not occur. Any material to be removed from site for reuse should also be inspected. The environmental professionals should continue to review any new materials being added to ensure there is a path to disposal.

The site will be inspected daily to help track the debris stored on site and help mitigate any potential fire hazards or risks to the environment by determining what needs special attention. During the inspections, identifying what materials need to be salvaged and which need to be recycled should be documented. Ensuring that any hazardous waste on site is separated from the public and stored in a safe manner awaiting disposal. Bins should be inspected for signage and to ensure proper waste is being disposed in the right bin. Volume of waste in bin can also be tracked.

Storm systems should be continuously monitored during the construction process. In the event that a storm watch is announced, arrangements should be made for all waste on site to either be removed or secured in the most efficient way possible. The goal is to minimize any potential damage to the environment and, in turn, the public. All material must be secured preferably in trailers in case of flooding and all waste bins should be emptied or capped off until the storm passes. Special attention should be given to reducing the amount waste on site and near the site.

5.4.7 Storage, Collection and Disposal

Proper storage of waste is considered a priority. It is important not only to environmental health but also human health. There will be 8 roll off bins located throughout the project site. Once containers are full, they will be swapped with an empty one. Bins should be monitored to ensure they are free from damage. The container full of waste will be handled based on its contents. Any other disposal bins should have lids affixed to keep contents and odor from leaking out. The log to document bin

and contents should be utilized. Each bin will be designated for one of the four categories: glass, plastics, steel or wood debris. All waste should be disposed of in the proper bins to avoid cross contamination. Employees and contractors should be made aware of disposal locations as well type of waste being disposed. Proper storage of materials can also greatly reduce the amount of waste generated by reducing disposal of damaged material. Materials can be sorted and placed in containers according to material type to protect from weathering.

Contractors will be responsible for collecting and disposing of waste generated from work activities. They should be made aware of disposal process and locations on site. The commitment to proper disposal of waste should be a priority for every person involved with the project.

Designated dumpsters should be centrally located for ease of access and removal. Signage should be placed on dumpsters and a number system should be implemented to ensure material is being disposed of in the right bins.

Any areas where waste will be contained on site should be properly identified for that specific waste and monitored to ensure compliance with the SWMP.

5.4.8 Waste Types

This operation will generate a range of waste including general waste, contaminated/hazardous waste and construction debris waste. Table 5.4 below is representative of potential wastes generated on site, their type and disposal methods.

Type of Waste	**Waste Form**	**Waste stream**	**Waste Destination**
Glass/Plastics	Solid	Recycling	Will be back loaded into Ocean freight Transporter and returned to the United States, where it will be picked up by a recycling company.
Steel	Solid	Recycling	Cut and loaded into a ship for return to United States or Nassau. Both locations

			have a strong need and recycling avenues available.
Wood/Debris	Solid	Incinerated	Loaded into a bin burner at a central location and incinerated.
Initial Construction Vegetation	Solid	Incinerated	Material will be sorted into piles and later repurposed for landscaping or added to the bin burner for incineration.
Concrete Waste/Block	Solid	Repurposed	Will be contained in a designated area. Once bin is full the concrete will be crushed and added as a base fill for road construction.
Waste Oil/Petroleum Products	Solid/liquid	Recycle	Oil will be enclosed in 250-gallon container and filters and other items will be stored in a 55-gallon steel barrel. Once container and bin are full, they will be loaded onto ship and oil disposal service will pick up and recycle it. A record of disposal will be maintained and included in reports to DEPP.
Hazardous Chemical Waste	Varied	Varied	The Contractor and EMT will evaluate hazardous chemicals to develop plans for management, use, storage and disposal in accordance with the manufacturer's recommendations and the EIA.

Table 5.4: Potential Waste Types

If there is a surplus in materials, exploring potential use in future operations should occur. They will be labeled as materials which can be used in the future and stored away from waste operations.

Waste that cannot be disposed of due to its category, class or material (e.g., old tires or contaminated waste). Unused Equipment, spare parts or discarded parts should be identified, dated and stored away. The potential for future use should be assessed to determine if it needs to be removed from site. Minimizing the potential for runoff or leachate contamination to the environment is important.

These items will be stored for short periods and also loaded onto the supply barge and returned to the United States.

5.5 Air Quality

5.5.1 Dust Control

Dust produced from the construction will be minimal. If the contractor chooses to have a landside staging area and concrete batch plant, minimal dust will be temporarily airborne due to the movement of equipment and concrete production. These activities will be concentrated on the south side of the island.

Construction impact minimization techniques to be implemented include:

- Clearing and grubbing of areas that have been surveyed and marked to ensure areas are not cleared outside of construction limits.
- Wetting 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, roads, and stockpiles to prevent the emission of excessive dust from the site.
- All access roads shall be periodically maintained by grading and watering to ensure they are free of debris.
- Trucks hauling loose material will be covered by a tarpaulin to prevent dust pollution and debris on the roads.

5.5.2 Airborne Pollution

The minimization of airborne 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 and ensure equipment is serviced regularly and equipped with air exhaust filters.

- The Environmental Officer 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.

5.6 Noise Nuisance and Quality

Noise will be generated primarily by the use of typical construction equipment, e.g., cranes, trucks, generators, etc. Although the project is in an isolated area noise and light disturbances due to construction activities need to be managed to reduce the impacts to the local community, particularly during the evening and overnight hours. 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 operations shall be periodically assessed by the Contractor and the Client in relation to the significance of potential disturbance.

The pile drilling and pile driving will produce the greatest amount of noise and vibration. The noise and vibration are generally a concern for marine mammals (see Appendix F: Marine Mammal and Construction Noise Management Plan), but other animals including turtles and their nests, as well as birds can be affected. Bird areas and marine mammals will be monitored during construction. In non-marine mammal cases where there is egregious disturbance, the Environmental Manager will call a meeting with the general contractor to determine how best to correct the disturbance.

Studies as discussed in PIANC Report Number 108 – 2010: Dredging and Port Construction around Coral Reefs indicate that there have been no observances of impacts to coral from construction noise and vibration. Fish, being motile, generally leave the area temporarily.

The Contractor will maintain equipment in good order to minimize extraneous noise. Advanced notice will be given prior to commencement of work. Any complaints from local communities concerning noise shall be reported to the Owner's Representative 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.
- The Bahamas does not have national noise standards but noise meters will be used to monitor levels on site. The site is not within close proximity to residential areas so daily monitoring will ensure that levels do not exceed 70dB, which may cause hearing damage. The source of any levels exceeding 70dB will be identified and repaired or replaced.

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 beaches.
- Tilting lights downwards.
- Using shielding to restrict the glare of lights.

5.7 Protection and Preservation of Natural Resources

5.7.1 Protection of Environmental Resources

All environmental resources within the project boundaries and those affected outside the limits of the permanent work under this project will be protected throughout the project duration and will be the responsibility of the Environmental Manager. The work conducted at the site will be confined to activities in areas defined by the project plans.

5.7.2 Protection of Land Resources

Prior to the beginning of any construction, the Environmental Manager will identify all land resources to be preserved during construction. The Environmental Manager will ensure that the work being performed does not remove, cut, deface, injure or destroy land resources including trees, shrubs, vines, grasses, and other landforms without special permission from DEPP. The Owner shall be responsible for the replacement of any damaged or destroyed areas outside of the project plans as approved by DEPP.

The site is dominated by the following types of terrestrial habitats:

- Dry Broadleaf Evergreen Forest

- Sand Strand
- Sand
- Herbaceous and Shrub-dominated Dunes
- Casuarina dominated Dunes
- Conocarpus Exposed Rock
- Mixed Mangroves
- Herbaceous Wetland Ponds

Negative impacts will include the loss of native vegetation, protected species, alterations to sand strands and ecosystems in the terrestrial environment.

To mitigate the impacts associated with terrestrial development the following activities will be undertaken during construction:

- Selective protected and native species will be tagged for removal and will be incorporated back into the project during landscaping.
- Casuarina and other invasive species will be removed where there is easy access and within the impacted areas.
- The landscape palette will be developed to emphasize native species, including protected species and noninvasive species.
- The landscape palette will be submitted to DEPP for approval prior to finalizing.
- To safeguard against the introduction of plant pest and disease, plant procurement will include sourcing from both local and international sources.
- Biological monitoring will help to identify any changes to the biota of this area and will therefore inform any changes required to project activities.
- The following measures will be implemented to restrict human impacts on environmental resources:
    - Dust control to reduce plant dieback due to reduction in transpiration rates;
    - Waste management to control waste streams and pollution;
    - Sediment and erosion control to minimize the potential for soil erosion;
    - Stormwater management to reduce runoff; and
    - Spill prevention to protect human health and the environment.

The site has large areas of natural native habitats and utilized by a significant avian population. The most significant impact the avian population due to construction will be the loss habitat. The development itself has left 84% of vegetation undisturbed while other areas are being developed. Areas will also be inspected for the presence of wildlife prior to land clearing.

5.7.3 Protection of Marine Resources

It is expected that direct impacts to the marine environment specifically reef building corals, barrel sponges and sea urchins, will result from the construction of 1) the open pile trestle and berthing pier; 2) the small vessel marina and associated marina protection armoring; and 3) the service ramp. The EIA indicated that there are reef-building corals present in areas on the site that will be affected by construction activity.

The Owner will be responsible for the relocation and monitoring of impacted coral and urchin species. An initial coral assessment has been conducted of the areas that will be impacted and a specific coral relocation plan has been developed (see Appendix C: Marine Mitigation and Coral Relocation Plan). The plan identifies areas where corals and other reef building species are present on the site, their abundance and relocation methodology, monitoring and reporting.

The Owner will be responsible for the relocation and monitoring of impacted coral and urchin species. An initial coral assessment will be conducted to create a specific coral relocation plan. The plan will identify areas where corals and other reef building species are present on the site, their abundance provide an understanding of the proposed activities that would affect important marine species, present options for relocation and outline relocation methodology, monitoring and reporting.

5.8 Protection and Preservation of Cultural Heritage

5.8.1 Archaeological Finds during Construction

A complete cultural resource study for archaeological and historical resources was completed prior to the submission of the EIA in addition to subsurface surveys for the marine works and preclearance surveys for the landside works. Shoreline preclearance surveys will be completed prior to any construction activities taking place to confirm there have been no changes from a marine or terrestrial perspective. With the relocation of the BOH, there are no anticipated impacts to the historic structures located during the landside cultural resource study and there are no plans to ever develop

where ruins or historic structures are located. The Lighthouse is a historic resource and will experience no impacts as a result of the construction activities. Per the HOA, safe, environmentally friendly access will be created around the Lighthouse and to the southernmost point of the Property to highlight the natural beauty of the site while preserving the existing resources. However, if previously unidentified items/areas of potential archaeological significance are identified during construction works, the following steps shall be undertaken:

- The work in the area shall cease immediately.
- The items/areas of potential indigenous archaeological significance will be protected from any damage or disturbance by maintaining a 50 ft. barrier and erecting signage.
- The contractor will notify the Owner and the Antiquities, Monuments and Museum Corporation (AMMC) to evaluate next steps and coordinate final disposition. All cultural resources onsite will be assessed in coordination with the AMMC for their potential eligibility for inclusion on The Bahamas National Register of Historic Resources.
- If a human burial is encountered, all activity that might disturb the unmarked human burial or its immediate locale will cease immediately. The discovery or exposure of unmarked human burials legally requires the immediate halt of all activities that might further disturb the burial or vicinity and requires notification of the proper authorities.

To prepare the construction teams for the possibility of items/areas of potential archaeological significance, the team's training of safe practices onsite will include the instructions for the steps above as well as a presentation on the previously identified finds so construction staff is aware of the potential of discoveries if the situation should arise. Best practices for instruction and clear communication of strategies and procedures as outlined above will highlight the importance of the preservation and protection of any archaeological finds.

5.9 Spill Prevention and Mitigation

The Spill Prevention and Mitigation Plan (SPMP) was developed for the use of all contractors and sub-contractors, to prevent and control any spillage associated with the project construction activities. The scope of SPMP is to minimize the risk of spillage during the execution of Contractor´s activities in the project site in addition to providing information about equipment and materials (contingency equipment) to undertake appropriate immediate remedial actions. The SPMP has been developed in accordance with the relevant environmental regulations.

A high degree of preparedness shall be maintained at all times in order to respond quickly and efficiently to control any spill emergency situation. This will be ensured through training, emergency drills, personnel qualifications and job descriptions.

The SPMP has been prepared in order to safeguard the environment and shall be applied to the following operational sites and/or activities:

- All Contractor and Sub-contractor activities.
- Contractor and Sub-contractor personnel movements to/from the operational sites.
- Mobilization and demobilization of equipment.
- Interfaces with third parties during Contractor's activities.

Contractor recognizes the importance of marine operations and the necessity of implementing all possible reasonable measures to avoid pollution and any contamination. Based on this, Contractor and Sub-contractors are aiming for zero spills through environmental safeguarding and performing best practices during their onshore and offshore operations.

The basic philosophy in planning the spill prevention and response measures can be summarized into five levels:

- 1st Spill prevention.
- 2nd Minimize the volume of any potential spill.
- 3rd Minimize the environmental effect of spills.
- 4th Contingency planning in the event of a spill.
- 5th Corrective actions.

See Appendix U: Emergency Response Plan for more information on identifying responsible individuals, spill notification and reporting and cleanup efforts.

5.10 Pollution Control Plan

During construction activities the contractor will seek to reduce pollution by controlling waste streams, soil erosion, waterway sedimentation, and airborne dust. Below the different types of

pollution that may be produced as a result of construction activities and ways the contractor will manage and reduce its contribution.

5.10.1 Terrestrial

The following Best Management Practices will be implemented for terrestrial pollution control:

1. Preservation of Existing Vegetation
    a. Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity. The project has identified large portions of land that will remain intact.
    b. Minimize clearing and the amount of exposed soil within limits of construction.
    c. Protect ponds, vegetation, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.
2. Construction Scheduling
    a. Properly sequence construction activities.
    b. Schedule or limit grading to small areas.
    c. Install key sediment control practices before site grading begins.
    d. Ensure site stabilization activities, such as industry standard slope protection measures, or install landscaping. All stabilization measures are to be installed or completed immediately after the land has been graded to its final contour.
3. Maintenance of Vehicles and Equipment
    a. Vehicles and equipment brought to site will be in good working order.
    b. Vehicles will be serviced on a regular basis to ensure they are in good working order to ensure emissions and fluid leaks are prevented.
    c. Where possible biodegradable products will be used.
4. Sediment and Erosion Control
    a. Inspect and maintain control measure daily and especially after each rain event or storm.
    b. Ensure all erosion control measures are properly installed.
    c. Turbidity curtains will be installed at the Ro-Ro construction site.
    d. All in water construction activities will monitored for turbidity. Readings above 29 NTU will be a holding point and all works will cease until levels drop.
5. Implementation of the Spill Prevention and Clean-up Plan
    a. Use a dedicated fueling areas onsite.

b. Discourage “topping-off” of fuel tanks.
c. Dedicated fueling areas should be level, and in consideration of downstream watercourses.
d. Protect fueling areas with berms and dikes to prevent run-on, run-off, and to contain spills.
e. Use vapor recovery nozzles with automatic shutoffs to control drips as well as air pollution.
f. Fueling areas should have proper signage and barricaded to prevent any potential accidents which would result in a release to ground.
g. Keep spill kits near fueling areas to ensure a timely cleanup in the event of a spill.

6. Waste Management
    a. Collect concrete and wash water in concrete washout facilities, especially when operations are near water resources.
    b. Containers must be adequately sized to handle solids, wash water and possible rainfall.
    c. Choose smaller, covered containers and more frequent collection.
    d. Do not allow waste to accumulate on-site.
    e. Separate recyclable materials from waste and keep covered.
    f. Conduct visual inspections of dumpsters and recycling bins, removing contaminants and keeping containers covered.
7. Air, Dust and Noise Control
    a. Apply water on haul roads.
    b. Loose materials are to be hauled in trucks with tarps or sealed containers.
    c. Restrict vehicle speeds to 10 mph.
    d. Do not leave excavated areas exposed for long periods after activity ceases.
    e. Reduce the number of open excavations.
    f. Stockpile processed materials on-site separately. Place, grade, and shape stockpiles to drain surface water.

5.10.2 Marine

In an effort to manage any potential sources of contamination to the marine resources, the contractor will ensure that all marine resources have adequate protection from contamination due to potential spills, releases or water runoff, and that employees follow the SWMP and the Spill

Prevention and Mitigation Plan. In addition to implementing the terrestrial best management practices and environmental mitigation plans the following should be implemented to ensure proper protection of water bodies:

- All waste bins should be located at a manageable distance from entry ways to water sources.
- All liquid waste is stored in airtight containers away from water bodies until time of disposal.
- All containments are monitored daily to ensure no damage has occurred which would create a potential release to ground or into a water body.
- Spill kits are fitted with absorbents necessary for containing any release and preventing travel to a water body.
- All equipment will be maintained in good proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products.
- Storage of fuels and petroleum products will comply with safe operating procedures, including containment facilities in case of a spill.
- Pile cut-offs, waste or any miscellaneous unused materials will be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown overboard.
- Equipment used in concrete works should be rinsed in designated areas or containers and not in or near waterbodies.

5.11 Chemicals Management Plan

The Chemicals Management Plan has been developed to ensure the safe and proper use of hazardous chemicals and to comply with applicable governmental regulations addressing the procurement, use, storage, management, transportation and disposal of both hazardous and non-hazardous chemicals. It was also developed to reduce the potential for accidents involving hazardous chemicals and/or wastes. The SWMP in Section 5.4 outlines the handling of hazardous waste include chemicals they may be exposed to while onsite. The site safety training and toolbox talks will inform the workers on methods to access the safety data sheets, any precautionary measures and the labeling system to be used. Any new chemicals introduced to the site should be accompanied by the SDS which will be added to a safety data sheet log for employee retrieval when necessary. See Appendix U: Emergency Response Plan (Section VI) for more details.

The EMT will ensure that the Chemicals Management Plan is available for review by all team members. During the site induction, meetings will be held to communicate to all construction personnel the principles, procedures, and safe management process of hazardous chemicals on-site as well as ensure compliance by all employees. The contractor, subcontractors and vendors are expected to cooperate with Environment, Health & Safety personnel to mitigate any potential exposure to chemicals by reporting any unsafe practices and/or conditions involving the use of chemicals.

The following control practices will be implemented to ensure proper management of chemicals on site:

- A chemical log will be created to track inventory of bulk chemicals brought on to site.
- Contractors will be required to submittal an SDS for the chemical being introduced to the site as well as ensure the proper storage infrastructure is available.
- SDS sheets will be available at the storage location, if enclosed, and the construction site office.
- Adequate amount of spills kits will always be kept on site.

5.12 Sedimentation and Erosion Control Plan

Sedimentation and erosion have the potential to negatively impact the environment by way of the pier construction and upland excavation activities. Sediment and erosion control will be monitored in the daily site inspections. The following control methodologies will ensure those impacts are prevented or minimized:

- Turbidity curtains will be installed at the Ro-Ro construction site per the manufacturer specifications. The curtains will be monitored daily and repaired as needed.
- Turbidity will be limited to drill operations. While drilling, a turbidity curtain will be used to minimize the spread of sediment.
- Turbidity levels will be monitored daily during active marine construction activities. If turbidity exceeds 29 NTU above natural levels, drilling will be stopped until sediments have settled before drilling can commence again.
- Silt fencing will be installed in the upland area at clearing and grubbing sites near the wetland areas. There is a buffer zone of at least 50 ft. between upland works and the

wetland areas. The method statement included in Appendix M: Upland Construction details the best management practices for sediment and erosion control in these areas.

- Control measures such as silt curtains, geotextile installation, gravel bag berms, etc. will be implemented as needed.
- Supplemental sedimentation monitoring in nearshore waters at pre-determined fixed sites including near planned beach improvement areas, Small Vessel Marina breakwater, and other upland construction areas.
- All material stockpiles will be placed at least 100 ft. away from the coastline and secured.

The driving and drilling operations will have turbidity curtain surrounding the pile. Driving pile doesn't generate turbidity but drilling can have minimal impacts and the curtain will mitigate any issues. Further information on sedimentation and erosion can be found in both Appendix G: Water Quality Monitoring Protocol and Appendix M: Upland Construction.

5.13 Fire Management

The objective of this Construction Fire Safety Plan is to eliminate the causes of fire, prevent loss of life and property by fire, and to comply with the OSHA standard on fire prevention, 29 CFR 1926.24. Additionally, it provides employees and the public with information and guidelines that will assist them in recognizing, reporting, and controlling fire hazards during construction.

Fire safety is everyone's responsibility. All employees should know how to prevent and respond to fires and are responsible for adhering to company policy regarding fire emergencies. See Appendix U: Emergency Response Plan for more information on fire management and safety.

6.0 Environmental Monitoring Measures

6.1 Environmental and Ecological Monitoring Protocols

A biological monitoring program will be implemented on a daily and quarterly basis to check for the presence and condition of adjacent biological resources and provide short-term feedback to minimize construction impacts around each event. Long-term complementary monitoring of marine resources will also occur every six months throughout the construction phase of the project to provide larger scale and more detailed information on potential impacts and trends (see Appendix

B: Marine Benthic Resources Monitoring Plan).

6.1.1 Maintenance of Water Quality and Water Quality Monitoring

Monitoring water quality during construction will be conducted to determine if construction activities may be exceeding suspended sediment thresholds that could negatively impact marine resources. Water quality monitoring will primarily focus on using turbidity as a proxy for suspended sediments/light and sedimentation effects associated with the main construction activities including drilling, pile driving, cement pouring, and barge movement. During construction, water quality monitoring will include both a continuous array of real time water quality buoys with satellite link placed around each construction area coupled with in-water measurements using a hand-held multi-parameter Sonde by on-site biologists. Buoys will be equipped with satellite connectivity and designed to provide continuous real-time feedback for turbidity that allow for any necessary corrective actions to be rapidly taken. A single offshore buoy will also measure and transmit other water quality parameters (temperature, salinity, DO, pH, and Chlorophyll) along with weather, current and wave height information. Data will be transmitted every 30-60 minutes from each buoy via a web datacenter service that can be accessed on-site by the Environmental Manager and biologists.

For upland construction activities, water quality will be monitored within adjacent water bodies (nearshore and/or inland ponds) that are within 50 ft. of construction areas. On-site biologists will use hand-held Sonde three times per day taking both surface and bottom measurements of turbidity and other parameters along at least three inshore to offshore transects. If turbidity containment curtains are being used, water quality readings will also be taken inside and outside of curtained areas. See Appendix G: Water Quality Monitoring Protocol for a more detailed description of buoy positions during construction and protocols.

The supplemental long-term monitoring data collected before and during the construction phase of the project will be analyzed for temporal and spatial variations in order to determine the appropriate monitoring design, i.e. number of sites, frequency of monitoring, indicators, etc., for inclusion in the Operational EMP.

6.2 Environmental Management Team

The Environmental Management Team (EMT) will be comprised of representatives from the American Bridge Environmental Management team, WDI Construction Management team, Disney

Environmental Integration team and Disney Wildlife Conservation team. Each team member will be tasked with consensus building within their area of influence.

6.2.1 Duties of the Environmental Management Team

The object of the EMT is to familiarize themselves with the project specific environmental requirements, educate the various stakeholders within their area of influence, build consensus among the stakeholders, implement the environmental requirements and BMPs, and communicate the results. Tasks to accomplish this objective includes:

1. Kickoff meeting
2. Preliminary reviews of the EMP
3. Monitor adherence to the EMP
4. Correct deficiencies
5. Communicate compliance

6.3 Organizational Chart

The Organizational Chart is presented in Figure 6.3 below. The Environmental Management Framework outlined herein identifies key elements for developing, implementing, achieving, reviewing and maintain the environmental policy; including organizational structure, planning activities, responsibilities, practices, procedures, processes and resources.

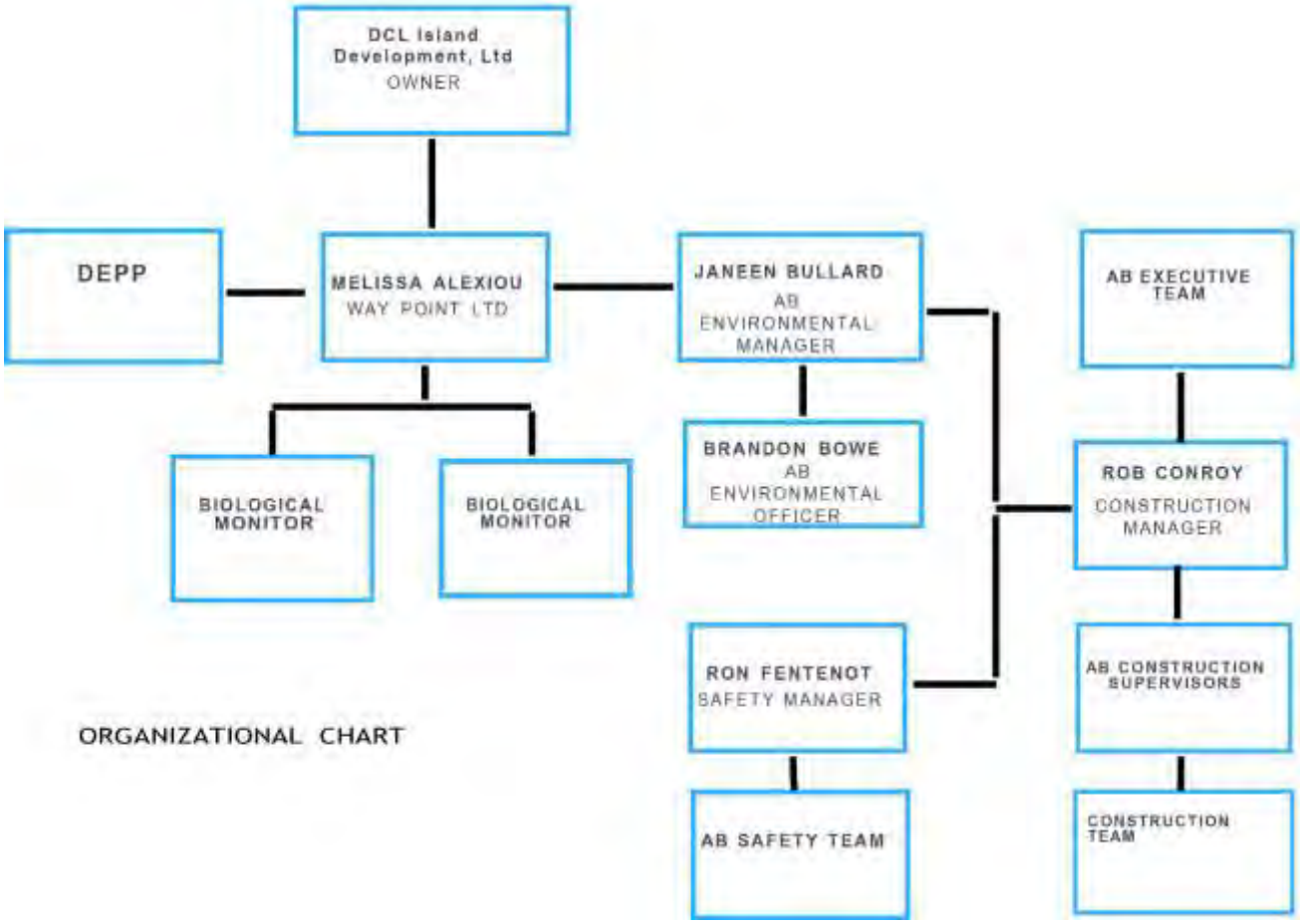

Figure 6.3: Contractor's Organizational Chart

6.3.1 Owner's Authorized Project Environmental Managers

The Owner's Environmental Managers would be responsible for long-term monitoring of native wildlife and assist Contractor's Environmental Manager with compliance items highlighted in the EMP.

6.3.2 Contractor's Project Environmental Manager

The project Environmental Manager would be responsible for coordinating and managing all the environmental activities during the construction phase. The project Environmental Manager would carry out the following duties:

- Develop and review the Contractor's EMP and Method Statements.
- Identify and ensure delivery of the appropriate environmental training to the project team.
- Review and improve method statements for environmental aspects prior to work starting.

- Monitor construction activities performance to ensure that the control measures are effective and are in compliance with the EMP.
- Preparation of status reports as necessary.
- Liaison with the Owner's Environmental Managers.
- Perform environmental audit of subcontractors and suppliers.

6.4 Environmental and Construction Status Reports

Environmental and Construction Status reports will be completed on a daily basis and kept in the project files. The Environmental Manager will be responsible for maintaining all monitoring events and reports.

6.4.1 Commencement of Work

DEPP will be notified at least 48 hours prior to commencement of work.

6.4.2 Water Quality Monitoring

All water quality data will be reported quarterly and QA/QC processed data will be uploaded to a website which DEPP personnel can access at any time. A final report will be submitted to DEPP within 90 days once construction is complete. The report will summarize the state of the project and any anomalies that occurred.

6.4.3 Benthic Resource Inspections

Environmental reports (i.e., Pre-Construction Baseline, During Construction Monitoring of Key Resource Sites, Post-Construction Report, etc.) will be submitted to the DEPP Commission within 90 days of the monitoring event. Reports will include the name and contact information of the Owner and consultant, name of the party responsible for conducting the monitoring, dates the inspection were conducted, photo documentation if applicable, and pertinent monitoring data.

6.4.4 As-Built Certification

Within 90 days of substantial completion of construction, the Engineer or designee shall submit as-built drawings of the authorized work. As-built drawings shall include the following: a plan view drawing including all earth disturbance and a list of deviations between the authorized work and work as constructed.

6.4.5 Construction Monitoring Form

In the case of incidents, all aspects of the incident are to be addressed and entered to the relevant logs for appropriate review. The Environmental Manager and Construction Manager shall be notified of any incident with actual or potential site impacts on the community or the biophysical environment immediately. The Environmental Manager will make an assessment, determine any actions to be taken and notify the client who will notify DEPP. A detailed report will be submitted and measures to mitigate against any further occurrence (see Appendix P: Reporting Templates).

6.5 Incident Reporting

The forms described below will be compiled and an environmental monitoring report will be submitted to DEPP on a monthly basis for review and approval (see Appendix P: Reporting Templates).

6.5.1 Endangered Species Log

Contractor shall keep a log detailing sightings, collisions, or injury to corals, sea turtles, manatees, Bahamian pintails, piping plover that have occurred during the construction period. Following project completion, a report summarizing these incidents and sightings will be submitted to DEPP.

6.5.2 Water Quality

If water quality turbidity readings are above the action threshold and meet the requirements to stop work, within 72 hours DEPP will be notified of elevated readings and corrective measures implemented to mitigate the occurrence.

6.5.3 Environmental Incident Reporting Form

Employees are required to report incidents to the Construction Manager or Environmental Manager immediately. The Construction Manager will ensure that the Environmental Manager is immediately informed of an incident. The Environmental Manager shall log all incidents for reporting. Major incidents such as large fuel spills are to be reported to the BESTPROTECT242 APP and notify DEPP of the incident via telephone. The Contractor's EO is required to submit to the Environmental Manager detailed reports outlining an incident with an environmental concern. The Environmental

Manager will include incident reports in monthly environmental reports to DEPP. An incident report template is provided in Appendix P: Reporting Templates.

6.5.4 Non-Conformance Report Form

Non-conformance Reports (NCR) will be issued by the Environmental Manager as an official notification of an environmental concern. An incident report template is provided in Appendix P: Reporting Templates. It outlines the issue of concern and requires the Contractor to provide corrective actions to be taken. When an NCR is issued, the Environmental Manager will ensure that corrective actions described in NCR are carried out.

6.5.5 Hazardous Materials Form

Hazardous materials such as paint, solvents, fuel and other chemicals are considered harmful to the environment and human health; therefore, there shall be no contact with open water through spillage, hosing off surfaces or cleaning of tools. Hazardous materials will be kept in a specified and secured waste bin to prevent the potential for mixing with water and substances being released into the environment or affecting human health. The material safety data sheets (SDS) should be provided and made available for all hazardous materials brought on site.

Proper training for handling, storage and use of these materials will be provided during the site induction and specific toolbox talks (see Appendix U: Emergency Response Plan for spill prevention and handling).

6.6 Social Risk and Monitoring

6.6.1 Public Communication and Reporting Procedures

Disney has hosted multiple information sessions on Eleuthera over the past several years and has met with hundreds of local community members to further build relationships, maximize opportunities for Bahamians, and provide project updates, and will continue to do so. A log of these meetings conducted between April 2018 and February 2021 prior to the submission of the EIA can be found in Section 13.0 of the EIA. When possible, representatives from American Bridge will attend these information sessions in the future.

Working with American Bridge, Disney will further develop a process to receive community feedback. Prior to the commencement of works, posters will be placed in the surrounding communities and signage at the site with contact information to provide comments and complaints. The Site Manager is in direct contact with the community and as such will receive all grievances to be addressed. They will communicate with DCL prior to providing a statement. All feedback will be responded to in an order that addresses those that require immediate attention first. The comments and relative responses associated with the public grievance mechanism will be recorded and included in the environmental reports.

6.7 Training Program

6.7.1 Construction Personnel

Environmental and Site Safety inductions are to be conducted prior to the commencement of construction activities and for all new employees. All project team members and sub-contractors, will be required to sign that they have received, understood and will comply with measures as set forth in the site inductions. A register of all persons attending site inductions will be maintained as a part of the record keeping for the project and included in the environmental report.

Environmental Site Inductions: Environmental Site Inductions will be conducted by the EMT. Topics to be covered in the presentation include:

- Project's Organizational Structure.
- Description of Site's Biological Aspects including vegetation, avian population and marine life.
- Protection of the marine environment including sediment control and impacts of marine debris on marine life.
- Waste Management including storage and disposal of solid and hazardous waste.
- Noise and light control.
- Spill Prevention Control Plan Procedure.
- Proper use of Spill kits.
- Hurricane Preparedness Plan Procedures.

Site Safety Inductions: Site Safety Inductions will be conducted by the Contractor's Safety Management Team and EMT (see Appendix T: Health and Safety Precautions and Response Plan).

7.0 Emergency Contingency Plans

7.1 Inclement Weather

Lighthouse Point is subject to hurricanes and tropical storms in the summer and fall months and severe Northeasterly storms during the winter. Prior to mobilization to the site, the Contractor must develop and submit for approval an action plan for inclement weather. Of utmost importance is the establishment of a safe harbor(s) for all floating machines, tools and equipment.

7.2 Oil Spills

Although the primary goal is to prevent any oil spills, it is necessary to have a plan in place that prepares for and established acceptable responses for accidental oil spills that occur in and around the project waters.

7.2.1 Response Plan

A complete response plan is provided in Appendix U: Emergency Response Plan. The plan will provide the following information at a minimum in the Spill Prevention Control and Countermeasure (SPCC) plan:

- A list of the oil containers at the jobsite (including their contents and location).
- A brief description of the procedures that will be used to prevent oil spills. For example, the steps that you use to prevent fuel spills when fuel is transferred from a storage tank to construction equipment.
- A brief description of the measures to be installed to prevent oil from reaching water.
- A copy, available for review, of the Material Safety Data Sheet (SDS) for each chemical to be used during the Project.
- A brief description of the measures to be used to contain and cleanup an oil spill to water.
- A list of emergency contacts and first responders.

At a minimum, the contractor must adhere to the following guidelines:

- If a release or spill occurs, the Contractor will stop operations and take immediate measures to control the release and prevent dispersal of the spilled material.
- Use containers suitable for the oil stored. Use a container designed for flammable liquids to store gasoline.

- Identify contractors or other local personnel who can help clean up an oil spill.
- Provide overfill prevention for the oil storage containers.
- Provide effective, sized secondary containment for bulk storage containers, such as a dike or a remote impoundment.
- Provide effective, general secondary containment to address the most likely discharge where you transfer oil to and from containers and for mobile refuelers.
- Periodically inspect and test pipes and containers.
- Ensure all equipment is in good operating order and inspected on a regular basis.

7.3 Human Health and Safety

The contractor will ensure that a fulltime medical professional is onsite during working hours and appoint a designated full-time site safety professional with an acting safety officer always appointed in their 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. Minor and major accidents shall be recorded in an accident logbook.

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):

- Hazardous materials
- In confined spaces
- With heavy equipment
- Water safety

Refresher training will be conducted every six months to ensure that all safety procedures are actively being adhered to.

Personal protective equipment (PPE) including protective suit, gloves, hard hats, respirators and goggles shall be worn in areas designated for their use. At all times work sites shall be maintained in an orderly, safe and tidy state. Precautions against fire accident shall be taken and appropriate fire safety equipment supplied and clearly indicated at work sites.

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

7.3.1 COVID-19 Protocols

In response to the COVID-19 pandemic, the American Bridge Health and Safety Department has created a Response Plan which is attached in its entirety in Appendix T: Health and Safety Precautions and Response Plan. The plan provides a guideline for all AB jobs both domestically and internationally using recommendations from the Centers for Disease Control (CDC), OSHA, and the National Institute for Occupational Safety and Health (NIOSH).

The plan is customized to align with standards set by the Bahamian government.

8.0 Back of House Facilities

8.1 Wastewater Treatment Plant

Wastewater will be generated from the onsite work camp, kitchen facilities, port-o-lets, and general onsite construction operations. The wastewater treatment plant will be located near the work camp area at the BOH. The temporary living quarters will be plumbed directly to the plant and there will be a pump out station located at the same location for collection of other waste. The wastewater will be treated in the plant and the potable treated effluent will be pumped into a deep well for disposal.

Photo 8.1-1: Example of a Wastewater Treatment Plant

The solids collected will be sludge containing low amounts of water. Once there has been a build-up of sludge, a local company that is licensed in handling sewage will be called out to pump the sludge into their tanker truck and hauled away for proper disposal.

Photo 8.1-2: Portable Toilets

Onsite port-o-lets will be collected twice a week, or more often if required, and pumped at the pump-out station located next to the wastewater treatment plant. The port-o-lets will be cleaned, sanitized, and made ready for service afterward.

8.2 Electric Power

During construction electric power will be supplied by diesel power generators. During operations the primary source of electric power will be solar panels capturing 90+% energy generation for the site. Electric power during operations will be further outlined in the Operational EMP.

8.3 Renewable Energy

During construction activities there will be no renewable energy production or program. The site will be powered by diesel generators.

The Walt Disney Company recently released its environmental goals for 2030, which serve as a compass for the company's business globally, including Disney Cruise Line.

Through the Heads of Agreement (HOA) with the Government of The Bahamas, Disney committed that a minimum of 30% of the energy supply to the Lighthouse Point operation would come from renewable sources. However, the most recent design for Lighthouse Point increases this substantially.

During operation, it is anticipated that 90% of Lighthouse Point's electricity needs will be met by way of renewable energy sources and sending zero waste to landfill. Waste to energy capture and optimization of water conservation is also being explored.

The design of Lighthouse Point includes onsite solar panels and batteries to provide 90% of electricity needs. Remaining emissions are driven by refrigerants, as well as the energy needs from heating, cooking and a subset of the transport systems. There are back-up systems that require fossil fuels, like diesel generators, but those would only be used in cases where solar energy is not available for extended periods of time. Project initiatives include:

- Solar panels (PV) and batteries sized to cover 90% of the estimated project electricity consumption.
- Centralized cooling of larger spaces to increase efficiency and support nighttime load shedding.
- Electric golf carts to support operations.
- Smart lighting solutions, with energy efficient fixtures designed to minimize light pollution.
- Optimized thermal systems to improve efficiency and align energy usage with the availability of renewable electricity.
- Building envelopes designed to reduce energy loss.

8.4 Communications

There will be 2 modes of communication on the project during construction: cell phones and handheld radios. Each will be specific to the role an individual plays on the project.

Each foreman will be assigned a handheld radio. There are 4 frequencies through which employees can communicate and the range will only be available onsite. There will be a home base at the office to lessen the gaps in range. Cell phones will also be used as a means of communication and a contact list will be generated for distribution.

Each manager will be assigned a handheld radio and a Bahamian cell phone or use their US cell phone for communication. This information would be included on the contact list.

Radios will be the main form of communication. Wi-Fi will be made available for the project site. Emails, texting and general internet access will also serve as a mode of communication.

8.5 Solid Waste Generation and Disposal

A SWMP has been developed that identifies the source of waste on site along with the methods of handling and disposal (see Section 5.4). This will be temporary during construction and include using burn boxes for clean wood and vegetative waste, separation of waste such as plastics and steel which will be shipped to recycling facilities in the United States.

8.6 Fuel Storage

The contractor will obtain fuel from a local fuel (or other) supplier or distributor. The fuel will be stored on land in approved fuel cells. These fuel cells will offer double wall containment to ensure no leaking of fuel on to ground or into the water. In some occasions, a fuel cell may be stored temporarily on a tug boat, work barge or on a materials barge. All barges and tugs will be outfitted with appropriate spill containment kits. There will be shore-side spill and containment kits near the landside stored fuel areas as well. Fuel storage is to be located in a lined and bermed area.

8.7 Stormwater Management

Stormwater may cause erosion and should be directed in drainage swales throughout the site. These areas will retain the stormwater and percolate into the ground. The grading plan should be implemented so that it does not increase pooling and collection of stormwater which would increase erosion effects.

8.8 Incinerator

The incinerator will not be installed until closer to the operations phase. See the SWMP (Section 5.4) for the waste handling methods that will be implemented in the absence of an incinerator.

Appendix A

Terrestrial Wildlife Monitoring Protocol

Survey Overview

Surveys are conducted monthly over the span of five days with at least two weeks separating the end of one survey and the beginning of the next. A survey consists of four inland transects that each include 8 point counts, an eastern shoreline transect that does not include point counts, a southern and western shoreline transect that does not include point counts, and 8 point counts that are not part of a transect. Each day, survey activities begin within 30 min of sunrise and are conducted on foot except for one transect along the shoreline of Big Pond that is conducted by kayak. While quantifying avian diversity is the primary focus of the survey, additional wildlife are documented when encountered including snakes, invasive mammals, and land crabs.

Figure 1: Lighthouse Point Transect Map

Figure 1 Overview

Grey dots identify point counts. Of the 9 point counts that are not part of transects, two are in the forest interior, two are at each of the smaller ponds on property (i.e., an unnamed pond at the northwest corner of the property, Shad Pond, White Pond), and one is at the southern tip of the property to document avian use of the cays to the south. Shoreline transects are not depicted but inland transects are delineated by colored lines:

- Transect 1 (purple) mostly follows the main road into the property.
- Transect 2 (green) mostly follows a new road to be added in the western portion of the property.
- Transect 3 (blue) follows the eastern shoreline of Big Pond.
- Transect 4 (orange) follows a new road to be added in the eastern portion of the property.

Transect Protocol

Travel to the first point count of the transect. Before beginning the transect, record the point count ID, temperature, maximum wind speed, humidity, and cloudiness based on the scale on the datasheet. Record the start time of the transect when the first point count begins. Record the type and number of all avian species seen and heard as point counts are conducted and while traveling between point counts. Try not to record individual birds more than once. Record the number of people and vehicles observed during the transect. Note any sightings or sign (scat or prints) of snakes or invasive mammals (cats, dogs, raccoons, rats) and record their locations. On road transects, record the number of live and dead crabs encountered on the roadway between each pair of point counts. Record the final point count ID, temperature, maximum wind speed, humidity, cloudiness and stop time after this point count has been completed. The direction in which the transect is conducted should be switched between surveys. For shoreline transects, record the name of the start and stop points for the southern/western transect as NWshore and SWshore and the start and stop points for the eastern transect as NEshore and SEshore.

Point Count Protocol

Before beginning a point count, use a GPS unit to record the location where the count will take place and label it with the name of the point count. Begin a point count by recording the start time. Record all species seen and heard in 4 time blocks of 2.5min each. Within each time block identify the location of each individual as occurring within 0-25m, 25-50m, >50m, or as a flyover. Try not to count the same individual twice and only record new individuals seen or heard in subsequent time blocks.

After this 7.5min of passive listening and observation, play the calls of the following species for 15s each with 15s of silence between each species (1min total) then listen for 1min and 30s: great lizard cuckoo, Kirtland's warbler. Rate how difficult it was to hear birds during the survey using the noise scale on the datasheet and note any human disturbances that occurred during the point count in the comments section. After each point count, record the temperature, maximum wind speed, humidity, and decibel level.

Appendix B

Marine Benthic Resources Monitoring Plan

Overview

Disney has committed to developing and operating the Lighthouse Point site in a sustainable manor with the goal of minimizing any losses to existing marine biodiversity and, to the extent possible, improving the condition of resources over time. The only way to assess if this goal is being met is through the development of a long-term monitoring program designed to establish pre-development baselines and track changes. A primary goal of the marine monitoring program is to distinguish natural regional variations from Site Specific influences. Regular repeat monitoring of representative high and low impact sites during development can inform if there are any unexpected secondary impacts associated with construction. Monitoring can also inform how successful or not marine mitigation projects such as coral or structural enhancement and transplantation may be. Therefore, the objectives of the marine resources monitoring plan for Lighthouse Point is both to inform short-term corrective actions during specific construction while also providing the basis for longer-term change detection and eventual management of the area.

Photo 1: Fixed impact monitoring site at Lighthouse Point

The marine systems monitoring framework for the Lighthouse Point is designed to meet multiple objectives utilizing the best available scientific information of the area. Factors influencing the monitoring plan include the size and complexity of the area, proposed development footprint, proposed operational use, dive safety requirements for scientific diving, and overall monitoring capacity and budget. During the 3-year Environmental Impact Assessment (EIA) investigation of the

Lighthouse Point area, 7 distinct benthic habitats and 5 hardbottom sub-types were identified and mapped using satellite imagery and ground truthing. The larger Lighthouse Point coral reef ecosystem begins nearshore and extends out over a moderately wide shelf (3-7 km) down to depths of over 30m. The principal habitats consist of reefs (patch reefs, reef crests, fore reefs, reef walls, and scattered coral mounds), hardbottoms (subtypes 1-5), sand, and seagrasses (see Table 1A and 1B). The majority of planned activities (both constructional and operational) for the Lighthouse Point site will take place at water depths shallower than 20 m (60 feet) which is proposed as the outer depth limit of the monitoring plan. Using this outer depth cutoff, the marine area of the Lighthouse Point site that will be monitored is approximately 14 km^2 in extent, with approximately 30% of the monitoring area (e.g., 4 km^2) occurring along the southern shelf and 70% (e.g., 10 km^2) occurring along the east side of the property. Thus, the bulk of the marine monitoring effort will be located within the Lighthouse Point shelf area boundaries with selected additional sites outside of the Lighthouse Point property area to be used as control sites.

The Project is expected to result in direct construction-related impacts to the development footprint which may result in physical disturbance to the seafloor. Pile driving, placement of structures, and the use of large construction barges can also cause increases in water turbidity and rates of sedimentation and sediment stress or sediment burial on corals and seagrasses (Erftemeijer et al., 2012). The placement of additional sand on south coast beaches also has the potential to cause secondary sedimentation impacts to nearshore areas. Therefore, the benthic monitoring program during construction phase of the Project will emphasize bioindicators that have been shown to be sensitive to water quality and sediment stressors (Cooper et al., 2009).

Benthic Monitoring Goals

- Quantitative marine benthic monitoring to provide additional information for bioindicators that are sensitive to changes in water quality.
- Detect any trends at the colony and population level that can be used to pre-emptively inform development and adaptive management actions during construction and operation of Lighthouse Point.
- Before and After control Impact (BACI) monitoring design to distinguish construction related impacts from natural variation.
- Coupled analysis of water quality monitoring for identification and characterization of relationships and causes for local stressors.

- Provide permanent high-resolution record of large areas of the seafloor before, during and after construction (landscape photo mosaics of fixed 100m^2 plots).

Approach

The most appropriate sampling design for monitoring and evaluating the influence of small-scale impacts (human or natural) on ecosystems is a before-after-control-impact/treatment (BACI) design (Eberhardt 1976). This approach allows strategically chosen fixed sites within suspected impact areas to be compared to control sites outside of the area of impact. By monitoring the same seafloor area and associated sessile invertebrate species over time (paired treatment and control sites), changes in selected bioindicators that respond rapidly to localized stressors can be statistically analyzed and quantified. Placing an array of such sites within, around, and outside of impact areas also allows distinguishing small-scale effects and associated spatial gradients away from the source of stress. This approach is appropriate for understanding and evaluating potential impacts associated with construction of a new facility in order to provide regular feedback to inform management measures to prevent or minimize the loss of marine habitats and/or species. The development of the array of sites used to monitor for potential impacts should include replicate sites within and outside of the various zones of predicted impact.

Fixed sites and fixed plots greatly reduce the inherent spatial variation (noise) for habitats with high between and within site variability. Therefore, at Lighthouse Point, a network of fixed sites marked with a single stainless-steel pin will be established before construction begins and will be the basis for evaluating primary and secondary impacts associated with the development of Lighthouse Point. Each monitoring location will include a 10x10m plot area (or in some cases a single 100x0.5 m belt transect) marked by a stainless-steel pins. The advances in underwater camera resolution and mosaicing technology increasingly enable the rapid collection of downward facing high resolution images that can be collected quickly by a small team and reduces the reliance for on-site marine species-level identification expertise. These images can then be analyzed in the lab by professionals trained species-level to extract for individual biotic indicators and metrics (e/g., coral size). Images can also be stitched together to provide a single landscape mosaic of large areas of the seafloor which in turn can be analyzed at both the colony and population level using computer software. This approach is particularly useful for fate tracking of individual coral colonies (marked colonies) over time and quantifying small changes in the benthos within the plots.

Photo 2: Diver collecting overlapping downward looking photos over a 10mx10m plot.

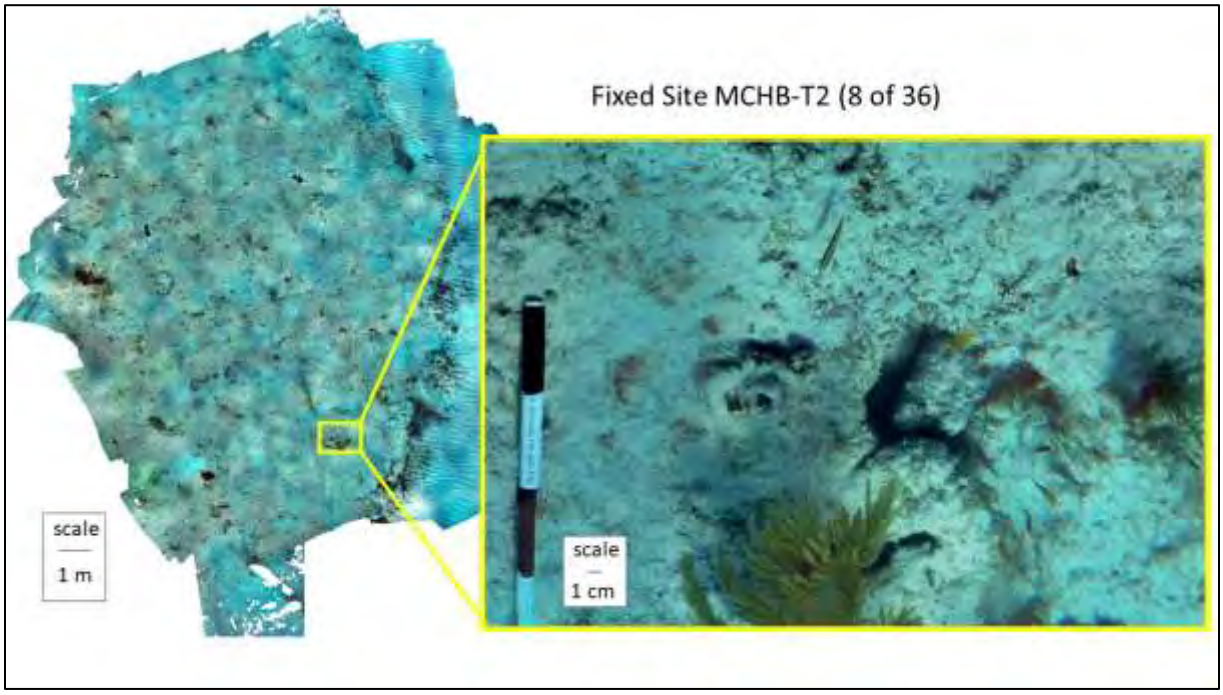

Figure 1: Landscape photo mosaic of Site MCHB-T2 showing a 10x10m area of hardbottom habitat composed of 1856 individual digital images. A 50x50 cm inset is shown of the mosaic revealing its true resolution capable of distinguishing individual coral species down to 4 cm. These images will be used to track any changes at the colony level during construction for a suite of bioindicators that are sensitive to water quality changes.

Benthic Monitoring Network Design

An initial network of 36 fixed sites has been developed for the Lighthouse Point area based on the proposed construction development plan, size and variability of habitat community composition in the area, monitoring capacity, and an examination of other coral reef impact monitoring studies. This number of stations allows for multiple replicates across habitat types, depths, and distances from development areas that should be adequate for assessing potential secondary impacts to marine resources during construction and operation of the facility. The amount of seafloor that will be monitored within the network represents 360,000 m^2 or approximately 2% of the total Lighthouse Point marine shelf area. High resolution imaging will repeatedly cover 3,600 m^2 of hardbottom, coral reef, and seagrass habitat (nearly 1 acre of seafloor) encompassing many hundreds of individual hard corals and other sessile invertebrates. Additional sites may be added to the network over time to provide more resolution around specific areas or to better quantify suspected impacts or stressors. The core 36 sites will remain during construction but may be modified after construction for the operational phase of the Site. At least 50% of the core monitoring sites will remain within the network to provide a long-term continuous record of change to inform site management and coral reef conservation efforts in the Bahamas.

The majority of the proposed Lighthouse Point development in-water impacts (e.g., trestle, cruise ship berthing area, small boat marina, service dock) are located on the southern shelf area. Construction will directly impact 5.5 acres of seafloor with a 75' wide buffer placed around all planned structures. Proposed plans also call for two of the beaches on the south coast (South Family Beach, South Beach Cabanas) to be widened nourished with sand and stabilized with nearshore structures to minimize sand loss. In contrast, the more extensive east side of the Lighthouse Point property will experience no in-water development, no beach nourishment and guest activity are anticipated to be concentrated around a single 500 m stretch of beach where limited beach facilities are planned. Therefore, during the construction phase, most impact monitoring sites will be located along the south coast. The allocation of sites will be weighted around the projected impact areas as discussed above and outlined in the EIA with 2/3rds of the monitoring sites to be located on the more impacted south side of the development and 1/3rd of the sites to be located along the less impacted east side beaches. Control sites that are beyond limits of the Lighthouse Point property (estimated at 5-6 km from the trestle construction area) will be included in the monitoring network. The network of sites should balance the distribution of sites across inshore, mid-shelf, and offshore habitats to a depth limit of 60 feet. A summary of the allocation across geomorphic shelf, water depth, habitat type, and

distance from construction footprint of the existing 32 of 36 fixed benthic monitoring sites is shown in Figure 3. Sites that are within the development footprint are expected to be directly impacted; secondary impacts may occur within an additional 75'. Secondary impacts are also more likely on inshore habitats adjacent to proposed beach developments. The level of projected direct and secondary impacts at 32 of the existing monitoring sites is shown in Figure 4.

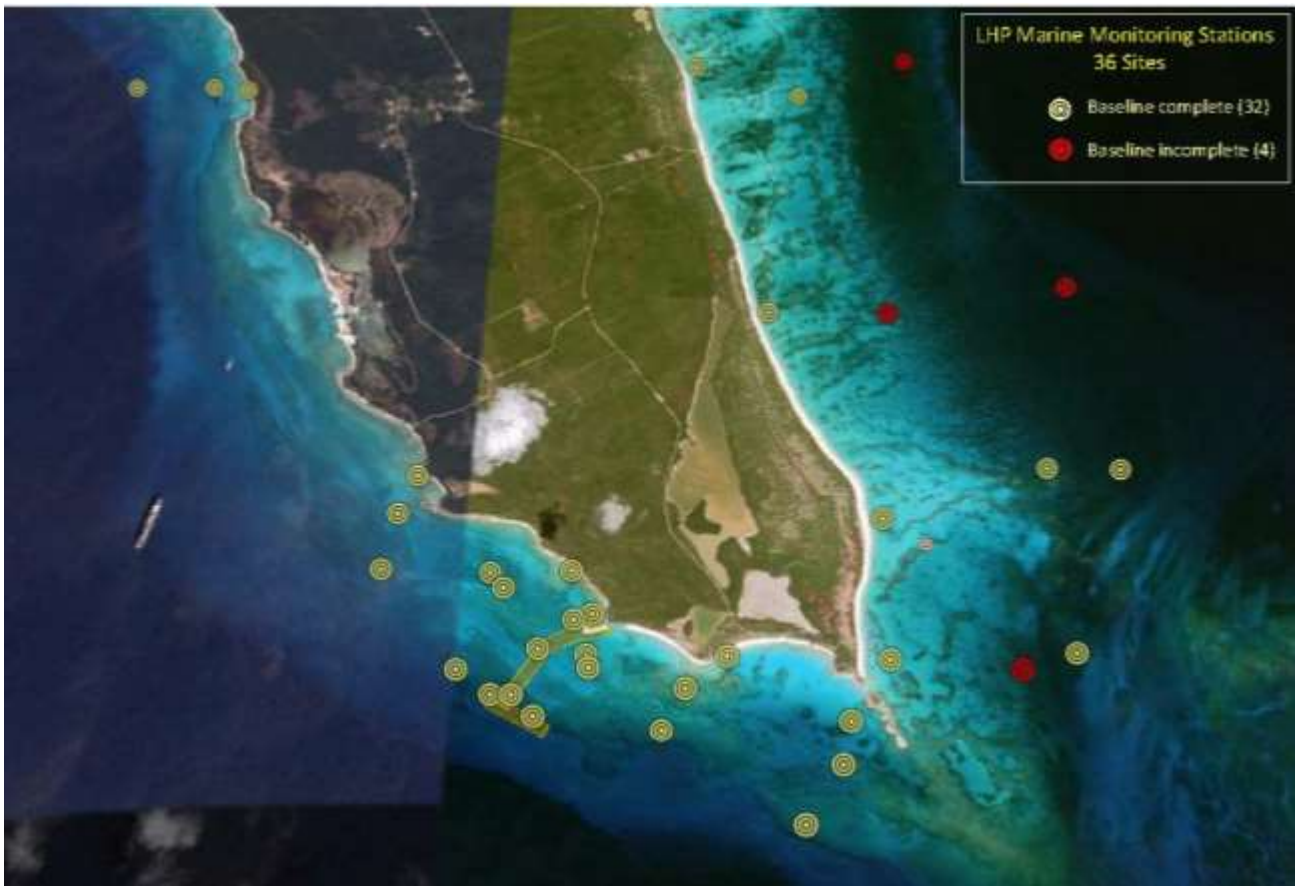

Figure 2: Location of network of 36 fixed monitoring sites around Lighthouse Point. Since 2020, a total of 32 sites have been established and baseline before construction monitoring has taken place. An additional 4 sites will be added to the east-side around the upland beach development and east-side construction areas where nearshore sedimentation impacts are possible.

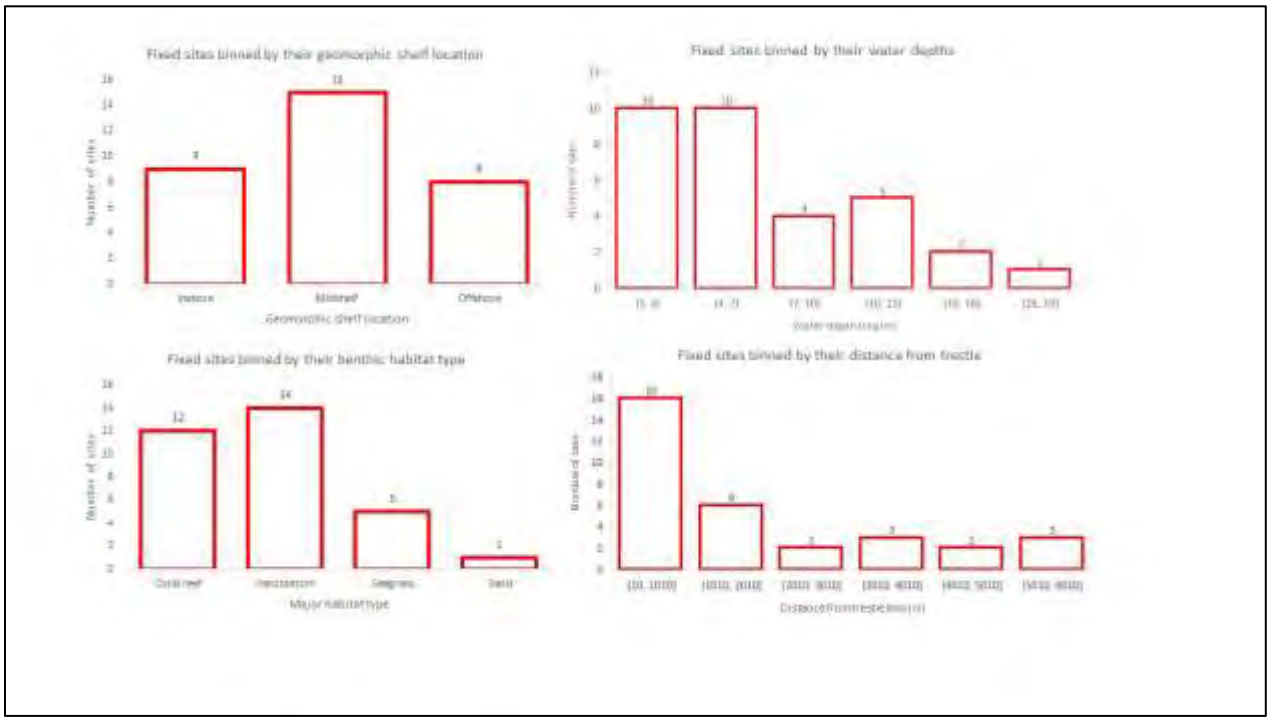

Figure 3: Allocation of sites into potential stress categories associated with construction development. Impacts expected are for sites that fall within the “directly impacted” development footprint. Categorization is based primarily on proximity to proposed development and operational activities. Control sites are expected to have no impacts associated with the development and are located outside of the Lighthouse Point property.

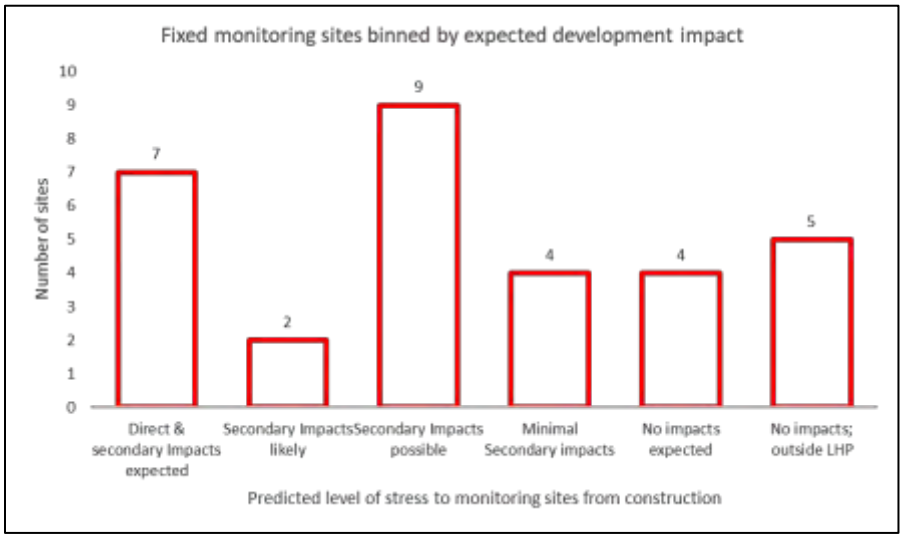

Figure 4: Allocation by different factors for the first 32 out of a total of 36 fixed monitoring sites that will form the Lighthouse Point long-term marine monitoring network.

Bioindicators

The biological indicators selected for the fixed site monitoring will emphasize those that show a rapid (< 3 month) response to water quality changes and are fairly feasible and cost effective to collect (Cooper et al., 2009). The influences of greater sediment deposition on corals and other benthic organisms during construction periods will also be a focus of the impact monitoring and the selection of bioindicators that show a rapid response to increased levels of sedimentation (Jones et al., 2019). Physical breakage or damage to corals, other invertebrates, and the seabed will also be recorded. For quarterly construction related benthic resources monitoring, on-site biological technicians will visit a subset of fixed plots/tagged coral colonies that range in distance from less than 10 meters to over 6,000 meters from the construction area. Tagged corals will include a range of species and morphologies and susceptibilities to sediment stress and physical damage and diseases. Lan-view images of coral colonies and photographs of individual colonies will be collected for each tagged coral and used to score colony condition for the bioindicators listed in Table 2. Short-term marine resource monitoring (including SCTLD presence) will be conducted at least twice per month and reported out to DEPP quarterly.

Bioindicators will also be analyzed from high resolution Landscape photo mosaics that are collected and processed every six months from 1/3rd of the monitoring stations. All corals 4 cm or greater in diameter will be identified to species level and their condition quantified and compared to their baseline condition. Tracking the condition of the same colonies through time will provide a high confidence of detecting any changes that may be caused by either natural or construction related impacts. Bioindicators will include tissue color, surface mucus, disease lesions, partial tissue mortality, survivorship, and growth as summarized in Table 2. Five of the sites also include seagrasses within the plots where bioindicators will also include shoot density and overall % seagrass cover. Community level bioindicators will also be collected every six months at fixed sites using the mosaics and AGRRA protocol to extract community-level measures of hard coral diversity, benthic cover, fish abundance Table 2).

Bioindicator	**Method**	**Measurement**	**Response time**	**Threshold**
tissue color	Visual observation/Photomosaic	Bleaching index	Days to weeks	>20% colonies showing discoloration
surface mucus	Visual observation/ Photomosaic	Present/absent	Days to weeks	>20% of corals with surface mucus
Disease/lesions	Visual observation/ Photomosaic	Present/absent	Days to weeks	>10% of corals with lesions
Partial tissue mortality	Visual observation/ Photomosaic	% colony area from planar view	Days to weeks	>5% of corals with recent tissue mortality
skeletal damage	Visual observation/ Photomosaic	Present/absent	Days to weeks	>5% of colonies with physical damage
mortality	Visual observation/ Photomosaic	No live tissue present	Months to years	>5% of colonies dead
size	Photomosaic	Planar surface area of live tissue	Months to years	>5% net loss in tagged coral tissue area

Table 1A: Colony Level Bioindicators

Bioindicator	**Method**	**Measurement**	**Response time**	**Threshold**
Hard coral species richness	AGRRA	# species, families, genera	Months to years	Any decrease
Recruitment	AGRRA	#/m^2	Months to years	>50% decrease

Benthic cover	Mosaic	% cover	Months to years	>10% loss in hard coral cover
Benthic index	AGRRA	0-5 scale	Months to years	>1 change
Macroalgal index	AGRRA	% cover x height	Months to years	>50% increase
Fish species richness	AGRRA	# species, families	Months to years	Any decrease
Fish abundance	AGRRA	#/100m^2	Months to years	>50% decrease
Fish biomass	AGRRA	g/100m^2	Months to years	>50% decrease

Table 1B: Community Level Bioindicators

Monitoring Frequency

Monitoring of fixed plots will occur at two levels: 1) Visits by on-site biological technicians at least once every 2 weeks or around any suspected stress events (e.g., high turbidity events) to photograph and assess condition of tagged corals using qualitative visual metrics (Table 1A); 2) Re-imaging and community-level monitoring every 6 months using a rotating panel design that quantifies metrics in 12 of the 36 fixed stations per monitoring interval (Table 1B). At each 6-month monitoring interval, control sites that are outside of the development footprint will also be monitored with impacted sites (paired treatment and control). These two levels of monitoring of the fixed sites will provide short-term on-site construction related resource assessment coupled with quantitative longer-term evaluation of bioindicator trends to both provide early indications of potential acute constructional related stressors and more quantitative analysis of any cumulative or chronic impacts and causes. This will in turn allow for rapid feedback of results and corrective actions during either construction and/or operational phases.

Proposed 6-month benthic monitoring schedule (continued for duration of construction phase)																								
Month	pre constru	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6			
Week	baseline/annu	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
visual assessment/scoring of tagged colonies (2-person team)																									
Flagging of sites with colony level bioindicators beyond thresholds; triggered additional monitoring/adaptive actions																									
colony level Photomosaic of fixed plots on 12 sites + controls																									
community level monitoring of 12 sites + control																									
Report of change and statistical analysis for causes																									
LHP Environmental Team monitoring synopsis meeting + recommendations																									

Table 2: Monitoring Schedule

Daily Construction Benthic Resources Assessment

Apart from fixed site monitoring, rapid resource assessments will also be conducted in the waters around each new construction area (marine and upland) prior to construction as a secondary check to verify that significant biological resources have been previously documented and/or relocated outside of impact areas and check for the presence/location of any unexpected resources (e.g., seagrasses, corals, sponges, mobile invertebrates). Assessments will mainly be visual reconnaissance documenting what is seen within 30m (100 feet) within each of four quadrants surrounding a site. Downward looking video and photographs will be collected to document any features using either snorkel or scuba or using a remotely operated vehicle. These assessments may be conducted any time before or during construction at the discretion of the Environmental Manager or Construction Manager and used to take any corrective actions including the adjustments in the placement of construction equipment on the seafloor to minimize impacts. Similarly, post construction resource assessments will be conducted over the same areas to document condition of resources and seafloor for prioritizing post-construction seafloor stabilization activities to speed up recovery. Any unanticipated impacts to marine resources documented during these assessments will result in an incident report, notification to DEPP within 72 hours, and consultation with DEPP for undertaking remediation actions.

Statistical Analysis

Statistical analysis will only be undertaken on the 6 month monitoring datasets every monitoring period. Analysis of bioindicators (treatments) will utilize generalized analysis of variance to determine if changes are significant between control and treatment sites (Downes et al. 2002). As both control and impact sites will be monitored simultaneously, they can also be treated as fixed effects and to allow treatment impacts to be distinguished from background/natural temporal effects shared by all sites. We will also explore the use of Bayesian methods to estimate probabilities of secondary impact for sites that are outside of the construction area (Conner et al., 2015). Water quality parameters (e.g., turbidity) will also be analyzed to develop distance decay relationships using mixed model regression to examine relationship to bioindicator changes.

Bioindicator Thresholds

Thresholds for bioindicators are useful for triggering interventions and guiding decision making during construction. Thresholds will be assessed at two levels: (1) biweekly monitoring by visual observations by tabulating colony level results for each site visited; (2) 6-month monitoring and analysis of before and after change for bioindicators. For the biweekly monitoring, the exceedance of thresholds will trigger a response outlined in the adaptive decision-making section below. For the 6-month monitoring data, the exceedance of thresholds will trigger a more detailed statistical analysis with confidence intervals and probabilities that changes are associated with construction activities. The large range of indicators includes a suite of sublethal ones to provide an early indication of ecological change and focus attention on preventing lethal changes through adaptive decision making.

Adaptive Management Framework

Benthic bioindicators recorded during routine weekly observations that exceed thresholds for a site will be flagged and trigger a consultation with the Environmental Manager, and possibly the larger Environmental Management Team (EMT). Depending on the Site (s) (e.g., impact classification) and specific bioindicator/change several outcomes are possible. (1) The visual monitoring frequency for flagged sites may be increased to twice weekly (or more) to determine any trend and linkages to other bioindicators or possible causes; (2) A more detailed analysis of the site may be undertaken by an expert consultant and/or the 10x10m monitoring plot for a flagged site may be reimaged and analyzed by constant to quantify bioindicator changes and examine water quality data or other

possible causes for change; (3) A meeting between the Environmental Manager and Construction Manager to determine if changes or stoppage of `construction activities are necessary.

For 6-month repeat quantitative monitoring of photo mosaics and community level indicators, results and analyses of change will be completed within 3 months of data collection. Sites with bioindicators that are beyond thresholds will be flagged and examined for possible causes and links to water quality and other environmental information including control sites outside of Lighthouse Point. Monitoring results will be shared with the EMT during planned bi-annual 1-day meetings with the other wildlife monitoring teams. The Lighthouse Point EMT will make recommendations and notify the Environmental Manager of any construction-related causes of change that need to be addressed or possible actions to reduce sources of construction-related stress. It will be the responsibility of the Environmental Manager to meet with the Construction Manager to discuss these recommendations and make appropriate contingency adjustments, including stoppage of construction activities.

In cases where secondary impacts to benthic habitats outside of the construction footprint are likely and significant, the Construction Manager will need to determine if construction activities causing stress can be changed (avoidable) or not (unavoidable). A meeting will be held with Bahamas DEPP to discuss findings and determine if changes to the development plan are needed or if additional compensatory mitigation will be required.

Quality Control/Assurance

All benthic monitoring data will be collected by certified trained personnel. Quality control checks will be made before data are entered into the database and during review of results after each monitoring period. All original photographs and landscape photo mosaics will also be organized within the Lighthouse Point wildlife monitoring database. Benthic monitoring reports summarizing weekly and bi-annual benthic monitoring results will be prepared twice per year during construction.

Current Status of Preconstruction Monitoring

A before-construction baseline has been collected from 32 of the 36 fixed monitoring sites as of June, 2021. At each site, a single landscape photo mosaics was collected using a dual mount Nikon D200 SLR camera system and/or a bar-mounted array of six go-pro cameras. AGRRA data for each site was collected at each of the hardbottom or coral reef sites fishes, benthic, and coral. These data have been processed and are being organized into the Lighthouse Point Environmental Monitoring

database. Photo mosaics have been constructed for 20 of the 32 plots and will be analyzed for coral parameters and condition. On-going analysis of the mosaics and AGRRA data will continue over the coming months and form the basis of the Lighthouse Point long-term marine ecosystem monitoring database. Processing of the before construction photomosaics is complete for 18 of the 36 mosaics and is underway for an additional 14 of the sites expected to be completed by the end of 2021.

Gaps

Four additional sites remain to be established on the east side to complete the network of 36 sites. In addition, baseline sedimentation levels need to be quantified at all fixed sites. This will include measuring sediment depth to bedrock every 1 m along 100m transects orientated parallel to shore (2 transects per site) and laboratory analysis of surface sediment grain size frequency distribution at all sites.

Appendix C

Marine Mitigation and Coral Relocation Plan

Introduction

The Lighthouse Point Marine Resources Mitigation commitments by the Developer centers around coral transplantation and benthic habitat rehabilitation within and adjacent to directly impacted areas. Other related commitments made by Disney include the establishment of a long-term monitoring program of the marine resources for Lighthouse Point and targeted support in The Bahamas for marine education, research, and conservation of coral and other marine resources. The proposed Lighthouse Point coral monitoring program for construction and operational activities can be found within the Lighthouse Point Environmental Management Plan.

Coral transplantation and habitat rehabilitation efforts at Lighthouse Point are proposed to include direct actions designed to restore impacted marine habitats and species within the Lighthouse Point marine development footprint. The three proposed actions include A) translocating biologically significant stony corals and other selected marine resources (e.g., barrel sponges) to adjacent similar habitat outside of the impact area before construction activities; B) stabilizing directly impacted hardbottom areas soon after construction activities to minimize erosion and allow rapid substrate recolonization and habitat rehabilitation; and C) post-construction habitat enhancement at mid-channel and offshore of the trestle designed to provide substrate for coral settlement and structure for fish. Inshore areas of the trestle will emphasize open fish thruways to facilitate along-shore fish migration. This plan outlines the proposed actions of component A- Coral and Select Species Transplantation other mitigation efforts (component plans B and C) will occur after construction activities and will be outlined in separate plans for approval before any activities are undertaken.

Proposed transplantation efforts will focus on stony corals and two other species of importance (Barrel Sponges and Long-Spined Urchins) that occur within the proposed development footprint on the South side of the Property (see Figure 1). The construction footprint contains primarily low relief hardbottom habitat with sparse growth of stony corals, octocorals, and sponges. The directly impacted area covers a total of 5.04 acres. The combined live tissue planar surface area of stony corals, barrel sponges and soft corals within the direct impact area is estimated to be ~0.145 acres (6,324 ft^2/5,875,312 cm^2). To account for secondary impacts possible during construction, an additional 75' distance buffer will be added around all proposed structures thereby increasing the total area where mitigation is being proposed by approximately three-fold.

Objectives

- Mitigate against potential losses of stony corals of biological significance that fall within the proposed development footprint of the marine infrastructure.
- Preserve structure and genetic diversity of the larger slow-growing coral species.
- Enhance adjacent comparable hardbottom habitats with translocated corals to increase their diversity, complexity, and ecological value as habitat for fish and other marine organisms.
- Enhance coral reproductive output where possible through spatial arrangements within selected coral transplantation plots.
- Minimize losses to other selected invertebrates of ecological importance (e.g., Barrel Sponges (*Xestospongia muta);* Long-Spined Black Sea Urchin (*Diadema antilllarum*)).

Baseline Information

Hardbottom habitats within the Lighthouse Point marine development footprint contain sparse densities of soft corals (octocorals), sponges, and stony corals. A summary of the coral species composition derived from underwater surveys of the impacted areas were conducted in fall 2019 and 2020. In total, 165 belt transects (each $10m^2$) were systematically laid within the proposed development footprint covering all potentially impacted habitats. The average density of stony corals with diameters 4 cm or greater within the impacted hardbottom areas was 3.9 corals per 10 m^2. Species composition of the 762 stony corals surveyed within the construction footprint is shown in Figure 2. Nearly all coral species surveyed are skewed towards smaller sized species. Most corals are 20 cm or less in diameter and no live coral diameters greater than 50 cm were observed. The size frequency distribution of the live surface tissue area (cm^2) is shown in Figure 3. Octocorals had an average density of 8.2 per $10m^2$. A total of 49 barrel sponges were encountered with most occurring within the offshore hardbottom and scattered coral mound habitat types at typical densities of ~1 per $10m^2$. The diameter of barrel sponges surveyed ranged from 12 to 60 cm with an average of 27 cm.

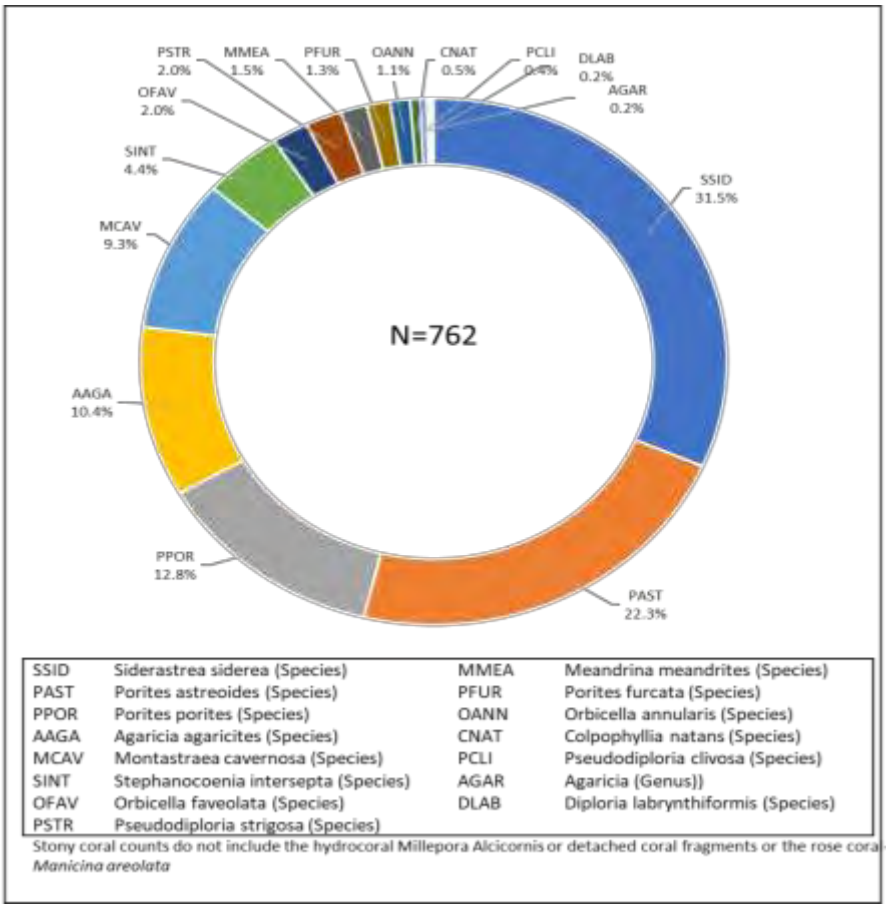

Figure 1: Stony coral community composition within primary impact area based on 165 10m^2 belt transects.

Stony corals have a range of life histories from fast growing/recruiting species that can quickly colonize disturbed areas to long-lived/slow growing species that can reach large sizes (e.g., >25 cm diameter), but also may have low natural recruitment (Darling et al., 2012). In the Caribbean, fast growing weedy species have been replacing slower growing reef building species for several decades which is thought to be contributing to the flattening of reef areas and decreasing the productivity of reefs (the reef building species that are primarily from the genus *Orbicella, Montastraea, Diploria, Pseudodiploria*, *Meandrina* and *Dendrogyra.* Hardbottom areas (and increasingly many reefs) are usually dominated by stony coral species with relatively short lifespans and small colony sizes (<25 cm) that have fairly high levels of natural recruitment (e.g., species *Siderastrea*, *Porites, Agaricia, Favia*). This is not a clear division, as some species are both fast growing and major reef constructors including *Acropora palmata* and *Acropora cervicornis*. Other species tend to be high recruiting but are also capable of reaching large sizes (e.g., S*iderastrea*

siderea, Porites porites, Dichocoenia stokesii). Within the construction footprint hardbottom areas, the stony coral assemblages are dominated by smaller fast recruiting corals that collectively compose nearly 66% of the stony coral community composition.

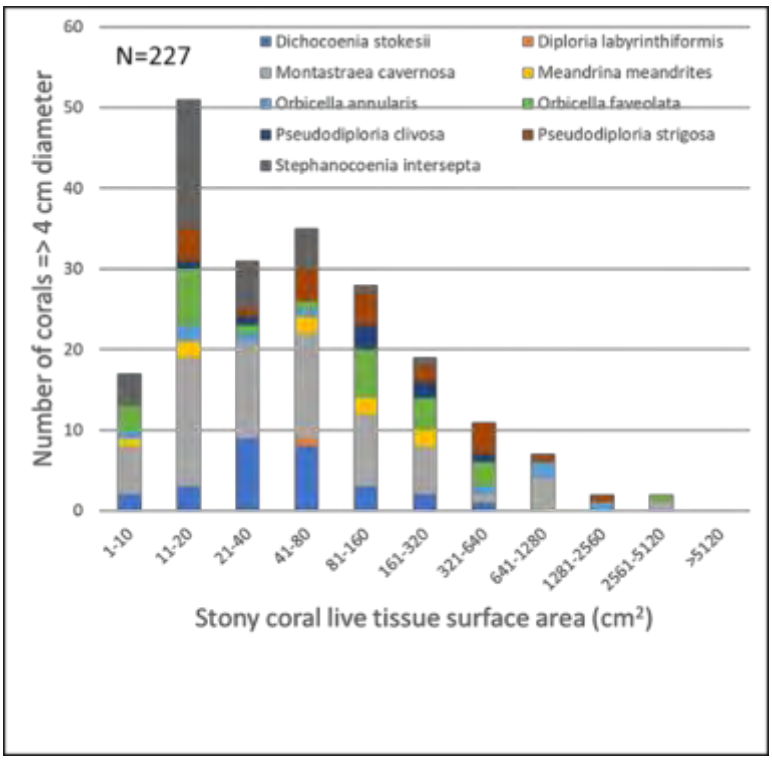

Figure 2: Size frequency distribution of selected high value stony corals surveyed within the primary construction footprint that would be candidates for relocation to adjacent suitable habitats.

Compensation for Unavoidable Impacts

The Project proposes focusing transplantation efforts to species of highest value, such as reef-building stony corals species that have been shown to have high transplantation success. This is consistent with guidelines of the Florida Department of Environmental Protection (FDEP) for mitigation to coral reef and hardbottom communities in Florida. Soft corals (octocorals) and sponges can also be relocated but techniques are not as well developed as those for stony corals, and success is less certain. Moreover, many of the fast-growing sponge and octocoral species that are found on hardbottom habitats have naturally high background levels of natural recruitment from the water column and will repopulate the seafloor within the impacted area once it is stabilized. An exception to this is the long-lived barrel sponges. The Lighthouse Point coral transplantation efforts

will be focused on longer lived and larger growing species that have the highest biological value. A list of targeted coral species for relocation is shown in Table 1.

Coral Size and Condition

Previous coral transplantation efforts have documented that larger colonies have higher survival rates after outplanting than smaller colonies due to their ability to better withstand partial mortality, predation, and colony fragmentation. Large colonies may also be decades or even centuries old and not as easily restored as smaller colonies. The Lighthouse Point coral transplantation efforts has proposed to focus on colonies of the species listed in Table 1 with diameters of 10 cm or more. Using the size-frequency distribution as a guide, we estimate that approximately 30% of the biologically-significant corals within the impacted area would meet this size threshold. The condition of corals that meet the species and minimum size requirements will also be evaluated before removals. Corals will not be removed if they exhibit any abnormal conditions such as recent tissue loss, discoloration, paling/bleaching, or parasites.

Estimated Number of Focal Corals to be moved

Using the in-water survey information collected from the impact area coupled with the species and the 10 cm minimum size thresholds discussed above, yields a total estimate of ~1,400 corals within the impact area that would be targeted for removal and transplantation. Most of these corals (~68%) are located within the offshore hardbottom habitats associated with the outer portions of the trestle, pier, and ship berthing area at water depths ranging from 8-15 m.

Coral Outplanting Site Locations

One of the principles for successful coral transplantation is to select similar habitat type to which corals targeted for removal have already adapted. Relocating corals to adjacent similar habitat can reduce stress associated with corals having to adapt to different conditions. For example, it has been shown that the symbiotic zooxanthellae algae that reside within coral tissue can change clades when relocated to different depths. Two of the primary factors influencing the distribution and orientation of benthic habitats within the southern Lighthouse Point shelf impact area include water depth and distance from shore over which changes in wave energy and currents and sedimentation. The five hardbottom sub-types mapped within the impact footprint generally fall within three cross shelf zones-inshore (water depths 0-5 m), midshelf (water depths 2-7 m), and offshore (water depths 8-15 m). The Lighthouse Point coral and sponge outplanting sites are designed to fall within these

broad zones and be replicated with at least two sites within each zone to spread out risks of losing corals. The exception to this is the inshore hardbottom impact areas where surveys found very low coral abundance and only approximately 100 coral colonies are expected to be candidates for transplantation.

Scientific name	Common name	Observed in Construction Footprint	Species considered for transplantation	Average size (cm)	Minimum transplantation size (cm)
Acropora cervicornis	Staghorn Coral	N	NA	NA	NA
Acropora palmata	Elkhorn Coral	N	NA	NA	NA
Agaricia agaricites	Lettuce Coral	Y	N	13	NA
Agaricia fragilis	Fragile Saucer Coral	Y	N	7.5	NA
Agaricia humilis	Low-relief Lettuce Coral	Y	N	6.7	NA
Agaricia lamarcki	Whitestar Sheet Coral	N	NA	NA	NA
Colpophyllia natans	Boulder Brain Coral	Y	Y	13.2	10
Dendrogyra cylindrus	Pillar coral	N	NA	NA	NA
Dichocoenia stokesii	Elliptical Star Coral	Y	Y	10	10
Diploria labyrinthiformis	Grooved Brain Coral	Y	Y	10	10
Eusmilia fastigiata	Smooth Flower Coral	Y	Y	7.3	10
Favia fragum	Golfball Coral	Y	N	4.3	NA
Helioseris cucullata	Sunray Lettuce Coral	Y	N	4.5	NA
Isophylla sinuosa	Sinuous Cactus Coral	N	NA	NA	NA
Isophylla rigida	Rough Star Coral	Y	Y	6.4	10
Madracis decactis	Ten-ray Star coral	Y	Y	9.4	10
Manicina areolata	Rose Coral	Y	N	5.4	NA
Meandrina jacksoni	Whitevalley Maze Coral	Y	Y	30	10
Meandrina meandrites	Maze Coral	Y	Y	12.3	10
Montastrea cavernosa	Great Star Coral	Y	Y	13.6	10
Mycetophyllia lamarckiana	Ridged Cactus Coral	Y	Y	7	10
Orbicella annularis	Boulder Star Coral	Y	Y	24.6	10
Orbicella faveolata	Mountainous Star Coral	Y	Y	17.2	10
Orbicella franksi	Boulder Star Coral	Y	Y	10	10
Porites astreoides	Mustard Hill Coral	Y	N	9.4	NA
Porites furcata	Thin Finger Coral	Y	N	10.9	NA
Porites porites	Finger Coral	Y	N	9.4	NA
Pseudodiploria clivosa	Knobby Brain	Y	Y	17.2	10
Pseudodiploria strigosa	Brain Coral	Y	Y	7.3	10
Scolymia sp.	Disc coral	Y	N	4.8	NA
Siderastrea radians	Lesser Starlet Coral	Y	N	7.1	NA
Siderastrea siderea	Massive Starlet Coral	Y	N	9.3	NA
Solenastrea bournoni	Smooth Star Coral	Y	Y	10	10
Stephanocoenia intersepta	Blushing Star Coral	Y	Y	6.8	10
Millepora complanata	Branching Fire Coral	Y	N	NA	NA
Millepora alcicornis	Blade Fire Coral	Y	N	NA	NA

Table 1: List of coral species observed, and species proposed for transplantation. Average size refers to the average diameter of colonies counted within survey transects for south Lighthouse Point development areas only.

Surveys conducted around the southern Lighthouse Point area examined the suitability for outplanting. As discussed previously, much of the southern shelf area is composed of hardbottom habitats and sand with patch reef development increasing towards the SE side of proposed development. In general, hardbottom habitats to the NW of the proposed cruise pier and ship berthing area are poorer for coral and sponge growth than habitats found to the SE. This general trend is reflected in the loss of the offshore scattered coral mound habitat and in the absence of patch reefs. Patch reefs do reappear approximately 5 km NW of the Disney property on the west side of south Eleuthera, but conditions are quite different (lower currents, higher turbidity) and the area is considered too far to be practical for relocation. Therefore, coral and sponge outplanting sites were selected primarily to the SE of the impact areas. The exception to this is the inshore hardbottom outplanting site which is located 1 km to the NW of the infrastructure area. This site was chosen in part because it was found to have better than average coral growth for inshore hardbottom, had less sedimentation and sand movement than other areas to the SE, and is one of the only areas of inshore hardbottom habitat with larger corals (pseudodiploria strigosa, *dendrogyra cylindrus*). The locations of the proposed outplanting sites are shown in Figure 3 and Table 2.

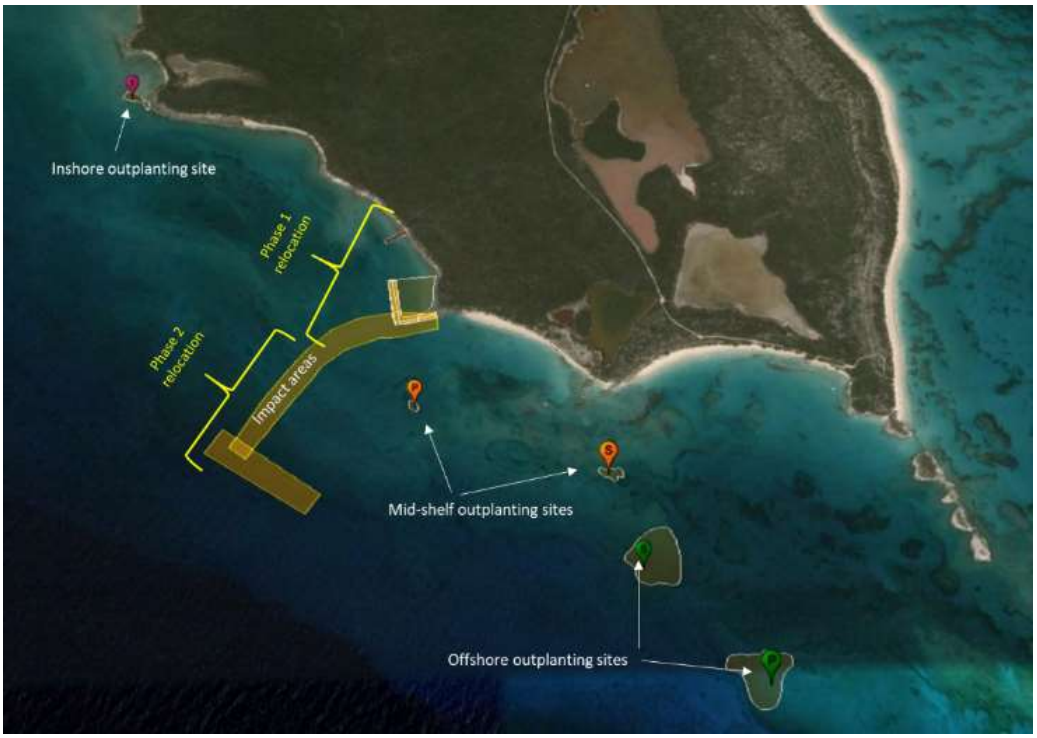

Figure 3: Map of Lighthouse Point showing location and size of proposed coral and sponge out-planting areas.

Outplant Site Name	Lat	Long	Water Depth range (m)	Outplant Area (m^2)
Inshore 1	24° 37.435'N	76° 10.122'W	1-2	1,000
Midchannel 1	24° 36.674'N	76° 9.542'W	3-6	700
Midchannel 2	24° 36.783'N	76° 9.220'W	3-6	2,000
Offshore 1	24° 36.484' N	76° 8.977'W	8-14	15,000
Offshore 2	24° 36.639'N	76° 9.166'W	8-14	15,000

Table 2: Proposed coral and sponge outplanting locations.

Photo 1 (on left): Landscape view of Offshore Hardbottom Site 1.

Photo 2 (on right): Landscape view of Inshore Site 1 proposed for out-planting.

Significant research has been conducted to determining which outplanting designs (such as density, spacing, and arrangement) maximize the survivorship and growth of outplanted corals, but most experimentation has occurred with branching corals (*Acropora* spp). There is no one outplanting design that is superior to others. It is generally recommended to outplant at moderate densities (~ 3-4 corals/m^2), which allows for enough physical distance to reduce disease and predation threats while maximizing sexual reproductive success for broadcasting coral species. Planting high densities or thickets of branching corals allows for greater stability and protection, but densely packed corals can attract damselfish and other predators leading to higher incidences of coral predation and disease.

Below we propose outplanting corals in two different arrangements and densities based on the differences in preexisting coral densities and slightly different goals and objectives for each design.

1. *Offshore/Inshore Hardbottom Outplanting Design:* The goal of the offshore and inshore hardbottom outplanting is to preserve the existing coral community structure of sparsely populated hardbottom by outplanting at low densities. Corals will be outplanted along 100 m fixed transects (marked with stainless steel pins on either end) so they can be efficiently re-laid for tracking colony survivorship during monitoring. Transects will not cross large drop offs or major depth changes and will be orientated in a NW to SE direction, which is parallel to the orientation of the shoreline and shelf margin. Transects will be non-intersecting and separated by a minimum of 10 m from one another. Corals will be outplanted every other meter on each side of the line out to a maximum distance of 1 m. A total of 100 corals will be outplanted per transect resulting in densities of 0.5 corals/m^2. As stated above the corals will be grouped to minimize competition potential disease spread. We expect to lay at least 4 transects per offshore outplanting site, but only 1-2 transects will be needed for the inshore outplanting site because of the expected small number of corals. The low-density outplanting design will not significantly change the existing coral community structure or density of offshore hardbottom areas. This design will also make monitoring of the outplanted corals quick and easy. Furthermore, it is possible that some of these corals could be used after construction has been completed for proposed mitigation structural habitat enhancement efforts. See Figure 4 for a schematic representation of the proposed outplanting design.

2. *Midshelf Outplanting Design:* The goal of the midshelf outplanting effort is to enhance the existing coral community structure outplanting at moderate densities over small areas. Corals will be outplanted within 10 x 10 m plots placed around the existing hardbottom patches. Efforts will be made to utilize existing substrate relief features such as limestone rock slabs and plant corals in clusters. We expect to have at least three plots per site. These corals will remain at these sites and will not be used for other mitigation purposes after construction. It is possible that these sites may be further enhanced with nursery grown corals at a further date should they prove to be ideal locations for jump-starting patch reef type coral growth.

Outplanting Site	Coral density range (colonies >4 cm/ per m^2)	Average coral density before outplanting (colonies >4 cm/ per m^2)	Coral density after outplanting (colonies >4 cm/ per m^2)
Offshore	1.1-2.2	1.3	1.8
Mid-channel	0.4-4.2	1.0	4.5
Inshore	0.3-0.7	0.35	0.8

Table 3: Outplanting sites and proposed coral densities.

Photo 3: Landscape view of Midshelf-1 proposed outplanting site.

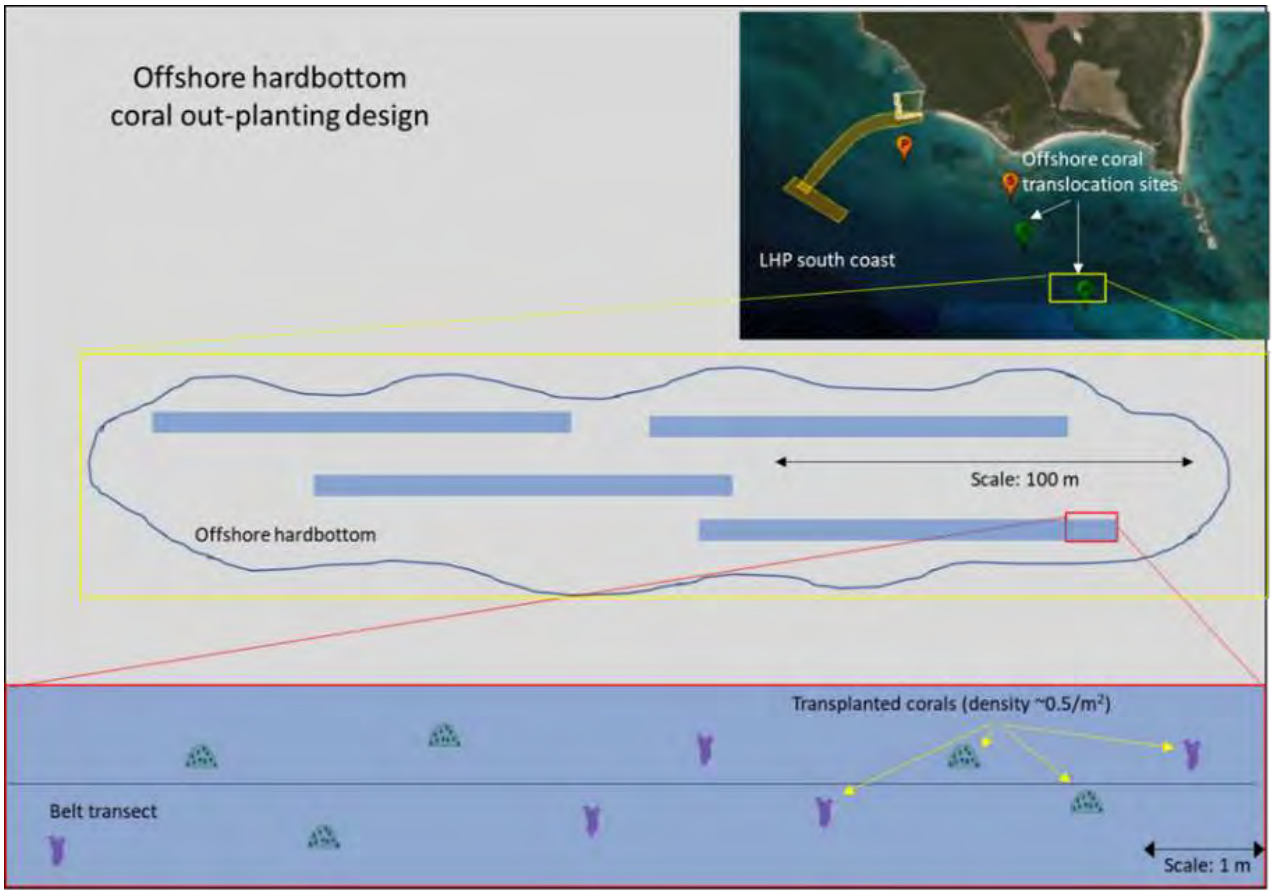

Figure 4: Offshore hardbottom out-planting site design. Corals to be planted along either side of 100 m long transects. The same design will also be used for the inshore hardbottom out-planting site.

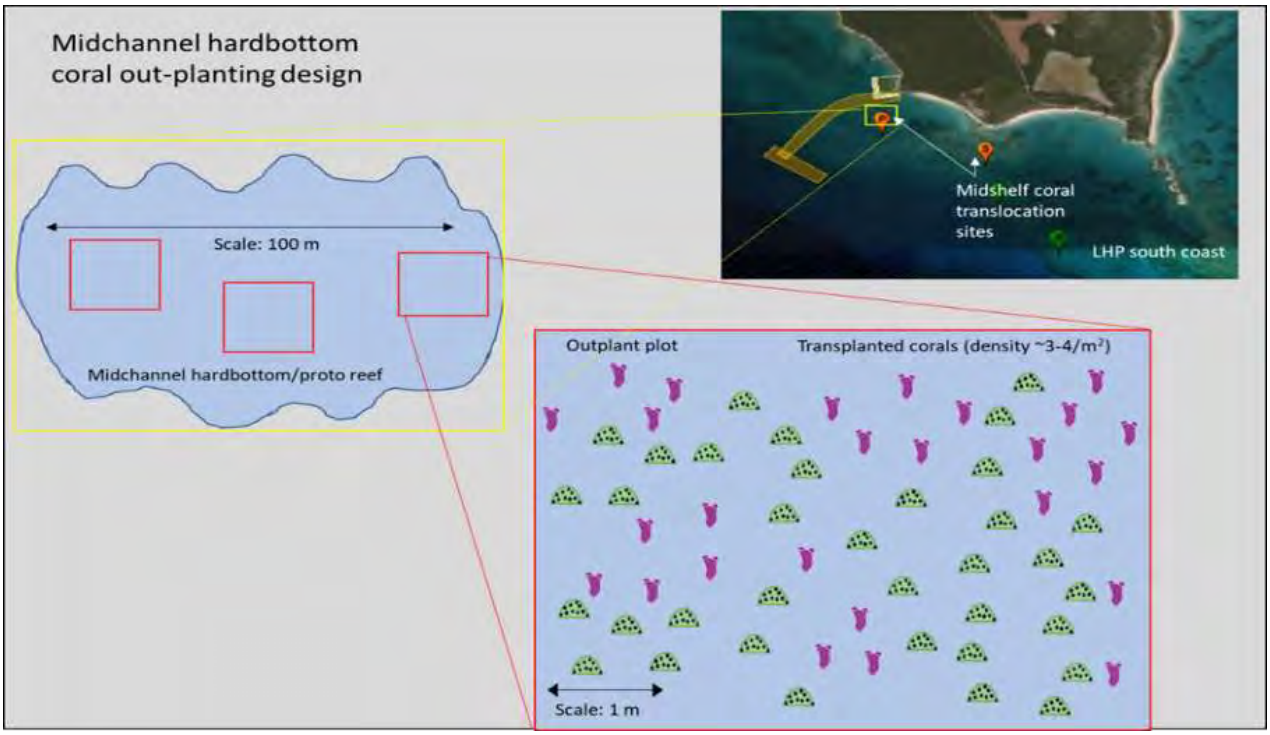

Figure 5: Midchannel hardbottom and exposed bedrock (protected) out-planting design. Corals to be planted within 10mx10m plots at densities of 3-4 per square meter in clusters of similar species to enhance sexual reproductive success.

Methods

Timing for Coral and Sponge Relocation Activities

Coral relocation field work is proposed to occur outside of high-stress periods associated with warmer sea surface temperatures increasingly associated with high levels of coral bleaching and disease (July-September). Relocation efforts will take place no later than mid-June in a given year to provide as much time for recovery and stabilization before increased sea surface temperatures occur. On the backside, no relocation efforts will be attempted before mid-October. Efforts will be made to adjust the field work schedule around predicted bleaching outlook using NOAA satellite derived tools. https://coralreefwatch.noaa.gov/satellite/bleachingoutlook_cfs/outlook_cfs.php

Schedule

Coral relocation is planned to occur in advance of marine construction activities in two phases. The first phase will take place over a 2-week period as a pilot to examine the suitability of all primary and secondary proposed receiving sites and to test experimental sponge methods. The first phase will

cover the inshore areas where coral and sponge abundances are lowest (Ro-Ro ramp, small vessel marina, first two trestle blocks extended out 650 ft. from shore) and where marine construction is scheduled to start. The second phase will begin two months or more after the first phase to allow an assessment of phase 1 outplanting and refinement of the methods and any suggested changes to receiving sites. The second phase will take place over a 6-week period that will encompass the mid-shelf and offshore hardbottom habitats where coral and sponge abundance within the impacted footprint are higher (trestle blocks 3-5, berthing area, pier areas).

Stony Coral Tissue Loss Disease (SCTLD) Contingency

Over the past two years of disease monitoring of the Lighthouse Point area, no evidence of SCTLD was observed based on the SCTLD Case Definition by the Florida Coral Disease Response Research and Epidemiology Team (2018). However, SCTLD was reported throughout several areas of the northern Bahamas (Dahlgren et al., 2021) and most recently in North Eleuthera. Given its rapid spread throughout the Bahamas since 2017, the potential for SCTLD to impact the Lighthouse Point area during or after coral relocation is possible despite the precautions that Disney is taking to prevent potential spread by disinfecting all boats and gear used in the area. An SCTLD survey will be conducted in advance of each coral relocation phase to determine if SCTLD is present, and if so, at what stage of infection (based on the SCTLD Case Definition including characteristics such as species affected, severity and description of lesions and species susceptibility). Surveys will be conducted by trained surveyors using standardized methods that are aligned with the Bahamas SCTLD task force (e.g., similar methods to Dahlgren et al. (2021)). If SCTLD is found within the Lighthouse Point development footprint area, Disney will communicate this finding immediately to DEPP and work with them to develop a SCTLD response including coordinating with them prior to taking any action.

Coral Collection Area Preparation

Impacted coral removal areas will be marked with weighted buoys located by precise GPS based on the Lighthouse Point development site plan. One-hundred-meter-long fiberglass transect lines will be used underwater by divers to further delineate coral collection areas within inshore, midshelf, and offshore “blocks”. Roving surveys will be conducted within each block and candidate corals that meet species and size requirements will be marked using weighted flagging tape markers.

Removing Corals

Targeted corals will be removed by trained divers using chisels and hammers and pry bars. Efforts will be made to minimize breakage and damage to coral colonies by taking as much of the underlying substrate as possible. Hydraulic tools including chippers may be used to reduce fragmenting large flat encrusting corals such as *Diploria clivosa* which occur along inshore areas. Associated biota (e.g., encrusting sponges, other smaller corals) that are attached to dead portions of a coral's skeleton will be included when possible. Larger mounding coral colonies (>50 cm in diameter) were rarely encountered during baseline surveys of the area. Should any of these larger colonies be encountered during coral removal phase, small lift bags may be used by trained divers to facilitate moving them.

Photo 4: Example of diver removing coral with hammer and chisel.

Transportation and Care of Corals

Corals will be transported from the impact footprint to out planting sites using methods that reduce stress to the corals. Salvaged corals will be placed in carriers constructed of plastic with gaps that are smaller than the smallest fragments to protect the corals during transport. Carriers will be suspended between the hulls of the work vessel (a catamaran style barge) and, if feasible (based on wind/wave conditions), remain entirely submerged during their slow and short journey to the receiving site. If conditions are too rough to allow this, carriers will be placed on the vessel deck inside plastic bins filled with fresh seawater and shaded and transported to the receiving site. Larger

corals (e.g., > 30 cm in diameter) may be transported by placing them individually in large mesh plastic storage carriers that will be placed in containers with fresh seawater on the floor of the boat or covered with sea water-soaked sheets or towels. Aerators may also be set up in large plastic bins on a surface vessel which will allow coral filled baskets to be maintained overnight if necessary (see Photo 5). Fresh seawater will be continually added to keep corals cool. Shade cloth will also be placed over corals to reduce heat and light stress. Before planting, corals will be prepared for reattachment by trimming and cleaning dead areas and removing loose fragments. This will be accomplished by hand using clippers and other hand tools. Corals that are unavoidably broken in very small pieces (10 cm^2 of tissue area or diameters less than 4 cm) or less during removal will be separated from larger corals and fragments into mesh bags. Our goal will be to outplant corals in batches, with each batch being re-planted within 24 hours or less of removal.

Photo 5: Example of transporting corals using aerated holding tanks on the R/V Angari.

Out-planting Site Preparation

Within the outplanting area, we will select raised areas (topographic heights) that are free of sediment for coral reattachment where possible. The maximum amount of sand/sediment for spots selected for outplanting will be 1 cm. Within these areas, all fouling organisms (e.g., algae) and sediment will be cleared from the substrate attachment points using small wire brushes and scrapers. Hydraulic tools such as grinders may be used in some cases over small areas to speed up this process. Areas with high existing invertebrate cover (e.g., sponges, zoanthids, *Palythoa*, stony

corals) will be avoided. Small weights marked with biodegradable flagging tape will be used to mark cleared spots for coral relocation in advance of transporting corals for replanting.

Reattachment of Corals

Prepared and intact corals and larger fragments (> 10 cm^2 live tissue surface area; 4 cm fragment diameter) will be relocated to outplanting sites chosen to have similar in habitat from which corals were taken. Most corals are expected to have round boulder type morphologies. We will use two-part underwater epoxy and/or a Portland cement mixture strengthened with fumed silica to reattach them to the limestone substrate. Where necessary several contact points will be made between the coral and the substrate to provide redundancy and promote self-attachment. Reattached corals will be checked within 24 hours to ensure that the epoxy has set properly and that corals are firmly attached. Any corals found to be detached will be reattached with epoxy and/or cement. Metal fasteners will only be used in cases where epoxy or cement are not sufficient to secure a coral due to its large size. Small colony fragments (tissue areas smaller than 10 cm^2) that may result during collection or cleaning will not be individually attached using epoxy given their small size and low probability of survivorship. These fragments will be brought to the outplanting sites and placed around the area into crevices or other protected locations where some may survive, and all can contribute structure to the area. Details for longer-term monitoring schedule for evaluating outplanting colony survivorship can be found below.

Other Marine Species of Significance

Other species that are proposed for mitigation within the impacted southern Lighthouse Point construction area include the Giant Barrel Sponge (*Xestospongia muta*) and Long-Spined Black Urchin (*Diadema antillarum*). Efforts will be made to relocate both of these species to adjacent similar habitat that is outside of the primary and secondary construction impact area. The same outplanting sites outlined for corals will be used for both species, maintaining the inshore, midshelf, and offshore divisions (e.g., all species collected from inshore impact areas are outplanted to the inshore outplanting site).

Barrel Sponge (Xestospongia muta) Relocation

Barrel sponges occur at sparse densities (~0.1/m^2) on hardbottom habitats of the Lighthouse Point area. Their large size (average diameter of 27 cm) and slow rates of growth make some of these specimens some of the oldest invertebrates in the Lighthouse Point area and serve as structure for

numerous species. We will attempt to relocate larger barrel sponges with base diameters 25 cm or greater outside of the impacted areas. There has been limited experimentation transplanting barrel sponges (McMurray and Pawlik, 2009). The lack of structure and soft tissue and ease with which they can be damaged require different methods than what are used with hard corals. An experimental approach is proposed whereby the bases off the sponge will be cut with a large stainless-steel bread knife or saw near their bases to remove the top of the sponge. The base will be left in place to regrow should they remain undamaged during construction. The upper portion is expected to retain a portion of the solid base with it after removal. To reattach the sponge, the substrate will be prepared first by drilling a ½" hole (8-12" deep) and cementing in a stainless steel or nylon threaded rod such that it protrudes above the substrate by at least 20 cm. A large plastic washer (similar to a fender washer) with a ½" hole in the center and ¼" perforations throughout will be placed inside the base of the sponge. The sponge will then be secured to the substrate by placing it over the threaded anchor so that the threaded bolt extends through the base of the sponge and washer. A nylon nut will then be tightened down over the washer to clamp the base in place. Adhesive will be used on the substrate to help secure the sponge in place. A schematic diagram of the proposed barrel sponge method is shown in Figure 6. As the approach is experimental, it will be tested as a pilot on a small number of barrel sponges during phase 1 of the relocation effort before being scaled up to include all of the large barrel sponges in the area. If the technique proves unsuccessful, other techniques utilizing "straps" to hold the transplanted sponges in place may also be tested (McMurray and Pawlik, 2009.

Photo 6 (on left): Typical Barrel Sponge within southern Lighthouse Point.

Photo 7 (on right): Adult Diadema within nearshore hardbottom habitat at southern Lighthouse Point.

Long-Spined Urchin (Diadema antillarum) Relocation

Long-spined urchins are motile invertebrates that occur at generally low abundances within the Lighthouse Point impact area (~average density of 0.02/m^2). The only habitats where they were found at slightly higher densities were nearshore hardbottom areas particularly near rocky shoreline promontories. Therefore, *Diadema* relocation efforts at Lighthouse Point will focus mainly on moving larger adults from directly impacted nearshore habitats. *Diadema* will be collected using short sticks and hand nets and placed into shallow plastic bins filled with fresh seawater. Bins will be transported immediately to outplant site and *Diadema* released around existing structure. Nearshore outplant site 1 has well developed structure to provide shelter and minimize predation. Disney has over a decade of experience relocating *Diadema* at the Castaway Cay site and the techniques for successful collection and transport are well established. Two important considerations for relocation are structure and predation. When *Diadema* are relocated to areas without sufficient structure for them to hide, they can be rapidly predated upon.

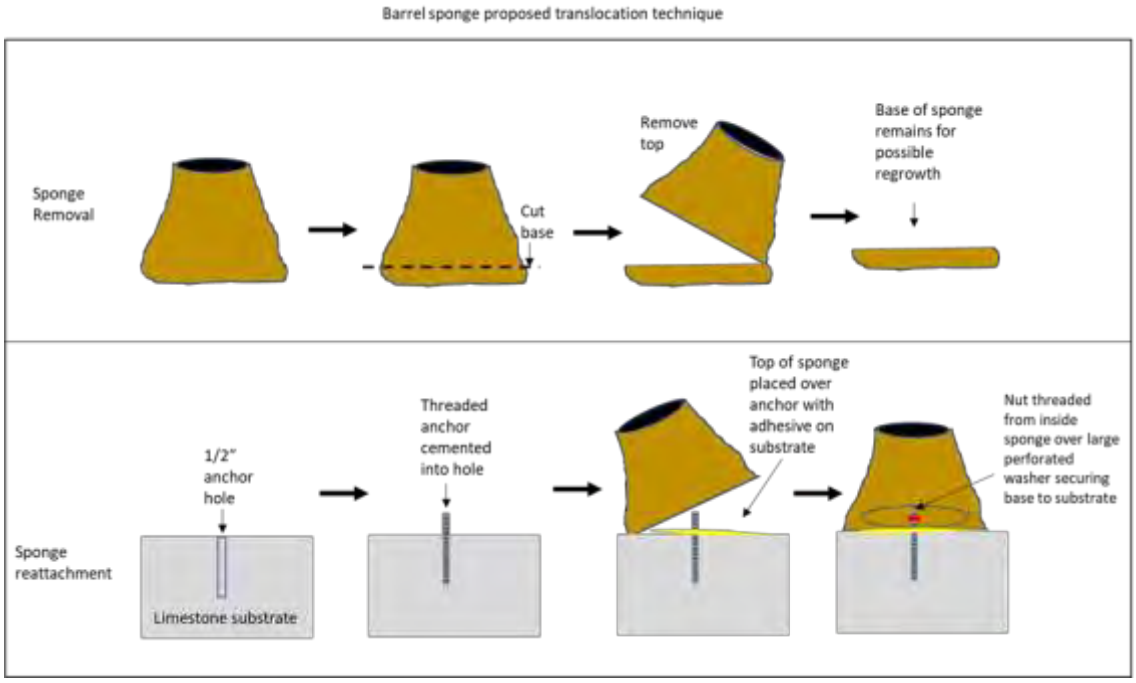

Figure 6: Proposed method for removal and reattachment of Barrel Sponges.

Ecological Performance Standards

The proposed benthic resource mitigation is designed to minimize impacts to benthic resources within the Lighthouse Point Project areas that provide habitat for important marine species. Performance standards are necessary to evaluate the success of the mitigation efforts. It is our intent to obtain a minimum of 80% survival of all transplanted corals, barrel sponges, and long-spined urchins over a period of 3 years. Moreover, the design of the mid-channel coral outplanting aims to also improve the overall ecological state of these habitats by enhancing coral reproductive output, coral community structure, benthic index, and fish community structure. Our intent is to obtain no net loss in any of these parameters over a 3-year period with the potential of also documenting an increase in several indicators associated with the mitigation efforts.

Performance Monitoring

To evaluate the success of the coral and sponge outplanting, monitoring will be conducted over a three-year period from the date of relocation. Monitoring methodology will center on “colony fate tracking”. For offshore and inshore outplanting sites, monitoring will be conducted along fixed 100 m transects with the ends marked during the outplanting phase. Each individual coral or sponge will be photographed and evaluated for condition and size. For midchannel sites, high resolution photos will

be collected within each 10 x 10 m outplanting plot. These will be stitched into a single mosaic image and each outplanted coral will be evaluated for condition, size, and growth. Indicators or metrics reported for each monitoring interval will include transplanted colony % survivorship, live tissue surface area (cm^2), condition (disease, bleaching, partial mortality), and causes for mortality. Performance evaluation criteria are listed in Tables 4 and 5.

A total of six (6) out-planting fate tracking monitoring events are proposed over a 3-year period to evaluate survivorship and overall project performance. This includes the baseline- performed before any outplanting, first monitoring of outplanted corals and sponges performed within 3 months; 6 months; 12 months; 18 months; 24 months; and 36 months (Table 5). Baseline AGRRA ecological assessments at or near the proposed outplanting sites were completed in November 2020 and will be repeated annually over the three-year period to assess any changes in structure or function at the outplanting sites. This will be particularly important for the higher density mid-channel outplanting sites where same species clustering and overall spacing is designed to support higher reproductive output.

	Objective	Metric	Method	Criteria/Outcomes
Offshore and Inshore Hardbottom outplanting locations	**Monitor relocation of stony corals**	Coral Survivorship and Condition (mortality, disease, bleaching)	100 m transects/photos	Prevalence of Conditions: <5% recent mortality <5% bleaching mortality <10% disease (not including SCTLD) <5% predation <5% competition <= physical impacts on wild corals
		Reproductive Capacity (Coral Size, recruits)	100 m transects/Photos	Sexual reproduction is observed in relocated corals, coral size of relocated corals not reduced
	Monitor relocation of barrel sponges	Barrel Sponge Abundance	100 m Transects	No net change or positive increase in abundance
		Barrel Sponge Size	100 m transects	No net change or no net decrease in size of relocated sponges
	Monitor relocation of *Diadema antillarum*	*Diadema* Abundance	100 m transects	No net change in abundance (although relocated urchins may be difficult to find after relocation due to their natural tendency to hide in crevices)

Table 4: Proposed performance monitoring for offshore and nearshore hardbottom outplanting sites.

	Objective	Metric	Method	Criteria/Outcomes
Midchannel hardbottom/proto reef outplanting locations	**Monitor relocated corals**	Coral Species Richness and Diversity	Photomosaic	At least two colonies of each coral species (>10 cm) present in footprint are outplanted at relocation site
		Coral Abundance and Cover	Photomosaic	No net change or a positive increase in abundance or cover
		Coral Survivorship and Condition (mortality, disease, bleaching)	Photomosaic	Prevalence of Conditions: <5% recent mortality <5% bleaching mortality <10% disease (not including SCTLD) <5% predation <5% competition <= physical impacts on wild corals
		Reproductive Capacity (Coral Size, recruits)	Photomosaic	Sexual reproduction is observed in relocated corals, coral size of relocated corals not reduced
	Monitor reef community status	Reef structure (Reef height)	AGRRA surveys	No net loss in reef height; potential increase in height
		Benthic Community	AGRRA surveys/ photomosaic	No net decrease in benthic community index
		Reef Fish Community	AGRRA surveys	No net change in reef fish community, potential increase in abundance if reef structure increases
		Habitat Quality (Turbidity)	Secchi disk depth	No net increase in turbidity

Table 5: Proposed performance monitoring and ecological criteria for midchannel hardbottom outplanting sites.

Proposed Coral Translocation Monitoring Plan for LHP													
Year	pre construction	Year -1				Year 2				Year 3			
Quarter	baseline	1	2	3	4	1	2	3	4	1	2	3	4
Phase 1- outplant coral colony and pilot barrel sponge fate tracking	■	■	■		■		■		■				■
Phase 1-monitoring of inshore and midshelf construction footprint for regrowth of barrel sponges (timing will need be adjusted around construction activities)		■					■						■
Phase 2 Outplant o coral colony and all barrel sponge fate tracking	■		■	■	■		■		■				■
Phase 2-Monitoring of construction footprint for regrowth of barrel sponges (timing will need be adjusted around construction activities)			■				■						■
Outplanting site ecological monitoring (includes AGRRA benthic and fish indicators)	■				■				■				■

Table 6: Monitoring schedule for performance evaluation.

Quality Control and Quality Assurance

All data will be collected or evaluated by trained personnel and entered into a Lighthouse Point Access Monitoring Database. Quality control checks will be made before data are entered into the database and during review of results after each monitoring period. Performance monitoring reports that include statistics of % survivorship, growth, and condition will be generated after each fate tracking monitoring event.

Adaptive Management Contingency

In the event of an SCTLD outbreak or that performance monitoring documents unusually high levels of mortality during the first 12 months of the translocation, a contingency plan will be implemented to improve overall project performance. A detailed report will be prepared examining why the translocation was not successful. A meeting will be held with Bahamas DEPP to review the overall

project goals. Possible contingencies may include relocating select transplanted corals to either (1) one of the other existing outplanting sites that has high survivorship; or (2) a land-based coral holding facility. Another possible contingency would be to increase habitat enhancement near the trestle structures. Overall, we will use an adaptive approach based on monitoring results and only attempt further coral treatment interventions if there is a high likelihood of success. All further interventions will be vetted and approved by Bahamas DEPP before proceeding.

Coral Monitoring and Environmental Awareness

Disney has over 14-years' experience working with corals and reef systems in The Bahamas. During the operational phase of the project, biannual coral monitoring will be utilized to document baseline conditions and track trends on coral reefs and other benthic habitats in the LHP area. Patch reefs and selected inshore hardbottom areas immediately adjacent to shore will be of particular emphasis. Monitoring results will be used to inform adaptive management approaches in order to minimize secondary impacts to these areas as a result of site activities. Options that may be considered could include prohibiting access to sensitive habitat areas or requiring that all snorkeling activities be conducted with a trained guide. Additionally, chemicals in many sunscreens are reported to adversely affect marine life, including corals. To mitigate this, access will be provided to sunscreens that are free from oxybenzone and octinoxate shown to be harmful to coral and other marine organisms, on the ships and at Lighthouse Point. Disney will also provide educational information about sun protection, including the use of sun-blocking clothing and appropriate application of sunscreens. Disney will stay abreast of ongoing scientific research on the environmental effects of sunscreens (e.g., National Academies of Sciences, Engineering and Medicine (https://www.nationalacademies.org/our-work/environmental-impact-of-currently-marketed-sunscreens-and-potential-human-impacts-of-changes-in-sunscreen-usage#sectionProjectScope).

Appendix D

Bonefish Monitoring Plan

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Bonefish & Tarpon Trust

Scope of Work

Justification

Worldwide, bonefishes (*Albula* spp.) are economically and ecologically important constituents of tropical, shallow-water systems. In the Caribbean Sea and western North Atlantic Ocean, *Albula vulpes* supports economically important recreational fisheries. For example, the estimated annual economic impact of the recreational fishery for bonefish in The Bahamas, exceeds $169 million USD. Similarly, bonefish, tarpon (*Megalops atlanticus*), and permit (*Trachinotus falcatus*) comprise the recreational flats fishery that collectively generates an annual economic impact exceeding $465 million in the Florida Keys and $50 million in Belize. The economic importance of bonefish has led to the creation of strict regulations to protect the fishery: bonefish are catch and release only in Florida, Belize, Puerto Rico, and the U.S. Virgin Islands. In The Bahamas, capture with nets and commercial sale are illegal, but harvest with hook and line for personal consumption is allowed. The recreational flats fishery in Cuba occurs within marine protected areas designated as recreational catch and release zones, outside of these zones there are no regulations on what appears to be an intensive net fishery with high harvest. In addition to their fishery value, the abundance of bonefish in shallow coastal habitats, the dominance of benthic invertebrates in their diet, and their role as prey for sharks and barracudas suggest that bonefish play an important ecological role in structuring tropical shallow-water food webs.

Recent and ongoing research has greatly increased our understanding of the bonefish life cycle. Adults exhibit high home range fidelity to shallow flats habitats of sand, seagrass, mangroves, and hardbottom during non-spawning time periods. Adults undergo migrations to pre-spawning aggregation (PSA) sites, which tend to be shallow protected bays near deep water, between October and April, with spawning mostly occurring near full moons. The PSAs move offshore at dusk to spawn at night in offshore waters, where they descend to 137m as part of the spawning process before spawning at 70m depth at the top of a rapid spawning ascent. After spawning fish return to their shallow water flats habitats. Fertilized eggs hatch in approximately 24 hours, and the larvae live as plankton for 41 – 71 days before metamorphosing into juveniles on sand or sandy mud bottoms

in shallow, protected bays adjacent to deeper water channels that provide larval access and are near eventual adult habitats.

An International Union for the Conservation of Nature assessment classified bonefish as Near Threatened due to habitat loss and fragmentation, coastal development and urbanization, declines in water quality, and harvest by commercial, artisanal and recreational fisheries. In locations with recreational fisheries and no commercial harvest, such as The Bahamas, the top threats are habitat loss, habitat degradation, and illegal harvest of bonefish for commercial sale using nets.

Identification of bonefish PSAs is important for fishery conservation. Because individuals from a large geographic area are highly concentrated at PSA sites, these spawning aggregations and their associated populations are especially vulnerable to human impacts such as habitat degradation and loss. Loss of productivity at a localized aggregating site may have population-level consequences. For example, harvest of fish from spawning aggregations has caused regional population declines for Nassau grouper and other species, and coastal development has impacted Nassau grouper spawning sites in the Mexican Caribbean. Similarly, construction of causeways that disrupted bonefish spawning migrations on Kiribati in the Pacific Ocean have contributed to the cessation of spawning at numerous sites, and changes in bonefish population demographics.

Recent oceanographic and genetic research revealed high levels of connectivity of bonefish populations among islands in The Bahamas as well as throughout the Caribbean. This means that when bonefish spawn, a significant portion of their larvae are transported to other locations. Thus, spawning at one site likely provides larvae to sustain the local population, but also supports different populations. For example, some of the larvae spawned on Abaco will settle on Grand Bahama and Andros. Thus, identification and protection of PSA sites has regional conservation implications. Understanding where PSAs occur and designing mitigation measures to reduce anthropogenic impacts will contribute to regional bonefish conservation.

Methods

The research protocol that we have developed to identify bonefish PSA sites has been effective. With this protocol we are able to identify PSA sites, estimate spawning migration routes, determine connectivity to home range flats, and determine the months during which spawning occurs. Recent research has identified eight bonefish PSA sites in The Bahamas. Sites have been identified on

Abaco, Grand Bahama, Eleuthera, Andros, Long Island, and Bimini. Spawning typically occurs between the first quarter and full moons of these months, with the peak spawning month differing by island. For example, the peak month in Abaco is usually November, and is March in Bimini.

We will apply this protocol to research at Lighthouse Point, Eleuthera, The Bahamas, to determine if a bonefish PSA occurs in this area. If a bonefish PSA does occur, we will determine the lunar periodicity, months of occurrence, migration routes between home range flats and the PSA site, and offshore spawning tracks. We will use two approaches to determine if a bonefish PSA occurs near Lighthouse Point and to connect spawning bonefish to their home ranges – acoustic telemetry, mark-recapture, and visual observation. The protocol is summarized in: Adams, A.J., J. Shenker, Z. Jud, J. Lewis, E. Carey, A.J. Danylchuk. 2019. Identifying pre-spawning aggregation sites for bonefish (Albula vulpes) in the Bahamas to inform habitat protection and species conservation. Environmental Biology of Fishes. 102(2): 159-173.

Because the bonefish spawning season extends from October through April, and we don't know the peak spawning month(s) for this area of Eleuthera, it is essential that a full season of monitoring occurs so that all spawning months are sampled. This may occur within a single spawning season (October – April) or sequential spawning seasons (e.g., February – April of Season 1 and October – January of Season 2).

Initial Site Assessment

No data on bonefish use of habitats near Lighthouse Point are available. Similarly, no data on the suitability of habitats for bonefish are available. No assessment of the location relative to bonefish has been conducted. Aerial and satellite imagery of the site are insufficient to determine bonefish use and habitat suitability. Therefore, it is not possible to determine the extent to which bonefish currently use the area as a home range or PSA site without a site assessment.

The topography and location match characteristics found at bonefish PSA sites on other islands in The Bahamas: shallow bays protected from the prevailing northeast winds during the spawning season in proximity to the edge of the continental shelf, at the most upstream location accessible from home range flats via shallow water. Possible sources of bonefish migrating from home range flats to the Lighthouse Point location to spawn are the network of lagoon flats to the northwest (approximately from John Millers to Deep Creek), the sandy beach shorelines along the southern

portion of the Atlantic coast of Eleuthera, and the protected bays farther north on the Atlantic coast (Half Sound, Savannah Sound). A PSA site near Cape Eleuthera has been identified and appears to host bonefish from the flats on the western side of the island.

When migrating from home range flats to a PSA site, schools of bonefish follow shallow depth contours. Therefore, structures nearshore and perpendicular to shore, or dredging that creates deep areas nearshore, may disrupt spawning migrations. This has been observed in Kiribati, where the construction of causeways and other structures perpendicular to shore have reduced spawning activity. Similarly, in areas where docks/piers have been constructed (e.g., Sandy Point, Abaco), migrating bonefish schools travel around the deep and of the structure rather than through the pilings. Migrating bonefish schools and bonefish in PSAs are especially susceptible to anthropogenic disturbances, including boat traffic, fishing, and swimming, which disrupt their behavior, and likely reduce spawning success. In addition, bonefish undergo complex behaviors when they move offshore to spawn at night, so offshore activities (e.g., boat traffic, lights) may interrupt spawning.

Therefore, if the Lighthouse Point location is used as a PSA site by bonefish, measures should be taken to ensure safe, uninterrupted nearshore passage of migrating schools, protection from anthropogenic interactions must be given to PSAs, and the offshore area where spawning occurs should be avoided during spawning.

Acoustic Telemetry

We will implant 30 acoustic transmitters (V13, Vemco, Nova Scotia) in bonefish on their home range flats in the lagoon network of flats northwest of Lighthouse Point – ranging from John Millers to Deep Creek. This is the closest area with high bonefish abundance from which bonefish might migrate to a PSA site near Lighthouse Point. Given the considerations of a short time frame for project completion, tagging will not occur on the east side of Eleuthera since the low density of bonefish will require a high amount of effort to capture and tag bonefish. Thus, tagging only in this location and not along Atlantic coast shorelines will only enable us to obtain findings on whether the Lighthouse Point location hosts a PSA for bonefish from the flats northwest of Lighthouse Point.

At the beginning of the spawning season (October 2020), bonefish will be captured with seine nets or hook and line. For transmitter implantation, a 2 cm incision will be made on the ventral surface, and the transmitter inserted into the peritoneal cavity. The incision will be closed with interrupted

sutures (Ethicon 3-0 PDS II, Johnson and Johnson, New Jersey). Bonefish will be placed in a floating mesh pen for approximately 30 minutes before being released at the site of capture.

Also in October, acoustic receivers (VR2W, Vemco, Nova Scotia) will be placed at the mouths of the creeks connecting the lagoon flats to the ocean to determine the dates that tagged bonefish leave these flats. Acoustic receivers will also be placed at strategic locations between the flats and Lighthouse Point, including the coves adjacent to the Disney property, to detect bonefish migrations and determine whether PSAs occur along this coastline. See Figure 1 for tagging locations and approximate acoustic receiver placements.

If a bonefish PSA is observed near Lighthouse Point, bonefish will be captured from the PSA, implanted with acoustic tags, and released back into the PSA. Acoustic receivers will be rearranged and placed along the drop-off to estimate the offshore spawning track.

Behavioral Observations and Reproductive Status

When bonefish gather in PSAs, the density of fish and their behaviors differ from what occurs on the home range flats. The fish in the PSAs are tightly bunched, with fish moving in a circular motion. In late afternoon, bonefish are observed 'ventral nudging' which consists of one fish swimming behind another and then bumping or rubbing its snout on the side or posterior end of the ventral region of the lead fish. Concurrently, individual fish will 'porpoise', which consists of either partially or fully jumping out of the water, or then returning to the school. As the aggregation began to move offshore at dusk, streams of bubbles could be seen emerging from the bonefish themselves. Although the specific purpose of these behaviors and observations remains under investigation, such behaviors are only witnessed in bonefish that have formed pre-spawning aggregations right before they move offshore at dusk.

We will use visual observations from shore, by boat, and with small aerial drone to search the study area for bonefish PSAs during the five days prior to each full moon during the spawning season. Once located, we will conduct snorkeling surveys to observe and record the behavior of bonefish using GoPro underwater video cameras.

When a PSA is found, we will capture bonefish from the PSA using hook and line, and cannulate fish to determine if the fish are reproductively ready to spawn by examining the diameter and coloration of eggs.

Figure 1: Locations of tagging (areas in ovals) and receiver placements (dots) for bonefish tracking between October 2021 and April 2022.

Timeline

All observations will occur during the week prior to the full moon. Receiver deployment and acoustic tagging will occur two weeks prior to the full moon in the first month of field work.

Full Moon Calendar:

2021 - October 20, November 19, December 18

2022 - January 17, February 16, March 18

Appendix E

Sea Turtle Nesting Survey Protocol

Note: Protocols are adapted from the Florida Fish and Wildlife Conservation Commission Sea Turtle Handbook. (Florida Fish and Wildlife Conservation Commission, 2016. Marine Turtle Conservation Handbook. 〈https://myfwc.com/media/3133/fwc-mtconservationhandbook.pdf〉. Accessed March 22, 2020.)

In most of Florida, sea turtle nesting season spans March 1 - October 31. Each morning during the recognized season, trained and permitted Disney personnel survey a 7-kilometer stretch of beach for sea turtle nesting activity near Disney's Vero Beach Resort. Turtle tracks left behind overnight provides clues as to whether a female sea turtle has laid eggs in the sand or not, and also identifies the species that left it. There are three species of sea turtle that regularly nest in Florida: loggerhead (*Caretta caretta*), green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtles. Data are collected for every species and reported to the Florida Fish and Wildlife Conservation Commission (FWC), the governing body that oversees the Statewide Nesting Beach Survey (SNBS), Index Nesting Beach Survey (INBS) and Nest Productivity Assessment (NPA) programs. Surveyors are responsible for marking a predetermined subset of the nests they locate each morning on the beach, and those nests are monitored until they hatch. All data are collected and archived through a customized sea turtle monitoring mobile data app (www.narwhalsystems.com).

Turtle surveys begin at first light each morning. Most nesting activity has been completed by this time, as loggerhead, green, and leatherback sea turtles typically deposit their nests overnight. While conducting the survey, ATVs should be driven as low on the beach as possible to ensures that surveyors do not miss any crawls or run over sensitive vegetation and/or wildlife. ATV tire pressure should be kept around 2-3 PSI to avoid deep ruts in the beach sand. Deep ruts can be hazardous to hatchling sea turtles and shorebirds.

During nesting surveys, surveyors look for two possible types of sea turtle activity: nesting and non-nesting emergences. Each type of emergence should have an "up" crawl track, indicating a sea turtle has crawled out of the water, and a "down" crawl track, indicating the sea turtle has returned to the water (if a "down" crawl is not observed, it is possible the turtle is still on the beach and in need of assistance). Tracks left by each species can be differentiated by the flipper patterns left in the sand (see Figure 1). A nesting emergence is characterized by a fluffy mound of sand at the apex of a crawl, indicating that the turtle camouflaged her nest before returning to the water. Without the characteristic fluffy mound of sand, a crawl is likely a non-nesting emergence or "false crawl."

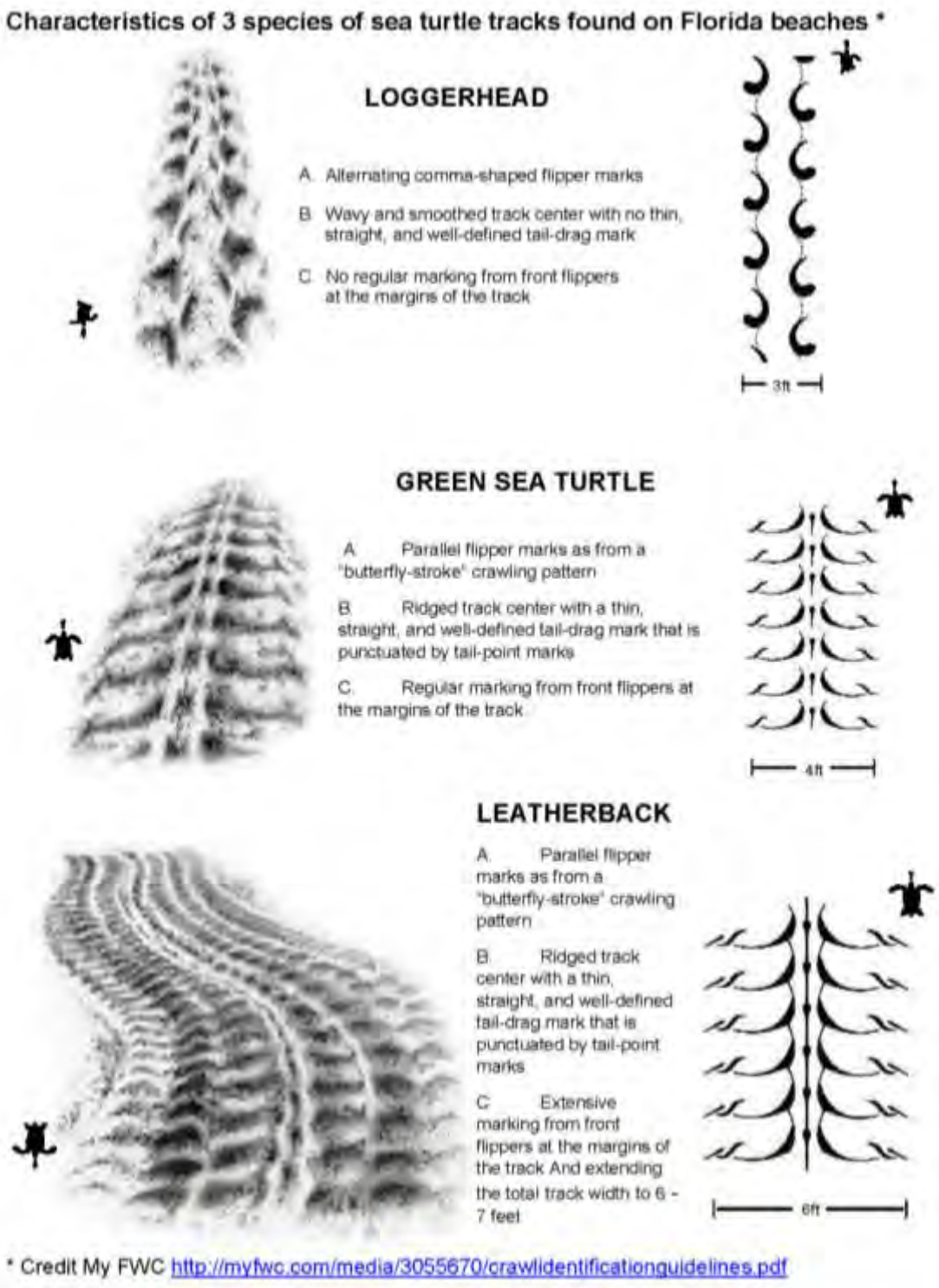


Figure 1: Track identification for loggerhead, green, and leatherback sea turtles. Photo credit: Florida Fish and Wildlife Conservation Commission.

Additional crawl characteristics are recorded for each observation, including the number of times the turtle created abandoned body pits and egg chambers associated with the crawl, whether the apex of the crawl is above or below the recent mean highwater tideline, and any obstructions the turtle encountered while attempting to nest.

The FWC's NPA program requires that a certain nest marking scheme be applied to the survey, resulting in a subset of nests that are marked and followed for the entire incubation period. The marking scheme is determined each year based on a running average of the previous five years of nesting data, with the goal of monitoring at least 100 nests per survey beach. For NPA nests, surveyors determine the precise location of the clutch in the sand before adding stakes around the nest. Additionally, if nests are found in high traffic areas or otherwise appear at risk from human activity, they can be staked off for protection ("Conservation nests"). All marked nests, whether NPA nests or Conservation nests, require a sign be stapled onto one of the nest stakes that informs beachgoers of the protected status of all sea turtle species. The nest sign also contains information on the type of species, and potential consequences of disturbing the protected nest.

When marked nests hatch, surveyors conduct nest inventories. Hatch-outs are characterized by a small, concave depression in the sand, with small, numerous hatchling tracks. Nest inventories are conducted by digging up the nest three days after it has hatched, in order to allow time for all hatchlings to emerge on their own. Nest contents are divided into the following categories: Hatched shells, Unhatched eggs, Damaged eggs, Live Hatchlings, Dead hatchlings, Live pipped hatchlings, and Dead pipped hatchlings. Damaged eggs are examined for root damage, water damage, ghost crab damage, etc. Once the inventory is complete and data recorded, nest contents are reburied as they provide critical nutrients to the dune plant community in an otherwise nutrient-starved ecosystem.

As a state-permitted sea turtle survey group, we are required to submit many different reports to the FWC, and sometimes to other municipal governing bodies as well (in our case, these data are reported to Indian River County in conjunction with the county's Habitat Conservation Plan for sea turtles).

- Obstructed Nesting Attempts (ONA) Reports: A monthly record of all turtle encounters that involved an obstacle during an attempted nesting process. This can result in either a false crawl or a nest. Possible obstructions include beach furniture, recreational

equipment, natural debris, rocks, escarpment or man-made debris. The event is documented by taking photos, a GPS point, and recording what obstacle obstructed the turtle.

- Nest Productivity Assessment (NPA) Reports: This report requires a subset of nests to be marked and monitored throughout the incubation period in order to measure seasonal productivity. Each NPA nest is monitored daily and the GPS location recorded. Additional details regarding the nests are recorded and reported to FWC: whether or not the nest is seaward of a structure, the first emergence date, the date of nest excavation, full nest inventory, and the date and details of any nest disturbances. Nest disturbances include predations, washovers and wash out events. Canines, raccoons, bobcats and other mammalian predators are known to dig into sea turtle nests and consume the eggs. If viable eggs remain after a predation, the nest is re-covered with sand and left to complete incubation. Nests may also experience washover and wash out events due to high tides, high surf and strong storm events. If eggs are exposed due to these events, surveyors re-cover the eggs with sand and leave the nest to complete incubation.
- Statewide Nesting Beach Survey (SNBS) Reports: The survey period, survey start times, and survey frequency are included in this report. Boundaries of where surveys begin and end are also reported. Data on all fresh crawls (above and below the high tide line) are identified to species as either a nest or false crawl and reported. FWC is notified of events that may affect turtles or nests such as beach nourishment or erosion due to storms.
- Disorientation Reports: Disorientations occur when either adult or hatchling turtles are unable to locate the ocean. Prior to artificial lighting, the ocean was the brightest light source on the beach. Unfortunately, in areas with high light pollution, sea turtles may become disoriented, making it difficult to locate the ocean. Adult disorientations are typically characterized by sea turtle tracks running parallel to the ocean, or in circular patterns. Hatchling tracks going towards the dune, going in circles or running parallel to the beach are indications of disorientation. Disorientations are photographed and reported to FWC.
- Sea Turtle Stranding and Salvage (STSSN) Reports: Sea turtle strandings are recorded in the event that a dead or alive sea turtle washes up onto the beach. The STSSN form is filled out, requiring detailed information on the turtle, location, and possible reason for the stranding. The form is sent to FWC by email. Deceased turtles are spray painted to reduce the chance of re-documentation, and then either buried or salvaged for necropsy.

Appendix F

Marine Mammal and Construction Noise Management Plan

Marine Mammal Presence

According to The Bahamas National Trust, The Bahamas Marine Mammal Survey, The Bahamas Marine Mammal Research Organisation, The Bahamas Marine Mammal Stranding Network, and personal observations of members of the EIA team, over 20 species of marine mammals are known to spend all or part of their lives in Bahamian waters (see Table 1).

The spatial distribution, seasonal variation, and residency of these species vary from species to species. Individuals of some species may spend their entire lives in Bahamian waters, while individuals of other species may include only a part of The Bahamas in their wide-ranging territories. All marine mammals are protected species in The Bahamas pursuant to Chapter 244A (refer to Section 5), and several of these species are included in databases tracked by the International Union of the Conservation of Nature (IUCN) and designated as Critically Endangered, Endangered or Vulnerable.

Although no marine mammals were encountered during the marine assessments at the subject site, interviews with local boat captains have revealed seasonal occurrences of bottlenose, spotted dolphins, and pilot whales in the general vicinity from December through April. Migratory populations of humpback whales (*Megaptera novaeangliae*) migrate through the Western Atlantic and along the coast on the east side of the assessment area between December and March and beaked whales (*Mesoplodon spp., Ziphius cavirostris*), are present in offshore waters year-round. Of the 34 documented sightings of killer whales in The Bahamas reported by Dunn and Claridge (2013), one was to the west of South Eleuthera.

Interviews with the local boat captains indicated manatees are very rare in the area.

Table 1: Marine Mammals of The Bahamas Common Name, Scientific Name, IUCN Status, and Hearing Frequency Category

Common Name	**Scientific Name**	**IUCN Status**	**Hearing Frequency**
North Atlantic right whale	*Eubalaena glacialis*	Critically Endangered	Low
Bryde's whale	*Balaenoptera edeni*	Least Concern	Low
Fin whale	*Balaenoptera physalus*	Vulnerable	Low
Humpback whale	*Megaptera novaeangliae*	Least Concern	Low
Pygmy killer whale	*Feresa attenuata*	Least Concern	Mid
Short-finned pilot whale	*Globicephala macrorhyncus*	Least Concern	Mid
Fraser's dolphin	*Lagenodelphis hosei*	Least Concern	Mid
Risso's dolphin	*Grampus griseus*	Least Concern	Mid
Killer whale	*Orcinus orca*	Data Deficient	Mid
Melon-headed whale	*Peponocephala electra*	Least Concern	Mid
False killer whale	*Pseudorca crassidens*	Near Threatened	Mid
Pantropical spotted dolphin	*Stenella attenuata*	Least Concern	Mid
Striped dolphin	*Stenella coeruleoalba*	Least Concern	Mid
Atlantic spotted dolphin	*Stenella frontalis*	Least Concern	Mid
Rough-toothed dolphin	*Steno bredanensis*	Least Concern	Mid
Common bottlenose dolphin	*Tursiops truncatus*	Least Concern	Mid
Sperm whale	*Physeter catodon*	Vulnerable	Mid
Gervais' beaked whale	*Mesoplodon europaeus*	Data Deficient	Mid
Blainville's beaked whale	*Mesoplodon densirostris*	Data Deficient	Mid
West Indian Manatee	*Trichechus manatus* ssp. *latirostris*	Endangered	Mid
Cuvier's beaked whale	*Ziphius cavirostris*	Least Concern	Mid
Pygmy sperm whale	*Kogia breviceps*	Least Concern	High
Dwarf sperm whale	*Kogia sima*	Least Concern	High

The area between South Eleuthera and Little San Salvador has been identified by CEI and others as a very important habitat as a travel corridor for cetaceans and as an intersection for pelagic and more coastal species. In its October 2018 newsletter, CEI states:

"The narrow undersea bank stretching from Lighthouse Point to Half Moon Cay, known as The Bridge, is rich with marine life. Pelagic fishes seem to congregate here along both the northern and southern drop-offs to feed on tight schools of baitfish skipping across the surface. Birds dive down from above to forage alongside bonita and mahi-mahi, and sharks patrol between ancient coral heads rising up from the seafloor."

Even though transect surveys consistent with standard EIA assessments did not detect marine mammals at the time of the surveys, the operator will assume any one of these animals, except for the right whale which is found in more northern waters of The Bahamas, could potentially be in the vicinity at some point during construction.

Construction Noise Impacts

Construction in the marine environment will be limited to pile techniques. Construction noise has the potential to impact local marine fauna, particularly marine mammals that are present in the surrounding waters. The impacts of noise on marine organisms are poorly understood; however, recent studies with marine mammals indicate that some types of noise may adversely affect cetacean populations, upsetting their use of echolocation or damaging their sensory organs (Richardson, Greene Jr, Malme, & Thomson, 2013, Southhall et al. 2007). Some research suggests that low-level noise, such as that arising from boat engines and navigation equipment such as depth sounders, does not result in behavioral alterations while others have found contextual behavioral changes (Mattson et al., 2005; Pirrotta et al., 2015, Gomez et al., 2016).

Humpback whales are considered low-frequency cetaceans, with optimal hearing between 7 Hz and 35 kHz. The non-baleen whale species anticipated to be in the area are considered mid-frequency cetaceans, with optimal hearing between 150 Hz and 160 kHz, but the two species of *Kogia* found in deep water are high considered to have high-frequency hearing, 275 Hz to 160 kHz (NMFS, 2018). According to United States regulations, a "Level A take" can cause physical damage or hearing loss (either permanent or temporary). Hearing loss can be caused by sudden high-amplitude sounds or longer-term exposure to lower amplitude sounds, which is

why NMFS (2018) sets acoustic Level A thresholds with two different acoustic metrics (peak and weighted cumulative sound exposure level). NMFS (2018) Level A thresholds will be used to estimate potential acoustic impact from construction and operation, and this will be used to inform mitigation and monitoring strategies.

According to Unites States regulations, a “Level B take” is considered the area within which the animals’ behaviors can be influenced. These distances are less clear and dependent on context (Ellison et al., 2011, Southall et al., 2007, Pirrotta et al., 2012). Alteration of humpback whale foraging behavior due to anthropogenic noise has been documented (Blair et al., 2016). Male humpback singing has also been demonstrated to be temporarily impacted by ship noise (Tsujii et al., 2018). However, it is worth noting that these effects were observed due to noise from ships in transit at sea and at nominal interaction distances on the order of 500 to 1000 meters between the ship and whale. Beaked whales have been studied extensively and have been shown to have behavioral changes from ship noise at 5.2 km (Pirrotta et al., 2012). This may be influenced by differing acoustic transmission loss in deep versus shallow water. This encounter scenario is different than what would occur for a fixed construction barge in shallow water. In this case, the cetaceans would have to advance towards the barge (in shallow water), as the barge remains in a fixed location (although it moves short distances between piling installation locations).

Noise associated with pile driving has the potential to impact cetaceans in the region. The noise level associated with pile driving varies significantly depending on the equipment utilized, the overall size of the piles, the substrate into which the piles are driven, the force applied and the distance to the source. To demonstrate this variation, two size pilings at the same distance, the larger diameter pile would have a higher amplitude but, as the distance from the source changes, the dynamics change. This is demonstrated in an example referenced in Dahl, de Jong and Popper (2015). The typical maximum (source level) reported a value of 220 dB (re 1 μPa^2) for a 0.75-meter diameter pile at a range of about 10 meters while a 5-meter diameter pile at a range of 300 meters has a value of 200 dB (re 1 μPa^2). The NOAA mid-frequency cetacean threshold for Level B impulsive sound is 160 dB re 1µPa (rms). For Level A, the thresholds are 230 dB re 1µPa (0-peak) and 185 dB re 1μPa^2s (frequency weighted, cumulative SEL). The proposed construction is in shallower water, which may attenuate the noise, but it is uncertain at this point. It should also be noted that a portion of the noise for migrating humpback

whales will be attenuated by the shallow water and island to the north and east of the construction site.

Methods

NMFS guidelines (NMFS 2018) were followed in estimating the Level A zones of influence for Low, Mid, and High-Frequency Cetaceans. Likewise, NMFS thresholds (160 dB_{rms} re 1 µPa for impulsive sounds and 120 dB_{rms} re 1 µPa for continuous sound) were used to estimate Level B zones of influence for cetaceans. The majority of pile installation work will be done using vibratory pile driving. However, the final setting of piles may require some impact pile driving as well. Zones of influence were therefore estimated for both vibratory and impact pile driving. A number of assumptions were made to estimate the zones of influence. They are described in detail in the section below.

Assumptions

Transmission loss has not been measured at the construction site and therefore a conservative assumption (following NMFS 2018) of a transmission loss coefficient of 15 was chosen (see Table 2). Piles of three different sizes (30-, 36-, and 48-inch steel piles) will be in this project. A literature search was conducted to provide impact and vibratory pile driving sound levels to estimate zones of influence. Due to its extensive analysis across multiple locations and years, the NAVFAC (2017) report was used to estimate pile driving sound levels. NAVFAC (2017) provides measured sound levels for 24-, 36- and 48-inch steel piles. Regardless of the pile size, the highest typical measured sound level reported by NAVFAC (see Table 18 of NAVFAC 2017 report) was used in our estimates of the zones of influence (see Table 2). By using the highest typical measured sound levels, our assumptions will be conservative (i.e., lead to over-estimates of the size of the zones of influence). The number of piles driven per day, the duration of vibratory driving, and the number of impact strikes per pile were set in discussion with construction engineers. These assumptions are the likely maximum values and thus are also conservative (see Table 2). Frequency weighting for Low, Mid and High-Frequency cetaceans was applied following the guidance of NFMS (2018).

Factor	**Value**
Transmission Loss Coefficient	15
Vibratory Driving	
Vibratory Driving rms (dB re 1µPa @ 10m)	159
Number of piles in 24 hour period	5
Duration to drive single pile (minutes)	15
Impact Driving	
Impact Driving Peak (dB re 1µPa @ 10m)	211
Impact Driving SEL (dB re 1µPa·s @ 10m)	184
Impact Driving rms (dB re 1µPa @ 10m)	195
Number of piles in 24 hour period	5
Number of strikes per pile	15

Table 2: Assumptions used for estimating marine mammal zones of influence.

Results

Estimates of the zones of influence for Level A and Level B are provided in Table 3 and Table 4, respectively. Level A zones of influence are highest for impact pile driving and using the NMFS SELcum threshold, as expected. High-Frequency Cetaceans have the largest Level A zone of influence at 247 m, while Mid-Frequency Cetaceans have the smallest Level A zone of influence at 7 m (see Table 3). The Level B zone of influence for vibratory pile driving (3,981 m) is larger than the Level B zone of influence for impact pile driving (2,154 m; see Table 4).

Range to Threshold (m)			
Activity	**Low-Frequency Cetaceans**	**Mid-Frequency Cetaceans**	**High-Frequency Cetaceans**
Vibratory Driving	6	1	9
Impact Driving (SELcum Threshold)	207	7	247
Impact Driving (PK Threshold)	3	NA*	40

**PK source level is ≤ to the threshold for that marine mammal hearing group.*

Table 3: Estimates of Level A zones of influence.

Activity	**NMFS Threshold (dB re 1µPa)**	**Range to Threshold (m)**
Vibratory Driving	120	3,981
Impact Driving	160	2,154

Table 4: Estimates of Level B zones of influence.

Mitigation Strategies

The developer will use industry best practices and mitigation strategies to avoid Level A effects and minimize Level B effects. These include the following:

1) Within the first two weeks of construction, follow NMFS guidelines to measure vibratory and impact pile driving noise, and transmission loss to ensure the maximum Level A zone of influence is no larger than 250 m.
2) Ensure regular maintenance of construction equipment to avoid excessive noise from machinery and piling activity.
3) Given the high current velocities on site, a bubble curtain is not an option.
4) Two Marine Mammal Spotters will conduct visual observations for 30 minutes before the start of impact pile driving to ensure that no cetaceans are within 250 m of the impact pile driving activity. For the first half of the observation period, Spotters will monitor a real-time Passive Acoustic Monitoring (PAM) to detect calling and echolocating marine mammals to help the

Spotters ensure marine mammals are not present in the 250 m shut- down zone; during the second 15 minutes they will turn on a Bell hydrophone that will transmit a gradually-increasing, full-spectrum noise with an imbedded recording of the construction noise. This will end with the sound level at the dB of the equipment being used. This will serve to replicate a “soft start” approach to give animals warning so they can choose to move away in both Zones A and B.

5) Passive Acoustic Monitoring will continue throughout construction for the day. If cetacean-derived noise is detected, the EM team will investigate with visual observations to determine whether cetaceans are within the Level A zone. If marine mammals enter the exclusion zone during impact pile driving, construction activity will shut down as soon as practically possible.

Appendix G

Water Quality Monitoring Protocol

Monitoring water quality during construction will be focused on nearshore marine waters where construction and secondary impacts that could negatively impact marine resources will be concentrated. The water quality monitoring will primarily focus suspended sediments/light and sedimentation effects associated with the main construction activities but will also record overall environmental conditions (wind, temp, wave heights, currents) along with other general water quality parameters (salinity, temperature, Dissolved Oxygen, pH, chlorophyll). Daily water quality monitoring will include both a continuous array of real time water quality buoys with satellite link placed around each construction area coupled with in-water measurements using a hand-held multiparameter Sonde by on-site biologists. Supplemental water quality monitoring across the entire Lighthouse Point area to provide additional context including spatial and temporal trends in general water quality and sediment characteristics.

Background

Observed ocean water clarity/visibility within the vicinity of Lighthouse Point and South Eleuthera is generally excellent. There are no known local sources of discharge or runoff in the area, and the overall water quality is presumed to be good. The presence of deep water immediately off both coasts ensures that the tidal prism is at a maximum with little stagnation of nearshore water. Underwater visibility typically ranges from 60 to 100 ft. suggesting that little or no sedimentation is present in the water column during calm conditions. One of the greatest potential causes of coral degradation is the accumulation of sediment on either hardbottom or coral reef habitat often referred to as “sedimentation” (Rogers 1990). Sedimentation occurs as a result of both natural (resuspension during storms; runoff from land) but also from several human related causes (Erftemeijer et al., 2012). During coastal construction, surficial sediments may enter nearshore waters if runoff is not properly controlled. In-water construction can disturb and resuspend sediments or even generate new sediment by drilling and pile driving through underlying limestone formation. In all cases, the introduction of suspended sediments increases the turbidity of the water column. Turbidity is a measure of water clarity and is associated with suspended particles and reduced visibility. Coastal marine environments experience wide ranges of turbidity as a result of natural physical forces, coastal construction, and terrestrial runoff (Fabricius 2005).

The focus of the current plan is for the construction phase of the project. Even though dredging is not planned as part of this development, the Project will employ best practices and state of the art practices to monitor water quality typically done only on large scale dredging projects (PBS&J, 2008).

Water quality monitoring will primarily focus suspended sediments/light and sedimentation effects associated with the main construction activities but will also record overall environmental conditions and form a detailed permanent record for long-term operational management of the Site. Longer term water quality monitoring during operations will include a broader array of parameters that include nutrients, microbes, and pollutants and will also include groundwaters and surface waters. This long-term water quality monitoring plan will complement the current construction water quality monitoring plan and will be submitted for review separately at least six months before construction ends.

Construction Water Quality Monitoring Goals: To provide ambient water quality data of the Lighthouse Point Site for nearshore waters and other inland water bodies that can be used to inform construction activities and identify any potential secondary construction related impacts to nearshore and brackish water biological resources.

Daily Marine Construction Water Quality Monitoring

A real time network of water quality buoys will be deployed around marine construction sites to provide continuous real-time feedback for turbidity that allow for any necessary corrective actions to be rapidly taken. A single deeper offshore buoy will also measure and transmit wind, currents (direction, velocity) and wave period/height measurements and other water quality parameters (temperature, salinity, DO, pH, and Chlorophyll). Data will be transmitted hourly (or less) from each buoy via a web data center service that can be accessed on-site by the EM and biologists. Two of the buoys will be moored on the perimeter the buffer/mixing zone area for each construction phase with one on the mid-point of the up current side and one on the midpoint of down current side. It is anticipated that there will be at least 4 different monitoring configurations during the piling driving phases of the project (RoRo ramp/Small vessel marine/inshore trestle configuration, 2 trestle construction configurations, and the pier berthing area configuration. Each configuration will involve repositioning and mooring the water quality buoys (see Figures 3-6). Water quality data buoy moorings will be designed to be secure up to tropical force wind conditions and will removed from the water in the event of a hurricane.

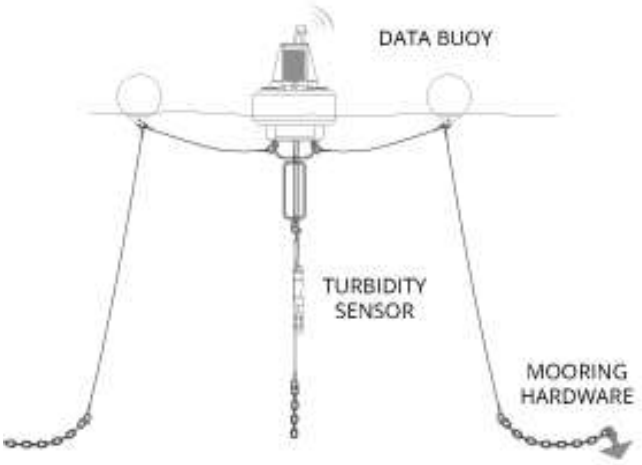
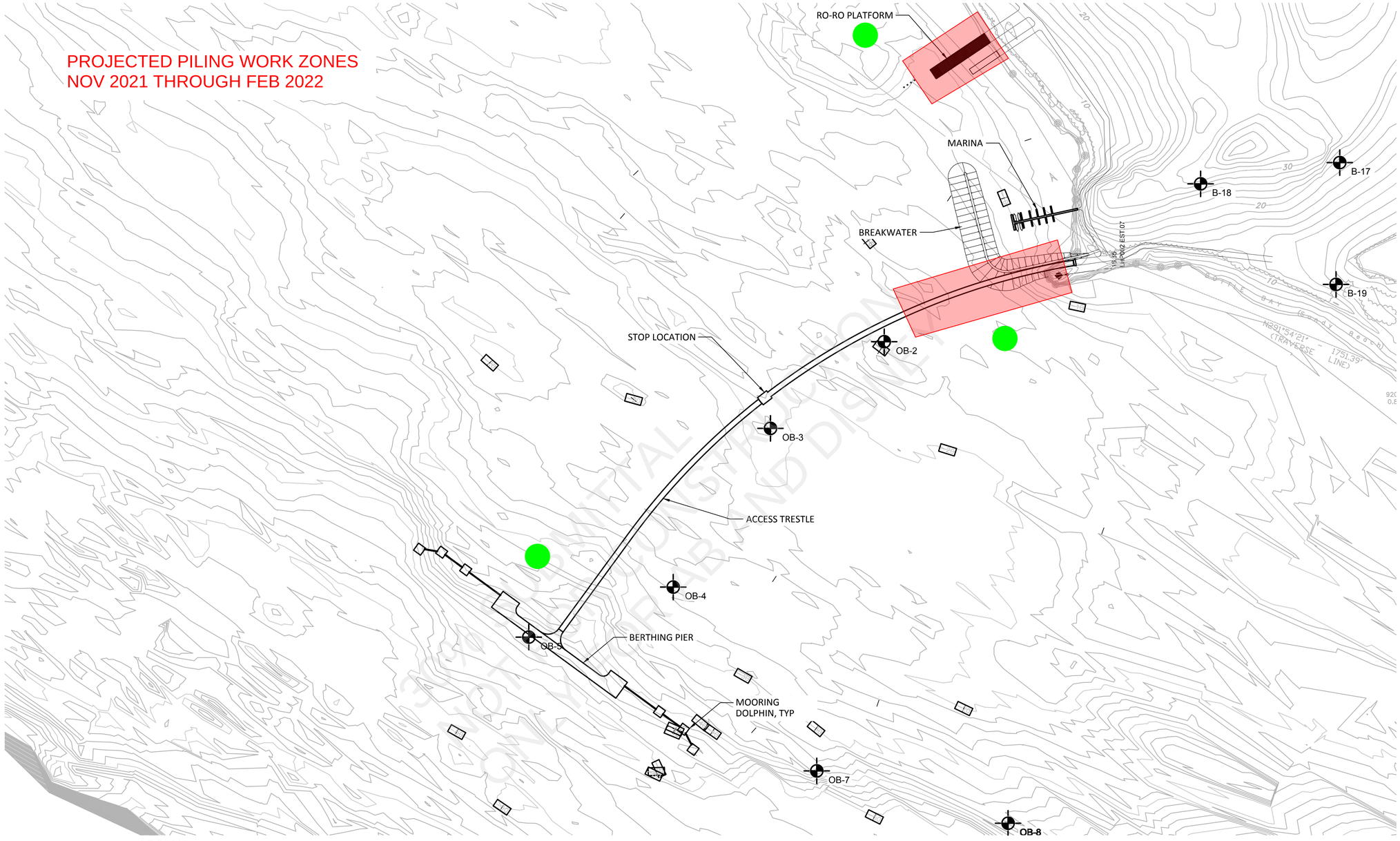


Figure 1: Example of water quality data buoy (CB-450 Fondriest Data Buoy)

Figure 2: Example of water quality hand held Sonde (YSI EXO2)

Figures 3-6 (below): Water quality buoy configurations for turbidity monitoring during construction

PROJECTED PILING WORK ZONES
NOV 2021 THROUGH FEB 2022



LEGEND:

XX-X GEOTECHNICAL INVESTIGATION BY GOLDER DATED JANUARY 2021.

1 - **GEOTECHNICAL BOREHOLE PLAN**

SCALE: 1" = 200'

200 0 200 400
scale feet

WSP USA Inc.
800 Gessner Road
Suite 1125
Houston, TX 77024
TEL: (832) 384-7800
FAX: (832) 384-7801

30% DESIGN - NOT FOR CONSTRUCTION

MARK	REVISION DESCRIPTION	BY	APP.	DATE

American Bridge

Disney Cruise Line

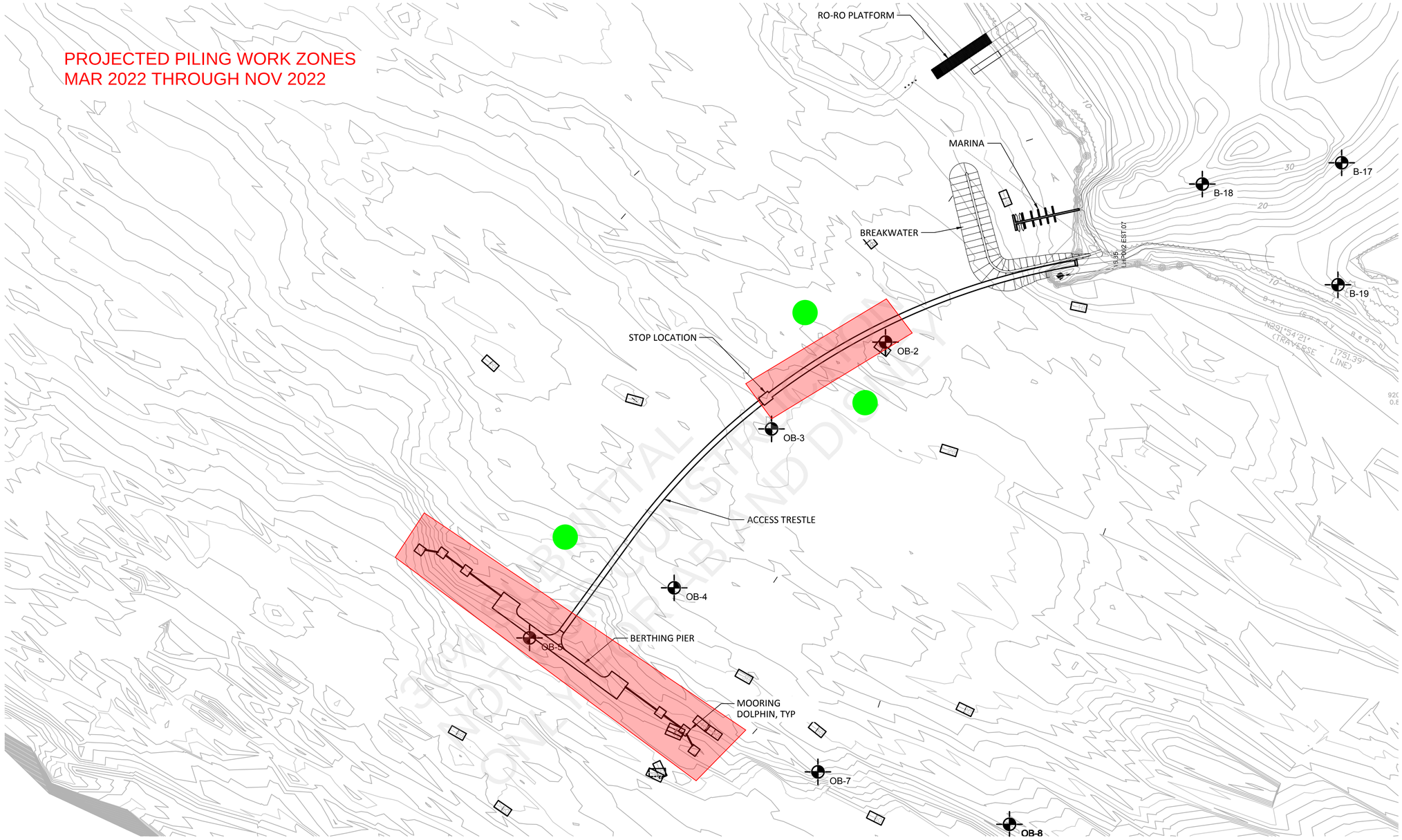
DRAWN BY JM
DESIGN BY DAS
CHECK BY VKK
PROJ MGR JS

DCL ISLAND DEVELOPMENT, LTD.
PROJECT LIGHTHOUSE POINT, SOUTH ELEUTHERA, BAHAMAS
MARINE PACKAGE

PLAN - GEOTECHNICAL BORINGS

DRAWING NO. G-6
PROJECT NO. 30901102
DATE: 7/2/21
SHEET NO.

PROJECTED PILING WORK ZONES
MAR 2022 THROUGH NOV 2022



LEGEND:

XX-X GEOTECHNICAL INVESTIGATION BY GOLDER DATED JANUARY 2021.

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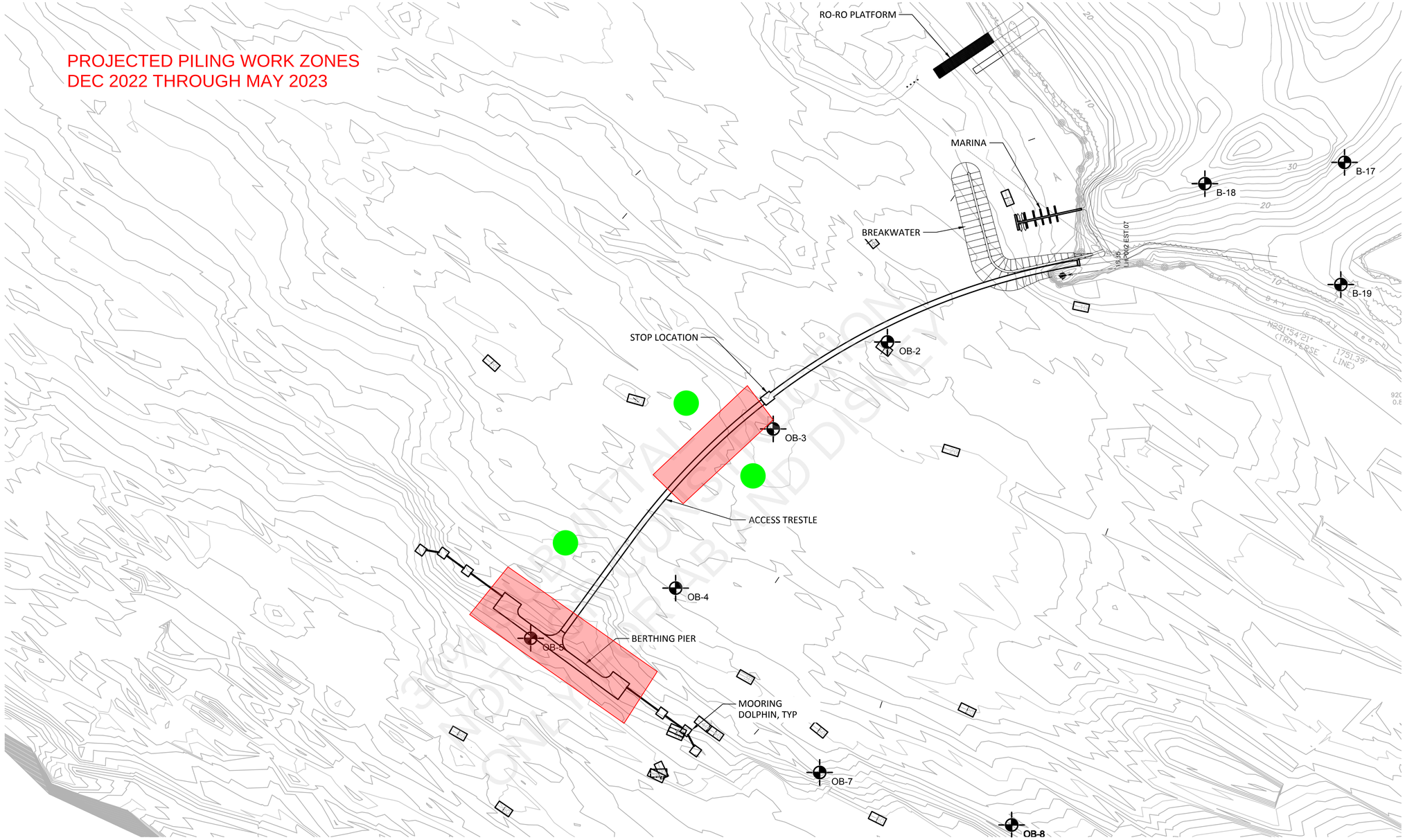
PLAN - GEOTECHNICAL BORINGS

DRAWING NO. G-6
PROJECT NO. 30901102
DATE: 7/2/21
SHEET NO.

PROJECTED PILING WORK ZONES
DEC 2022 THROUGH MAY 2023



LEGEND:

XX-X GEOTECHNICAL INVESTIGATION BY GOLDER DATED JANUARY 2021.

1 / - **GEOTECHNICAL BOREHOLE PLAN**
SCALE: 1" = 200'
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scale feet

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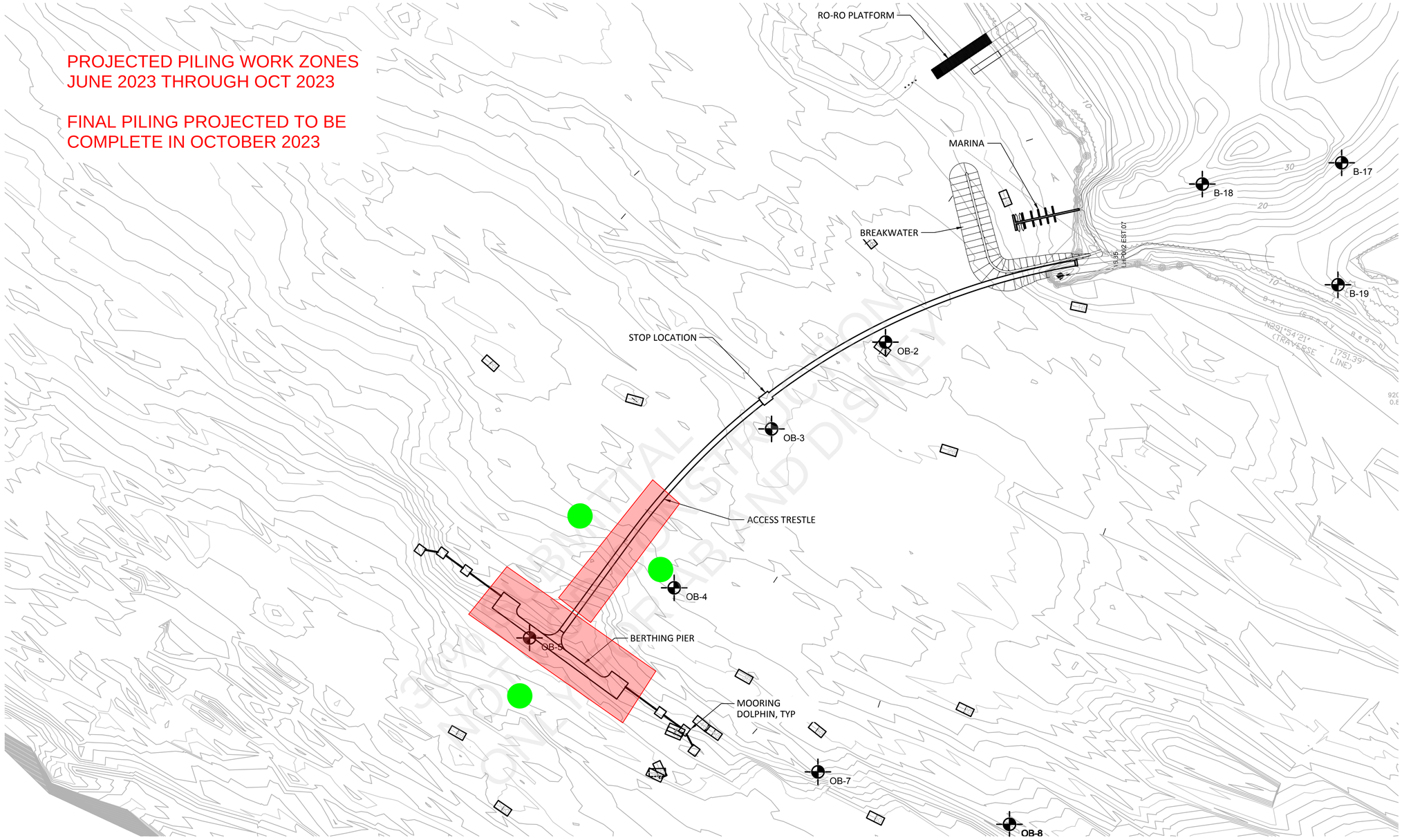
PLAN - GEOTECHNICAL BORINGS

DRAWING NO. G-6
PROJECT NO. 30901102
DATE: 7/2/21
SHEET NO.

PROJECTED PILING WORK ZONES
JUNE 2023 THROUGH OCT 2023

FINAL PILING PROJECTED TO BE
COMPLETE IN OCTOBER 2023



LEGEND:

XX-X GEOTECHNICAL INVESTIGATION BY GOLDER DATED JANUARY 2021.

1 - **GEOTECHNICAL BOREHOLE PLAN**

SCALE: 1" = 200' 200 0 200 400 scale feet

WSP USA Inc.
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FAX: (832) 384-7801

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PLAN - GEOTECHNICAL BORINGS

DRAWING NO. G-6
PROJECT NO. 30901102
DATE: 7/2/21
SHEET NO.

Daily Marine Construction Water Quality Response Plan

We will employ an adaptive 2 stage response for daily construction related water quality turbidity monitoring. Buoy turbidity readings that are located on either side of the construction area will be utilized as the first stage monitoring mechanism. Any measurements of turbidity made by either buoy that is greater than 15 NTU's above baseline will cause an "alert message" to be sent out. This trigger will initiate in-water surveys using a handheld turbidity meter to thoroughly check the perimeter of the mixing area. A second response will be triggered if either a water quality buoy or handheld instrument reaches a turbidity readings of 29 NTU or above baseline that will cause a stoppage of construction and initiate further in-water surveys until turbidity readings outside of the mixing zone fall below 15 NTU. The 29 NTU threshold within the mixing zone for dredging and other construction projects within coral areas are established in Florida and USACOE under Florida Administrative Code 62-302. (https://www.epa.gov/sites/default/files/2014-12/documents/fl_section62-302.pdf).

- **Turbidity Threshold Trigger 1:** Initially set at two or more readings from any of the water quality buoys that are 15 NTU units above before construction baseline.
  Response 1: Initiate biologist in-water survey using handheld towed Sonde around perimeter of buffer/mixed zone to determine full scope of turbidity ranges in and around construction area.
- **Turbidity Threshold Trigger 2:** 29 NTU units above baseline measured by either a buoy or by handheld instrument (YSI EXO2 turbidity Sonde) outside of the buffer/mixing zone.
  Response 2: Construction activities to seize for at least one hour; Before construction resumes, conduct an in-water handheld turbidity survey (YSI EXO2 Multi-parameter water quality Sonde) around perimeter of buffer/mixing zone to verify turbidity is below 29 NTU threshold.

Daily Upland Construction Water Quality Monitoring

For upland construction activities, water quality will be monitored within adjacent water bodies (nearshore and/or inland ponds) that are within 50 feet of construction areas. Biologists will use hand-held Sonde three times per day taking both surface and bottom measurements of turbidity and other parameters along at least three inshore to offshore transects. If turbidity containment curtains are being used, water quality readings will also be taken inside and outside of curtained areas.

Daily Upland Construction Water Quality Response Plan

If water quality turbidity readings are above the action threshold and meet the requirements to stop work, within 72 hours DEPP will be notified of elevated readings and corrective measures implemented to mitigate the occurrence. Construction will not resume until water quality monitoring indicates turbidity is below 15 NTU above baseline. An incident report will be prepared and submitted for each occurrence. Additional sedimentation monitoring sites may also be established in the immediate vicinity of upland construction areas in cases where more than three high turbidity events are documented during construction.

Supplemental Water Quality and Sedimentation Monitoring

Additional water quality monitoring will also be made quarterly within the directly impacted areas and across the entire Lighthouse Point nearshore area at the 36 fixed benthic monitoring sites to characterize the spatial and temporal variance in a range of standard parameters (Secchi disc, temperature, salinity, DO, pH, and Chlorophyll) using a calibrated hand-held Sonde (surface and bottom water measurements). In situ loggers will be deployed at 12 of the sites to record temperature and light readings every 15 minutes. These loggers will be downloaded and serviced quarterly. These sites also include control sites that are more than 5 km away from where the construction activities will be concentrated.

Measurements of sedimentation will also made at fixed sites near hardbottom and coral reefs communities. Two 50-m long transects will be run in opposite directions (generally shore parallel) from a fixed stainless-steel stake and sampled at 1.0-m intervals (50 points per transect, two transects per site). Standing sediment along the line-intercept transects, where present, will be recorded if there is any visible accumulation of sediment and measured with a ruler to the nearest cm. Surface sediment will also be collected at stations to evaluate any changes to sediment grain size distribution (skewness and kurtosis). Sedimentation measurements will be made before construction and repeated every six months to quantify any changes in sediment accumulations and/or siltation to hardbottom and coral reef areas. These measurements will be made in conjunction with benthic community monitoring of coral condition within fixed plots to further evaluate potential secondary impacts to marine resources.

Figure 7: Map showing location of fixed sites that will be sampled quarterly for water quality and sediment parameters as part of the supplemental water quality monitoring effort.

Quality Assurance and Quality Control Protocols

Calibration

For hand-held instruments, each parameter will be calibrated prior to each field use according to the manufactures specifications. Turbidity will be done using ISO 7027 standards and correlated to measurements of total suspended solids (TSS) using dry weight methods on waters collected from the Lighthouse Point area.

Baseline

Baseline before construction turbidity ranges will be determined for the Lighthouse Point area by deploying the offshore water quality buoy for at least 30 days before construction. Fixed site water quality measurements and sedimentation will be made at least one time before construction. Control locations (located further than 5 km from construction areas) will also be used for comparative purposes.

Data Processing

Water quality data will be checked through for gaps and outliers. All outliers will be flagged and compared with other collected parameters to determine their validity. Spot checks of digitally entered data will be made with field datasheets. All quality control checked valid water quality data will be synthesized and summarized in both graph and table form and in map form where appropriate.

Statistical Analysis

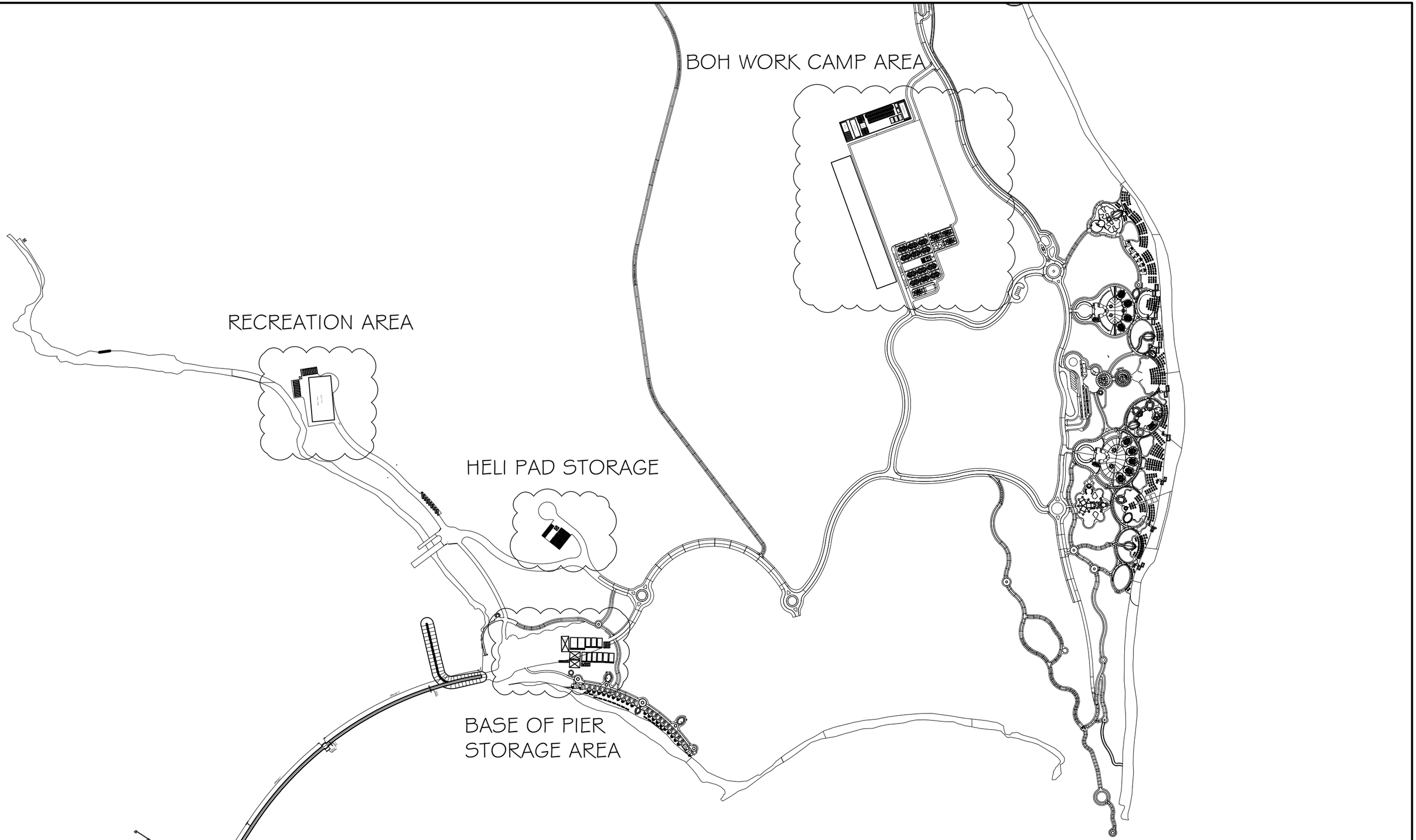
The near continuous buoy data will be synthesized and summarized in graphs (box plots). The magnitudes of turbidity and other variables, their variability, any time trends will be examined and confidence intervals calculated. Statistica and R will be used to make these initial evaluations of the data using either parametric or non-parametric approaches as appropriate. More detailed analysis and correlations to other monitoring datasets may also be undertaken.

Reporting and Storage

All water quality information during the planned 30-month construction period will be synthesized and reported quarterly. All water quality and environmental data will be shared with the other supplemental wildlife monitoring programs. All water quality data will be stored within Site Management Environmental Monitoring database and a final report submitted to DEPP within 90 days after construction had ended.

Appendix H

Site Plan with Lay Down and Construction Areas



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MARINE PACKAGE

STATE | COUNTY

		Drawn	Date	Check	Date	Description
6						
5						
4						
3						
2						
1						

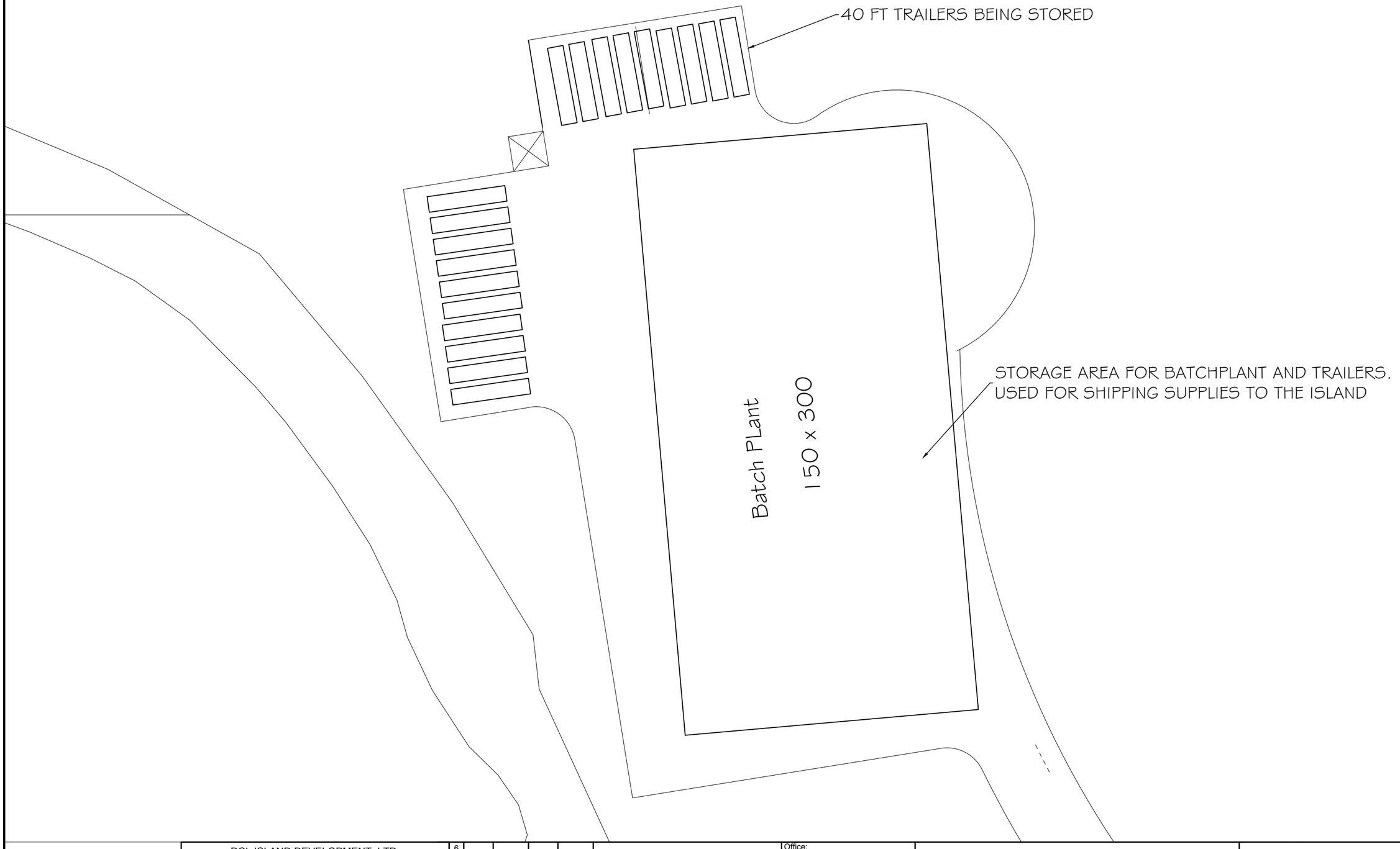
Revisions

Office: TAMPA
Design By:
Drawn: ACK | Checked:
Date: 09/13/21 | Date:
In Charge Of: JONATHAN YATES

EMP LAYOUT DRAWINGS
PROJECT PLAN VIEW

American Bridge
Region: SOUTHEAST

AB Job Number: 516910 | Rev: 0
Sheet Number: 1



DCL ISLAND DEVELOPMENT, LTD.
PROJECT LIGHTHOUSE POINT
SOUTH ELEUTHERA, BAHAMAS
MARINE PACKAGE

STATE | COUNTY

	Drawn	Date	Check	Date	Description
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Revisions

Office: TAMPA
Design By:
Drawn: ACK | Checked:
Date: 09/13/21 | Date:

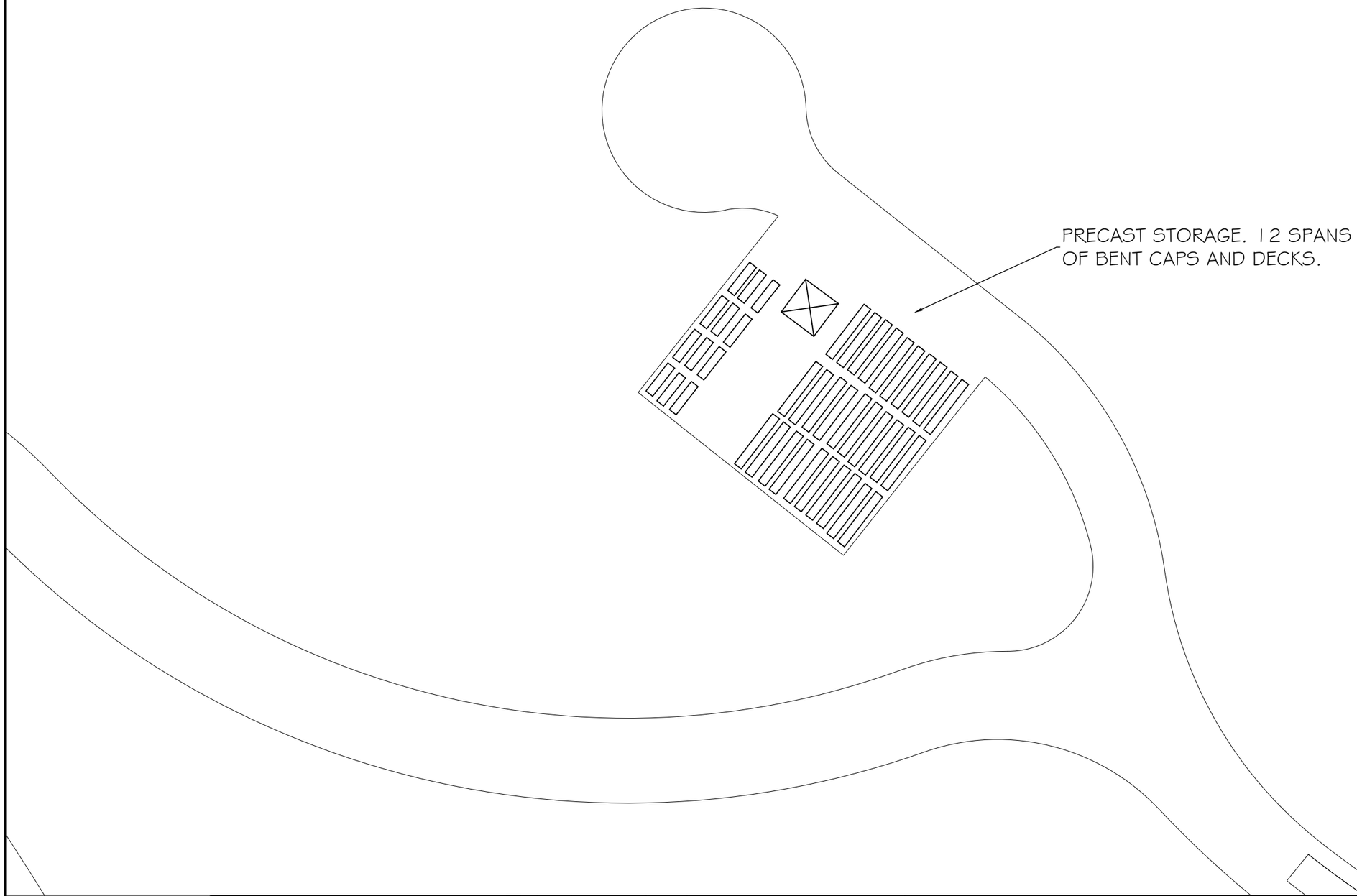
EMP LAYOUT DRAWINGS
RECREATION AREA

In Charge Of: JONATHAN YATES

American Bridge

Region: SOUTHEAST

AB Job Number: 516910
Rev: 0
Sheet Number: 2



DCL ISLAND DEVELOPMENT, LTD.
PROJECT LIGHTHOUSE POINT
SOUTH ELEUTHERA, BAHAMAS
MARINE PACKAGE

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Office: TAMPA
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Drawn: ACK
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Date: 09/13/21
Date:

EMP LAYOUT DRAWINGS
HELI PAD STORAGE

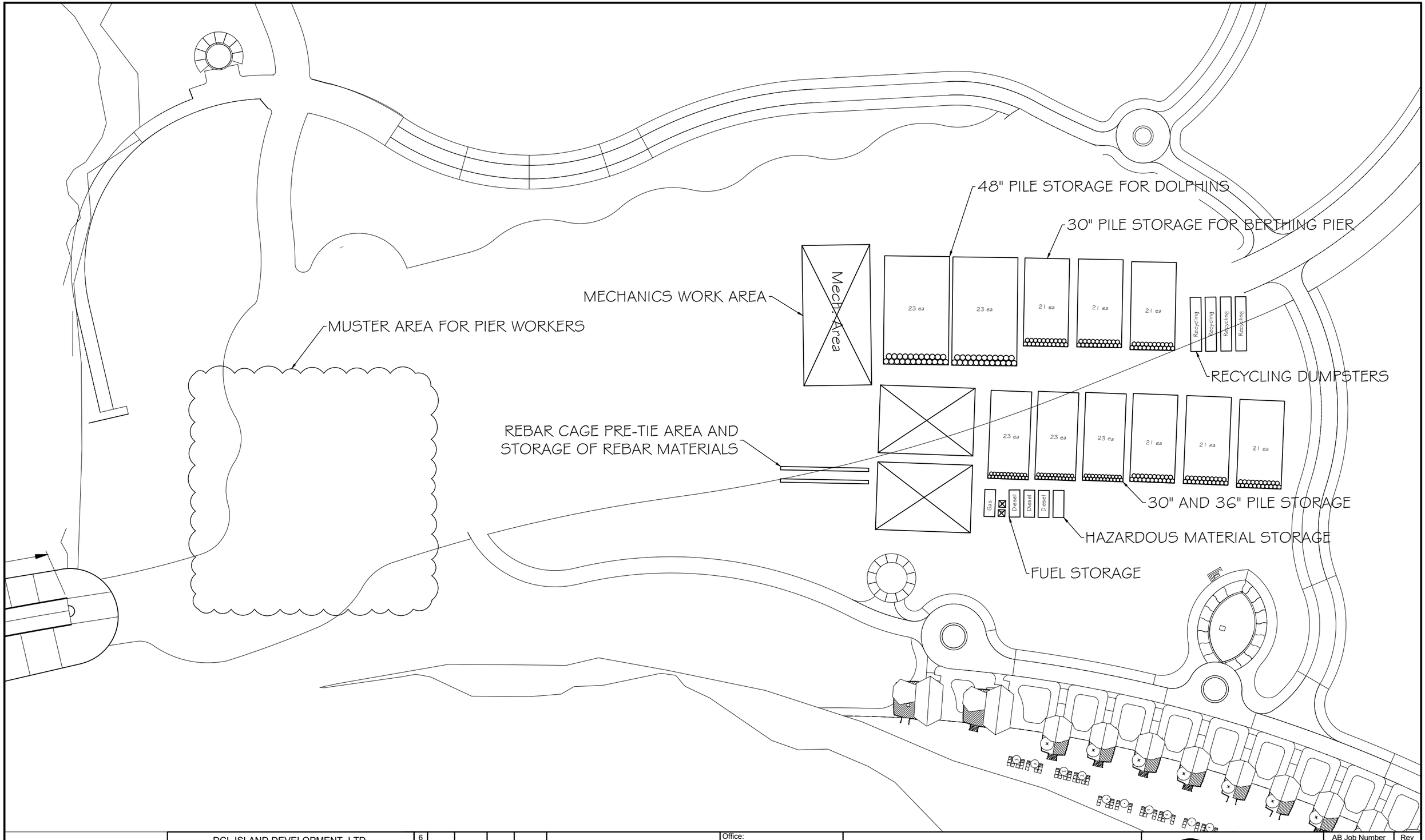
In Charge Of: JONATHAN YATES

American Bridge

Region: SOUTHEAST

AB Job Number	Rev
516910	0

Sheet Number: 3



DCL ISLAND DEVELOPMENT, LTD.
PROJECT LIGHTHOUSE POINT
SOUTH ELEUTHERA, BAHAMAS
MARINE PACKAGE

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Office: TAMPA
Design By:
Drawn: ACK
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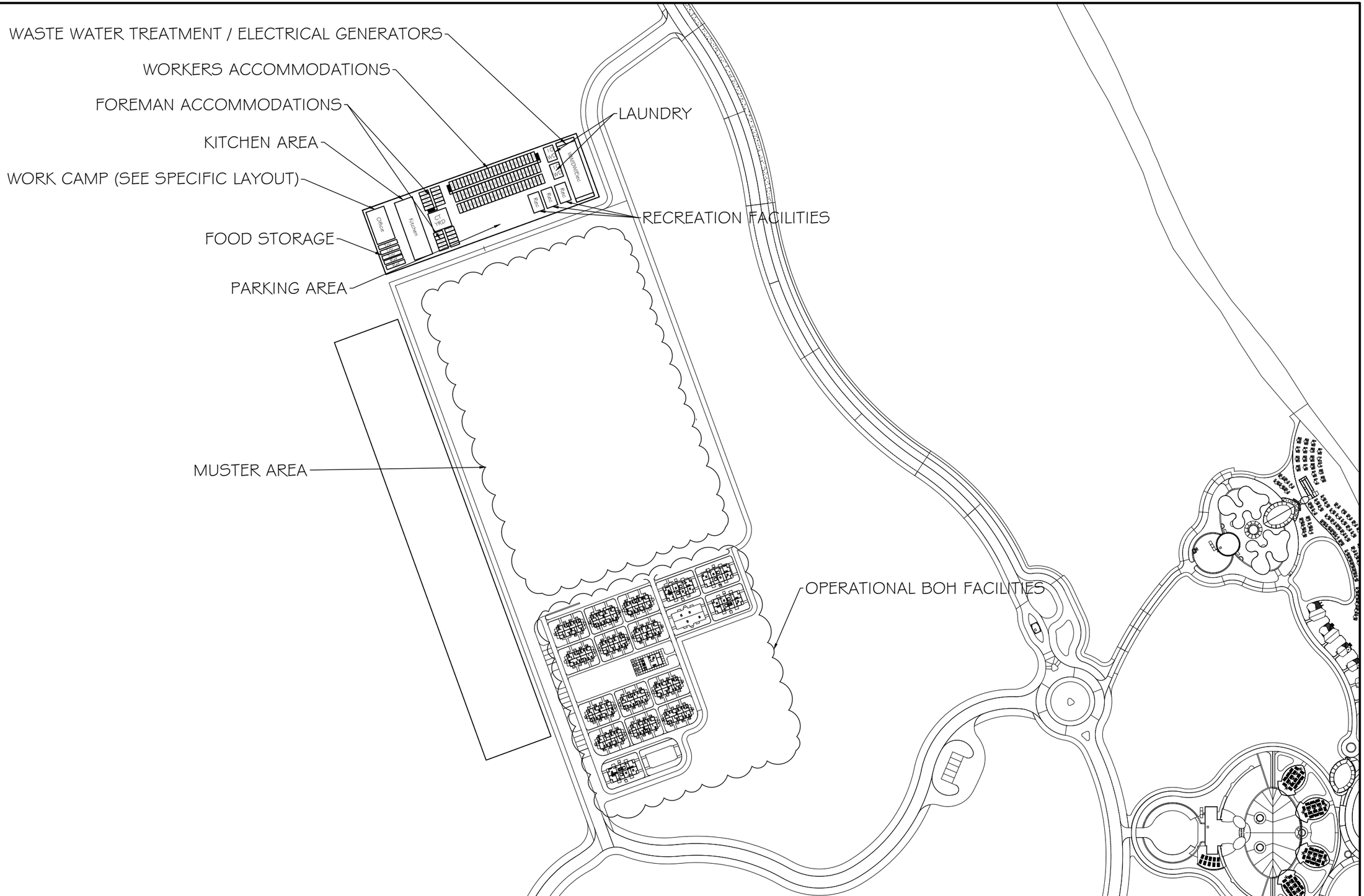
Date: 09/13/21
Date:
In Charge Of: JONATHAN YATES

EMP LAYOUT DRAWINGS
BASE OF PIER STORAGE AREA

American Bridge
Region: SOUTHEAST

AB Job Number: 516910
Rev: 0
Sheet Number: 4



DCL ISLAND DEVELOPMENT, LTD.
PROJECT LIGHTHOUSE POINT
SOUTH ELEUTHERA, BAHAMAS
MARINE PACKAGE

STATE | COUNTY

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Revisions

Office: TAMPA
Design By:
Drawn: ACK | Checked:
Date: 09/13/21 | Date:

EMP LAYOUT DRAWINGS
BOH WORK CAMP AREA

In Charge Of: JONATHAN YATES

American Bridge

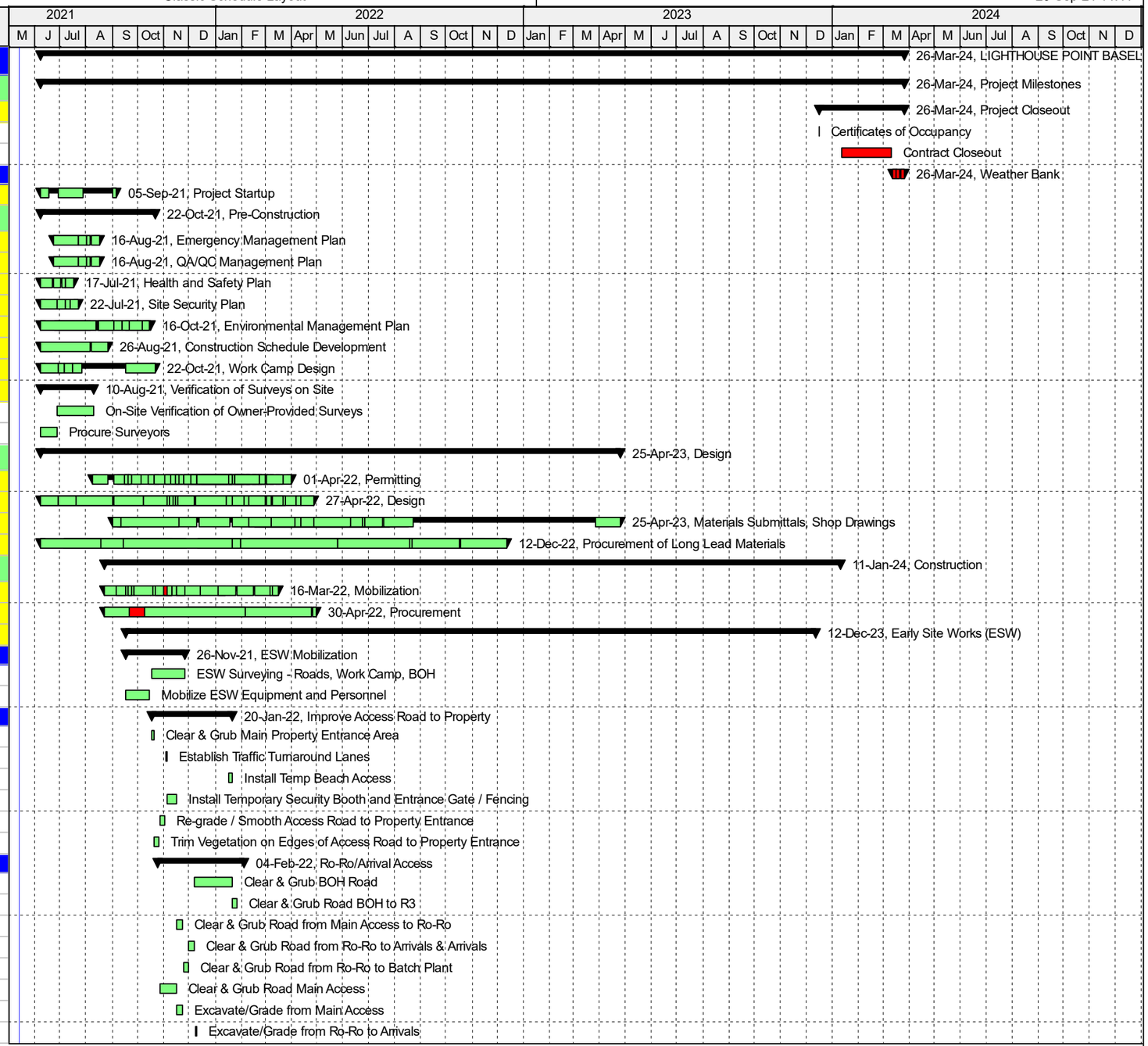
Region: SOUTHEAST

AB Job Number: 516910
Rev: 0
Sheet Number: 5

Appendix I

Project Construction Schedule

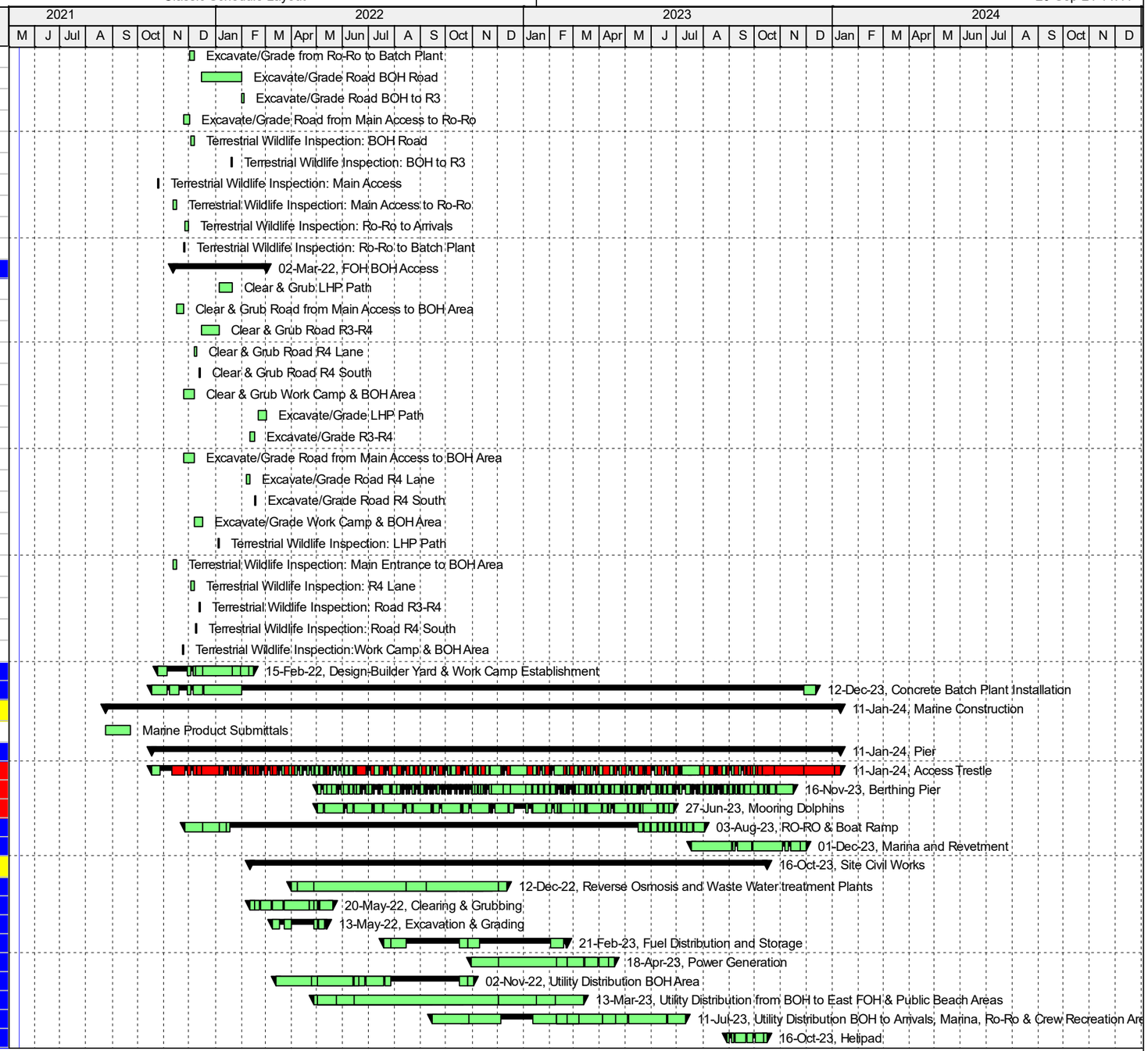
Activity ID	Activity Name	Start	Finish
LIGHTHOUSE POINT BASELINE SCHEDULE R3 20210		08-Jun-21	26-Mar-24
Project Milestones		08-Jun-21	26-Mar-24
Project Closeout		16-Dec-23	26-Mar-24
MLST.0800	Certificates of Occupancy	16-Dec-23	16-Dec-23
MLST.0900	Contract Closeout	12-Jan-24	11-Mar-24
Weather Bank		12-Mar-24	26-Mar-24
Project Startup		08-Jun-21	05-Sep-21
Pre-Construction		08-Jun-21	22-Oct-21
Emergency Management Plan		23-Jun-21	16-Aug-21
QA/QC Management Plan		23-Jun-21	16-Aug-21
Health and Safety Plan		08-Jun-21	17-Jul-21
Site Security Plan		08-Jun-21	22-Jul-21
Environmental Management Plan		08-Jun-21	16-Oct-21
Construction Schedule Development		08-Jun-21	26-Aug-21
Work Camp Design		08-Jun-21	22-Oct-21
Verification of Surveys on Site		08-Jun-21	10-Aug-21
SV10	On-Site Verification of Owner-Provided Surveys	28-Jun-21	10-Aug-21
SV05	Procure Surveyors	08-Jun-21	27-Jun-21
Design		08-Jun-21	25-Apr-23
Permitting		09-Aug-21	01-Apr-22
Design		08-Jun-21	27-Apr-22
Materials Submittals, Shop Drawings		02-Sep-21	25-Apr-23
Procurement of Long Lead Materials		08-Jun-21	12-Dec-22
Construction		23-Aug-21	11-Jan-24
Mobilization		23-Aug-21	16-Mar-22
Procurement		23-Aug-21	30-Apr-22
Early Site Works (ESW)		17-Sep-21	12-Dec-23
ESW Mobilization		17-Sep-21	26-Nov-21
ESW.MC	ESW Surveying - Roads, Work Camp, BOH	18-Oct-21	26-Nov-21
ESW.MC	Mobilize ESW Equipment and Personnel	17-Sep-21	15-Oct-21
Improve Access Road to Property		18-Oct-21	20-Jan-22
ESW.AC	Clear & Grub Main Property Entrance Area	18-Oct-21	20-Oct-21
ESW.SE	Establish Traffic Turnaround Lanes	03-Nov-21	04-Nov-21
ESW.SE	Install Temp Beach Access	17-Jan-22	20-Jan-22
ESW.SE	Install Temporary Security Booth and Entrance Gate / Fenci	05-Nov-21	15-Nov-21
ESW.AC	Re-grade / Smooth Access Road to Property Entrance	27-Oct-21	02-Nov-21
ESW.AC	Trim Vegetation on Edges of Access Road to Property Entra	21-Oct-21	26-Oct-21
Ro-Ro/Arrival Access		25-Oct-21	04-Feb-22
ESW.CL	Clear & Grub BOH Road	07-Dec-21	20-Jan-22
ESW.CL	Clear & Grub Road BOH to R3	21-Jan-22	26-Jan-22
ESW.CL	Clear & Grub Road from Main Access to Ro-Ro	16-Nov-21	23-Nov-21
ESW.CL	Clear & Grub Road from Ro-Ro to Arrivals & Arrivals	30-Nov-21	06-Dec-21
ESW.CL	Clear & Grub Road from Ro-Ro to Batch Plant	24-Nov-21	29-Nov-21
ESW.CL	Clear & Grub Road Main Access	27-Oct-21	15-Nov-21
ESW.EX	Excavate/Grade from Main Access	16-Nov-21	23-Nov-21
ESW.EX	Excavate/Grade from Ro-Ro to Arrivals	08-Dec-21	09-Dec-21



Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

TASK filter: Normal.

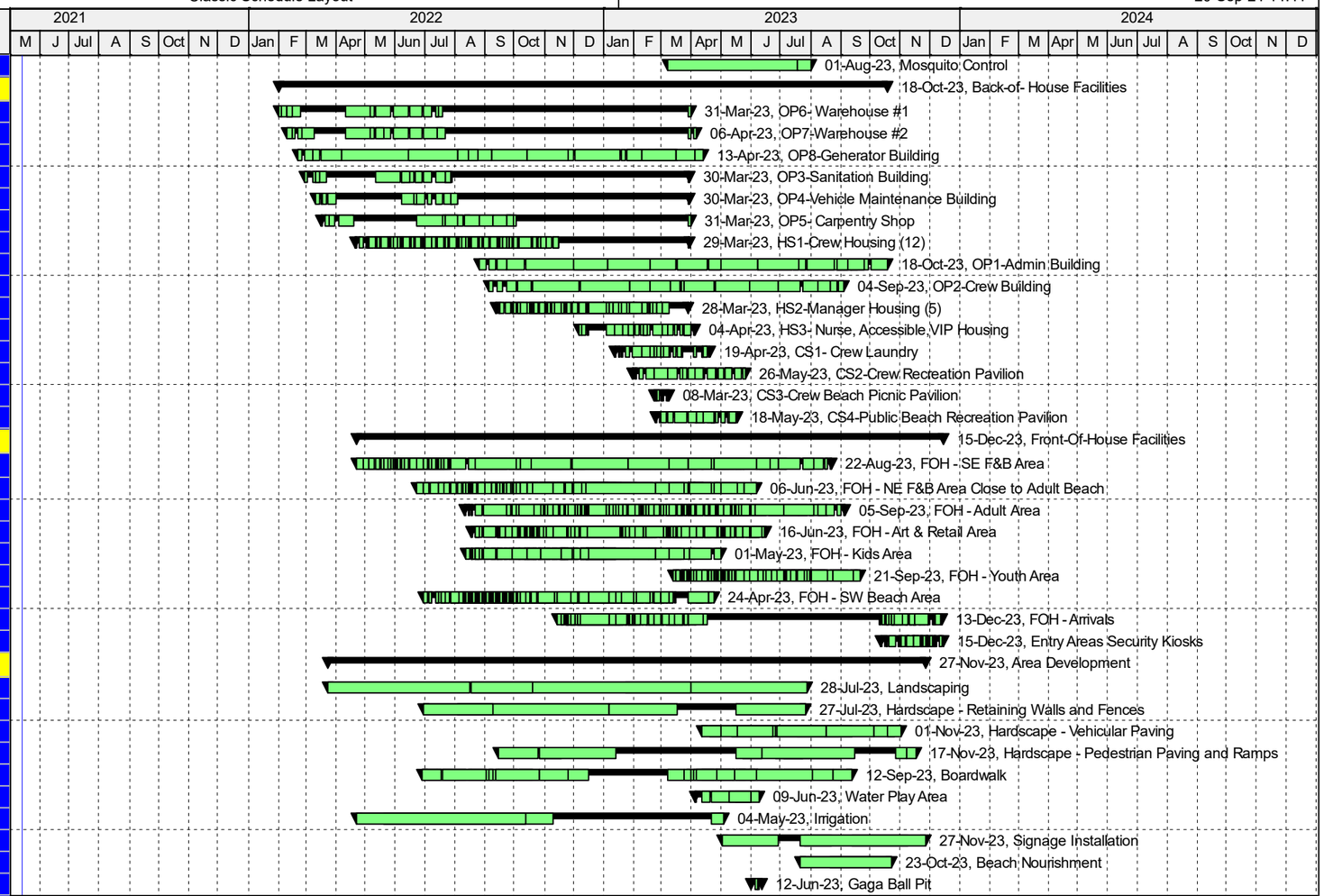
Activity ID	Activity Name	Start	Finish
ESW.EX	Excavate/Grade from Ro-Ro to Batch Plant	02-Dec-21	07-Dec-21
ESW.EX	Excavate/Grade Road BOH Road	16-Dec-21	31-Jan-22
ESW.EX	Excavate/Grade Road BOH to R3	01-Feb-22	04-Feb-22
ESW.EX	Excavate/Grade Road from Main Access to Ro-Ro	24-Nov-21	01-Dec-21
ESW.ISF	Terrestrial Wildlife Inspection: BOH Road	03-Dec-21	06-Dec-21
ESW.ISF	Terrestrial Wildlife Inspection: BOH to R3	19-Jan-22	20-Jan-22
ESW.ISF	Terrestrial Wildlife Inspection: Main Access	25-Oct-21	26-Oct-21
ESW.ISF	Terrestrial Wildlife Inspection: Main Access to Ro-Ro	12-Nov-21	15-Nov-21
ESW.ISF	Terrestrial Wildlife Inspection: Ro-Ro to Arrivals	26-Nov-21	29-Nov-21
ESW.ISF	Terrestrial Wildlife Inspection: Ro-Ro to Batch Plant	24-Nov-21	25-Nov-21
FOH BOH Access		12-Nov-21	02-Mar-22
ESW.CLI	Clear & Grub LHP Path	06-Jan-22	20-Jan-22
ESW.CLI	Clear & Grub Road from Main Access to BOH Area	16-Nov-21	24-Nov-21
ESW.CLI	Clear & Grub Road R3-R4	15-Dec-21	05-Jan-22
ESW.CLI	Clear & Grub Road R4 Lane	07-Dec-21	10-Dec-21
ESW.CLI	Clear & Grub Road R4 South	13-Dec-21	14-Dec-21
ESW.CLI	Clear & Grub Work Camp & BOH Area	25-Nov-21	06-Dec-21
ESW.EX	Excavate/Grade LHP Path	21-Feb-22	02-Mar-22
ESW.EX	Excavate/Grade R3-R4	11-Feb-22	16-Feb-22
ESW.EX	Excavate/Grade Road from Main Access to BOH Area	25-Nov-21	06-Dec-21
ESW.EX	Excavate/Grade Road R4 Lane	07-Feb-22	10-Feb-22
ESW.EX	Excavate/Grade Road R4 South	17-Feb-22	18-Feb-22
ESW.EX	Excavate/Grade Work Camp & BOH Area	07-Dec-21	16-Dec-21
ESW.ISF	Terrestrial Wildlife Inspection: LHP Path	04-Jan-22	05-Jan-22
ESW.ISF	Terrestrial Wildlife Inspection: Main Entrance to BOH Area	12-Nov-21	15-Nov-21
ESW.ISF	Terrestrial Wildlife Inspection: R4 Lane	03-Dec-21	06-Dec-21
ESW.ISF	Terrestrial Wildlife Inspection: Road R3-R4	13-Dec-21	14-Dec-21
ESW.ISF	Terrestrial Wildlife Inspection: Road R4 South	09-Dec-21	10-Dec-21
ESW.ISF	Terrestrial Wildlife Inspection:Work Camp & BOH Area	23-Nov-21	24-Nov-21
Design-Builder Yard & Work Camp Establishment		25-Oct-21	15-Feb-22
Concrete Batch Plant Installation		18-Oct-21	12-Dec-23
Marine Construction		24-Aug-21	11-Jan-24
A40002	Marine Product Submittals	24-Aug-21	22-Sep-21
Pier		18-Oct-21	11-Jan-24
Access Trestle		18-Oct-21	11-Jan-24
Berthing Pier		02-May-22	16-Nov-23
Mooring Dolphins		02-May-22	27-Jun-23
RO-RO & Boat Ramp		26-Nov-21	03-Aug-23
Marina and Revetment		18-Jul-23	01-Dec-23
Site Civil Works		11-Feb-22	16-Oct-23
Reverse Osmosis and Waste Water treatment Plants		01-Apr-22	12-Dec-22
Clearing & Grubbing		11-Feb-22	20-May-22
Excavation & Grading		09-Mar-22	13-May-22
Fuel Distribution and Storage		19-Jul-22	21-Feb-23
Power Generation		31-Oct-22	18-Apr-23
Utility Distribution BOH Area		14-Mar-22	02-Nov-22
Utility Distribution from BOH to East FOH & Public Beach Areas		27-Apr-22	13-Mar-23
Utility Distribution BOH to Arrivals, Marina, Ro-Ro & Crew Recreation A		15-Sep-22	11-Jul-23
Helipad		29-Aug-23	16-Oct-23



Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

TASK filter: Normal.

Activity ID	Activity Name	Start	Finish
	Mosquito Control	08-Mar-23	01-Aug-23
	Back-of- House Facilities	01-Feb-22	18-Oct-23
	OP6- Warehouse #1	01-Feb-22	31-Mar-23
	OP7-Warehouse #2	10-Feb-22	06-Apr-23
	OP8-Generator Building	21-Feb-22	13-Apr-23
	OP3-Sanitation Building	28-Feb-22	30-Mar-23
	OP4-Vehicle Maintenance Building	11-Mar-22	30-Mar-23
	OP5- Carpentry Shop	16-Mar-22	31-Mar-23
	HS1-Crew Housing (12)	20-Apr-22	29-Mar-23
	OP1-Admin Building	26-Aug-22	18-Oct-23
	OP2-Crew Building	05-Sep-22	04-Sep-23
	HS2-Manager Housing (5)	12-Sep-22	28-Mar-23
	HS3- Nurse, Accessible,VIP Housing	06-Dec-22	04-Apr-23
	CS1- Crew Laundry	12-Jan-23	19-Apr-23
	CS2-Crew Recreation Pavilion	30-Jan-23	26-May-23
	CS3-Crew Beach Picnic Pavilion	22-Feb-23	08-Mar-23
	CS4-Public Beach Recreation Pavilion	23-Feb-23	18-May-23
	Front-Of-House Facilities	22-Apr-22	15-Dec-23
	FOH - SE F&B Area	22-Apr-22	22-Aug-23
	FOH - NE F&B Area Close to Adult Beach	23-Jun-22	06-Jun-23
	FOH - Adult Area	11-Aug-22	05-Sep-23
	FOH - Art & Retail Area	17-Aug-22	16-Jun-23
	FOH - Kids Area	12-Aug-22	01-May-23
	FOH - Youth Area	13-Mar-23	21-Sep-23
	FOH - SW Beach Area	30-Jun-22	24-Apr-23
	FOH - Arrivals	14-Nov-22	13-Dec-23
	Entry Areas Security Kiosks	12-Oct-23	15-Dec-23
	Area Development	23-Mar-22	27-Nov-23
	Landscaping	23-Mar-22	28-Jul-23
	Hardscape - Retaining Walls and Fences	30-Jun-22	27-Jul-23
	Hardscape - Vehicular Paving	11-Apr-23	01-Nov-23
	Hardscape - Pedestrian Paving and Ramps	15-Sep-22	17-Nov-23
	Boardwalk	28-Jun-22	12-Sep-23
	Water Play Area	05-Apr-23	09-Jun-23
	Irrigation	22-Apr-22	04-May-23
	Signage Installation	02-May-23	27-Nov-23
	Beach Nourishment	21-Jul-23	23-Oct-23
	Gaga Ball Pit	01-Jun-23	12-Jun-23



Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

TASK filter: Normal.

Appendix J

Marine Substructure Construction

Refer to Section 5.3.1 Trestle Construction – “Lead Crane” for information on Marine Substructure Construction.

Appendix K

Marine Superstructure Construction

Refer to Section 5.3.1 Trestle Construction – “Second Crane for Access Trestle Construction” for information on Marine Superstructure Construction.

Appendix L

Marina and Ro-Ro Construction

The design of the Lighthouse Point Ro-Ro, Marina and Rock Revetment is still under development. Information specific to the design methodology of these structures will be updated in the EMP once it is complete.

Ro-Ro Construction

The equipment required for construction of the Ro-Ro will loaded on barges in the U.S. and towed to Lighthouse Point or placed on a charter ship from the U.S. to Rock Sound. The equipment landing in Rock Sound will then be transported via truck from Rock Sound to the Project site. Since the Ro-Ro will be the main supply access for the project, it is important that the construction begins. Figure 1 and Figure 2 below show the general configuration of the Ro-Ro and the structure as it is intended.

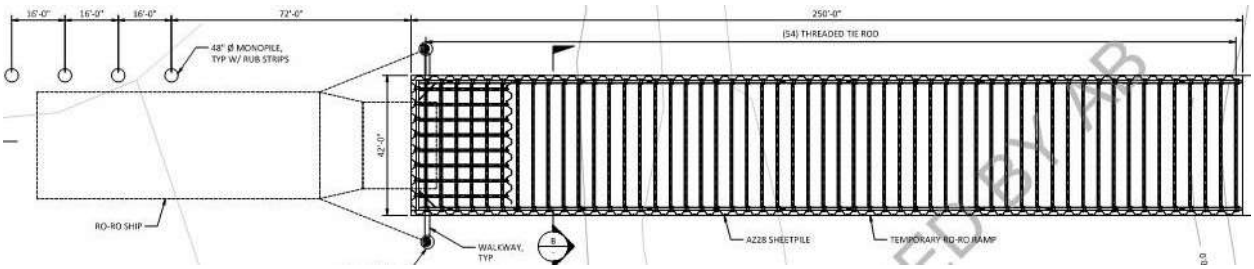


Figure 1: General configuration of the Ro-Ro in plan view.

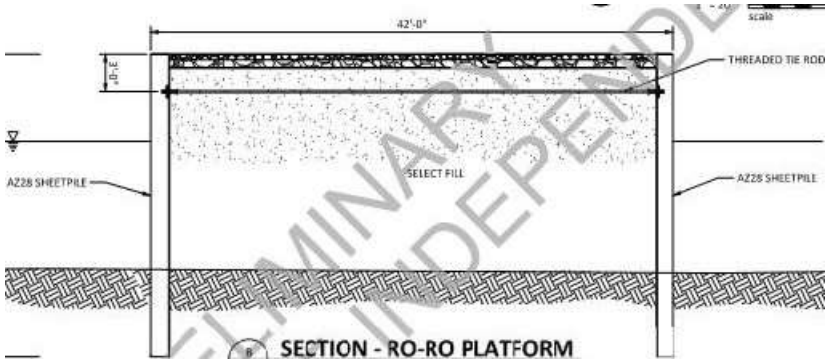


Figure 2: Ro-Ro structure in section view.

Construction will be done using a land-based crane and it will work its way out as the sheet piling is installed. The sheets will be driven with a vibratory hammer to the design grade. We don't anticipate using an impact hammer but there will be one available if a certain situation arises where the sheet

can't get to grade. Both walls of the Ro-Ro will be driven to keep the leading edges relatively close. Clean fill will be dumped from land and pushed out between the sheet pile walls to an elevation just below the elevation of the threaded tie rods. The walers and tie rods will be installed at that point and then more fill will be pushed in to reach final grade. The sheet pile, threaded ties and sand will continue in unison, progressively being installed working out to the design end of the Ro-Ro until the water depth reaches 10 ft. For the entire duration, there will be floating turbidity curtain containing the open end of the fill process to control turbidity within the areas to be filled. Turbidity levels will be monitored three (3) times per day during active marine construction where turbidity is created. If turbidity exceeds 29 NTU above natural levels, works will be stopped until sediments have settled below 29 NTU and before work can commence again (See Appendix Q: Daily Construction Related Monitoring Locations and Protocol). Turbidity measurements will be taken 250m upstream and 250m downstream from the works taking place.

Once the sheet pile walls have reached the design length and water depth, a front wall will be installed to connect the 2 side walls. This will close the structure and allow the remaining to be filled in and supported with the internal tie rods. The top elevation will be graded off and the structure will be available for unloading materials and equipment form barges and Ro-Ro vessels that arrive to the project.

Rock Revetment Construction

The rock revetment is planned to be a typical trapezoidal section of rock placed as a breakwater to protect the Marina. Rock will likely be imported from Freeport, Bahamas and barged to the Ro-Ro at Lighthouse Point. Rock will be unloaded at the Ro-Ro and trucked to the base of the pier where an excavator will be placing the rock. Survey will place PVC poles online at the top of slope and at the toe of slope. The marine biologists will then confirm there is no marine life within the footprint of the breakwater. If any is found, there will be relocation to a safe habitat.

The excavator will grab the rocks and begin placing within the limits represented by the PVC poles. The material will build in height towards the middle of the footprint and will gradually expand from the toe of slope to the middle top of slope. As the rock is built up, the excavator will gradually walk out onto the rock and continue to grab rock from behind as it is delivered and places it forward. The excavator will progress forward, building its way out to the outer limits of the breakwater design.

During the revetment construction, the rock will be stockpiled. During stockpiling, silt fence will be installed outside the perimeter of the pile to guard against any runoff contamination. The area outside the limits of the slopes and ahead of the excavator will have turbidity barrier to protect the areas outside of the work zone from turbidity. The equipment will be regularly checked during the day to ensure there are no leaks and the equipment isn't a source of pollution. Once the rock is installed the equipment will be removed along with the turbidity barrier.

Appendix M

Upland Construction

Clearing and Grubbing

There will be two start points for the clearing works. One operation will progress from the main entrance guard shack to the east and the other will progress to the south towards the Ro-Ro location.

The clearing to the east will follow the permanent design of the perimeter road and allow access to the public beach and continue to the Back of House (BOH) location (see Figure 1). The BOH area will be cleared and graded for the construction of the temporary housing and preliminary building pads for the permanent facility buildings. The road and BOH are along uncleared areas, and the debris will be stockpiled and disposed of with an air burner.

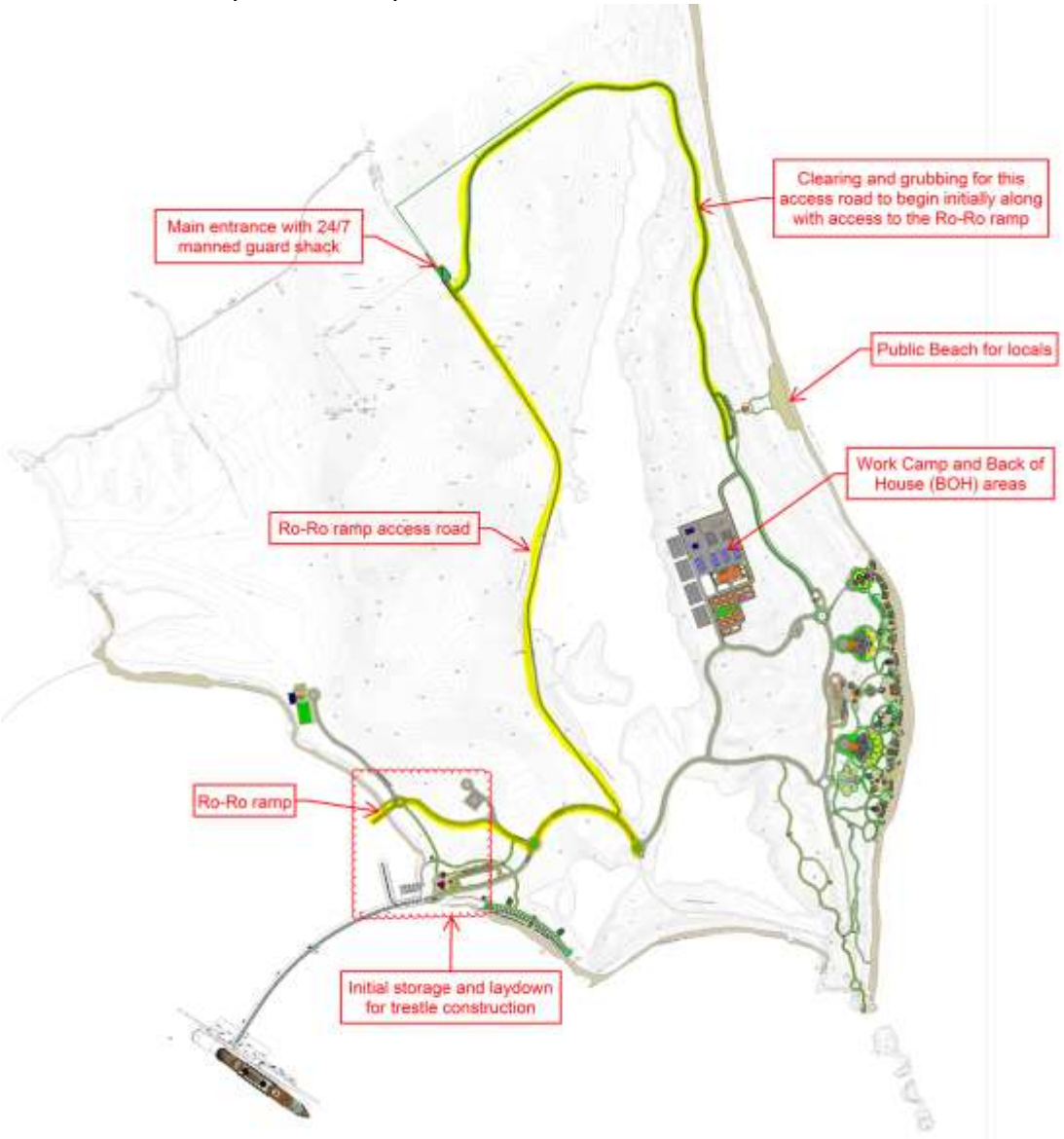


Figure 1: Lighthouse Point Upland Construction Plan

The clearing to the south towards the Ro-Ro ramp will follow an existing road that will require grading and widening for equipment access (see Figure 1). At the farthest southern point of the existing road, the clearing will follow the designed road location to the west to the Ro-Ro location. The road will be widened and graded where the road is existing, and the remaining will be cleared and grubbed. At the location where the permanent pier is located, an area will be cleared and graded, which will serve as a temporary laydown area and a location to construct the temporary trestle spans for the pier construction.

Clearing and grubbing of the road will continue to the Ro-Ro location and areas cleared per the final plan. All debris will be stockpiled and disposed of using an air burner.

Trenching/Dewatering

Dewatering is not anticipated to be required for this area. The site is 15 ft. above sea level and any trenching and excavation will be within 10 ft. However, if ground water is discovered during trenching works, the following protocol will be adhered to in order to remove the water from the trench:

1) Conduits and pipe for the relevant utility will be installed at specific locations within the trench. Conduits will be appropriately bedded prior to placement.
2) Concrete structures for pull, junction, and valve boxes will be cast-in-place at specific locations, using wooden formwork, reinforcement and concrete from batching plant.
3) The excavated trench material of processed material will be used for backfilling of trench, with warning tape placed at specific locations above relevant utility. Backfilling will be by using traditional methods of backhoe, plate compactor, and roller.
4) Conduits and pipe for the relevant utility will be installed at specific locations within the trench. Conduits will be appropriately bedded prior to placement.
5) Concrete structures for pull, junction, and valve boxes will be cast-in-place at specific locations, using wooden formwork, reinforcement and concrete from batching plant.
6) The excavated trench material of processed material will be used for backfilling of trench, with warning tape placed at specific locations above relevant utility. Backfilling will be by using traditional methods of backhoe, plate compactor, and roller.
7) The suction hose will be placed into the lowered end of the trench, the end of the discharge hose will be placed in a vacant area; and the pump will be turned on (see Figure 2 below).

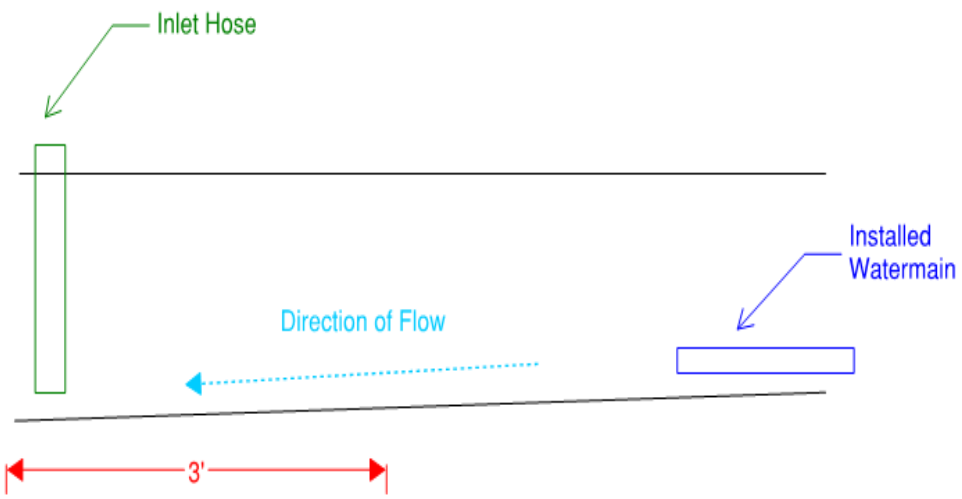


Figure 2: Trenching/Dewatering Sketch

8) The trench will be kept to an appropriate length, to ensure the dewatering is satisfactorily carried out.
9) After the trench is sufficiently dried, the trench will be bedded and the utilities will be installed.
10) The trench will be backfilled toward the sump where the suction hose is located to ensure the water can continuously moves toward the lowered end and can subsequently be removed from the trench.

Karst Formations

The EIA identified that Karst formations are a dominant geomorphology of the site. There is the potential to encounter formations during trenching and excavation. During the geotechnical investigations dissolution holes were discovered but they are outside of the construction zone. In the event that any formations are discovered during construction activities, work will cease immediately. The area will be recorded for mapping and reported to the Project Engineer. Each formation will be evaluated to determine the best method of treatment.

Construction

After the clearing and grading of the initial access roads, maintaining beach access for the public is of great importance (see Figure 1). The guard shack will control all access to the project and employees and will be monitored through an RFD system. Public visitors to the beach will be signed

in and out due to safety concerns and to know who is on property in case of an emergency. The site will be marked with highly visible signage to control the traffic flow and to ensure the public knows where to proceed for their access. A camera system will be used to monitor areas and will be accessed by the onsite security as well as video taken and saved for record purposes. Figure 3 shows the proposed camera locations for overall site safety and time lapse monitoring to record progress as the project develops. Security will have access to the live camera feeds along with designated supervisory personnel.

Figure 3: Lighthouse Point Proposed Camera Locations

Sediment and Erosion Control Plan

The purpose of the control plan is to ensure control measures are in place to minimize erosion, contain excess storm water runoff, and prevent any offsite sedimentation. The control measures should be defined prior to construction taking place and carried out at each step to mitigate sediment loss and potential contamination to the environment.

To ensure sediment is controlled in upland works near the wetland areas, a 40 – 200 ft. buffer will be established between works and the identified ponds. Silt curtains will be the primary prevention measure implemented but other measures will be included as necessary during construction activities.

The Control plan should encompass the entire site where soil will be disturbed. It should include installation and maintenance practices to control any anticipated erosion and prevent the increase in sediment loss and runoff from site.

Erosion Control is often referred to as a soil stabilization. It consists of source control measures that are designed to prevent soil particles from being transported in storm water runoff. Erosion control protects the soil surface by covering and or binding soil particles.

- *Preservation of existing vegetation*: The contractor shall protect and preserve existing vegetation within the project area if practicable before removing. If possible, vegetation adjacent to all the work areas. The protection of the vegetation will help to control erosion and filter out sediment. The limit of works will be determined prior to commencement of clearing to reduce the possibility of overclearing.
- *Soil binders*: Applying soil binders to disturbed soil surfaces that may be left temporarily to prevent water and wind induced erosion of exposed soils.
- *Geotextiles and mats*: Exposed, disturbed areas (stockpiles) shall be temporarily covered with plastic covers, matting, or rolled erosion control products at the end of each day and prior to rain (see Photo 1).

Photo 1: Geotextiles

Sediment Control measures are intended to compliment erosion control measures and help reduce sediment discharges on active construction sites. The controls are designed to intercept and settle soil particles that can be transported by water. The measures this project will implement are:

- *Silt Fence*: A temporary sediment barrier stretched across and attached to supporting posts, trenched in and supported with a wire mesh fence (see Photo 2). Inspection of this silt fence should be done periodically by contractor. See Figure 4 for the locations where silt fence will be installed on the Project site to control sediment during upland construction activities.
- *Fiber rolls*: These rolls may be installed along the perimeter of the project are and as designated on the control drawings (see Photo 3). They must extend and to cover the entire disturbance area around the site. The rolls must be trenched and backfilled into the ground ¼ to 1/3 the thickness of the roll. Fiber rolls can be staked into ground using wood stakes with a minimum length of 24 inches, spaced at a maximum of 4 feet. If fiber roll is placed in a row, the rolls should be overlapped, not abutted. Any sediment buildup behind the fiber rolls, shall be removed.
- *Gravel Bag Berms*: May be used in place of fiber rolls on impervious surfaces (see Photo 4). Bags should be stacked two bags high, if it has become clogged with sediment it will

need to be replaced. Sediment detained by check dams shall be removed when the sediment is 1/3 the height of the check dam or as directed by the contractor.

Photo 2: Silt Fence

Photo 3: Fiber Rolls

Photo 4: Gravel Bag Berms

Figure 4: Planned Silt Fence Installation Locations at Lighthouse Point

Stormwater Management is a major component in controlling sediment and erosion. A drainage system will be installed during the initial phase of construction. This will include the installation of swales and drainage wells. The swales and drainage wells will serve to:

- Trap and remove sediments and other pollutants prior to entering the groundwater system.
- Reduce peak runoff velocity and promote infiltration by reducing the ponding time of stormwater.
- Reduce erosion.
- Provide for some groundwater recharge.
- Transmit surface water underground and drainage wells will reach to a depth of 150 ft.

The following best management practices will be followed.

Prior to Construction:

- Identify and protect critical vegetation including trees, associated rooting zones and vegetation areas.
- Identify vegetative buffer zones between the site and sensitive areas, and other areas to be preserved. For example, near the wetland areas the buffer zone is no less than 50 ft.
- Hold a pre-construction meeting to discuss the specifics of erosion and sediment control measures and construction limits.
- Ensure that all construction staff have been trained.
- Establish material and waste storage areas, concrete washouts, and other controls prior to start of construction activities.
- Review any soil surveys and the accompanying geological investigations. Map out any areas on the project site with limitations e.g. flood plains, steep slopes, existing bodies of water and unstable soil. Designate any natural vegetation and trees to be left undisturbed during construction. Note that natural vegetation helps to control soil erosion.

Good Housekeeping:

- Inspect containment structures prior to rainfall and prior to and during use.
- Required repairs must be done before a rain event, and in a timely manner.
- At the end of a shift or after use, ensure containment structures and the general work areas are clean.
- Properly dispose of all wastes.

Site Access Areas:

- Stabilize site entrance and exit access roads prior to start of construction.
- Grade the construction exit/entrance to prevent runoff from leaving the site.
- The material used should be able to support the weight of the traffic to and from the site.
- Access areas should be inspected periodically and repaired as needed.

Dust Control:

- The immediate excavation area is to be mist with a water spray to prevent airborne dust particles. During dust generation activities, perform continuous water spraying or use of a water truck.
- While spraying, be sure to prevent ponding and/or generation of runoff that could potentially reach storm drains inlets.

Concrete Management:

- Capture all runoff from curing operations in a lined or otherwise impervious containment area.
- A concrete washout station will be established near the batch station.
- Residual from concrete and asphalt concrete saw-cutting operations should not build up and will be removed with a commercial vacuum.
- All water bodies, wetlands and sensitive vegetation areas will always be protected during concrete operations.
- During or just before rain events, concrete disposal or work must not be performed.
- Prevent wash out from mixers, buckets, mortar boxes, and tools from spilling onto bare ground.
- Minimize the amount of water used during coring/drilling or saw cutting.

Materials Delivery and Storage:

- Grade the area or construct a low berm to prevent run-on of stormwater and runoff of spills or provide a roof/seal/door skirt to keep out rain.
- Construction materials must be neatly always stored onsite. Storing materials together in a staging area will make it easier to cover them to prevent runoff caused by wind or rain.

- Store materials away from high traffic.
- Keep chemicals in their original labelled container.
- Chemical storage areas must have spill kits.
- Materials must be labelled.
- Petroleum products (fuels and oils) and other chemicals should be stored in approved containers and should not be overfilled. Containers should be placed in temporary containment facilities for storage.
- Compressed gases are to be labelled with contents and secured from falling.
- Oxygen cylinders are to be stored at least 25 feet away from fuel.
- There is to be a secondary containment for hazardous materials, liquids and solids. Design secondary containment for outdoor storage areas to contain a spill from the largest individual vessel. If the area is open to rainfall, design secondary containment to include the volume of a 24-hour rainfall.

Stockpile Management:

- Stockpiles will be stored onsite. During the rainy season, these stockpiles are to be covered with a tarp each day or surrounded by a temporary barrier for containment.
- When in use, all exposed soil piles will be sprayed with water periodically to prevent excessive dust.

Spill Prevention and Control:

- In preparation of a potential spill, locate and clearly label spill-kits and disposal containers.
- Appropriateness of the response is determined by the quantity and/or composition of the spilled substance as follows:
    - Small quantity of oil, gas, paint, etc., that can be controlled by the first responder at the scene. Instructions: contain the spill, recover the spilled material, clean the spill area and dispose of cleanup materials appropriately.
    - A moderate spill can be controlled by the first responder with the aid of another person, and the spill may require the stopping of all other activity. On impermeable surfaces, surround the spill with absorbent material to contain it. Clean spill using absorbent material. On dirt areas, construct an earthen dike to contain the spill. Dig

up contaminated soil and dispose of properly. If spill occurs in rain, cover spill area to prevent contaminating stormwater runoff.

- Major Spill cannot be controlled by personnel in the immediate vicinity. In the event of a significant spill the discharger should immediately contact the required authorities.

Monitoring and Reporting:

- There will be daily inspections of all construction site works.
- All major issues such as spills, over clearing etc. will immediately be reported to the EMT.
- All handling of waste materials is to be recorded and reported to the EMT.
- All inspections are to be included in the monthly reports to DEPP.

Appendix N

Excavation Plan

Method Statement for Excavation Activities

The construction of the pier at Lighthouse Point does not require any dredging activities. There will be minor excavation works, limited to the construction of building foundations, as outlined below:

Excavation:

Prior to the commencement of works a surveyor will conduct the site survey to mark and/or stake-out the lines and levels of the objective excavation for foundations as indicated in approved drawings. This ensures that the area to be excavated will be properly marked and cleared prior to work commencement. The surveyor will also periodically check the excavation depths to avoid over-excavation. No excavations greater than 6 ft. are anticipated for the Project.

The works will be carried out by an excavator who will be responsible for loading dump trucks and moving the material to a designated stockpile area. The edges of the excavations will be benched to a slope of 30 degrees on the sides of any excavation deeper than 3 ft. This will eliminate the potential for a cave-in on workers.

For all excavation activities, adequate safety barriers and advance notice will be used. All works will be inspected during compaction. The compaction test report will be submitted to the Engineer for approval prior to proceeding to succeeding work.

Backfilling Work:

After completion of the compaction under blinding, tie beams and ground slab, backfilling will occur using similar excavated material. Care shall be taken to remove bolder, vegetation and any other deleterious materials. Prior to backfilling, the compacted surface shall be accepted by the Engineer. Once the sub-grade is accepted, the excavated materials or approved material source will be placed in layers, compacted, and tested when the surface level is ready. In-situ dry density test (compaction test) shall be performed at the rate indicated in the specification. Backfilling followed with compaction will continue till the final level is achieved.

Safety:

All works shall comply with safety procedures and instructions as outlined in the Health and Safety Precautions and Response Plan (see Appendix T: Health and Safety Precautions and Response Plan). Basic Personal Protective Equipment (PPE) will be worn by all staff. Trained operators and

staff will be engaged to control or operate heavy equipment and machinery. Any active trenches or excavation sites will be secured with a barrier of caution tape and/or fencing and made apparent with reflective cones and lighting when unattended.

Appendix O

Pile Driving Guidelines

The Pile Driving Guidelines for the Lighthouse Point Project are still under development alongside the ongoing foundation design. Once the final design has been established, pile sizes, driving criteria, tolerances, and hammer type and size will be updated in the EMP. Pile driving activity will follow best management practices as outlined in the EMP.

Appendix P

Reporting Templates

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

Nonconformance 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	☐ Marine Environment
(attach photos on separate page)	☐ 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:	

Incident Report Form

Date of Incident		**Time of Incident**	

TYPE OF INCIDENT

	Chemical Spill		Excessive air emission		Sediment		Excessive vegetation clearing or damage
	Sanitary Spill		Excessive Noise		Flood		Protected vegetation damage
	Waste Management		Excessive Odor		Fire		Fauna Injury

Details of Incident

Response to Incident

Measures to prevent reoccurrence

Name:	Position:
Signature:	Date:

Spill Report Form

Project		**Location**	
Date of Incident		**Time of Incident**	
Name & Title of Observer			
Agency Notified		**Notification Time**	
Type of Material Spill		**Quantity Spilled**	
Details of spill			
Response to Spill			
Measures to prevent reoccurrence			
Name:		Position:	
Signature:		Date:	

Hazardous Material Report Form

Reporting Party's Name:	
Position:	
Address/City/State:	
Phone:	
Description of hazardous material (including nameand any unique formula identifiers (UFIs) for the containers):	
Weight or volume of material disposed of:	
Location where material was collected:	
Location where material was disposed of:	
Summary of disposal method:	
Name and position of licensed contractor disposingof material:	
Signature of licensed contractor:	
Date of disposal:	

A copy of the signed receipt from the licensed facility where the hazardous material wasdisposed of should be attached to this form.

Lighthouse Point Project - Environmental Monitoring Checklist

Site Description		**Weather Conditions**	
Location		**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 freshwater drinking available?				
2	**Waste Management**				
a	Is good housekeeping practiced on site?				
b	Are appropriate storage containers being used and properly labelled?				
c	Are litter bins conveniently placed throughout the site?				
d	Is waste collection needed?				
e	Is hazardous waste separated in laydown area?				
f	Is spill response equipment on site and easily accessible?				
g	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 refueling 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 appropriate, 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?				
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 refueling operations a minimum of 100 feet from any excavations withexposed groundwater?				

6	Portable Potties/Restroom facilities			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**	**YES**	**NO**		
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 refueling 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**			**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 buildup 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 theconditions and remarks cited by the above Environmental Manager.	Signature: Date:

LIGHTHOUSE POINT PROJECT DAILY LOG – TURBIDITY MONITORING

Report Date:	Report No.:	Rev. 0

1. TEST POINTS

1
2

2. MONITORING

Point	Time	Eastern	Western	NTU	Additional Information
1					
2					

3. METEROCEAN CONDITIONS

Point	Wind Speed (Kts)	Wind Dir	Current Dir	Additional Information
1				
2				

4. TIDE

	High		Low	
Time				

5. REMARKS

Contractor's Representative:	Witness:
Position:	Position:

Appendix Q

Daily Construction Related Monitoring Locations and Protocol

Q1. Introduction
Q2. Approach and Requirements of the Turbidity Monitoring
Q3. Summary of Turbidity Monitoring Requirements
Q4. Pre- and Post-Project Survey of Key Resource Sites

Q1. INTRODUCTION

Management Techniques

The following are management techniques to address turbidity monitoring in relation to all water-related construction works that may have an effect on the marine environment. These management techniques may also be implemented in the event of failure of the monitoring buoy equipment planned for use during the construction of the Project. Works will be conducted according to specific method statements outlined in Appendix B: Marine Benthic Resources Monitoring Plan.

Training:

- **Site Induction:** Potential impacts associated with marine environment management will be included in the site induction training to be administered to all personnel on site before commencement of any works.
- **Toolbox Talks:** Toolbox talks, or on-site meetings, outlining the works methodology will be administered before the execution of tasks to ensure that all personnel involved understand the potential impacts and how works are to be executed to avoid or minimize identified impacts.

Q2. APPROACH AND REQUIREMENTS OF THE TURBIDITY MONITORING

Turbidity Control Plan

Turbidity is a measure of the degree to which water loses its transparency due to the presence of suspended particulates. The more total suspended solids in the water, the higher the turbidity. Waterborne sediment not only affect water clarity but can also collect on marine flora and fauna resulting in suffocation and eventual death of organisms. Turbidity control will be managing in three ways: 1. Control of the amount of turbidity from the source (source control), 2. Containment of sediment released and 3. Monitoring of sediment levels.

Control:

- The first effort will be to limit the amount of turbidity generated due to the activity.
- Every effort will be made to conduct works during favorable weather conditions.
- The Contractor will monitor weather conditions and the turbidity generating activity will temporarily cease if weather conditions are unfavorable; resulting in turbidity levels that are at or near the established threshold (see monitoring section for threshold details).

Containment:

- Turbidity curtains will be utilized during the Ro-Ro construction and will be deployed prior to activities.
- Turbidity generated by construction activities will be contained by the installation of turbidity curtains.
- A turbidity curtain is a floating sediment control barrier that is installed in water bodies to contain suspended sediments associated with construction activities. The curtain is a flexible material that extends downward from the water surface and is maintained in a vertical position by floatation material at the top and an anchoring mechanism at the bottom. Turbidity curtains control sediment through settlement. The curtain acts as a containment barrier for suspended sediment and allows particles to settle (see Figure 1 sample turbidity curtain detail).
- The Contractor is to provide specification for turbidity curtains to be used which will have a skirt raised one foot off the seafloor during high tide.
- The locations for the turbidity curtains placement have been included in the monitoring location plans which illustrates curtain placement that fully enclose the work zone.
- The Contractor will provide a detailed method statement for the installation of the turbidity curtains.

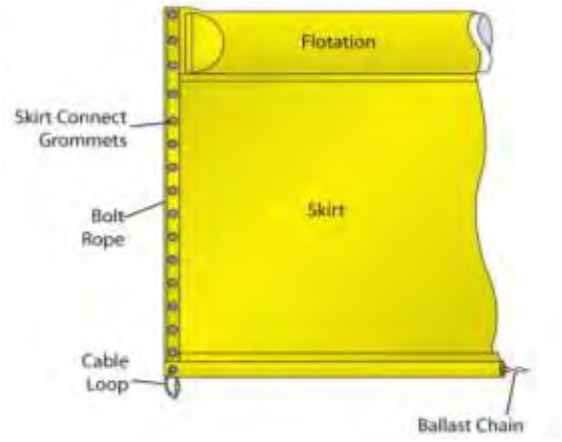


Figure 1**:** Sample Turbidity Curtain Detail

Turbidity Curtain Installation Steps:

1. Lay out sections of turbidity curtains on land.
2. Connect sections until the required length is achieved.

3. Sections will be securely connected in accordance with the manufacture's recommendations for the brand.
4. The assembled curtain will be carried or towed to the desired location and set in place according to the approved placement site plan.
5. Anchor the curtain as per the manufacturer's specifications for the product.
6. Release the panels when the turbidity curtain is in the desired position and anchored.

Protocol for Inspection of Turbidity Curtains:

- Turbidity curtains will be inspected after installation and daily before the start of works to ensure that there are no breaches in the connection points that would allow sediment to escape.
- Boat visual inspections will be conducted along the path of the turbidity curtain.
- In water swimming inspections will be conducted along the path of the turbidity curtain for the presence of marine organisms that may have entered the work zone overnight.
- If damage or weak points are noted, repairs will be made as needed prior to commencement of works.
- Divers will be equipped with underwater cameras to capture any breaches observed and will share image with the construction team and the EMT to discuss repair needs.
- If there is a breach in the curtain during the execution of works, activities will be stopped immediately, repairs will be made and works recommenced after a turbidity reading below the prescribed threshold is achieved.

Q3: SUMMARY OF TURBIDITY MONITORING REQUIREMENTS

Turbidity Monitoring Protocol:

- Turbidity is measured in NTU: Nephelometric Turbidity Units.
- The instrument used for measuring Turbidity is called nephelometer or turbidimeter.
- Baseline turbidity levels will be established by taking readings one week prior to the start of works.
- The established threshold for turbidity levels is 29 NTU above background readings.
- Turbidity monitoring readings will be taken 3 times per workday.
- The Environmental Manager will oversee operations and request additional monitoring reading based on visual observation of turbidity levels during execution of works.

- Turbidity readings will be undertaken by the Contractor and witnessed by the Environmental Manager.
- Measurements will be conducted during the active working operations.
- Monitoring will be conducted for the duration of the turbidity generating activity.
- If test results are near prescribed levels, operations/methodology will be modified as needed.
- If test results exceed prescribed levels, in-water construction activities will temporarily cease until turbidity has settled and a turbidity reading is taken that indicates levels are below the prescribed threshold.
- Works methodology will also be adjusted in response to excess turbidity e.g., work will cease during periods of intense wave activity contributing to excess turbidity.
- Installation of turbidity curtains for prolonged periods can result in stagnant waters enclosed in the curtains and will be removed upon completion of works.
- All sediments within the turbidity enclosure will be allowed to settle out before removal of turbidity curtain.

Q4. PRE- AND POST-PROJECT SURVEY OF KEY RESOURCE SITES

Turbidity Measurement Protocols:

- The turbidity meter will be calibrated at the beginning of each sampling session.
- Samples will be taken at the densest part of the turbidity plume.
- Mixing zone
- Samples will be taken two feet from the surface of the water.
- Samples will be taken at 250m upstream and downstream from the construction works.
- Daily monitoring logs will be kept.
- Turbidity monitoring will be included in the monthly environmental report submitted to DEPP by the Environmental Manager.

Potential Impacts:

Potential impacts to marine organisms as a result of the works include:

- Animals crossing the turbidity barrier and entering the work zone into the area of impact can sustain damage or death by dredging equipment.
- Animals may become entangled in ropes connecting turbidity curtain sections and sustain injury or death.

The following practices will be implemented to mitigate the potential for harm to marine organisms during dredging:

- The benthic area inside the turbidity curtain will be inspected at the start of each workday for the presence of marine organism that may have entered the work zone overnight.
    - If a marine organism is present in the work zone, the Environmental Manager will be notified, and a section of the turbidity curtain will be opened to allow the animal to safely leave the area. The turbidity curtain connection will be reestablished, and work will be allowed to commence after all outer daily safety inspections and check are completed.
- A spotter will be assigned during dredging as a look out to identify marine organism in or near the area of impact.
    - If an animal is sighted works will cease immediately, The Environmental Manager will be notified, and works will remain suspended until the animals have left the area of impact at which time works can recommence.
- If at any point a marine animal is found to be entangled or otherwise impaired by the presence of the turbidity curtain, all activities will cease immediately, and the Environmental Manager will be notified.
    - The Environmental Manager will contact DEPP and Department of Marine Resources (DMR) immediately and log the incident into the BESTPROTECT242 APP.
    - The Environmental Manager will assess the scenario and determine the best course of action to assist the animal based on consultation with DMR and DEPP.
    - Efforts to assist the animal may involve contractors and resources present on site.
    - When the animal has be released, the turbidity curtain will be inspected for damage, and repairs or replacement made prior to recommencement of works.
    - The Environmental Manager will provide a detailed incident report to DEPP and DMR within 48 hours of the incident outline the details and actions taken to address the matter.
    - Repeat occurrence of animals entering the work zone or becoming tramped will be investigated to identify the root cause and actions to prevent reoccurrences.
- The possible presence of marine organisms in work zones will be included in the site induction.
- Protocol for marine organism sightings will be administered as a toolbox talk prior to

commencement of dredging works.

- Signage will be installed indicating the possible presence of marine organisms in the work zone.

Appendix R

Beach Maintenance & Improvement Plan

The work along the East Beach will include the supply, delivery and placement of approximately 30,000 cubic yards of sand above the mean high water level to construct the beach fill. The sand will be sourced from a local company that is permitted to supply sand in an environmentally responsible way and will be permitted in accordance with all requirements set forth in the HOA. The sand will be mined from an offshore location (borrow site) and will generally be free of rubbish, roots and organic matter or other perishable material. The offshore borrow site will be designated as part of the Operational EMP. The surveyor will confirm and monitor the setting out of work for the beach profile.

Sand will be hauled to the beach areas needing new sand using articulated dump trucks, which will unload the sand in heaps. The heaps of imported sand will then be spread to the desired beach profile elevations using track-type bulldozers.

To ensure limited impacts from sand placement a pre-survey will be conducted to determine the limit of works to reduce the disturbance of the surrounding vegetation. As part of terrestrial wildlife surveys, shorelines are inspected monthly to document and protect any shorebird nests (see Section 4.9.3). In addition, one week prior to construction activities in an area (including sand placement), the area will be inspected for the presence of bird nests (see Section 4.1.3.3). The area will also be cleared of any preexisting debris. The debris will be disposed of as per the site waste management plan.

In order to minimally impact the dunes, the project will work to employ best management practices while removing the invasive Casuarina while planning to leave the root system in place for stability along with treating the remaining structure to stunt future growth.

No rock groins are planned for Lighthouse Point. See Appendix L: Marina and Ro-Ro Construction for information on the rock revetment planned for the Project.

The cadence of beach maintenance will be determined once there is a baseline in place to understand the movement of sand. Beach maintenance, including cadence, monitoring, and long term planning, including plans for maintenance in relation to storms and significant weather events, will be designated as part of the Operational EMP. See Appendix G: Water Quality Monitoring Protocol.

Appendix S

Demolition Plan

The scope of this project does not require any demolition.

Appendix T

Health and Safety Precautions and Response Plan

PROGRAM MANAGEMENT

Vision, Mission, Values

The following Vision, Mission, and Values statement defines guiding principles of American Bridge Company and is the foundation of our safety culture.

Vision

Our vision is to maintain a culture that values employee safety above all else.

Mission

To protect the health, safety and welfare of each other through the achievement of a zero incident workplace.

Values

- The achievement of zero workplace incidents is our priority.
- Every Employee must commit and contribute to a safe workplace.
- We will never compromise our employees' safety and health.
- Safety has no hierarchy – "See Something, Say Something, Do Something"

Safety Responsibilities

The following is an overview of the safety responsibilities for American Bridge Company:

A. Vice President – Operations

Responsible for the company's project safety performance. Accountable to the Chief Operating Officer (COO). The responsibilities of the Vice President of Operations are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains 30-hour OSHA Construction Safety Outreach Training certification.
3. Assures implementation of the American Bridge Safety Program in his/her area and seeks progress in the reduction of injuries and illnesses and associated costs.
4. Establishes with his/her management team a clear understanding of each person's safety responsibilities.
5. If deemed necessary, establishes additional control measures, programs, or procedures that will help assist in meeting the area's safety objectives.

6. Reviews at least monthly his/her area's safety performance and holds necessary discussions with staff members regarding same.
7. Makes documented safety observations quarterly for a project in his/her area of responsibility. Initiates corrective actions as necessary.
8. Monitors internal and external safety inspections/audits of the jobs under his/her area of responsibility and follows up to assure immediate corrective actions are taken regarding any identified unsafe conditions or practices.
9. Proposes changes to the American Bridge Safety Program and/or Health and Safety Precautions and Response Plan to improve safety performance or meet new conditions.
10. In the event of a fatality or serious incident, establishes an investigation team.
11. Reviews federal and/or state OSHA safety inspection activity and proposed citations. Discusses inspection results with the Corporate Safety Director and COO.
12. Implements and enforces the Company's discipline procedures.
13. Has the responsibility and authority to stop work in the immediate area when an imminent danger exists.

B. Area Manager

The Area Manager is responsible for the safety performance of the jobs under his/her assignment and is accountable to the Vice President of Operations. The responsibilities of the Area Manager are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains 30-hour OSHA Construction Safety Outreach Training certification.
3. Monitors Project Manager's compliance with the American Bridge Safety Program, and any additional safety/health controls, procedures, programs, etc. developed to eliminate accidents and associated costs.
4. Prior to commencement of each major phase of work on a project, visits the site with the assigned Project Manager and General/Craft Superintendent(s) to discuss the scope of work on the project and potential safety hazards or concerns.
5. Reviews all internal and external safety inspection reports, incident/accident reports, etc., and ensures corrective action, if warranted, is taken.
6. Participates in the investigation of all serious incidents/accidents.
7. Makes documented safety observations monthly for each covered project. Initiates corrective actions as necessary.

8. Reviews the safety performance of jobs under his/her responsibility and develops necessary procedures or control measures if a negative safety trend develops.
9. Implements and enforces the Company's discipline procedures.
10. Has the responsibility and authority to stop work in the immediate area when an imminent danger exists.

C. Project Manager

The Project Manager is responsible for the safety performance of the project under his/her assignment and is accountable to the Area Manager. The responsibilities of the Project Manager are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains 30-hour OSHA Construction Safety outreach training certification.
3. Monitors General/Craft Superintendent's compliance with the AB Safety Program, and any additional safety/health controls, procedures, programs, etc. developed to reduce accidents and associated costs.
4. Conducts a Pre-Job Safety Survey with General Superintendent and Safety Manager.
5. Prior to commencement of each major phase of work on a project, visits the site with the assigned General/Craft Superintendent(s) to discuss the scope of work and potential safety hazards or concerns. Establishes a schedule for the development of safety and health procedures to address necessary procedures or safety controls.
6. Establishes a schedule for the development of Job Hazard Analyses (JHAs) to address necessary procedures or safety controls.
7. Implements and oversees execution of project's substance abuse program.
8. Monitors the projects compliance with all applicable project specific site safety & health programs, OSHA regulations, and contract specifications. This is done in collaboration with the Safety Professional if one is assigned to the project.
9. Makes documented safety observations twice per month of the project. Initiates corrective actions as necessary.
10. Organizes, or sees that the General Superintendent organizes, weekly Safety Meetings with all supervisory personnel (including foreman).
11. Establishes with the project management team a clear understanding of each person's responsibilities.

12. If necessary, establishes additional control measures, programs, or procedures that will help assist in the elimination of unsafe conditions and practices, and the reduction of injuries or illnesses and associated costs.
13. Regularly reviews the accident and incident reports occurring on the project and develops the necessary procedures or control measures if a negative safety performance develops.
14. Reviews any corporate/district or OSHA non-compliance reports and works to assure their resolution.
15. Notifies Corporate Safety of federal and/or state OSHA inspection activity.
16. Notifies and assures copies of federal and/or state proposed citations are provided to Corporate Safety.
17. Participates in the investigation of all serious incidents/accidents.
18. Implements and enforces the Company's discipline procedures.
19. Ensures subcontractor compliance with all applicable American Bridge, federal, state and local rules and regulations.
20. Has the responsibility and authority to stop work in the immediate area when an imminent danger exists.

D. Safety Manager

The Safety Manager is responsible for implementing and following procedures established and assigned by the Project Manager, and to provide the project with technical support and direction in the implementation and promotion of an effective safety culture. The Safety Manager is accountable to the Area Manager, Project Manager, or Corporate Safety Director, as established by the Vice President of Operations. The responsibilities of the Safety Manager are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains 30-hour OSHA Construction Safety outreach training certification.
3. With the assistance of the Project Manager and the General/Craft Superintendent(s), the Safety Manager is responsible for overseeing the implementation or expediting of all applicable safety and health rules/regulations and has the responsibility and authority to take prompt corrective measures and implement additional safety procedures as necessary to eliminate working conditions that are unsanitary, hazardous, or dangerous to employees.
4. Maintains working knowledge of the American Bridge Safety Program and the Health and Safety Precautions and Response Plan.

5. Arranges for and maintains adequate first aid supplies and provide advice and approval of personal protective equipment for the project.
6. Makes a documented safety observation of the project daily. Promptly initiates corrective action with responsible parties as necessary.
7. Ensures that Daily Hazard Analysis (DHA's) are conducted and monitors the quality of the DHA's through periodic attendance and participation.
8. Reports identified safety hazards to Project Manager, General/Craft Superintendent(s), and affected Subcontractor(s) and provides written verification and documentation to the project owner when so required.
9. Participates in or conducts Weekly Toolbox safety meetings.
10. Check job procedure drawings prepared by the area office for accuracy and application to actual site conditions.
11. Participates in federal and/or state OSHA inspection tours if necessary.
12. Conducts or assists in the indoctrination of all new/transferred project/craft personnel as well as assist with safety training and retraining, as necessary.
13. Participates in the development and review of Job Hazard Analysis (JHA's) for adequacy.
14. Participates in the investigation of, and prepares or receives, reviews, and distributes project incidents, reports accidents as may be required by the Project Manager or Construction Manager/Craft Superintendents, and conducts analysis of incidents/accidents/injuries/near misses, and develops or recommends necessary controls based on the analysis.
15. Performs or coordinates the performance of all engineering design required for project specific safety controls such as excavation support, rigging, etc.
16. Ensures subcontractor compliance with all applicable American Bridge, federal, state and local rules and regulations and notifies when safety measures are inadequate or corrective measures need to be taken.
17. Maintains necessary OSHA recordkeeping forms, including the OSHA 300 Form.
18. Implements and enforces the Company's discipline procedures.
19. Has the responsibility and authority to stop work in the immediate area when an imminent danger exists.

E. Project/Field Engineer

Responsible for implementing and following procedures established and assigned by the Project Manager. Accountable to the Area Manager, Project Manager, or General Superintendent as

established by the Vice President of Operations. The responsibilities of the Project/Field Engineer are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains 30-hour OSHA Construction Safety outreach training certification.
3. Assists in the implementation of the American Bridge Safety Program and any safe job procedures or safety controls as directed by the Project Manager and General Superintendent.
4. Makes a documented safety observation of the project weekly. Initiates corrective actions as necessary.
5. Participates in safety meetings.
6. Check job procedure drawings prepared by the area office for accuracy and application to actual site conditions.
7. Participates in federal and/or state OSHA inspection tours when the General Superintendent is unable to accompany the compliance officer(s).
8. If required on an assigned project, conducts or assists in the indoctrination of all new/transferred project/craft personnel.
9. Responsible for implementing and following procedures established and assigned to him/her by the Project Manager.
10. Participates in the development of Safe Job Procedures for unusual or hazardous operations.
11. Participates in the investigation of accidents as may be required by the Project Manager or General/Craft Superintendent.
12. Performs or coordinates the performance of all engineering design required for project specific safety controls such as excavation support, rigging, etc.
13. Ensures subcontractor compliance with all applicable American Bridge, federal, state, and local rules and regulations.
14. Enforces the Company's discipline procedures.
15. Has the responsibility and authority to stop work in the immediate area when an imminent danger exists.

F. General/Craft Superintendent

Responsible for the safe performance of an assigned job or phase of job assigned to him/her. Accountable to the Project Manager. The responsibilities of the General/Craft Superintendent are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains 30-hour OSHA Construction Safety outreach training certification.

3. Participates in the Pre-Job Safety Survey with the Project Manager. Reviews Pre-Job Safety Survey with subordinates as necessary.
4. Enforces all phases of the AB Safety Program, OSHA and contract specifications as well as any other safety and health controls established by the Vice President of Operations, Area Manager, Project Manager, and/or assigned Safety Professional.
5. Participates with the Project Manager in making a safety review prior to the commencement of each major phases of work on a project.
6. General/Craft Superintendent is responsible for the overall implementation and enforcement of applicable safety and health rules and has the responsibility and authority to take prompt corrective measures to eliminate working conditions that are unsanitary, hazardous, or dangerous to employees. This is performed in collaboration with the safety professional when one is assigned to the project.
7. Ensures that all necessary personal protective equipment, job safety materials, and first aid equipment is readily available on the project for the work to be performed.
8. Instructs General Foremen and Foremen of their safety responsibilities.
9. Assigns housekeeping duties to individual assistants and Foremen. Makes daily check of work areas to ensure safety and health procedures are being implemented and housekeeping is being maintained.
10. Organize and conduct weekly safety meetings with all supervisory personnel (including Foreman) if such training is not performed by the Project Manager.
11. Develops and maintains a workable inspection schedule of project tools and equipment.
12. Arranges and participates in documented Weekly Toolbox Safety Training Meetings for all employees under his/her responsibility.
13. Conducts or coordinates indoctrination on new Foremen.
14. Participates in the investigation of accidents and serious incidents. Reviews accidents and major equipment failures with Foremen. Sees that all necessary corrective actions are immediately taken.
15. Conducts or arranges for the safety indoctrination of new hires. Observes new hires to determine whether they are sufficiently experienced and in such physical condition as their job assignment may warrant and instructs other supervisors to do the same.

16. Makes daily documented observations of the project for unsafe conditions, unsafe acts, rule violations, etc. Initiates corrective action if such conditions are observed.

G. General Foremen/Foremen

Responsible for the safety of assigned employees, the safe condition of the assigned work areas, and the safe operation of equipment. Accountable to the General/Craft Superintendent. The responsibilities of the General Foremen/Foremen are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains 10-hour OSHA Construction Safety outreach training certification.
3. Enforces all phases of the established American Bridge Safety Program with all members of his/her crew.
4. Sees to the overall safety of his/her work areas, including anybody, or anything not connected with his/her crew, entering, working in, or leaving the work area.
5. Maintains proper housekeeping in his or her work area.
6. Continually monitors assigned work areas to detect hazards and takes necessary corrective action. Reports to his/her direct supervisor or craft superintendent conditions he/she are unable to correct; including housekeeping, hazards from electrical and other utility lines, traffic, other trades, inadequate guarding, employees working over each other, operations of others, etc.
7. Monitors to ensure that equipment under his or her responsibility is inspected and properly maintained.
8. Communicates with operators of cranes and of other mobile equipment for any defects.
9. Provides safety indoctrination of newly assigned employees on the hazards of the work.
10. Observes assigned employees to see, as far as is possible, whether they are sufficiently experienced, alert, or in good physical condition for the work to be performed.
11. Attends and participates in safety meetings as required by the General/Craft Superintendent; holds his/her own toolbox safety training meetings, at least once a week, with his/her assigned employees - training employees in applicable safety rules, procedures, etc.
12. Investigates all incidents and injuries occurring to his/her assigned employees.
13. Prepares and conducts the Daily Hazard Analysis (DHA) Form with crew members.
14. Conducts safety inspection of his/her work area(s).
15. Immediately reports any incidents or accidents to General/Craft Superintendent. Assists in the investigation of accidents.

16. Ensures subcontractor compliance with all applicable American Bridge, federal, state and local rules and regulations.
17. Implements and enforces the Company's discipline procedures.
18. Has the responsibility and authority to stop work in the immediate area when an imminent danger exists.

H. Craft Persons

Craft Persons are responsible for their personal safety as well as the safety of their co-workers around them. They are also responsible for the safe condition of their work areas and the safe operation of any equipment they may operate. Craft Persons are accountable to the General Foremen/Foremen and/or the General/Craft Superintendent. The responsibilities of Craft Persons are as follows:

1. Exhibit through action and example a sincere attitude toward maintaining a safe workplace.
2. Obtains OSHA 10-hour Construction Safety outreach certification, where required.
3. Attend and participate in the new hire safety orientation. Follows all phases of the established American Bridge Safety Program with all members of his/her crew.
4. Monitors the safety of his/her work areas, including anybody, or anything not connected with his/her crew, entering, working in, or leaving their assigned work area.
5. Monitors assigned work area to detect hazards and takes necessary corrective action. Reports to General Foreman/Foreman or General/Craft Superintendent conditions he/she is unable to correct.
6. Performs all work in accordance with the Construction Work Rules and Code of Safety Practices provided at the new hire safety orientation.
7. Follow the basic safety rules provided for American Bridge employees in American Bridge's Safety Manual booklet.
8. Attends and participates in safety meetings and training sessions as assigned.
9. Properly inspects, uses and maintains all personal protection equipment at all times.
10. Follows and abides by all discipline warnings (whether verbal or written) provided by any supervisor or manager.
11. Maintains a proper and cooperative attitude toward safety among his/her co-workers and company management. Sets a proper example in his/her own observance of safety rules.
12. Has the responsibility and authority to stop work in the immediate area when an imminent danger exists.

Substance Abuse

It is the policy of American Bridge to maintain a work environment that is safe for all employees. As part of this policy, no illegal drugs or intoxicating beverages are allowed in vehicles, any offices, or other work locations including project sites of the Company. Possession or use of any alcohol, mind-altering drugs, or other controlled substances will be cause for immediate dismissal. Employees or others under the influence of alcohol or narcotics shall not be permitted on the project site. In addition, employees will not be permitted to consume alcoholic beverages during their lunch breaks. While prescription drugs are not prohibited, they should not render an employee unfit for duty. Employees shall be subject to reasonable suspicion and post incident drug testing as determined by AB Project Management.

Safety Incentive Program

While safety incentive programs can be used as a tool to improve employee safety attitudes and behavior, it is important that the safety incentive program does not contribute to the non-reporting of injuries.

Incentive programs aimed at reinforcing acts that reduce risk (leading indicators) can be more effective than the traditional incentive program that is solely based on rates of reported injuries/illnesses (lagging indicators). Ideally, the incentive program should focus on changing employee behavior and help employees embrace positive safety awareness and attitudes.

When a project elects to use a safety incentive program, it should be designed to reward employees for safety related behaviors and activities. Below are examples of some leading indicators that should be considered:

1) Identifying/correcting unsafe practices or conditions
2) Interaction and involvement in safety program
3) Attendance at Daily Hazard Analysis and Toolbox Safety Training Meetings
4) Safety improvement suggestions
5) Reporting near-miss incidents
6) Volunteering for safety committees

When developing a project-specific safety incentive program, it is important to not make the program too complicated. Creating a program that is easy to administer and easy to understand works better,

as employees need to understand the benefits of good safety behavior. Also, continuous communication and promotion of the safety incentive program is crucial to success.

Corporate Safety is available to assist the project management staff when developing a project-specific safety incentive program. The Vice President of Operations approval must be received prior to development and implementation of any district or project-based safety incentive program.

Safety Disciplinary Procedure

This procedure is applicable to craft personnel (Both union and nonunion) working on the project. AB Supervisors have the responsibility for maintaining proper conduct and discipline of employees under his/her supervision. When disciplinary action appears to be necessary, the supervisor will conduct an interview with the subject employee for the following reasons:

- To give the employee a clear understanding of exactly what is expected
- To explain in what way the employee has failed in following safety policies, procedures, and site rules
- To give the employee an opportunity to account for his/her actions or lack of actions
- To take appropriate disciplinary action if the situation warrants it. All disciplinary discussions should be done in a climate conductive to good understanding and reasonable discussion.

Forms of Disciplinary Action:

- Verbal Warning: The basic cause of the incident should be clearly pointed out, suggestions made for its correction, and the employee told what consequences to expect should incidents of like nature continue to occur. The Safety Discipline Notice can be found in the Exhibits. The original is forwarded to the Human Resources Department. Copies of the documented verbal warning may not be retained on site. A copy of the documented verbal warning may be provided to the employee if requested.
- Written Warning: If a problem is caused by a second occurrence of the act(s), which had previously resulted in a verbal warning, a written warning (or possibly discharge) may be necessary. However, under most circumstances, a second occurrence of an incident that had necessitated the earlier noted verbal warning and which is NOT judged to have been premeditated or deliberate will result in a written warning. The copy of the written warning is provided to the employee. The original is forwarded to the Human Resources Department. Copies of written warning may not be retained on site.

- Suspension with Pay: When, in the judgment of the supervisor, immediate suspension of an employee is necessary to protect the safety of persons or property or for similarly grave reasons, the supervisor will direct the employee to leave American Bridge premises at once and either: (1) to report back to the supervisor the following day, or (2) to remain away until further notice.
- Suspension without Pay: This action may be taken to impress upon the employee the serious nature of his/ her act or offense. This should be considered as a notice that the employee is facing possible termination.
- Termination: In case(s) of gross misconduct, dangerous behavior, or repeated failure to comply with safety policies, procedures, and site rules, an employee may be terminated from employment with American Bridge.

Further info regarding AB's Safety Disciplinary Policy can be found in the AB Safety Discipline Procedure, (See Exhibits Section).

Recordkeeping and Required Postings

The following safety-related documents are to be stored in the project's Procore safety folder throughout the entirety of the project, unless stated otherwise by Contract or AB Executive Management:

a) Daily Hazard Analysis (DHA) Forms
b) Job Hazard Analysis (JHA) Forms
c) Equipment Inspections
d) Drug Testing Paperwork
e) Medical Evaluations, (fit test, blood lead, etc.)
f) Employee Emergency Contact Information
g) Any applicable safety certifications collected from employees during new-hire orientation.

A bulletin board or designated posting area shall be located in the main project office. The following safety related documents shall be posted ***(See Exhibits Section).*** The safety bulletin board shall be periodically checked and maintained to ensure the required documents are posted and legible. Any missing, damaged or outdated documents should be replaced.

- OSHA "Job Safety & Health – It's the Law" Poster

- American Bridge Construction Work Rules
- American Bridge Code of Safety Practice
- Notice - Report All Injuries
- Notice – Access to SDS & Medical Records
- Notice – In Case of Emergency
- Notice – Field Absenteeism Policy
- The State's Workers' Compensation notice (if required in the state work is being performed)
- All other required postings specific to the project, area, owner, and State or local regulations.

Posters/Notices Not Included in Exhibits Section (Contact Corporate Safety/HR)

- American Bridge EEO Policy
- Fair Labor Standards Act – Poster – Federal OSHA
- Your Rights Under the Family and Medical Leave Act – Poster – Federal OSHA
- Uniformed Services Employment and Reemployment Rights Act – Poster – Federal OSHA
- Employee Right Under NLRA – Federal OSHA
- OSHA 300A for the previous year (February 1 through April 30).

Incident Management

Every incident involving an employee that occurs in connection with American Bridge's operations on a project is to be immediately investigated.

The Project Manager or designee is responsible for managing the investigation of all injuries and illnesses on the project.

In addition to the following reporting requirements, all injuries shall be immediately reported telephonically to the Corporate Safety Department and Corporate Risk Manager.

1. **Near Miss Incident Report**

   A near-miss incident is an event that did not result in an injury, illness or serious property damage, but could have under slightly different circumstances. A near miss incident presents an opportunity to improve workplace safety based on a condition or an incident with the potential for a more serious consequence. As such, the goal of near miss incident reporting

is not to assess blame, but rather to use the event as an opportunity to improve processes and reduce future risk exposure to a potential catastrophe.

Employees should be encouraged to report near miss incidents based on the fact that if not reported and the root cause corrected, a similar incident could again occur, but the next time it might result in an injury, illness or serious property damage.

All Near Miss Reports are to be completed in Procore through the *Incidents* tab and distributed to the appropriate AB personnel as laid out in the Procore Directory. New members of the project staff are encouraged to contact Corporate Safety for Procore Safety Training.

Upon completion of the Near Miss Incident Report, it is to be forwarded to the responsible foreman or Superintendent. If forwarded to the responsible foreman, the foreman is to review, take necessary corrective actions, and forward the report to the Superintendent. The Superintendent and the Project Manager are to sign the report and provide any additional comments concerning the near miss incident or corrective actions that need to be taken.

2. American Bridge Accident Investigation Report

The American Bridge Accident Investigation Report is to be used to investigate and report all injuries and illnesses involving:

- Injuries involving onsite medical treatment.
- Injuries involving offsite treatment by a physician or licensed health care professional.
- Injuries to non-employees when American Bridge may be involved.

The Accident Investigation Report is to be initiated the same day the accident occurs or when project management learns of the accident. Assistance of the responsible foreman, including his/her statement, is required during the investigation of the accident.

During the investigation of accidents, measures shall be taken to determine the cause of the accident and to develop changes or corrections that are needed to prevent recurrence of the same or similar type of accident.

All Accident Investigation Reports are to be filed into Procore through the *Incidents* tab and distributed to the appropriate AB personnel as laid out in the Procore Directory. Initial notification of a jobsite injury should be given to the Corporate Safety Department and AB Risk Manager by the end of the shift. If training is needed on how to properly fill out an Accident Investigation Report in Procore, please contact the Corporate Safety Department for training.

3. Injured/Witness Statements

Statements of witnesses and a statement of the injured, if possible, are to be obtained using the Statement of Witness/Injured form. This form can be found in the *Forms* tab in Procore. Statements may also be obtained on regular lined paper. Statements are used as supporting documents in conjunction with the American Bridge Accident Investigation Report.

If the witness/injured employee does not write the statement, after reading the dictated statement, he or she is to be asked to write at the end of the statement the following: *"I have read the above (number) pages and they are true"* and then sign the document. Any changes in the statement as originally recorded are to be made by drawing a line through the wording to be deleted or corrected, inserting the revised wording, and have the person initial all corrections and/or deletions.

Witnesses are not confined to those who actually saw what happened, but should include all who were working with the injured or who may have some knowledge that may help in determining the cause of the accident. In so called "un-witnessed" accidents, statements should be obtained from those working with the injured employee. Have each witness state where they were, what they were doing, what was observed and if they have any knowledge of the accident.

Statements are to be distributed with the American Bridge Accident Investigation Report.

4. Root Cause Analysis

The true purpose of incident/accident investigation is to prevent recurrence. It is important to keep this purpose in mind. Determine what needs to be changed and how. This requires

collecting and analyzing all the facts surrounding the accident before assuming what caused it to happen.

Root cause analysis is any technique that identifies the underlying deficiencies in a safety management system that, if corrected, would prevent the same and similar incidents from occurring. It is easy to list "human error" as the cause of the incident. Unfortunately, this is often where incident investigations end. A basic failure of most investigations is that they identify and correct only the immediate causes, or symptoms of an incident. The real cause of an incident usually is some underlying issue that must be corrected to eliminate recurrence.

The identification of root causes is the key to problem solving and continual improvement. The theory of root cause analysis is a very simple and effective method of understanding problems in a safety system. The application of this theory and method is the foundation for any constructive incident investigation. If you do not take time to identify all the contributing factors to an incident, you'll miss critical information about the underlying issues. Without conducting a root cause analysis, you have not significantly reduced the potential for similar incidents in the future.

a) Root Cause Analysis Worksheet

To help employ root cause analysis in the accident investigation process, the Root Cause Analysis Worksheet is to be used to help determine the root cause of the various incidents covered under item "B" in this Section. This form is available for use in the Procore *Forms* tab, and can be added as an attachment into any new Procore Incident Report.

b) Required Use of Root Cause Analysis

Understanding the root cause of every incident is a crucial element of American Bridge's commitment to a zero-incident workplace. As such, a documented root cause analysis shall be conducted on:

- Every **fall incident** where an employee engages their personal fall arrest equipment, and
- Every incident involving a **recordable injury** to an American Bridge employee.
- Every "high risk" near miss, as determined by the Corporate Safety Department.

The Project Manager or designee is responsible for ensuring that a root cause analysis is completed on all required incidents and the results reported to the Corporate Safety Department.

c) Initiation/Completion/Distribution Requirements

Like the American Bridge Accident Report, the Root Cause Analysis Worksheet is to be initiated the same day the incident occurs or when project management learns of the incident. The Root Cause Analysis should be completed within ten (10) days of notification of the incident, unless additional time is required to complete the analysis.

d) Searching for Root Causes (The Five Whys)

Sometimes when you try to resolve a problem, you find that what you thought was a root cause is really a related symptom, not the actual cause of the problem itself.

Dig deep for root causes. Root cause analysis is usually accomplished by asking a series of 'why' questions. Ask 'why' a problem exists. Then come up with one or more causes. For each of these causes, ask 'why' again. If you can answer that question again, then the first answer is probably a symptom brought on by the more fundamental cause. Continue to ask 'why' for each answer until you can no longer generate a logical response. This lowest level is likely to be a root cause and is what generates the observed symptoms. Typically, 'why' should be asked five (5) times to drill deep enough to discover the actual root cause.

OSHA 300 Log

The project site shall maintain an OSHA 300 log listing all recordable occupational injuries and illnesses to American Bridge employees occurring on the project.

Recordable cases must be recorded on the OSHA 300 log within seven (7) calendar days after receiving information that a recordable injury or illness has occurred. If the outcome or extent of an injury or illness changes after recording the case on the log, draw a line through the original entry and write the new entry where it belongs. The most serious outcome of each case is to be recorded (e.g. if a case involves days away from work and restricted work, only the applicable information concerning days away from work is to be recorded on the log.)

Following is a comprehensive list of the 14 treatments by a physician or licensed health care professional that are considered first aid treatment. Any treatment not on this list is considered medical treatment.

- Using a nonprescription medication at nonprescription strength.
- Administering tetanus immunizations.
- Cleaning, flushing or soaking wounds on the surface of the skin.
- Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™.
- Using hot or cold therapy.
- Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc.
- Using temporary immobilization devices while transporting an accident victim.
- Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister.
- Using eye patches.
- Removing foreign bodies from the eye using only irrigation or a cotton swab.
- Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means.
- Using finger guards.
- Using massages.
- Drinking fluids for relief of heat stress.

In order to ensure the accurate injury and illness recordkeeping on our project sites, the Corporate Safety Department shall be contacted at the end of each month, and all injuries and illnesses that occurred during the month reviewed.

Claims Management

The purpose of American Bridge's Claims Management and Return-to-Work Program is to provide guidelines for project management to expedite the rehabilitation of an employee with a work-related injury, with the goal of returning the injured employee to the full-duty workforce without jeopardizing medical recuperation. If unable to place an employee in the original position due to prescribed restrictions or limitations, project management shall attempt to identify alternative work outside of the employee's original position that will meet operation needs.

This program facilitates gradual and consistent rehabilitation for an injured employee using temporary modified/alternative work assignments. American Bridge shall accommodate the injured employee through early rehabilitation and, where possible, placement into temporary work assignments to the benefit of both parties.

Prior to the commencement of work, the location and contact information for nearby medical care facilities and emergency transportation services shall be identified. The project safety manager or designee shall contact the facilities and make them aware of American Bridge's policies regarding return-to-work and the availability of modified/alternate work assignments for injured employees with medical restrictions and limitations resulting from a work-related incident.

Work that is assigned to injured employees must be within the physical restrictions specified by the physician. If the medical release is unclear, the physician is to be contacted for clarification. If necessary, review the restrictions with the workers compensation claims adjustor and/or the Corporate Safety Department.

SAFETY PLANNING

Work Planning/Job Hazard Analysis

The American Bridge Project Manager, General Superintendent, and management support team shall review Contract work to develop sequence of activities and necessary procedures/controls for the Project so that methods of performing the work will not involve undue danger to the personnel employed thereon, the public, and public or private property. **During this time, major phases of the work shall be identified which will require the development of a Job Hazard Analysis.**

Examples of common American Bridge JHA's include:

- Access to work locations
- Fall Protection
- Respiratory Protection
- Water Hazard controls
- Lead Exposure
- Hoisting, Rigging
- Critical Lifts
- Protection of Public
- General Bolting
- Rivet Removal
- General Welding
- Pile Driving
- Use of Portable Grinders
- Steel Erection
- Concrete Demo

See **Exhibits Section** for JHA template and instructions for completing a JHA.

General

A JHA is a safe job procedure for analyzing a scope of work for potential hazards and establishing control methods to eliminate or reduce the identified hazards. There are five basic steps involved in developing a JHA:

1. Define the scope of work covered by the JHA;
2. Break the scope down to individual tasks;
3. Identify the potential hazards and assess the resulting risk;
4. Eliminate or reduce the risk at the source, where possible; and
5. Recommend safe procedures and/or identifying control standards to abate the risks.

Procedure

1. Prior to commencing any major phase of work, a JHA is to be developed. The following outlines the general responsibilities/flow for preparing JHAs. While the development of a JHA is assigned to the Project or Field Engineer, JHAs may be prepared by others with review of the JHA as shown below:
   - **Project Manager:** Assigns development of JHA for work on the project. Reviews completed JHA for technical adequacy.
   - **Project/Field Engineer:** Develops assigned JHA for the various phases of work on the project.
   - **General Superintendent:** Assists in the development of JHAs. Reviews completed JHA for technical accuracy.
   - **Foremen:** Assists in the development of JHAs. Reviews applicable JHAs before performing work. Makes certain that applicable JHAs are reviewed with craft workers involved in the work to be performed
   - **Subcontractors:** Subcontractors will complete and submit JHA's to the Project Manager for review and approval.
2. After the development of the JHA, a roundtable discussion may be conducted utilizing the experience of all meeting attendees to identify any additional project-specific requirements and hazard(s) that may have been missed or experienced before when performing similar work activities. The JHA is to be revised to address any hazard(s) that are identified as a result of the round table discussion.

3. A copy of the completed JHA will be distributed to all supervisors involved in completing the scope of work.
4. The completed JHA is to be reviewed with all involved craft personnel prior to starting the applicable phase of work. Upon review, all employees are to sign off on the JHA Work Sheet indicating that the JHA was reviewed with each employee and that the employee agrees to work to the plan.
5. In addition, the hazards and associated controls contained in the JHA can be used to assist the supervisors in developing their Daily Hazard Analysis (DHA) Forms.
6. The JHA should be updated if there is a change in the work scope or execution methods.

Daily Hazard Analysis (DHA)

The Daily Hazard Analysis (DHA) is an American Bridge (AB) standard planning and communication tool required for use on every project. It is a complementary tool used in conjunction with the Job Hazard Analysis (JHA). It is NOT a replacement for the JHA. The standard DHA document is a carbon-copy booklet provided by AB.

Every crew or individual that undertakes work of any nature at a project is required to complete a DHA. Failure to complete an adequately detailed DHA will result in a stoppage of work.

To be effective, the DHA must be specific to the work activity for which it is prepared.
It will list the steps (tasks) and risks associated with the work activity as well as the specific means to mitigate those risks. The supervisor/foreman should lead the discussion and promote two-way communication to ultimately arrive at a plan that has buy-in from the entire crew. An effective DHA should recognize unique project circumstances including, but not limited to: site logistics and separation of people and equipment, crew experience, PPE, required equipment, means of communication, signage and barricades, adjacencies, weather (as applicable), access/egress, and lighting. Risks to be considered are both risks to the crew and risks to others who will be exposed to risks caused by the crew. The foreman must convey to the crew that every individual has the authority and obligation to stop the task and seek guidance should he/she feel unsure of the safe method of work.

Project Management & Supervision

- If assistance is required to complete DHAs, AB supervision or HSE personnel should be engaged. The importance of DHAs will be highlighted by AB supervision during site orientations and preparatory meetings.
- AB Project Management staff should periodically attend select DHA meetings to ensure that the DHAs are being completed in accordance with AB expectations. Particular attention should be paid to the level of detail of tasks, applicability of tasks to the actual work and communication between the foreman and crew.
- AB Project Management staff should review work in progress against the DHA and speak with workers to ensure the appropriate level of detail and applicability are present.
- Periodically request to review DHAs from workers; suspend work immediately if DHA not completed, insufficient, or not signed by all crew members. Work resumes only after acceptable DHA is executed.
- The project may erect a bulletin board in a central location near the work area to post completed DHAs each day. Ensure that copies of the completed forms are received daily from all trades and retained for 30 days.

Workers

- Complete a DHA at least daily, and when changing tasks and/or locations. The completion of the form should take approximately 15-20 minutes depending on the complexity of the task and other considerations.
- The standard AB form should be used, although subcontractors are permitted to use a custom form if approved by the AB Project Management Team.
- Utilize the appropriate JHA as a resource to help identify hazards relevant to the task(s) of the day. The DHA supports the JHA, and is utilized as the detailed task planning tool accounting for specific and unique circumstances that arise at the activity location, such as weather conditions, adjacent work, crew experience, etc.
- The crew foreman/supervisor is charged with completing the DHA; however, crew participation and buy-in is critical.
- The crew will examine the work area(s) prior to preparing the DHA and note any circumstances that may present a hazard.

- Checklists and sketches of definable features of work and details included in JHAs should be attached or referred to (as appropriate) ensuring best practices and pre-planning materials are being effectively utilized.
- The DHA must be complete and detailed enough to identify the different tasks associated with the activity and the safe plan associated with the elimination or mitigation of any identified hazard.
- DHAs for work involving a high potential for severe injury (Focus 4 – caught between, struck by, falls, electrocution) including items such as critical lifts, confined space entry, and utility shutdowns must be accompanied by an appropriate emergency action plan, permit, etc. A pre-activity huddle is also recommended involving all relevant parties, including AB, the owner representatives (as appropriate), and the actual work crew. The purpose of the huddle is to conduct a dry run to ensure that all safety challenges are recognized, rehearsed, and accounted for.
- The DHA should recognize all adjacent work taking place. Crews must be instructed to be mindful of other trades and look up/down/out for unsafe conditions and actions. DHAs should also identify conditions where workers are exposed to unfavorable weather conditions and communicate a plan to protect workers. The supervisor/foreman should communicate impacts of the plan to other affected parties, such as adjacent crews.
- DHAs involving work in occupied facilities should be completed with a high level of detail consistent with the level of risk to both workers and the public. Contingency plans must be in place for high-risk activities involving potential for impacts to the workers, public and critical facilities.
- The foreman should solicit feedback from the work crew to confirm a thorough understanding of the tasks to be completed, address any concerns, and confirm safe measures to be undertaken.
- Each crew's DHA must be signed by all personnel on the crew, posted in (or nearby to) the work area, and available for review. Ideally, each crew will have a clipboard that can be used to post the day's DHA and supporting documents such as their JHA, required permits, etc. The carbon copy of the DHA must be submitted to AB Project Management.

Emergency Preparedness and Response

The telephone numbers for emergency medical care, fire department, and ambulance service shall be identified on the *"Notice – In Case of Emergency"* form and posted on the designated bulletin board.

In addition, a map of emergency pick-up points for injured personnel shall been created and shared with emergency responders. Instructions on the use of the emergency pick-up points, weather precautions, and contacting first responders will be listed in the *AB Emergency Response Plan*, (See Exhibits Section).

In addition, emergency contact telephone numbers shall be posted in the field office near the telephone and other conspicuous locations where notices are customarily posted.

OSHA Inspections

It is the policy of American Bridge to fully cooperate with OSHA when visiting or inspecting American Bridge project sites.

Reason(s) for Inspection

OSHA may conduct an inspection for any reason including routine inspections, alleged imminent danger, fatality or catastrophe, employee complaint, health and environmental concerns, or follow-up of prior inspections.

Arrival of Compliance Officer at Jobsite

Thoroughly check each inspector's credentials and verify that credentials designate them as agents of OSHA. If there is some question as to the identity of an inspector, do not provide any information until his identity has been established.

Immediately notify the Corporate Safety Department by telephone.

If AB is a subcontractor, the project management team should notify the General Contractor of OSHA's presence.

It is a Company's right to request a search warrant from OSHA prior to an inspection. Under normal circumstances, we will not request one. Search warrants are relatively easy for OSHA to obtain and

demanding one usually leads to a more detailed inspection of the worksite. ONLY A CORPORATE OFFICER IS AUTHORIZED TO REQUEST A SEARCH WARRANT FROM OSHA.

Under no circumstances shall news media representatives be allowed to participate in OSHA inspections, discussions, or conferences at jobsite locations.

If the inspection is being conducted due to an employee complaint or an employee representative's complaint, obtain a copy of the written notice of the complaint, which they are required to furnish.

Determine type and scope of the inspection including:

1) Area(s) or phase of the job to be inspected:
2) An inspection in response to an employee complaint shall be limited to the scope of the complaint. The Compliance Officer(s) shall be escorted directly to the area and operation covered by the complaint.
3) Time schedule.
4) Type of industrial hygiene tests to be made.

Advise Compliance Officer(s) that jobsite safety and health rules, regulations, procedures, and requirements, such as head, eye, feet, ear, and respiratory protection, must be obeyed by members of the inspection party for areas visited.

If requested, records such as employee exposure and medical records, state accident reports and OSHA logs shall be made available for examination and copying. The Compliance Officer shall be advised to submit a written request for any document not required to be maintained under OSHA. Contact the Corporate Safety Department for guidance.

If the Compliance Officer is interested, make available for review only a copy of the American Bridge Company Safety Program, Hazard Communication Program, or any site specific Safety Program. The Compliance Officer may be provided with a copy of the American Bridge Construction Department Safety Manual booklet.

Identify and introduce the management representative(s) and employee representative who will accompany the inspector on the jobsite.

1) Management Representative

The Superintendent shall accompany the inspection group in each area visited. It is also recommended that the Field Engineer or Project Engineer accompany the inspection group**. NEVER LET THE INSPECTION GROUP TOUR AN AB WORK SITE WITHOUT AN AB REPRESENTATIVE WITH THEM AT ALL TIMES.**

2) Employee Representative

The employee's representative should be an employee employed at the site. Normally, this will be the craft steward. If the employees have no authorized representative, the Compliance Officer shall be so advised.

3) Subcontractor Representative

Contact appropriate subcontractor if a subcontractor's work will be included in the inspection tour. Subcontractor should appoint a representative to be part of the inspection group when touring subcontractor's work area.

Inspection Activities

a) The Compliance Officer oversees inspection activities. The management and employee representatives who are to accompany him during the inspection are subject to the Compliance Officer's approval and has authority to deny the right of accompaniment to any person whose conduct interferes with a fair and orderly investigation.
b) If a Compliance Officer should object to a particular management representative, the inspection should be stopped and the Corporate Safety Department contacted for advice.
c) During the inspection, do not harass, threaten, or otherwise intimidate the Compliance Officer.
d) Explain any condition or practice questioned by the Compliance Officer, but do not volunteer information beyond that necessary for understanding or needed for a factual evaluation of a situation. **DO NOT VOLUNTEER INFORMATION OR MAKE AVAILABLE CERTAIN DATA TO THE COMPLIANCE OFFICER FOR THE SIMPLE REASON THAT THE COMPLIANCE OFFICER APPEARS TO BE SYMPATHETIC TO THE SITUATION OR IS A REAL UNDERSTANDING PERSON. CAUTION IS THE WORD.**
e) A Compliance Officer has the right to privately question an employee, including any management employee. However, there is no requirement that any employee participate in any such interview. To the extent that members of management are willing to participate in the interview, they shall be truthful. If they are not willing to be interviewed, or to answer specific questions, they have the right to refuse to talk to the Compliance Officer or to

selectively answer. There is no legal requirement to sign any statement. If they do, a copy should be obtained. Management personnel shall not participate in discussions which are being recorded with a tape recorder or other video camera.

f) Where the Compliance Officer indicates that he believes a violation exists, but management does not agree, the facts should be discussed for the purpose of determining why the Compliance Officer takes the position indicated and attempt to resolve the issue. A friendly cooperative attitude must be maintained at all times. Notes of the discussion shall be made.

g) The management representative shall prepare on the spot notes, indicating actual conditions or practices the Compliance Officer considers to be a violation. Identify location, equipment, and employee(s) involved.

h) If the facts do not clearly indicate a violation, the management representative must not express his opinion that a given situation constitutes a violation.

i) To the extent possible, the Superintendent shall immediately address findings of the Compliance Officer without admitting a violation exists. When alleged violations are immediately corrected, they should be brought to the attention of the Compliance Officer during the conclusion of the inspection.

j) Management has no obligation to start work not scheduled because the Compliance Officer wants to see the work or conduct industrial hygiene monitoring. The Compliance Officer shall be informed when the work is scheduled if he asks.

k) The Compliance Officer shall be allowed to confer privately with individual employees, and there shall be no deduction from an employee's pay for the time spent during such discussions initiated by the Compliance Officer. However, OSHA regulations require that the conduct of inspection be such as to preclude unreasonable disruption of the work. The management representative shall ensure that the Compliance Officer adheres to the OSHA regulation prohibiting unreasonable disruption of the work.

l) Compliance Officers have authority to take photographs or video recordings and to collect samples for industrial hygiene purposes. If the Compliance Officer has a camera and takes photographs, the management representative shall, to the extent possible, take photographs of the same scenes.

    a. If the Compliance Officer requests photographs which may have been taken at a fatality site or serious incident, contact the Corporate Safety Department for advice before releasing any prints.

    b. Employee representatives shall not be permitted to take photographs. A copy of any

photographs supplied by management to the Compliance Officer shall not be furnished to employee representatives.

m) Management shall arrange for a thorough supplementary investigation, including photographs or other documentary evidence, as promptly as possible, concerning all conditions or practices the Compliance Officer indicated as alleged violations.

n) The management representative must immediately notify the District Office and Corporate Safety Department of any alleged imminent danger situation identified by the Compliance Officer.

o) Where inspection activities extend on a day-by-day basis, the superintendent or management representative shall report daily to the Corporate Safety Department of the findings of the Compliance Officer.

Closing Conference

a) At the completion of the inspection, the Compliance Officer will either hold a general meeting of all contractors or will meet with each contractor individually.

b) It is recommended that a closing conference be requested even if the Compliance Officer does not ask for one. It should be attended by both the Superintendent and Project Manager.

c) Attendance at the closing conference by the employee representative is not required but may be allowed by the Project Manager or Superintendent if it is considered desirable and it is agreeable to the Compliance Officer.

d) The management representative shall record:
    1) Date of closing conference
    2) Names and affiliations of all present
    3) Summary of comments by Compliance Officer and employee representative (if present)
    4) Summary of any management comments in rebuttal of Compliance Officer's findings.

Reporting of Inspection Findings

At the conclusion of the jobsite inspection and after the closing conference has been held, the management representative shall advise the Corporate Safety Department in writing of the results of the inspection, attaching a copy of any complaint presented by the Compliance Officer, signed statements, etc.

Citations

As a result of the inspection, citations and notice of monetary penalty may be issued. Should a citation and penalty notice be received, the following shall be done:

1) If sent directly to the site by OSHA, date and immediately forward original documents to the Corporate Safety Department.
2) Post a copy of each citation at the project site. Posting must remain for three working days or until corrections have been made, whichever is longer.
3) The Company has fifteen working days from receipt of a citation to contest the citation or to accept it. Failure to take action within that time frame means the Company has accepted the citation. Within the fifteen day period, an informal conference can be held with the OSHA Area Director in an attempt to resolve any problems. All decisions to contest a citation shall be made by Corporate Headquarters.

Subcontractor Management

Subcontractor Safety Program

Each subcontractor shall submit a copy of their Safety Program for review. AB Project Management shall consult their Project Safety Manager or the Corporate Safety Department when reviewing subcontractor safety programs to ensure that they meet or exceed the AB Safety Program.

Safety Data Sheets (SDS)

Each subcontractor shall submit all applicable Safety Data Sheets (SDSs) as required pursuant to the Hazard Communication Standard 29 CFR 1926.59.

Subcontractor Orientation

Prior to the start of work on the project, each subcontractor shall send a representative from Project Management and Project Supervision to meet with the AB Project Manager or designee for the purpose of discussing safety related matters. This may be completed with individual subcontractors or as a group. At the orientation, the American Bridge representative should make it clear to the subcontractor(s) what the safety expectations are for the project. The subcontractor should be advised that the safety of all persons employed by the subcontractor, or any other person who enters upon the premises of the project for reasons related to the subcontract, shall be the sole responsibility of the subcontractor and that the subcontractor shall take all reasonable measures and precautions to prevent injuries to any of their employees or any other person who enters upon the project site.

Subcontractors shall be advised that it is mandatory that a representative attend all scheduled project safety meetings. Subcontractors shall also be advised that American Bridge's policies for the required use of a hardhat, high-visibility safety vest or apparel and safety glasses are considered minimums applicable to all site personnel, including subcontractor employees. Furthermore, if applicable, subcontractors shall be advised on the project's confined space and lock-out tag-out procedure(s).

Reporting Requirements

Subcontractors shall be instructed to hold as a minimum, a weekly toolbox safety meeting with all their employees or to participate in project-wide weekly toolbox safety meetings. Subcontractors shall be required to immediately report any accidents or injuries and provide American Bridge with a copy of all accident reports.

Project Safety Meetings

All projects must conduct a weekly safety meetings as well as any required by the contract documents to insure proper communications, documentation, and control of the construction process. Weekly safety meetings may be stand alone or incorporated into the agenda of another weekly meeting depending on project needs.

As may be required by the project, subcontractor representatives should attend safety meetings conducted by the General/Craft Superintendent to discuss coordination and safety related matters for the work being scheduled.

Documentation of all meetings should conform to the requirements described in the American Bridge Processes and Procedures Manual.

Review of Subcontractor

Subcontractors shall be notified of safety violations, regulations and laws which apply to the subcontractor's work. The Project Manager or designee should keep a written record in the job site diary, project safety meeting minutes, or keep on file a letter or memo documenting the notification. When issuing safety warning to subcontractors, the following steps shall be observed:

a. Verbal warning for minor or first time infraction.
b. Written warning with a deadline for compliance of serious or repeated infractions.
c. Written "Stop Work" order for "Imminent Danger" situations or in the case of noncompliance with deadlines established through written warnings.

Multi-Employer Citation Policy

The actions of other parties, including subcontractors, on an American Bridge worksite may result in American Bridge being issued an OSHA citation. OSHA's Multi-Employer Citation Policy outlines OSHA's policy for issuing citations on multi-employer worksites.

Pre-Job Safety Survey

Prior to beginning work on a project site, a pre-job safety survey is to be conducted by the Project Manager and the General Superintendent to make certain that potential hazards are properly addressed. Input or attendance by a representative of the Safety Department should be requested when necessary.

Job layout, plans, and schedules should be reviewed during the pre-job safety survey. In addition, potential hazards shall be identified and necessary control measures or the need for a Job Hazard Analysis established. If need be, tentative dates shall be scheduled during the initial pre-job survey for any additional safety surveys that may be required so that potential hazards can be reviewed as work on the project progresses.

The "Pre-Job Safety Survey" form or other means, such as incorporating relevant safety procedures and controls in the site-safety program, should be used to document the pre-job safety survey.
The General Superintendent is responsible for instructing other superintendents/general foremen and foremen of the hazards and safe work procedures applicable to their work identified in the safety survey(s) and shall ensure that foremen adequately train their crew in same.

A "Pre-Job Safety Survey" form is located in Exhibits.

SAFETY AND HEALTH TRAINING

Management/Supervisory Training

All AB management and supervision personnel are required to have completed an OSHA 30 hour construction safety course. Additional Train-the-Trainer courses for MEWP, Forklifts, Rigging may be provided as needed.

Craft/Local Workforce Training

All craft and local workers shall be provided job-specific training throughout the project pertaining to the work they will be performing.

Examples include:

- OSHA Focus Four Hazards (Electrical, Caught Between, Struck By, Falls)
- Signal Person
- Rigging
- Forklift
- Mobile Elevated Work Platforms (MEWP)
- Fall Protection

Orientation (Craft Employees)

Newly employed and/or transferred project/craft personnel shall receive a safety indoctrination covering American Bridge and the project's safety requirements prior to starting work.

Safety indoctrination is the responsibility of the General Superintendent or other qualified assigned American Bridge representative (i.e., superintendent, general foreman, project/field engineer, administrative assistant, designated safety representative, etc.).

1. General Safety Orientation
   a) Each new or transferred project/craft employee shall be furnished a copy of the following documents. All material shall be reviewed with the employee, explaining in general the type of work that the employee will be assigned and the safety policies used to manage or eliminate hazards:
      - AB Vision/Mission/Values *(wallet card)*
      - AB Safety Manual/rulebook
      - AB Construction Work Rules (**See Exhibits Section**)
      - AB Code of Safety Practices (**See Exhibits Section**)
      - Notice to All Employees that outlines the requirements of the Hazard Communication Standard and AB's Hazard Communication Program (**See Exhibits Section**)
      - Disciplinary Policy *(ABHR-P41)* (**See Exhibits Section**)
   b) In addition, the following shall be discussed during the orientation process:
      - Location of bulletin board postings.
      - Arrangements and procedures for treatment of injuries and illnesses, and the requirement for prompt reporting of all injuries.
      - Requirement to observe all safety policies (posted or provided through training), and the need for alertness for possible hazards at all times.

- Full cooperation in the Safety Program. AB's principle that safety has no hierarchy should be explained and that no employee will be discriminated against for identifying a real or perceived safety hazard.

c) *Employee Indoctrination Acknowledgement Form - General Safety Orientation*
At the conclusion of the general safety indoctrination, each new hired or transferred employee shall sign and date the *General Safety Orientation* portion of the *Employee Indoctrination Acknowledgement Form* to acknowledge completion of the general safety portion of the indoctrination process. (**See Exhibits Section**)

2. General Fall Protection Orientation
   a) After completion of the general safety orientation, initial training on fall protection and prevention shall be conducted. Each employee shall receive and have reviewed the following handouts (**See Exhibits Section**):
      - Your Harness & Safety Lanyard
      - Anchorage Points
      - What Not to Use As An Anchorage Point
      - Retractable Lifelines
   b) While reviewing the above documents with the employee, it should be explained to the new or transferred employee the nature of the fall hazards in the workplace, any special requirements for anchorage points, and the requirement for inspection of their fall protection systems (i.e., harnesses, lanyards, & retractable lifelines) each day before use.
   c) In addition to the above, a construction fall protection video presentation may be used to augment general fall protection training. Fall protection video resources are available on AB's Access Site under Quick Links/Training; or hard copies may be obtained from the Corporate Safety Department.
   d) At the conclusion of general fall protection orientation, each new hired or transferred employee shall sign and date the *Fall Protection Orientation* portion of the *Employee Indoctrination Acknowledgement Form* to acknowledge completion of the general fall protection portion of the indoctrination process. **(See Exhibits Section)**

3. Initial Assignment of Personal Protective Equipment (PPE)
   a) During the safety indoctrination process, new or transferred employees shall be issued PPE appropriate to their initial job assignment.

b) A general description on the use, care, inspection, limitations, and replacement of PPE shall be discussed with the employee.

c) When issuing PPE, the Employee Indoctrination Acknowledgement Form shall be signed and dated by the employee to acknowledge receipt and initial training in the care, use, inspection, and replacement procedures for the PPE issued.

4. Work Assignment

a) Upon completion of indoctrination, employees shall be directed or escorted to their American Bridge supervisor to begin their job assignment. American Bridge supervisors shall provide additional task-specific training prior to starting work. Training shall include, but not be limited to, the following:

- Nature of work being performed
- Review of applicable Job Hazard Analysis and Daily Hazard Analysis
- Proper operation of assigned tools/equipment and handling of materials
- Identification of risks and potential hazards associated with the specific work activities and work areas and controls that will be used to eliminate or reduce risks
- Confirmation that each employee understands all required safety measures and PPE requirements

b) During the first thirty (30) days on the job, the assigned American Bridge supervisor should closely monitor new employees to ensure they are performing to required safety standards and in conformance with AB policies.

Orientation (Foremen/Supervisors)

Every new hire and/or transferred foreman shall be provided training to enable them to sufficiently demonstrate proficient working knowledge of American Bridge's Safety Program, exhibit the skills and knowledge necessary to identify and control work place hazards and display the management skills required to fulfill the responsibilities of the foreman position.

The General Superintendent or other qualified American Bridge supervisory personnel shall conduct foreman safety training

1. Each newly assigned foreman shall be furnished a copy of the following documents **(See Exhibits Section):**

- *General Foreman/Foreman Safety Responsibilities*
- *Daily Hazard Analysis Form*

2. Safety training must include, as a minimum, all of the training listed above for craft employees plus the following:
    - Document evidence of completion (or establish a timetable for completion) of the 10-hour OSHA safety outreach course (30-hour OSHA safety course is encouraged for long-term AB foremen).
    - Review the roles and responsibilities of a foreman as outlined in the document *"General Foreman/Foreman Safety Responsibilities"*.
    - Provide training on any of the Job Hazard Analysis (JHAs) or Daily Hazard Analysis (DHAs) which apply to their assigned work, and the use of these forms to train crew members.
    - Explain the importance of tutoring and mentoring new or inexperienced workers given that they could be most at risk on the job site.

3. The General Superintendent or other qualified AB supervisory personnel shall monitor and observe each new hire and/or transferred foreman on a continuing basis and provide any additional training to ensure all foremen are capable of carrying out their safety responsibilities.

Orientation (Visitors)

Visitors to AB Projects shall receive appropriate site-specific training addressing safety requirements or issues that may be encountered while on the site, or they shall be escorted by an American Bridge employee while on the premises. Visitors to AB project sites are subject to all PPE requirements and safety policies applicable to the project site, without exception.

CPR/First Aid Certification

Each project shall ensure that at least one American Bridge staff member and one field employee maintain a current CPR/First Aid Certification. A copy of the employee's training card shall be maintained on file with the original card maintained on the employee's person. All American Bridge jobsite supervisors are encouraged to hold current CPR/First Aid certifications.

All CPR/First Aid training shall be conducted through an approved American Red Cross or National Safety Council training program or equivalent.

Retraining

Employees observed incorrectly using personal protective equipment or appear unsure as to the proper safety rule or procedure for performing certain tasks, shall be retrained. Employees who continue such unsafe acts shall be appropriately disciplined.

ASSESSMENTS AND AUDITS

Safety Observation Checklist (Procore Inspections)

Safety Observations involve conducting site safety evaluations of a specific task with direct feedback to those who are being observed. Observations and feedback should include both good and bad (at-risk) acts and conditions. The observation process is designed to prompt the observer to take responsibility for helping find a solution to an observed concern or mistake, rather than just reporting problems. All levels of project management are to participate in the observation process.

When making and documenting observations, the name of the employee stopped for performing an at-risk behavior should not be included except for positive recognition. Remember, observations should be kept positive…this is not a "Gotcha" process.

Ideally, the observation process can be extended to craft workers. Project site incentive programs can use the safety observation process as a leading indicator. Examples include best observation, most quality observations, etc. "What happened and what did you do about it?" is a simple criteria for a quality Safety Observation.

The Safety Observation Checklist shall be completed in the Procore Inspections Tool.

<u>Steps for completing a safety observation include:</u>

1) Observe work task
2) Analyze work practices by focusing on safe and unsafe acts and conditions
3) Talk with employees who are involved in the task about safety
4) Actively correct and prevent unsafe acts and conditions
5) Reinforce safe behavior
6) Discuss any outstanding unsafe conditions with the Superintendent or Foreman

<u>Frequency of Documented Safety Observations:</u>

a) General/Craft Superintendent – Daily

b) Project Safety Professional – Daily
c) Project/Field Engineer – Weekly
d) Project Manager – Twice/Month
e) Area Manager – Monthly for covered projects

Project Safety Meetings

Daily Hazard Analysis (DHA)

Daily Hazard Analysis (DHA) are to be held by each foreman with crew members prior to beginning any work for that shift. Attendance of all crew members is mandatory. The purpose of the Daily Hazard Analysis Form is to deliver task-specific training and provide an assessment of the planned work activities.

Weekly Toolbox Safety Training Meetings (Toolbox Talks)

a) Toolbox Talks shall be conducted by the General Superintendent, or designee. Attendance is mandatory for all general foremen, foremen, field engineers, and craft employees.
b) Toolbox Talks should be held at least once weekly, preferably at the beginning of a shift or after a break. Duration of meetings should be approximately 10-15 minutes depending on the topic. Employee participation should be encouraged and suggestions and comments regarding safety should be solicited and recorded in meeting minutes.
c) Toolbox Talks shall be documented and kept on file at the project site. Documentation shall include the following:
    - Outline of the subject matter covered
    - Date held
    - Attendance sign off sheet with the signatures or names of employees who participated in the training.
d) The following resources, while not all inclusive, may be used when preparing for toolbox safety meetings:
    - AB Safety Manual (rulebook)
    - Site-Specific Rules
    - Weekly Safety Meeting outlines (sent out by Corporate Safety)
    - Code of Safety Practices
    - Near miss reports
    - Root cause analysis reports
    - Safety Bulletins
    - Internal or outside safety compliance audit reports

- JHAs (or other Safe Job Procedures)
- AB safety performance reports
- AB Hazard Communication Program and Safety Data Sheets (SDSs)
- Accident reports
- OSHA standards (www.osha.gov)
- AB safety notices or directives
- AB safety information contained on the SharePoint website

Weekly Supervisor Safety Meetings

The Project Manager or General Superintendent shall organize, as a minimum, weekly safety meetings with all supervisory personnel (including foremen). The supervisor safety meetings are designed to make certain that there is a clear understanding of the safety procedures and requirements and that a commitment to safety performance continues in an unbroken chain from management staff to first line employees. Supervisor safety meetings should include the review of any accidents, near misses, and root cause reports, observed unsafe practices or other safety incidents that need to be addressed. From those findings, action plans should be developed and implemented to achieve safety goals and objectives.

Note: Supervisor safety meetings shall be documented and any action items should be tracked to completion.

Safety Compliance Audits

American Bridge safety personnel shall conduct periodic safety compliance audits of project sites to assure compliance with established safety rules and regulations, as well as identify any unrecognized hazards which may require necessary corrective action.

The results of the inspection shall be immediately reviewed with the General Superintendent, Project Manager, and other management personnel at the site so that corrective actions can be initiated.

PROJECT SCOPE AND STAFF

Description of Work

American Bridge is responsible for the design and construction of a new cruise ship facility and upland development for Disney Cruise Line (DCL) in Eleuthera, Bahamas.

Scope of Work includes:

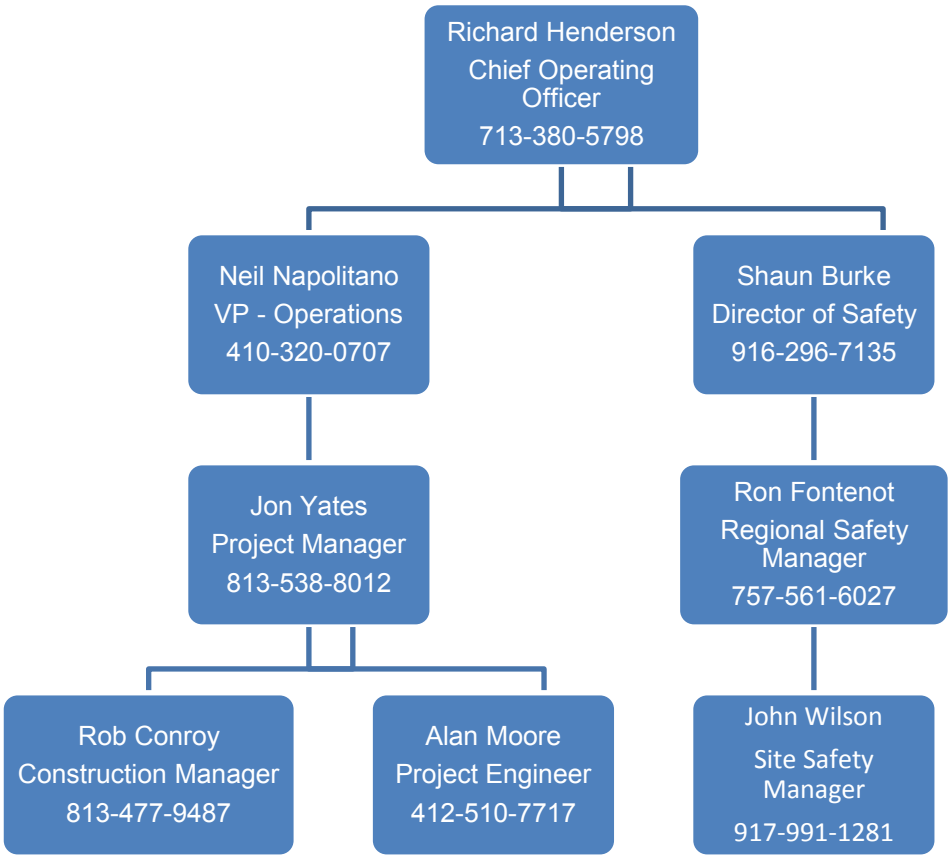
- Design and construction of berthing pier, mooring dolphins, and access trestle for DLC ships.

- Construction of a ro-ro platform
- Design and construction of upland works, including both Front of House and Back of House structures.
- Environmental management and compliance
- Quality Assurance/Quality Control
- Site Civil Works
- Landscaping and hardscaping

Major Equipment Involved:

- Spud Barge 54'x180' (7)
- Material Barge 30'x120' (2)
- Tugboat 1000HP (1)
- Tugboat 600HP (1)
- Manitowoc 2250 Crawler Crane (2)
- Manitowoc 4100 S2 Crawler Crane (3)

Project Organization/Contact Information



SITE HEALTH AND SAFETY RULES

Site Specific Safety Policy Statement

This site safety and health plan outlines the general safety and health requirements and procedures for American Bridge Company on the Lighthouse Point Project.

Every manager and supervisor is assigned the authority necessary to accomplish our mission of achieving a zero-incident workplace, and is held accountable for the project's safety performance.

While the ultimate success of the safety and health plan depends on the full cooperation of each individual employee, American Bridge Company understands that it is management's responsibility to see that a safe work environment is maintained at all times.

A safe work environment means:

- That safe physical conditions are provided and maintained to the extent feasible
- Employees are provided with and trained on the proper use of personal protective equipment
- Adequate safety rules and procedures are developed
- Training is provided
- Rules and procedures are enforced.

This Site Safety & Health Plan is based on the provisions of the Occupational Safety and Health Administration (OSHA) Standards, American Bridge Company's Corporate Safety Program Manual, and contract specifications. It is expected that this Plan along with any other applicable provisions of OSHA and the contract specifications be implemented and enforced throughout the duration of the project.

Compressed Gases

Moving and Hoisting:

- Valve protection caps are to be in place and secured when compressed gas cylinders are transported, moved, or stored.
- Cylinder valves are to be closed when work is finished. When cylinders are empty or being moved.
- Compressed gas cylinders are always to be secured in an upright position, except if necessary for short periods of time when cylinders are actually being hoisted or carried.
- Cylinders that are being hoisted will be secured on a cradle, pallet, or sling board. The use of a magnet or choker sling is prohibited for hoisting cylinders.

- Cylinders are not to be intentionally dropped, struck or allowed to strike each other violently. They are to be moved by tilting and rolling them on their bottom.
- Transportation of cylinders with a power vehicle is to be done with the cylinders secured in the vertical position.
- Regulators are to be removed and the caps on when cylinders are being moved if they are not secured on a bottle cart intended for that purpose.
- To keep cylinders from being knocked over during use they are to be in a cylinder cart or secured with rope or chain.

Storage:

- A minimum distance of 20-foot separation is to be maintained for oxygen and gas cylinders being stored, using a noncombustible barrier that is a minimum of 5 feet high with a two hour fire rating. The storage area is to be free of combustible materials, especially grease and oil.
- Cylinders are to be stored in an area safe from open flames, hot metal or portable heaters in the vertical position the valve ends up.
- Cylinders are to be kept far enough away from the actual welding or cutting operations so that sparks, hot slag, or flame will not reach them. When this is impractical, fire-resistant shields shall be provided.
- Cylinders shall be placed where they cannot become part of an electrical circuit
- Hoses and regulators can only be stored in ventilated boxes

Use:

- Compressed cylinders of any type cannot be taken into a confined space.
- Cylinders are not to be used at any time for supporting or rolling material, whether they are full or empty.
- Empty cylinders are to do marked “empty” or “MT”.
- Damaged or defective cylinders are to be removed from service and marked. The supplier is to be contacted and the cylinders removed from the site as soon as possible.
- Oxygen, fuel gas pressure regulators, hoses and torches need to be inspected before use for leaks, wear and proper operation.
- Torches can only be lit with a striker or other approved devices.

Cranes

Qualifications

a. Only competent operators for the type of equipment being operated will be permitted to operate cranes used on the Project. NCCO certification for the type of crane being operated will meet this requirement.
b. Copies of operator certificates are to be kept on file in the American Bridge Project office.
c. Operators must be evaluated by an individual who has the knowledge, training, and experience necessary to assess crane operators.
d. Evaluations should be documented using the AB Qualified Operator's Evaluation Form.

Yearly Crane Inspections

a. Cranes used on the project shall have had a current annual inspection performed by a Certifying Authority. Certification must be maintained throughout the duration of work on the project site.
b. A copy of annual certifications is to be kept on file in the American Bridge project office.

Pre-Shift and Monthly Crane Inspections

a. Equipment operators are to be provided with the *"American Bridge Company - Hydraulic, Mobile and Crawler Crane Inspection Form"* and instructed of their pre-shift and monthly inspection responsibilities (**See Exhibits Section)**. Cranes are to be inspected after setting up and prior to initial lift, before each shift, after any malfunction. (**Note:** Inspection forms supplied by crane rental companies may be used in lieu of the American Bridge inspection form.)
b. If adjustments or repairs are necessary which cannot be readily corrected by the operator, the condition is to be reported to the foreman or General Superintendent so that necessary corrective action can be initiated.

Critical Lift Plan

a. **A Critical Lift Plan** is to be prepared when cranes are used to make a critical lift. ***(See Exhibits Section)***
b. For the purpose of this program, a critical lift means a lift that…
    - Exceeds 75% of the rated capacity of the crane or derrick.
    - Requires the use of more than one crane or derrick.

- Any lift where exceptional care is required due to load size, weight, value, or proximity to electrical lines, other obstructions, buildings, roadways or tracks.
- Any lift over an occupied structure.
- Lifting of personnel in a personnel basket (Safety Bulletin No. 16)

c. The critical lift plan must be completed prior to any critical lift commencing and a pre-lift meeting must be held between the foreman, crew and crane operator(s) for the purpose of reviewing the plan.

Set-up/Operation

a. Assembly/disassembly of cranes must be directed by a person who meets the criteria for both a competent person and a qualified person. Per the OSHA Cranes and Derricks Standard (29 CFR 1926, Subpart CC), this person is called the Assembly/Disassembly director (A/D director).
   - The A/D director must understand the applicable assembly/disassembly procedures.
   - The A/D director must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any.)
   - *Crew* instructions*:*

     Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all of the following:

     (i) Their tasks.

     (ii) The hazards associated with their tasks.

     (iii) The hazardous positions/locations that they need to avoid.
   - See additional requirements for the A/D director in **Exhibits Section**.

b. Cranes must have the crane manufacturer's operating manual available with the crane (either inside the cab or inside the operator's control station). Cranes shall be operated according to the manufacturer's specifications and limitations.

c. Rated load capacities recommended operating speeds, and special hazard warnings or instructions shall be conspicuously posted on all equipment. Instructions or warnings shall be visible from the operator's station.

d. Cranes shall be on a firm supporting surface, level within 1% grade.

e. All mobile cranes shall be equipped with an anti-two-block device.

f. Outriggers shall be employed for all lifts except where the manufactured permits otherwise for assembly of boom only.

g. Cribbing/matting used must:
   - Be strong enough to withstand the weight of the crane without major deflection.
   - Bolted or secured together to prevent slippage and collapsing.
   - Be in complete contact with the soil with no voids or unsupported areas.
   - Extend on all sides beyond the outrigger pad and be sized to reduce the ground pressure exerted by the outrigger pad.

h. The crane operator shall be responsible for those operations under the operator's direct control. Whenever there is any doubt as to safety, the operator has the authority to stop and refuse to handle loads until safety has been assured.

i. If the operator loses contact with the signal person at any time for any reason, the operator must stop the movement of the crane until communication is restored.

j. Accessible areas within the swing radius of the rear of the rotating superstructure shall be properly barricaded to prevent employees from being struck or crushed by the crane. Control lines, warning lines, railings or similar barriers can be used to mark the boundaries of the hazard areas. *Exception:* When it can be demonstrated that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as "Danger--Swing/Crush Zone") and high visibility markings on the equipment that identify the hazard areas. In addition, the employee must be trained to understand what these markings signify.

k. No lifting shall be performed during times when wind gusts or sustained winds are in excess of those permitted by the manufacturer, lifting charts, lift plan, or current ASME standards.

Crane Signal Persons

Signal Persons shall meet the Qualification Requirements in the new OSHA Cranes and Derricks Standard (Subpart CC) prior to giving any signals. This requirement must be met by using either a third party qualified evaluator (The signal person must have documentation from a third party qualified evaluator, such as the local union.) or by receiving training from an American Bridge qualified evaluator.

- Documentation for whichever option is used shall be available at the site while the signal person is employed. The documentation must specify each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person is qualified to perform.

- AB's signal person training procedures can be found on AB's Access site under Safety/Forms/Other.

General Requirements

a. The equipment must not be operated in excess of its rated capacity.
b. Cranes shall not be used to drag or pull loads sideways.
c. The boom or other parts of the crane must not contact any obstruction.
d. The operator must test the brakes each time a load that is 90% or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90% or more of the maximum line pull, this requirement applies to the first lift but not to successive lifts.
e. A tag or restraint line must be used if necessary to prevent rotation of the load that would be hazardous.
f. The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.
g. Counterweight protection- Accessible areas within the crane's swing radius shall be barricaded.
h. Whenever there is a concern as to safety, the operator has the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.
i. The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator.
j. An operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for signal communications).
k. The operator must not leave the controls while the load is suspended, except where all of the following are met:
    - The operator remains adjacent to the equipment and is not engaged in any other duties.
    - The load is to be held suspended for a period of time exceeding normal lifting operations.
    - The competent person determines that it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions.
    - Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. No employees are permitted in the fall zone.

l. *Storm warning*. When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment.

Land Cranes on Barges

Waterborne exposures for cranes can present additional risks and concerns other than those encountered when this type of equipment is used on land. Securing the crane so that it does not move while in operations is required. The crane's lifting capacities are generally always reduced, the stability of the barge with a shifting crane load comes into play and the condition and suitability of the barge is a critical factor.

Securing the Crane – All cranes used on barges, vessels or other means of floatation must be physically attached to the barge. Cranes should be placed on hardwood timber mats in order to protect the deck of the barge and to adequately spread the load. The wood mats need to be separately secured to the deck to prevent any movement.

There are four options for securing land cranes to barges as outlined in 29 CFR 1926.1437(n).

Option 1: Direct cross cabling, chains, welding, bolting or otherwise connecting directly to the barge.

Option 2: Corralling with barricade restraints that do not allow the equipment to shift by any amount in any directions.

Option 3: Directly mounted and secured to rail system with rail clamps and stops.

Option 4: A Centerline wire rope system that is physically attached to the barge that can fully support the side load of the crane and that will secure the crane in one position while in operation.

Any of the systems used must be designed by a marine engineer, registered professional engineer familiar with the floating vessels or qualified person familiar with cranes on floating vessels.

Barge Stability and Suitability – The condition of the barge directly relates to the suitability and stability of the barge. The barge should be in watertight condition, even above the anticipated waterline. Hatches should be positively secured and any other holes or means of water ingress should be repaired or secured.

Barges that are leased should require both an "On-Hire" and a "Suitability" survey. The inspection should not be an external only inspection and must include an internal compartment inspection.

A List and Trim indicating device must be placed in the operator's cab. While the crane is in operation the maximum List and Trim cannot exceed 5 degrees.

Crane lifting capacity and working radius – Crane lift capacity charts must be modified (reduced) by either the manufacturer or a qualified person who has the expertise with respect to both land cranes/derrick capacity and the stability of the barge. The size of the barge or pontoon will directly affect the reduction in lifting capacity.

Reduced lifting capacity chart is required to be placed in the operator's' cab during all operations.

Inspections – In addition to otherwise required inspections for cranes and derricks, the crane and barge should be inspected at the following intervals:

- Shift – Inspection of crane tie downs
- Weekly – Full, empty or partially filled barge compartments should be inspected or sounded for leakage.
- Monthly – Inspection of crane tie downs, watertight integrity of barge including hatches, decks, and internal inspection of compartments for leaks or water accumulation. Deck loads properly secured and firefighting/lifesaving equipment in good operable condition.
- Annually – External condition of the barge by a qualified person for corrosion, wear, deterioration, or deformation.
- Every Four Year – Full barge internal/external inspection survey by a marine engineer, marine architect, qualified surveyor, or other qualified person.

Monthly, annual and four-year inspection are to be documented and retained for a minimum of four (4) years. All new or reinstalled floating cranes should be inspected and load tested by, or under the direction of a qualified person to not less than 100% or more than 110% of the modified rated load.

Cranes – Electrical Lines

Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, no part of a crane or its load shall be operated within 20 feet of an electrical line.

Cranes – Floating Cranes/Derricks

The document titled *"Land Cranes/Derricks Used on Barges, Pontoons, Vessels or Other Means of Floatation"* outlines the requirements found in OSHA Subpart CC – Cranes and Derricks in Construction (**See Exhibits Section).**

When using a land crane on a barge, pontoon, etc., one of the 4 options in the above-referenced document is to be used for securing the crane to the pontoon/barge.

Cranes – Suspended Personnel Platforms

If crane suspended personnel platforms/baskets are used for safe access to elevated work areas on the project, the requirements of Safety Bulletin No. 16 shall be followed. ***(See Exhibits Section)***

Note: Purchased manufactured platforms may be used in lieu of using the AB engineered/manufactured platform that is referenced in Safety Bulletin No. 16.

a. **Proof Test -** At the project site, prior to using each crane suspended platform, the platform and its rigging shall be proof tested to 125% of the platform's rated capacity by hoisting the platform approximately two feet and holding it in a suspended position for approximately five minutes with the test load connected to the platform. After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted.
   - Document the date of the proof test using Figure 2 in Safety Bulletin 16.

b. **Trial Lift** - A trial lift with the unoccupied work platform loaded at least to the anticipated lift weight is required to be made from ground level, or any other location where employees will enter the platform to each location at which the work platform will be hoisted and positioned. When using a purchased manufactured personal platform, the platform's test weight is to be connected to the platform in order to accomplish this loading provision of the trial lift.
   - The operator shall determine that all systems, controls and safety devices are activated and functionally properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the 50% limit of the hoist's rated capacity.

- A single trial lift may be performed at one time for all locations that are to be reached from a single set up position.
- A trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees.)
- **Figure 2 in Safety Bulletin No. 16** shall be used by the operator or foreman to document: 1) the proof test, and 2) that the total intended weight of the loaded platform and rigging does not exceed 50% of the rated capacity for the maximum radius and configuration of the crane.

c. **Fall Protection** - Except over water, employees occupying the personnel platform must use personal fall arrest systems. The system must be attached to a structural member within the personnel platform. When working over or near water, employees are to wear Personal Flotation Devices (PFDs).

d. **Hoisting personnel near power lines** - Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited.

e. **Wind** - When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, the General Superintendent (qualified person) must determine if, considering the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).

f. **Other weather and environmental conditions** – The General Superintendent (qualified person) is to determine if, considering indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).

Dropped Objects

Purpose

The purpose of this Dropped Object Prevention Plan is to establish guidelines for eliminating dropped objects when working at height. This plan is intended to significantly reduce both hazards and serious injury and risks to employees that dropped objects can pose. This plan should help mitigate dropped objects by ensuring that workers are properly trained to secure tools at height and understand correct procedures.

Application

This Prevention Plan applies to:

1. All locations where personnel are employed to perform work at height or where they may be exposed to a dropped object by working below other personnel, tools, equipment and platforms.
2. The requirements of this plan must be observed by all personnel involved in working at height or below at height activities.
3. This Prevention Plan must be reviewed in any job safety analysis or per-task planning for activities that require working at height with tools, and in those activities that require working below such activities.
4. This plan establishes minimum expectations in order to mitigate the risk of damage.

Definitions

- **Primary Drop System**- systems which serve as the tool's primary form of drop prevention and typically include the worker's hand placement or grip on the tool. Other forms may include main support systems for the tool (holstering a tool on the body or the platform a tool may be resting while not in use)
- **Secondary Drop System**- serves as a backup in the event the primary system fails and are utilized to prevent damage from a dropped or falling object after it has fallen. These systems may include passive systems such as guardrails with toe boards, mesh netting, screens, floor/hole coverings and tool canopies that have side protection. They may also include tool restraint systems which are utilized to secure a tool or object to an employee or stationary structure to prevent it from falling (includes pouches and transport buckets with closure systems). Tool arrest systems include tool tethers, which will arrest the fall of a tool and prevent it from striking a lower level or others below.
- **Drop Hazard**- Any tool, material or object that has the opportunity to fall from elevation to a lower level causing potential for damage to property, injury or death.
- **Mitigation**- The elimination or reduction of the frequency, magnitude or severity of exposure to risk by the minimization of the potential impact of a threat or warning.
- **Anchorage**- A secure point of attachment for tethers, tools and transport buckets with closure systems which is independent of an anchorage used for fall protection for personnel.
- **Attachment Point**- A devise designed and utilized to create a connection point on a tool to which the user can connect a tether or lanyard.

- **Tool lanyard/Tether**- an extension made of durable materials that is designed to prevent an object from being dropped, using a connection point on either end of the tether for securing n object to a worker or stationary item.
- **Dropped Object Zone**- An area with potential to be impacted by drop hazards currently present in a work in progress above. Dropped Object Zones are to be secured with barricades to prevent unauthorized entry. Signage stating the hazard and who to contact if access is needed. Post a spotter if needed in the area to prevent unauthorized access.
- **Safety Net**- A device install beneath work in progress to catch falling objects or personnel.
- **Tool Canopy**- A structure designed to rest over an area that can withstand the impact force of dropped tools or objects.
- **Static Load-** Maximum static load or Tensile Strength refers to maximum load can withstand before falling. This measurement does not consider drop distance or velocity.
- **Dynamic Load-** Maximum dynamic load refers to the load and object can withstand without failing when dropped a specified drop distance. Maximum dynamic load is usually much less than maximum static load due to the dramatic increase in force caused by the velocity of a falling object.

Management/Supervision Responsibilities

- Communicating the expectation that dropped objects will be eliminated in recognized areas and ensuring that this plan and associated procedures are implemented.
- Perform inspections to ensure the effectiveness of the procedures and selected equipment.
- Ensure all employees are properly trained in dropped object prevention for the areas work will be performed.
- Ensure work is scheduled to prevent workers from performing their duties below elevated work.

Employee Responsibilities

- Notifying His/Her supervisor of any drop hazards are in their work area.
- Perform work only after all dropped hazards have been eliminated.
- Stop work if hazardous conditions prevent work from being done safely.
- Immediately report any dropped or fallen objects.
- Communicate dropped object hazard potential to be included in JHA development.

Training

Training will be provided to each employee who may create or be exposed to drop hazards. When there is reason to believe that an employee who has had initial training does not have understanding of the dropped object plan in place the employee must be re-trained. All new employees or employees reassigned to a work area where dropped objects exist shall be trained.

This training shall include:

1. The nature of drop hazard in the recognized work area.
2. Correct procedures and equipment use for drop prevention.
3. Purpose of the primary and secondary drop systems.
4. How to identify any breaks or repair needed in systems in place before work begins.
5. Proper storage and handling of equipment.
6. Reporting requirements for dropped objects and near misses.

Drop Prevention Systems

Prior to selecting a tool lanyard, a proper attachment point must be established on the tool. If a tool has a built-in connection point placed by the manufacturer for the purpose of drop prevention, this step is not required. Load rating of the attachment is appropriate for the tools weight. Management and Supervisors shall determine a proper anchor connection for all tool used on site for work at heights.

Secondary Drop Systems

Safety Nets

When safety nets are necessary, net should be designed with specific sized webbing approved by the manufacturer for the selected tools and material that will be used day to day on the project. Forged steel safety hooks and shackles shall be used to fasten nets to their intended supports. Nets shall be as close as possible below the work to minimize drop distance. Safety nets shall be hung, maintained, tested and inspected as pre the manufactures or engineer of records recommendations. Nets designed for the use of falling object protection shall not be used for employee fall protection but shall have the capacity to accommodate a worker inspecting or clearing fallen objects from the nets.

Toe Boards

Toe boards shall be erected along the edge of overhead work in order to protect workers below. The toe boards will be capable of withstanding a force of at least 50lbs. in any downward or upward motion. The tow boards will be at least 3 1/2 inches tall with no greater than ¼ inch clearance over the work surface.

Guardrails

Guardrail systems will need to be inspected to ensure any openings are not large enough for tools or material to pass through if they are dropped and bounce. Install mesh or screen with small holes to prevent any tools or material from passing through or over guardrails.

Dropped Object Zones

Dropped object zones are to be clearly marked with danger/caution tape or barricades. Signage should be posted with contact information for anyone needing access to receive permission to access.

Human Performance

Housekeeping

Trash and waste should be kept in appropriate bins which are to be in convenient locations across the workplace. When at height, they are to be stored in transport buckets with closure systems, pouches, etc. with an ability to be closed and prevent spillage until the material can be properly stored in a waste bin. Employees should “clean as you go” and maintain an orderly work area, resulting in a lower chance for dropped material. Tools and other materials should also be kept in an organized, orderly fashion and stored in closed lid gang boxes when not in use.

Tool and Material Storage

Where tools or materials are stacked higher than the edge of the toe boards, screening or paneling will be constructed from the working surface to the top of the guardrail or mid-rail. This will be done for a sufficient distance to ensure these objects will not have an opportunity to become drop hazards. Unless guardrails with screening or paneling have been erected, materials should not be stored within four feet of the leading edge. All stacked materials should be stable, self-supporting and banded whenever possible.

Tool and Material Handling

Positive tool transfer should be utilized by employees. When transferring a tethered tool from one employee to another, "100% tie off" should be engaged. The tool should be tethered to the passing employee. Prior to handing off, the receiving employee should connect their tether to the tool as well. After positive connection has been completed, the passing employee may disconnect their tether from the tool. By utilizing this passing method, the tool never has an opportunity to become a drop hazard.

Equipment Inspection

All drop prevention systems shall be inspected prior to use. Excessively worn or damaged tools or materials must be immediately removed from service and replaced.

Electrical Safety

1) When using electrical tools, GFCI protection is required.
2) Extension cords must be of the three-wire type. Extension cords and flexible cords used with temporary and portable lights must be designed for hard or extra hard usage (for example, types S, ST, and SO).
3) Each cord set, attachment cap, plug and receptacle of cord sets; and any equipment connected by cord and plug, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage. Equipment found damaged or defective shall be immediately removed from service until repaired or replaced.
4) Defective or damaged extension cords, tools, etc. shall be removed from the work area immediately.
5) Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.
6) Extension cords shall be kept out of standing water.
7) All plugs on tools must have a ground pin or be double insulated.
8) Work spaces, walkways, and similar locations shall be kept clear of cords.
9) Light bulbs for general illumination must be protected from breakage, and metal shell sockets must be grounded.
10) Flexible cords must be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.
11) Barriers or other means of guarding and signage must be used to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of

equipment are exposed.

Environmental Protection

All environmental considerations will be made in accordance with the *Environmental Management Plan for Lighthouse Point.*

Excavation/Trenching

This policy contains the requirements for practices and procedures to establish safe work operations for employees involved in trenching and excavations. The guidelines listed are intended to be viewed as basic awareness when involved in trenching and excavations. American Bridge has the right to expect and impose more stringent requirements (Best Practices) than those listed below depending on the existing circumstances.

The estimated location of utility installations—such as sewer, telephone, fuel, electric, water lines, or any other underground installations that may be expected to be encountered during excavation work be located and marked prior to opening an excavation. -Pot holing with a vacuum truck is the best method for locating utilities.

Utility companies or owners will be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

When excavation operations approach the estimated location of underground installations, the exact location of the installations need to be determined by safe and acceptable means. While the excavation is open, underground installations will be protected, supported, or removed, as necessary, to safeguard employees.

Cleats or other appropriate means used in the connection of runway structural members must be attached to the runway's bottom or in a way that will prevent tripping from occurring.

All structural ramps that are used only as a means of access or egress from excavations by employees shall be designed by a competent person.

In areas where mobile equipment is required to approach the edge of an excavation and the operator does not have a clear view of the edge, a warning system shall be implemented such as barricades, mechanical signals, or stop logs. Whenever possible, the grade needs to be away from the evacuation.

Necessary precautions shall be taken to prevent employee exposure to an atmosphere that contains a concentration of a flammable gas in excess of 20 percent of the lower flammable limit. (Ventilation)

Support systems, including shoring, bracing, or underpinning shall be provided to ensure the stability of adjoining buildings, walls, or other structures endangered by excavations.

Excavation that is done below the level of the base or footing of any foundation or retaining wall that could present a hazard to employees shall not be pursued unless:

- A support system is provided to ensure employee safety
- The excavation is in stable rock
- A registered professional engineer has made approval that the structure is sufficiently removed from the excavation to be unaffected by the excavation activity
- A registered professional engineer has made approval that the excavation work will not present a threat to employees.

Each employee in an excavation will be protected from cave-ins by an adequate protective system except when:

- Excavations are made entirely in stable rock, or excavations are less than 5 feet (1.524 meters) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.
- Protective systems will have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

Employees must be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection will be provided by placing and keeping such materials or equipment at least 2 feet (0.6096 meters) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Daily inspections of excavations, the adjacent areas, and protective systems will be performed by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection needs to be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections also need to be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

A *competent person* will be designated by the Project Management team. Where a *competent person* finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees are to be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Each employee at the edge of an excavation 6 feet deep (1.8 meters) or more in depth will be protected from falling by a guardrail system, fencing or barricades when the excavations are not readily seen because of plant growth or other visual barriers.

In locations where oxygen deficiency or gaseous conditions are known or suspected, or in excavations 4 ft. (1.2 m) or greater in depth, air in the excavation will be tested prior to the start of each shift or more often if directed by the competent person, safety representative, or superintendent. A log of all test results will be maintained at the work site.

Protection from Water

Diversion ditches, dikes, or other means need to be used to prevent surface water entering an excavation and to provide good drainage of the area adjacent to the excavation.

Employees will not work in excavations in which there is accumulated water or in which water is accumulating unless the water hazards posed by accumulation is controlled:

- Freezing, pumping, drainage, and similar control measures must be planned and directed by a registered engineer. Consideration will be given to the existing moisture balances in surrounding soils and the effects on foundations and structures if it is disturbed.
- When continuous operation of ground water control equipment is necessary, an emergency power source will be provided. Water control equipment and operations shall be monitored by a Competent Person to ensure proper operation.

Protection from Falling Material

Employees will be protected (by scaling, ice removal, benching, barricading, rock bolting, wire mesh, or other means necessary) from loose rock or soil that could create a hazard by falling from the excavation wall: special attention is to be given to slopes that may be adversely affected by weather, moisture content, or vibration.

Materials, such as boulders or stumps, that may slide or roll into the excavation must be removed or made safe.

Excavated material will be placed at least 2 ft. (0.6 m) from the edge of an excavation or be retained by devices that are sufficient to prevent the materials from falling into the excavation. In any case, material is to be placed at a distance to prevent excessive loading on the face of the excavation.

When vehicles or mobile equipment are used or allowed adjacent to an excavation, substantial stop logs or barricades are to be installed. The use of a Spotter is recommended.

Workers are instructed to stand away from vehicles being loaded or unloaded to avoid being struck by spillage or falling materials.

Excavating or hoisting equipment is not to be allowed to raise, lower, or swing loads over or adjacent to personnel in the excavation without substantial overhead protection. Personnel will maintain a safe distance from hoisting operation until the load has been placed.

Employees exposed to machinery and vehicular traffic will be provided with, and will wear, high visibility apparel as this plan.

Employees will not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at lower levels are adequately protected from the hazard of falling material or equipment.

When operations approach the location of underground utilities, digging will progress with caution until the exact location of the utility is determined. Workers need to be protected from the utility and the utility protected from damage or displacement.

Employees entering excavations classified as a confined space or that otherwise present the potential for emergency rescue such as bell-bottom pier holes or similar deep and confined footing, will wear rescue equipment and maintain communication with the (confined space) attendant.

Sloping and Benching

Sloping or benching on the ground must be in accordance with one of the systems outlined below**:**

- For excavations less than 20ft (6 m) in depth, the maximum slope shall be 34° measured from the horizontal (1-1/2 horizontal to 1 vertical).
- All excavations less than 20ft (6 m) in depth which have vertically lowered portions will be shielded or supported to a height at least 18 inches (.5 m) above the top of the vertical side with a maximum allowable slope of 1-1/2:1.
- The design will be selected from and be in accordance with written tabulated data, such as charts and tables approved by a registered professional engineer.
- A copy of the tabulated data must include:
    - Identification of the parameters that affect the selection of a sloping or benching system drawn from the data;
    - Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;
    - Explanatory information as may be necessary to aid the use in correctly selecting aa protective system from the data; and
    - The identity of the Registered Professional Engineer who approved the data.

- The sloping or benching system must be designed by a Registered Professional Engineer. At least one copy of the design will be maintained at the job site during excavation. Designs should be in writing and include:
    - The magnitudes and configurations of the slopes that were determined to be safe for the particular excavation, and
    - The identity of the Registered Professional Engineer who approved the design.

Shield systems shall not possess loads exceeding the weight they were designed to withstand. All employees are not permitted in shields when they are being installed, removed, or moved vertically.

The design of support systems, shield systems, and other protective systems will be selected and utilized at the discretion of the American Bridge site management team, and will be managed by the Competent Person once put in place.

Employees are to receive awareness training in accordance with this plan**.**

Trench Specific Requirements

A *trench* is defined as a narrow (in length) excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of the trench (measured at the bottom) is not greater than 15 feet (4.6 meters).

Trenches 5 feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a *competent person* may determine that a protective system is not needed.

Trenches 20 feet (6.1 meters) deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 1926.652(b) and (c).

A stairway, ladder, ramp, or other safe means of egress will be located in trench excavations that are 4 feet (1.2192 meters) or more in depth so as to require no more than 25 feet (7.62 meters) of lateral travel for employees.

For support systems in trench excavations, excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

For shield systems, excavations of material no greater than 2 feet (.61 m) below the bottom of a shield shall also be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and no indications exist, while the trench is open, of a possible loss of soil from behind or below the bottom of the shield.

Trenches must be inspected daily before worker occupancy.

Fall Protection

1. Fall Protection Requirements

American Bridge Company is committed to the principles of 100% fall protection wherever the potential exists for an employee to fall from a height of six (6) feet or more. Unless otherwise noted herein, employees shall be protected from falling from unprotected sides or edges of walking/working surfaces greater than six (6) feet above a lower level through the use of guardrails, safety nets, warning line systems, fall restraint or personal fall arrest systems.

AB's 100% fall protection policy also extends to those walking/working surfaces that are above dangerous equipment or other hazardous situations where serious injury could result from a fall of less than six (6) feet.

In addition, prior to employees using walking/working services, it shall be determined by a member of AB's project management team that the surfaces have the strength and structural integrity to support employees safely.

2. Planning for Fall Protection

A. After identifying and evaluating fall hazards, the process required in planning for elevated work hazards consists of three fundamental considerations. <u>In order of priority they are:</u>

1) **Eliminate** fall hazards, if possible. Eliminating a fall hazard is the most effective fall protection strategy by making it impossible for someone to fall. For example:
   - Perform construction work on the ground before lifting or tilting the object to an elevated position.
   - Use tool extensions or other methods to perform overhead work from the ground.
   - Install permanent stairs early in the project so that workers don't need to use ladders between floors.
2) **Prevent** the fall hazard. Use appropriate systems and methods to prevent falls. For example:
   - Install guardrails, handrails, or perimeter safety cables around exposed walking/working surfaces.
   - Perform work out of personnel platforms or aerial lifts.
   - Perform work from scaffolding.
   - Use fall restraining systems to prevent employees from placing themselves near the fall hazard.
3) **Control** the outcome of a potential fall. Protect workers if they do fall. This is the domain of safety net systems and personal fall arrest systems (PFAS). PFAS cover the use of equipment such as full body harnesses, shock absorbing lanyards, self-retracting lifelines and lanyards, static line systems, and anchorage points. Use fall protection control systems only when you can't eliminate or prevent falls from occurring. A competent person is to oversee the selection of PFAS, installation and use.

B. Prior to the start of any elevated work operations, it is the responsibility of the Project Manager, lead Superintendent, or designee to:
   1) Plan the work. Identify potential fall hazards to be encountered, proper work procedures to be followed, and retrieval methods required. Whenever possible, when planning work, obtain feedback from the crew that will be performing the work.
   2) Include fall protection provisions for elevated work activities in the Job Hazard Analysis and/or Daily Hazard Analysis (DHA). When personal fall arrest systems are used, consideration shall be made for fall clearances and specific anchorage points which are adequate to support personal connection.

3) Communicate with all crew members the specific details of the fall protection provisions for elevated work activities.

3. Basic Systems and Equipment

This section describes some basic fall protection systems and equipment that may be used by American Bridge on the project.

A. **Anchorage Points** must be capable of supporting at least 5,000 pounds per attached employee, or designed as part of a complete fall arrest system which maintains a safety factor of at least two*. Objects, such as electrical conduit, wood guardrails, cable tray slats, fiberglass grating, hollow aluminum ladder rungs, etc. are not adequate anchorage points.

**Note: Shock-absorbing lanyards and retractable lifelines are typically designed to limit fall arresting forces to 900 pounds or less. Most manufactured horizontal lifeline systems are designed based on the 900 pounds of arresting force.*

B. **Full Body Harnesses** are the only acceptable forms of personal fall arresting equipment. Safety belts are not acceptable unless they are used for fall restraint only. Lanyards should always be attached to the D-ring behind the neck and between the shoulder blades. All other D-rings are prohibited for fall protection and are intended only for working adjacent to vertical surfaces, positioning or retrieval. Improper attachment to harness D-rings may result in serious injury. Only one (1) snap hook is permitted on a "D" ring.

C. **Rope Grab Devices** for vertical climbing or in suspended personnel platforms. Rope grabs should be connected to either the back D-ring on the full-body harness using an approved lanyard, or to the front chest D-ring on the full-body harness using a connector, such as a locking carabiner.

Grab devices must be compatible with the diameter of the lifeline.

Always follow the manufacturer's instructions for use of rope grabs.

D. **Shock Absorbing Lanyards** are the only acceptable (non-retractable) lanyard type to be used by AB employees. Locking snaps or carabiners are required to prevent "roll-out" of the anchorage point from the snap or carabiner. Knotting or tying lanyards to shorten them is not permitted.

1) In order to provide continuous fall protection, double lanyards shall be used where required to maintain 100% tie off (i.e., moving around posts, columns, and other interferences).
2) Whenever feasible, lanyards shall be utilized such that the maximum free fall that could occur is less than 6 feet. Free fall is defined as the vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This means that a 6-foot lanyard should be anchored (or hooked off) at shoulder height or higher, since the D-ring attachment point is at shoulder height. In some situations, it may not be feasible to comply with the 6-foot free fall distance, and that anchoring at the employee's feet will be necessary. If a 6-foot lanyard is rigged to an anchorage at floor level, the total free fall would be the sum of the vertical distance between the attachment point on the body harness and the floor (usually 4 to 4½ feet) plus the length of the lanyard (6 feet in this example), which totals about 10 feet. That means that the use of a 6-foot lanyard, rigged to an anchorage at the worker's feet would result in a free fall in excess of the 6-foot limit. This arrangement is only allowed where a more suitable anchorage or other form of fall protection cannot be provided. In a situation where limiting the free fall to 6 feet is infeasible, the free fall shall be limited to the extent possible and the arresting force is not to exceed 1,800 pounds. *(Note: Shock-absorbing lanyards and retractable lifelines are typically designed to limit fall arresting forces to 900 pounds or less.)* In lieu of a standard 6-foot lanyard, retractable lanyards with inertia reels may be used to limit fall distance.
3) A lanyard should never be wrapped around an object, such as a pipe or beam, and then connect back to the lanyard unless the lanyard and locking hook is designed to allow tie-back. The webbing and snap hooks of regular lanyards are not designed to withstand the rigors of tying back.
4) One lanyard should never be hooked into another lanyard to extend the length. The proper method is to use a choker or a "cross-arm strap" on the pipe or beam, and then connect the lanyard into the strap.

- Never attach a lanyard snap-hook to another snap-hook. Also, never attach a shock-absorbing lanyard to a self-retracting lifeline (SRL) as the shock-absorbing feature will disengage the clutching action of the SRL. In both cases, use a manufacturer's recommended connector ring capable of supporting 5,000 pounds.
- Be aware when using synthetic lanyards around cutting, welding or other flame producing operations. When synthetic lanyards are employed in such circumstances, care should be taken to protect the lanyard from damage and more frequent inspection should be employed.

E. **Self-Retracting Lifelines** (SRL) are normally intended for vertical work as in climbing up and down. They may be used horizontally for work only if attached to a horizontal lifeline so that it is always free to reposition directly over the harness D-ring of the worker below. If the block is not positioned directly over the point of operation there is a swing fall hazard from the "pendulum effect". This is particularly hazardous if there are obstructions for the user to strike against. The forces involved can be quite severe, depending on how far the worker swings. Therefore, it is critical that employees not move a distance of more than 5 feet horizontally from directly under the anchorage point, regardless of the manufacturer's allowed angle of operation for the retraction mechanism. If greater horizontal movement is required a horizontal life line should be considered.

F. **Horizontal Lifelines** (also known as static lines) shall be anchored such that each anchorage point will withstand the simultaneous fall impact of 5,000 pounds per employee attached or if engineered, designed as part of a complete fall arrest system which maintains a safety factor of at least two*. Horizontal lifelines shall not have more employees simultaneously tied off to the system between anchorage points than the system is designed for. Horizontal lifelines shall be installed with the proper amount of sag as required by the manufacturer or engineer responsible for the design of the system.

**Note: Shock-absorbing lanyards and retractable lifelines are typically designed to limit fall arresting forces to 900 pounds or less. Most manufactured horizontal lifeline systems are designed based on these 900 pounds of arresting force.*

G. **Vertical Lifelines** (drop lines) shall have a minimum breaking strength of 5,000 pounds. When vertical lifelines are used, each employee shall be attached to a separate lifeline. A vertical lifeline is attached to an overhead anchorage and must be connected directly to an employee's full-body harness, lanyard, retractable device, or rope grab.

H. **Fall Restraint Systems** allow tying off so that an employee can perform work but is physically unable to reach the fall hazard. The anchorage point for fall restraint systems must be able to support 3,000 pounds or twice the maximum expected force that is needed to restrain the person from exposure to the fall hazard. In determining this force, consideration should be given to site-specific factors such as the force generated by a person walking, leaning, or sliding down the work surface. Safety belts or full-body harnesses are permitted to be used for fall restraint. The attachment point to the body belt or full-body harness can be at the back, front, or side D-rings.

I. **Warning Line Systems.** Warning line systems may be used to alert workers who are approaching an unprotected edge of a deck or other large work surface.

Safe warning line system work practices:

- The warning line should be installed around all edges of the work area not less than 6 feet from the leading edge when mechanical equipment is not being used. When mechanical equipment is in use, this distance should be increased to 10 feet.
- The working surface should be relatively flat with a slope of 2:12 or less.
- The warning line should be 34 to 39 inches above the work surface.
- The warning line should be rope, wire, or a chain. Avoid using plastic tape for a warning line; workers should be able to feel the line if they back up against it, even if they're wearing heavy clothing.
- The warning line should be flagged at least every six (6) feet with high-visibility material and have warning signs that are visible to workers.
- Stanchions that support the warning line should be able to withstand a force of at least 16 pounds, applied horizontally in the direction of the unprotected edge 30 inches above the working surface, without tipping over.

- No workers can enter the area between the warning line and the unprotected edge unless they are protected with personal fall-arrest systems, restraint systems, guardrail systems, or safety nets. Never use a warning line as a substitute for a guardrail.

J. **Guardrail Systems** consist of a top rail, midrail, and intermediate vertical member. Guardrail systems can also be combined with toe boards that prevent materials from rolling off the walking/working surface.

Guardrail systems must be free of anything that might cut a worker or snag a worker's clothing. Top rails and midrails must be at least 1/4-inch thick to reduce the risk of hand lacerations; steel and plastic banding cannot be used for top rails and midrails.

Other requirements for guardrails:

- The top rail of a guardrail must be 42 inches (plus or minus 3 inches) above the walking/working surface.
- Midrails must be installed midway between the top rail and the walking/working surface unless there is an existing wall or parapet at least 21 inches high.
- Intermediate vertical members, when used instead of midrails between posts, must be no more than 19 inches apart.
- Wire rope used for a top rail must be marked at least every six feet with high-visibility material.
- A guardrail system must be capable of withstanding a 200-pound force applied within two inches of its top edge in any outward or downward direction. When the 200-pound test is applied in a downward direction, the top edge of the guardrail must not deflect to a height less than 39 inches above the walking/working level.
- Midrails, screens, and intermediate structural members must withstand at least 150 pounds of force applied in any downward or outward direction.
- When toe boards are used as protection from falling objects, they must be erected along the edges of the walking/working surface for a distance sufficient to protect persons working below. Toe boards shall be capable of withstanding a force of at least 50 pounds applied in any downward or outward direction at any point along the toe board. Toe boards shall be a minimum of 3.5 inches tall from their top edge to the level of the

walking/working surface, have no more than 0.25 inches clearance above the walking/working surface, and be solid or have openings no larger than 1 inch in size.

- Where tools, equipment, or materials are piled higher than the top edge of a toe board, paneling or screening must be erected from the walking/working surface or toe board to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect employees below.

K. **Covers for Holes** are simple and effective when they're properly installed. Rigid covers prevent workers from falling through temporary openings and holes in walking/working surfaces. Covers must:

- Support at least twice the maximum expected weight of workers, equipment, and materials.
- Be secured so they will not be displaced accidently.
- Have full edge bearing on all four sides.
- Be painted with a distinctive color or marked with the word HOLE or COVER.

4. Fall Rescue Requirements

Retrieval/rescue methods shall be in place prior to start of any work activities with fall hazards. Retrieval and emergency procedures shall be planned and communicated to all employees prior to the start of any work activity. Furthermore, another employee in the immediate vicinity shall always accompany employees utilizing personal fall arrest equipment, as fall victims are not normally able to assist in their own rescue and time is of the essence when retrieving a fall victim.

5. Inspection

A monthly documented inspection (i.e., colored bands, logs, tags, etc.) is to be made by a competent person.

Prior to each use, a visual inspection of personal fall arrest equipment shall be made by the employee who will be wearing and using the equipment. Below is a general overview of inspection criteria for harnesses, lanyards, and snaphooks:

Lanyards	Inspect webbing for cuts, fraying, pulled or broken threads, excessive wear, burns, or possible chemical damage. Also, the warning tag must not be visible - warning that the lanyard was placed under a load condition.
Harnesses	Look for same damage as on a lanyard. Also, de-formed or damaged hardware, grommets and buckles.
Snaphooks	Look for worn, cracked or pitted surfaces. Locks must operate properly and keeper latches must seal properly into the nose of the hook.

Any defective equipment shall be immediately removed from service and destroyed to prevent further use. Additionally, any lifeline, safety harness, or lanyard actually subjected to in-service loading (as distinguished from static load testing) shall be immediately removed from service and destroyed to prevent further use.

6. Training

A. Initial training in fall protection is to be conducted during General Fall Protection Orientation.

B. At the conclusion of this training, the *"Fall Protection Orientation"* portion of the *"Employee Indoctrination Acknowledgement Form"* is to be completed by the trainer and the employee.

C. Additional and/or supplemental fall protection training is to be conducted:

- When fall protection is addressed in a Job Hazard Analysis (JHA).
- When fall protection is addressed on a Daily Hazard Analysis (DHA).
- During Weekly Toolbox Safety Training Meetings.
- When there are new fall exposures and associated controls on a project site.
- When new fall protection equipment/systems that have not been used before are introduced on a project site.
- For employees involved in the installation of fall protection systems (vertical lifelines, horizontal lifelines, warning lines, etc.)

7. Exceptions to the 6-Foot Fall Protection Requirement

Trucks/Vehicles/Trailers

When loading / unloading deliveries, fall protection should be considered when a fall hazard exists greater than six (6) feet if doing so is practical and does not create a greater hazard.

Scaffold

Fall protection shall be used when working more than ten (10) feet above lower levels.

Portable Ladders

When using portable ladders, fall protection is not required but should be considered when a fall hazard exists greater than six (6) feet and if doing so is practical and does not create a greater hazard.

Dock/Barges (work areas)

There are many situations working in construction work areas on piers, docks and barges where the fall distance to the water is between six and ten feet. In particular, most material barges when empty generally have freeboard of ten (10) feet or less to the water surface from the barge deck. In these work areas, the following safety measures shall be provided:

- Ensure a competent person reviews these situations and reviews the various hazards/solutions and possible engineering/administrative controls.
- Workers must be wearing appropriate life jackets. Life rings with at least 90 feet of line shall be spaced not more than 200 feet apart. A rescue boat shall be immediately available.
- When the fall distance is greater than ten (10) feet to the water or greater than six (6) feet to solid lower level, a control access zone would be established utilizing a warning line system six (6) feet or more in from the pier/dock barge edge delineating the work area. Any activity outside of the work area would require 100% fall protection measures.
- A competent person must provide training to anyone requiring access to these areas under this condition.

Cranes

- ***Non-assembly and Disassembly Work*** - For non-assembly/disassembly work, fall protection equipment shall be used by employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows:
    - When moving point-to-point:
        - On non-lattice booms (whether horizontal or not horizontal).

- On lattice booms that are not horizontal. When the lattice boom is in the horizontal position, fall protection equipment shall be used by employees where the fall distance is 15 feet or more.

- While at a work station on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

- ***Assembly & Disassembly Work*** - For assembly/disassembly work, fall protection equipment shall be used by employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

8. Fall Accidents

A root cause incident analysis, as described in the Corporate AB Safety Program under Section 3.14.11, shall be conducted by the project management team for every **fall incident** where an employee engages their personal fall arrest equipment. It is American Bridge's goal to prevent falls and to learn from those instances when a fall does occur. The root cause analysis shall be conducted whether the fall results in a minor, serious, or no injury.

Fire Protection and Control

1) Firefighting equipment shall be conspicuously located and readily accessible at all times, shall be periodically inspected, and be maintained in operating condition.
2) Monthly Inspections - Fire extinguishers shall be visibly inspected each month for defects and to make certain that extinguishers are fully charged. Monthly inspections shall be documented on each extinguisher's tag.
3) At least one portable fire extinguisher, having the rating of no less than 20-B units, shall be located outside of, but no more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.
4) At least one portable fire extinguisher, having the rating of not less than 20-B units, shall be located not less than 25 feet from, nor more than 75 feet, from any flammable liquid storage area located outside.
5) At least one portable fire extinguisher having a rating of not less than 20-B:C units shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable

or combustible liquids.

6) An accessible fire extinguisher of 5BC rating, or higher, shall be available at all crane cabs.
7) LP-Gas storage locations shall be provided with have at least one approved portable fire extinguisher rated not less than 20-B: C.
8) Extinguishing the fire should be attempted only if there is a portable fire extinguisher available and the fire is in its incipient (initial or beginning) state and can be safely controlled or extinguished with the available equipment. If the size of the fire presents an immediate danger to life or health, evacuation, not firefighting, should be the primary objective.
9) Fire Extinguisher Use:
    a) The fire extinguisher should be discharged approximately eight feet from the fire with the wind at your back if possible.
    b) The fire should be attacked as you advance.
    c) Quick work is important because the discharge time to empty the contents of extinguisher is usually about one minute.
    d) With the water type extinguisher, the stream should be directed at the base of the fire and moved forward.
    e) When using dry-chemical extinguishers, the nearest edge of the fire should be attacked, and the user should move forward moving the nozzle rapidly with a side-to-side sweeping motion.
10) Employee training:
    a) Utilize weekly tool-box safety meetings to discuss fire prevention and protection procedures.
    b) Explain the proper use of each type of fire extinguisher available.
    c) Explain the fire reporting/alarm procedures

Forklifts

Only trained and authorized employees are permitted to operate forklifts.

1) Unless forklift operators are trained and certified by an outside source (i.e., union training program, forklift manufacturer training program, forklift rental company training program, etc.), the American Bridge Forklift Training Procedures shall be followed. A copy of the AB training program is available on American Bridge's Access site (Safety/Safety Manuals/Forklift Training Program).
2) Refresher training shall be conducted to ensure that forklift operators have the knowledge and skills to operate the forklifts safely. Refresher training in relevant topics shall be provided when:

- The operator has been observed to operate the vehicle in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the truck safely.
- The operator is assigned to drive a different type of forklift truck.
- A condition in the workplace changes in a manner that could affect safe operation of the forklift.
- An evaluation of each operator's performance shall be conducted at least once every three (3) years.

Hazard Communication

American Bridge's hazard communication requirements are contained in the *AB Hazard Communication Program,* (**See Exhibits Section**).

1) Each new employee is to receive a copy of the Hazard Communication information sheet (2 pages) when hired. The information sheet provides an overview of the hazard communication standard and methods used by AB to comply with the standard. The contents are to be reviewed with each new employee during orientation and signed by the employee. (**See Exhibits Section**)
2) A copy of the *AB Hazard Communication Manual* shall be located at the Project site along with a list of chemicals used on the site and corresponding Safety Data Sheets.
3) All substances with a manufacturer's label shall be maintained in a legible condition. Containers without labels will be relabeled with the proper information pertaining to the substance. Labels shall contain the identity of the hazardous chemicals contained and any appropriate hazard warnings.
4) A notice to employees that SDSs are available to employees or their authorized representative upon request shall be posted on the project site bulletin board. (**See Exhibits Section**)

Hot Work

1) Each welding/burning rig shall be equipped with a minimum 10# ABC fire extinguisher.
2) Hoses/leads shall be appropriately routed or protected to prevent their damage from slag or sparks. Damaged hose/leads shall be removed from service.
3) Hoses, leads, torches, gauges, regulators, cylinder valves and welding machines shall be inspected daily by the user for leaks and proper condition. Leaks or malfunctions shall be repaired or replaced prior to use.

4) Fuel-gas and oxygen cylinders in storage shall be separated by a minimum distance of 20 feet or by a noncombustible partition not less than 5 feet high with a fire resistance rating of ½ hour. Any fuel gases not used within 24 hours are considered in storage.
5) Oil and grease must be kept away from oxygen regulators, hoses and fittings. The storage of wrenches, dies, cutters, or other grease-covered tools, clothing, gloves or rags in the same compartment with oxygen equipment is prohibited.
6) Cylinders shall be kept far enough away from the actual welding or cutting operations so that sparks, hot slag, or flame will not reach them. When this is impractical, fire-resistant shields shall be provided.
7) Torches and/or hoses may not be left in a vessel, tank, or any other enclosed container because of the potential hazard of explosion from their leakage.
8) Compressed gas cylinders shall not be hoisted using slings or by the valve protection cap. Use only carts or racks designated and approved for hoisting.
9) Oxygen shall not be used as a substitute for compressed air or other gases (e.g., to operate tools, blow out lines, pressurize vessels, etc.)
10) All oxy-acetylene assemblies must have flash arresters either at the regulator or torch in accordance with the manufacturer's recommendations. The gauges shall be in good operating condition and the sight glass free from damage or discoloration.
11) Valve protection caps shall be in place and secured when compressed gas cylinders are transported, moved, or stored.
12) Cylinder valves shall be closed when work is finished and when cylinders are empty or are moved.
13) Compressed gas cylinders shall be secured in an upright position at all times, except if necessary for short periods of time when cylinders are actually being hoisted or carried.
14) Cylinders shall be placed where they cannot become part of an electrical circuit.
15) All work during electric welding must be grounded.
16) Stingers must not be laid on conductive materials.
17) Spent rods shall be disposed of in non-combustible containers.
18) Electric welders shall be shut off at the end of the shift or when not in use for extended periods.
19) Arc welders shall be equipped with protective hoods over exposed lugs.
20) Only cables free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

21) Cables shall be inspected daily by the user for proper condition. Cables in need of repair shall not be used. When a cable becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation. *(As stated in item 20 above, no repairs are permitted for a minimum distance of 10 feet from the cable end to which the electrode holder is connected.)*
22) Additional Information can be found in the AB Welding, Burning, Cutting Plan, along with the AB Hot Work Permit that is to be used, (See Exhibits Section).

Heat Stress

American Bridge is to ensure that workers are protected from extreme heat that could result in workers getting heat stroke, exhaustion, or any type of heat related illness. American Bridge is also to ensure that workers are protected from harshly cold environments that pose a risk of cold stress and cold induced illnesses.

Implementation of a heat illness prevention program shall be established by the AB Project Team. AB shall make sure the following precautions are present:

- Workers shall be provided with water, rest, and shade throughout the day.
- Allow new or returning workers to gradually increase workloads and take more frequent breaks as they adjust or develop a tolerance for working in the heat.
- Plan for emergencies regarding heat stresses and train your employees on how to prevent them.
- Frequent monitoring of employees for signs of illness.

To help prevent heat related illnesses, pursue the following:

- Drink water every 15 minutes
- Take rests in the shade
- Wear light-colored clothing and hats
- Learn the signs of heat illnesses
- Slowly acclimated yourself to working in the heat

Workers who are 65 years of age or older, are overweight, have high blood pressure or heart disease, or take medications that extreme heat may affect are at a greater risk of developing some form of heat stress.

Heat-Related Illnesses

Heat Stroke

Heat Stroke is the most serious illness that is heat related. It happens when the body loses control of temperature regulation: the temperature of the body quickly rises, sweating is nonexistent, and the body loses the ability to cool itself down.

Symptoms include:

- Confusion and slurred speech
- Loss of consciousness
- Seizures
- High body temperature
- Hot, dry skin

First-aid practices are as follows:

- Relocate the worker to a shaded area
- Place cold clothes on the person or simply wet the skin
- Circulate the air around the worker to speed cooling
- Call 911 and stay with the worker

Heat Exhaustion

Heat Exhaustion is the response from the body to an excessive loss of water salt, usually through excessive sweating.

Symptoms include:

- Headache
- Weakness
- Dizziness
- Irritability
- Nausea
- Heavy sweating
- Thirst
- High body temperature
- Decreased urine output

Treat a worker experiencing heat exhaustion with the following:

- Remove the worker from hot areas and give them liquids to drink
- Remove unnecessary clothing
- Cool the worker with cold compresses
- Take the worker to the clinic or call 911 if medical care is unavailable

Rhabdomyolysis

Rhabdomyolysis is a medical condition associated with heat stress and prolonged physical exertion. This results in the quick breakdown, collapse, and death of muscle tissue. After the death of muscle tissue, electrolytes and large proteins are released into the bloodstream, which can cause irregular heartbeats, seizures, and kidney damage.

Symptoms of rhabdomyolysis include:

- Muscle cramps/pain
- Weakness
- Exercise Intolerance
- Asymptomatic
- Abnormally dark urine

Workers who experience rhabdomyolysis symptoms should:

- Stop activity immediately
- Increase water intake
- Seek immediate care at a medical facility
- Ask to be checked for rhabdomyolysis (blood sample)

Heat Syncope

Heat Syncope consists of an episode of fainting or dizziness that usually occurs with prolonged standing or sudden rising from a sitting or lying position. A lack of acclimatization and dehydration may contribute to heat syncope.

Symptoms include:

- Short duration fainting

- Dizziness
- Light-headedness during long periods of standing
- Light-headedness during sudden rising from a sitting/lying position

Workers with heat syncope should:

- Sit/lie down in a cool area
- Slowly drink water, clear juice, or a sports drink

Heat Cramps

Heat Cramps are common among workers who sweat a lot when involved in strenuous activities. Sweating depletes the body's salt levels, and the low salt levels cause painful muscle cramps. Heat cramps can also be a sign of heat exhaustion.

Symptoms include:

- Muscle cramps, pain, or spasms in the abdomen, arms, or legs

First-aid for workers with heat cramps include:

- Drink water or a sports drink and have a snack every 20 minutes
- Avoid salt tablets
- Seek medical attention if the cramps do not subside within 1 hour

Heat Rash

Heat Rashes are skin irritations that result from constant sweating during hot, humid weather.

Symptoms of heat rash include:

- Red clusters that look like pimples or small blisters
- Usually found on the neck, groin, upper chest, under the breasts, and in elbow creases

Workers experiencing heat rash should:

- Seek a cooler work environment if practical
- Keep the rash area dry
- Apply powder for increased comfort
- Never use ointments and creams

Preventing Heat Stress

Controls:

By implementing engineering and work practice controls into your program, you can greatly help to reduce the chances of employees obtaining heat stress.

Engineering controls may include increasing air velocity, reducing steam leaks, wet floors, or humidity, and using reflective barriers or shielding.

For work practice controls, any of the following methods may be suitable:

- Limit the amount of time exposed to heat/increase recovery time in cool environments
- Increase the number of workers per task
- Reduce the job's metabolic demands
- Training of employees
- Buddy systems
- Provide cool water near work areas and encourage frequent drinking

Training

Workers should be trained on how to recognize signs of heat stress and appropriate actions to take if someone develops or shows symptoms of a heat-related illness.

A heat stress training program should be provided for all workers and supervisors and include the following content:

- Recognition of signs/symptoms of heat-related illnesses and first-aid administration
- The causes of heat-related illnesses mitigation procedures
- Non-occupational factors that may affect occupational heat stress
- Acclimatization importance
- Emergency response procedures for heat-related incidents

In addition, all supervisors should receive the following training:

- How to appropriately implement acclimatization
- How to monitor weather reports
- How to respond to hot weather advisories
- How to monitor employee's fluid intake and rest breaks

Acclimatization

Acclimatization is the result of beneficial physiological adaptations that are present after gradual increased exposure to a hot environment. Ensuring that workers are acclimatized before they begin work in a hot environment is important in the prevention of heat stress.

Remember:

- Gradually increase workers' time in hot conditions over 7 to 14 days
- Closely supervise new employees for the first 14 days
- Non-physically fit workers require more time to fully acclimatize
- Breaks in an air-conditioned environment will not affect acclimatization

Hydration

Employers are to provide appropriate hydration means to employees. This includes:

- Potable water less than 15ºC (59ºF) that is easily accessible for workers
- Estimation of how much water will be needed
- Individual drinking cups

Worker recommendations for staying hydrated include:

- If exposed to heat <2 hours and involved in moderate work activities, drink one cup of water (8 oz.) every 15-20 minutes
- Drink sports drinks containing electrolytes if prolonged sweating lasts several hours
- Avoid alcohol and drinks containing high sugar or caffeine
- Fluid intake should not exceed 6 cups per hour

Rest Breaks:

- If a worker feels heat discomfort, permit rest and water breaks
- Assign new, un-acclimatized workers with lighter work
- Shorten work periods and increase resting:
    - As humidity, temperature, and sunshine increases
    - When air movement is nonexistent
    - If workers wear protective clothing or equipment
    - During heavier work

Housekeeping

1) There shall be a daily cleanup for all refuse; rubbish, scrap materials, and debris caused by work operations, to the end that at all times the work site shall present a neat, orderly and workmanlike appearance.
2) All stored items shall be maintained in an orderly arrangement to allow access, not impede drainage or traffic, eliminate fire hazards and provide proper protection of material.
3) Materials shall be piled and stacked so that safe clearances are maintained and toppling is prevented.
4) Scrap, debris, waste materials, and other items not required for construction of the work shall be regularly disposed of at frequent intervals.
5) All items awaiting removal from the work site shall be adequately stored, observing all requirements for fire protection, health and protection of the environment. Containers shall be provided for collection and separation of all refuse. Covers shall be provided on containers used for flammable or harmful substances.
6) All loose material shall be removed from work areas or adequately secured at the end of the work shift or more often as wind and weather conditions may dictate.
7) The outside storage area near flammable and combustible liquids shall be kept free of weeds, papers, debris, and other combustibles not necessary to the storage.
8) A spill cleanup kit shall be made available for the volume of material stored on site.
9) Spillage of fuel, oil or hazardous materials shall be cleaned up or contained immediately.
10) Nails protruding from lumber shall be removed or bent over immediately.

Jobsite Security

All considerations made for jobsite security shall be made in accordance with the AB Site Security Plan for Lighthouse Point, (See Exhibits Section).

Ladder Safety

1) Portable and fixed ladders with structural defects—such as broken or missing rungs, cleats or steps, broken or split rails, or corroded components—shall be withdrawn from service by immediately tagging “DO NOT USE” or marking in a manner that identifies them as defective, or shall be blocked, such as with a plywood attachment that spans several rungs. Repairs must restore ladder to its original design criteria.

2) Portable non-self-supporting ladders shall be placed on a substantial base, have clear access at top and bottom, and be placed at an angle so the horizontal distance from the top support to the foot of the ladder is approximately one-quarter the working length of the ladder.
3) Portable ladders used for access to an upper landing surface must extend a minimum of 3 feet above the landing surface, or where not practical, be provided with grab rails.
4) Portable straight ladders shall be secured (i.e., tied off) to prevent accidental movement while in use.
5) Ladders must have nonconductive side rails if they are used where the worker or the ladder could contact energized electrical conductors or equipment.
6) Persons working from ladders at a standing height of six (6) feet or more above a lower level must utilize 100% fall protection when they must lean or reach outside of or beyond the side rails of the ladder to perform the work.
7) Employees shall be instructed to recognize hazards related to ladders and to use proper procedures to minimize these hazards. Employees are to be trained in the following areas, as applicable:
    - The correct procedures for erecting, maintaining, and disassembling the fall protection system to be used.
    - The proper placement and care in handling ladders.
    - The maximum intended load-carrying capacities of ladders used.
8) Stepladders shall be used only in the fully open position with the spreader locked in place. Never stand on the top two rungs of a stepladder.
9) Construction requirements pertaining to job-made wooden ladders shall be per ANSI A14.4.

Marine Works

1) U.S. Coast Guard approved personal flotation devices (PFDs) are to be provided and worn by employees working on or over water where the danger of drowning exists. *(Use is not required where employees are continuously protected by railings, nets, safety harness/lanyard, or other applicable fall protection provisions.)*
2) Ring buoys with at least 90 feet of line shall be provided and readily available at work locations to use for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
3) AB Safety Bulletins No. 3 - Life Jackets or Buoyant Work Vests and Ring Buoys (***See Exhibits Section***) shall be reviewed.

4) A lifesaving skiff shall be made immediately available for rescue operation when working over the water **(See Exhibits Section – Safety Bulletin No. 28).** As a minimum, the safety skiff shall be equipped as follows:
    a. Motor
    b. Two oars of proper length.
    c. One ring buoy (Coast Guard approved) with 90 ft. of 3/8-in solid braid polypropylene, or equivalent, line attached.
    d. One boat hook.
    e. Two (Coast Guard approved) buoyant work vests.
5) Water Rescue

The following procedure shall be reviewed with all applicable crews. In addition, water rescue scenarios should be discussed in daily safety huddles in order to be prepared in the event of such an incident.

- Launch safety boat before work over water.
- Designate the boat attendant(s) and notify all crews.
- All personnel should be familiar with the location of the life rings on the structure/work area.
- Upon observing a worker falling in the water, yell "*Man in the water! Man in the water!"* and throw a life ring to the individual.
- Supervisor on structure/in work area is to make an announcement on the radio of *"Man in the water! Man in the water!"* The designated boat attendant will acknowledge the call and ask for the location. If the attendant does not acknowledge, repeat the call until the attendant acknowledges.
- The boat attendant will immediately proceed to the boat, and proceed in the boat directly to the location of the employee in the water.
- The boat attendant will, if necessary, throw an additional life ring from the safety boat to the employee.
- The boat attendant will remove the employee from the water and perform first aid as necessary.
- The boat attendant will notify the supervisor of any injuries so that they may be noted to emergency services if necessary. The boat attendant will also notify the supervisor of the location the boat will return to.
- If necessary, the Supervisor will call 911.
- The boat attendant will return the boat to the nearest location where the employee can be safely

removed from the boat.

- As soon as the employee is removed from the water, move the employee to a warm environment, if the employee is not seriously injured. In case of a possible head, neck or back injury, do not move the employee.
- Cover the employee with towels or a blanket to keep the employee warm.
- Emergency medical services, if contacted, will be brought to the employee for proper care and transport.

Barge Safety

When working on a barge to perform project tasks, there are Inspections, Training and Safety Gear required before work begins.

- Wear PFDs, zipped and clipped at all times when on the barge or near the water's edge (6') on the landing.
- Inspect the barge for damage before loading materials and equipment to prevent the barge compartments from filling up with water when it is loaded.
- Inspect all hatch covers to ensure they are closed tight to prevent injury from falls or tripping.
- Inspect the barge deck, remove or mark (with bright colored paint) any obstruction that may cause a tripping hazard on the deck.
- Inspect any deck wenches or spuds on the barge for wear or damage. Report it to your Supervisor and repair as needed.
- Ensure all required safety gear is on board. Life rings with rope, fire extinguishers, stokes basket with floats and four point rigging, spill kits, first aid kits and eye wash. Blankets for cold weather in case of a man over board. Ensure all crew members know the location of all safety gear and how to use it.
- Complete Man overboard training with crew signatures. Perform a drill monthly.
- Inspect all safety gear daily and replace/restock immediately as needed.
- Ensure a proper gangway with hand rails is in use. One end must be tied at all times to prevent movement. Be sure to adjust the angle of the gangway with the tides to prevent trips and falls during access and egress.
- Ensure all barge lights are in place (white lights on all four corners) and functioning properly.

Minimizing Hazards on Deck

- Keep all walking and working surfaces clean, dry and free of obstructions.

- Keep all areas free of debris.
- Clean up and report all spills immediately.
- Secure gear and equipment when not in use.
- Stack materials in a stable manner and tie down whenever possible.
- Keep landings and gangways clear of equipment and materials that can become a tripping hazard.
- Have de-icing materials and procedures in place for cold weather.
- Controls to prevent a man overboard need to be in place. Mark the edge with contrasting paint or install hand or guard rails if practical.

Machinery and Equipment Hazards

- Inspect all equipment before use.
- Maintain equipment properly. Shut down and lock out the power source before repairing mechanical systems. Make repairs according to the manufacturers guidelines.
- Ensure that the person using the equipment is trained in its proper use and maintenance.
- Install appropriate rails, temporary or permanent, to avoid equipment from being driven off of the barge. Rolling equipment such as man lift must be tied down to the deck. All equipment with tires must be chalked. (ex. air compressors, welding machines)

Hoists, Cranes and Derricks

- Stay clear when a crane is being used unless you are part of the lift team. Never stand under a boom or hoisted load.
- Always wear proper PPE when working with a crane. Hardhat, safety glasses, gloves, PFDs and protective foot wear.
- A written start up inspection of any crane or hoist is to be completed before work begins.
- Secure/tie back any unused load block or ball.
- All cranes in use on a barge must be secured to the barge. Any crane that will be traveling along the barge must be secured with a running cable and chocks are to be in place at both end of the tracks.

Wenches

- Never use your hands to keep a wench line spooling properly.
- Enclose the wench drum in a cage if possible.

- Stay away from the wench, unless you are part of the operation.
- Never stand in, on or over, with lines or cables connected to wenches when they are under tension.
- Never stand on or walk over a wench drum.
- Inspect the wench system on a regular basis for localized deterioration, cracked welds, mechanical and/or electrical deficiencies.
- Inspect the cables and lines regularly.
- Guards should be installed between the wench operator and connected cables to protect the operator from possible backlash.
- Never stand in the bight of a line.

Confined/Enclosed Space

The Confined or enclosed spaces on barges may have an atmosphere that is unsafe, causing death or injury. Hazards include oxygen deficiency, explosive/flammable atmospheres and atmospheres containing toxic compounds. These hazards are found in watertight compartments with little or no ventilation.

An oxygen-deficient atmosphere inside a tank can be caused by many factors. Rusting can occur in a steel tank where water or water vapor are present. If the tank is airtight, as it is designed to be, the rusting process removes oxygen in the space from the tank atmosphere until there is not enough oxygen to support human life. Displacement of oxygen by another gas or vapor can occur in tanks that are sealed after being freshly painted.

An explosive or flammable atmosphere can also be found in closed barge compartments. Barge that may have been previously used to hold waste, fuel or other flammable chemicals stored in barge compartments. Gasoline or diesel spilled on the deck may enter the compartments causing an explosive atmosphere. Also, paint or coatings that have been applied to the compartments could ignite if not locally removed before hot work.

Before beginning work near or around barge compartments, a visual inspection must be performed to identify physical, atmospheric and fire hazards. The atmosphere must be tested using a gas meter prior to entering into any compartments. Performing hot work on the exterior of a barge compartment

can be just as dangerous as performing hot work in the interior of the barge if flammable vapors are present.

Several sources can be the cause of a toxic atmosphere-

- Compartments that are freshly painted and have the hatch covers closed shortly after the work is completed.
- Hatches that are left open with fuel powered equipment running nearby may introduce exhaust into the open compartments.
- Compartments with rust in them may become oxygen deficient.
- Fuel spills or oil that has leaked from a piece of equipment on deck and entered the space.

Fire Hazards

Due to the limited amount of space on a Barge deck it is important to separate flammables and combustible material. Before fueling equipment or performing hot work the area must first be inspected to ensure all ignition sources are removed from the area.

- Store engine fuel tanks and compressed gases away from any source of ignition.
- Only keep quantities of flammables and combustibles necessary for operations and maintenance.
- Make sure proper fire extinguishers are available on the barge at all times. Ensure that fire extinguishers are placed near equipment and accessible in close proximity to hot work.
- Consider where sparks will fall during hot work, use a fire watch.
- Cover openings to prevent sparks from entering.
- Shield fuel sources to protect them from ignition sources.
- When welding or cutting on the deck, the space below should be inspected to ensure there is not an ignition source in the work area.

Mobile Elevated Work Platforms (MEWP)

Reference *AB MEWP Safe Use Plan*, (See Exhibits Section).

Mobile Equipment

1) Back-up/bi-directional alarms (audible above surrounding noise) shall be installed and maintained on all mobile equipment and vehicles operating on site with obstructed rear views.

2) Pre-operational inspections of mobile equipment must include the function of the back-up/bi-directional alarm.
3) Any equipment or vehicle with an inoperable, malfunctioning, or inaudible back-up/bi-directional alarm shall be removed from service immediately and tagged “DO NOT USE.”

Personal Protective Equipment (PPE)

Appropriate clothing shall be worn at all times as is suitable for the work activity. Minimum apparel requirements include the following:

- Shirts which cover the shoulders and torso (t-shirts with a 4-inch sleeve are acceptable unless additional protection is required for a specific task). Tank tops and cut off shirts are prohibited.
- Long pants (shorts are prohibited)

The American Bridge General Superintendent will be responsible for obtaining, providing, and assuring the use of Personal Protective Equipment (PPE) for American Bridge personnel on the Project.

Employees issued PPE shall be instructed in the proper use and inspection of the equipment and to immediately notify their supervisor when it is necessary to replace any equipment that is damaged, worn or defective.

Project supervision shall monitor and enforce compliance by all employees regarding wearing of PPE. Disciplinary procedures shall be followed for anyone refusing or repeatedly failing to use the required PPE *(See Section on Discipline Procedures in this Site Safety & Health Plan).*

As a minimum, the following PPE will be used by American Bridge personnel on this Project based on an initial review of potential hazards/exposures. Additional PPE may be required based on future hazard/exposure reviews and/or as required by Job Hazard Analysis.

A. Head Protection (Hard Hats)

Any person, employee, or visitor entering the work area is required to wear a protective hard hat. Hard hats are required to meet the specifications contained in the latest edition of ANSI Z89.1-Safety Requirements for Industrial Head Protection and shall be worn without modification.

Hard hats are not required for employees when they are within a completely enclosed cab constructed of steel frame and glass, or inside a motor vehicle.

When conditions exist that the hard hat will not stay in its proper position due to wind or employee working position, chin straps or hard hat tethers should be used. .

Only hard hats marked with a "reverse donning arrow" may be worn frontward or backward.

B. Eye and Face Protection

Eye protection shall be worn at all times. Eye protection shall be marked indicating compliance with ANSI Z87. Safety glasses shall be the wrap-around type or have side shields.

A full-face shield AND foam/goggle type safety glasses (double eye protection) shall be worn in all grinding, chipping, or any other operation that produces flying particles/projectiles.

Burning goggles and/or welding shields shall be used where welding and cutting operations are being performed. Affected employees shall use equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation. Welders must wear approved safety glasses in addition to their welding helmet.

Employees whose vision requires the use of corrective lenses in spectacles shall be protected by goggles or safety glasses that can be worn over their corrective spectacles, or spectacles whose protective lenses meet the requirements of ANSI Z87 and provide optical correction.

When working with hazardous chemicals and liquids, the SDS should be consulted for appropriate eye protection requirements.

C. Safety Harnesses/Lanyards

Employees working six (6) feet or more above lower levels and not protected by guardrails or safety nets shall wear a full body harness with a shock absorbing lanyard (or self-retracting lanyard) and shall maintain 100% continuous tie-off.

Double lanyards are to be used when necessary to provide for continuous fall protection. Only one (1) snap hook is permitted on a "D" ring.

At least one lanyard shall be continuously attached to an anchorage point capable of supporting 5,000 pounds, or an anchorage point designed and installed to maintain a safety factor of at least two.

Employees shall inspect their fall protection equipment each day before use. Monthly documented inspections of safety harnesses and lanyards shall be made by a competent person. Defective equipment shall be immediately removed from service and destroyed to prevent further use.

Any safety harness or lanyard involved in a fall shall be immediately removed from service and destroyed to prevent further use.

D. Hearing Protection

Hearing protection, in the form of either disposable ear plugs or ear muffs, shall be worn by employees when exposed to noise levels that exceed levels shown in the following table. Such conditions may include working around air compressors and generators, welding, and when using pneumatic tools.

Table D-2 — Permissible Noise Exposures - 1926.52(d)(1)

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level

In all cases where the sound levels exceed the values shown in table D-2 and employees are provided with ear protection devices (i.e., ear plugs and/or muffs), the following controls shall be implemented:

1. When earplugs are used, employees shall be instructed on the proper method for insertion of plugs in the ear (Roll, Pull, and Hold).
2. A supply of clean disposable plugs shall be made readily available so that employees do not reuse dirty earplugs.
3. Plain cotton is not an acceptable protective device.

E. Work Gloves

Gloves appropriate for the work shall be worn when activities present the potential for a hand injury. Examples of activities where gloves are to be worn include but are not limited to: the handling of sharp objects; handling of certain chemicals; welding, burning and cutting operations; demolition operations; and the handling of wood materials.

F. Respiratory Protection

When controls required by OSHA 29 CFR Part 1926.55 (gases, vapors, fumes, dusts, and mists) or 1926.62 (lead) fail or are inadequate to prevent harmful exposure to employees, and/or until such time that an exposure assessment can be conducted that negates the need for respiratory protection, appropriate respirator protection shall be provided and used.

When performing work that requires the use of respiratory protection, the Site-Specific Respiratory Protection Program shall be followed, (See Exhibits Section). The program will address the following requirements:

1. Proper respirator selection.
2. Medical evaluations of employees required to wear respirators to determine workers' fitness for respirator use.
3. Qualitative or Quantitative fit testing procedures for proper use of respirators in routine and reasonably foreseeable emergency situations.

4. Procedure and scheduling for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.
5. Procedure to ensure adequate air quality, quantity, and flow of breathing air to atmosphere-supplying respirators.
6. Training of workers in respirator hazards to which they are potentially exposed during routine and emergency situations.
7. Training of workers in respirator use, user seal check procedures, limitations, cleaning, maintenance, and storage.
8. Procedures for regularly evaluating the effectiveness of the program.

Note: Each employee who voluntarily uses dust mask type respirators (negative pressure particulate respirators with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium - i.e., 3M 8511, 8210, 8233, etc.) shall be provided with a copy of Appendix D - *"Information for Employees Using Respirators When Not Required Under Standard"* **-** from the OSHA Respiratory Protection Standard 1910.134 **(See Exhibits Section)**. Medical evaluations are not required for dust mask type respirators.

G. Reflective Vests/Clothing

ANSI/ISEA 107 Class 2 or 3 high-visibility safety vests or garments shall be worn at all times.

The ANSI 107 standard gives a choice of clothing colors: orange, yellow-green or fluorescent versions of these colors for daytime work. In choosing clothing colors keep in mind:

- Workers should not be the same color as traffic barrels and traffic cones.
- Workers should not be the same color as construction vehicles.
- Workers should not be the same color as emergency vehicles.
- Workers should be identifiable to both motorists and construction vehicle operators.
- Motorists should be able to identify a worker before they get within 1,000 feet of the worker.
- Contrast against background is important. For example, orange vests may be best against wooded, green backgrounds, while green vests may be best to contrast with orange barrels and cones.

For nighttime work, garments must also be retroreflective. The retroreflective material shall be orange, yellow, white, silver, strong yellow-green, or a fluorescent version of one of these colors, and shall be visible at a minimum distance of 1,000 feet.

H. Footwear

All employees are required to wear, as a minimum, an ankle high sturdy leather work boot or similar footwear.

In addition, other types of foot protection, including steel toe and metatarsal guards, may be required when necessitated by exposure, contract, or regulation.

Safety-toe footwear for employees, when required, shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1.

Athletic type shoes, open toed shoes, high heel shoes, etc. are prohibited.

I. Personal Floatation Devices

Employees working over, on, or adjacent to water, where the danger of drowning exists, shall wear U.S. Coast Guard-approved personal floatation devices (PFDs).

PFDs shall be worn by all employees on floating pontoons, rafts, barges, personnel boats, tug boats, safety boats and other related floating equipment.

PFDs must fit properly and be securely fastened when worn. PFDs should be regularly inspected for defects which would alter their strength or buoyancy. Defective units shall be removed from service and destroyed.

Note: When *working over or near water, ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.*

J. Employee-Owned Equipment

It is policy that we provide suitable PPE to employees to protect them from all jobsite hazards, with the exception of protective footwear, which is to be provided by the employee and deemed adequate by their supervisor.

The project will also allow ANSI Z87 approved prescription safety glasses to be used at the job site. This option will be discussed and documented during the Initial Employee Safety Orientation.

All personally owned safety equipment must be approved for compliance by Project Management before use on site.

Pile Driving

A Pile Driving Plan and JHA should be developed and communicated to those participating in the pile driving operations. Pile driving operations is to be supervised by experienced / qualified person(s). Selection of pile driving equipment should be determined by the pile diameter, length and weight of the pile based on final tip elevations or expected refusal as designed by experienced engineer.

Vibratory Hammers/Power Packs:

1) All workers shall be trained in accordance with manufacturer's operation manual and demonstrate proper working knowledge of the Vibratory Hammer, Accessories, and Power Pack prior to use.
2) All pre-start inspection must be completed in accordance with manufacturer's instructions. All those connections shall be inspected for leaks, connection shall be wired, chained, or cabled to prevent whipping under pressure if a connection were to fail. Bolts and Nuts checked for tightness, inspection of jaw teeth for damage or excessive wear. Any defects, the hammer shall be taken out of service, repaired, and re-inspected prior to use.
3) Proper rated cable sling and shackle shall be connected to the lift point on the hammer with the shackle pin secured to provide a positive connector.
4) Never stand directly under hammer as it is being lifted into position on the pile. Use tag lines to guide hammer into position, never pull on hoses.
5) Ensure hammer is properly seated on pile prior to clamping jaws into position.
6) Start of Power Pack when given direction from Crane Operator.

7) During driving of pile, any chatter noise or strange vibrations, use emergency stop to shut down energy to hammer.
8) Upon completion of driving piles, hammer shall be disengaged from the pile and stored on the barge either lying flat on its side or stored in a manufacturer's supplied cradle, do not store on a job made cradle or leave resting unattached on the pile.

Diesel Pile Hammer/Leads:

1) All workers shall be trained in the assemble/disassemble and operation in accordance with manufacturer's operation manual and demonstrate proper working knowledge of the Diesel Hammer and Leads prior to use.
2) Diesel Pile Hammer shall be inspected prior to the first time that is put into operation and then annually by an expert.
3) Daily inspection for leaks, lose bolts/nuts, excessive wear of pile helmet, striker plate, and cushion block. Any defects, the hammer shall be taken out of service, repaired, and re-inspected prior to being put back into service.
4) Monitor weather conditions, changes in weather, wind speeds, and decreasing visibility. Stop work for critical conditions (e.g. Storms).
5) There should be two (2) class B fire extinguishers, minimum of 13 pounds capacity, during diesel pile operations capable to extinguish oil or electrical fires.
6) Maintain a minimum safe distance of 13 feet from the units to be driven during the operation of Diesel Pile Hammer. Only the crane operator and the foreman in charge should be permitted within the area of 1.5 times the lead height.
7) Avoid touching any moving part of the Diesel Pile Hammer or Leads, keep body parts away from moving mechanical systems.
8) Crane Operator shall never leave the seat with the Diesel Pile Hammer and Leads attached to the pile is still in operation.
9) Never work under the Diesel Pile Hammer, suspended loads, leads or material to be driven.
10) When the Diesel Pile Hammer is not in use, it shall be laid on the deck of the barge on dunnage, covered and secured while being stored.

In the event of any spill of diesel fuel, oils, or lubricants, they must be cleaned up immediately and disposed of in accordance with the Environmental Management Plan.

Rigging

1) Wire ropes, chains, and other rigging equipment shall be inspected prior to use and as necessary during use to ensure their safety. Defective gear shall be removed from service. Following is the removal criteria *(Reference ASME Standard B30.9)* for the common types of slings that will be used on the project. If any other types of rigging/slings are used, inspection and rejection criteria is to be in accordance with manufacturer or current ASME B30 requirements.

   a. Wire rope slings shall be removed from service when the following conditions are found:

   - Missing or illegible sling identification.
   - For strand-laid and single-part slings, ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay (see Figure 2).
   - Severe localized abrasion or scraping.
   - Kinking, crushing, bird caging, or any other damage resulting in damage of the rope structure.
   - Evidence of heat damage.
   - End attachments that are cracked, deformed, or worn to the extent that the strength of the sling is substantially affected.
   - Severe corrosion of the rope, end attachments, or fittings.
   - Hooks that are spread or bent (for additional hook removal criteria, see ASME B30.10)
   - For rigging hardware, removal criteria as stated in ASME B30.26.
   - Other conditions, including visible damage, that cause doubt as to the continued use of the sling.

   b. Synthetic webbing slings shall be removed from service if any of the following defects exist*:*

   - Missing or illegible sling identification.
   - Acid or caustic burns.
   - Melting or charring of any parts of the sling.
   - Holes, tears, cuts, or snags.
   - Broken or worn stitching in load bearing splices.
   - Excessive abrasive wear.
   - Knots in any part of the sling.
   - Discoloration and brittle or stiff areas on any part of the sling, which may mean chemical or ultraviolet/sunlight damage.
   - Fittings that are pitted, corroded, cracked, bent, twisted, gouged, or broken.

- Hooks that are spread or bent (for additional hook removal criteria, see ASME B30.10)
- For rigging hardware, removal criteria as stated in ASME B30.26.
- Other conditions, including visible damage, that cause doubt as to the continued use of the sling.

c. Synthetic round slings shall be removed from service if any of the following defects exist*:*

- Missing or illegible sling identification.
- Acid or caustic burns.
- Evidence of heat damage.
- Holes, tears, cuts, abrasive wear, or snags that expose the core yarns.
- Broken or damaged core yarns.
- Weld splatter that exposes core yarns.
- Round slings that are knotted.
- Fittings that are pitted, corroded, cracked, bent, twisted, gouged, or broken.
- Hooks that are spread or bent (for additional hook removal criteria, see ASME B30.10)
- For rigging hardware, removal criteria as stated in ASME B30.26.
- Other conditions, including visible damage, that cause doubt as to the continued use of the sling.

Note: Synthetic webbing slings should be stored in an area or facility where they will not be subjected to mechanical, chemical, or ultraviolet damage or extreme temperatures. The strength of synthetic webbing slings can be degraded by exposure to sunlight or ultraviolet light and chemical environments.

2) When U-bolts are used for eye splices, the U-bolt shall be applied so that the “U” section is in contact with the dead end of the rope.

Scaffolds

1) 100% fall protection is required for all persons erecting, using, and dismantling scaffolding when working ten (10) feet or more above lower levels.

2) Each employee who is involved in erecting, disassembling, moving, operating, repairing, or maintaining, a scaffold shall be trained by a competent person to recognize any hazards

associated with the work in question. The training shall include the following topics, as applicable:

- The nature of scaffold hazards;
- The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question;
- The design criteria, maximum intended load-carrying capacity and intended use of the scaffold;
- Any other pertinent requirements of the scaffold being used.

3) Each employee who performs work on a scaffold shall be trained in the following:
   - The nature of any electrical hazards, fall hazards and falling object hazards in the work area;
   - The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used;
   - The proper use of the scaffold, and the proper handling of materials on the scaffold;
   - The maximum intended load and the load-carrying capacities of the scaffolds used; and
   - Any other pertinent requirements of the type of scaffold being used.

4) When there is reason to believe that an employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, each such employee shall be retrained so that the requisite proficiency is regained. Retraining is required in at least the following situations:
   - Where changes at the worksite present a hazard about which an employee has not been previously trained; or
   - Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or
   - Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.

5) Each scaffold and scaffold component shall support, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.

6) Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mud sills, or other adequate firm foundations.

7) The General Superintendent or designated competent person/foremen shall inspect scaffold components for visible defects prior to initial use, before each work shift, and after any occurrence which would affect a scaffold's structural integrity.
   - The inspection is to use the below tagging system (or similar).
   - The tags are to be color coded and contain the name of the Competent Person, the date and time of the inspection and the inspection results.
   - Personnel using the scaffold shall be trained to know and understand the tagging system. Scaffold users shall read scaffold tags prior to using the scaffold. The instructions or warnings outlined on the tag must be followed.
   - Users shall inspect the scaffold prior to and during use and immediately report any defects or concerns to their supervisor.
   - The crew that erects the scaffold complete and attach the appropriate tag at eye level on or near the access ladder so it is easy to locate and plainly visible. An untagged scaffold is not to be used.

8) **Tagging System** – A two-tag system is to be used to identify complete and incomplete scaffolds.
   - A **green tag** will be completed and attached by the erecting crew to scaffolds which have complete handrails, midrails, toe boards, and decking.
   - A **red tag** will be used when the scaffold is being dismantled, is not yet completely erected, or for some other reason is not safe to use.
   - Any scaffold that is not tagged shall not be used.

9) American Bridge floats are designed for 3 workers or a total weight of 750 pounds. When working off of floats, employees are to secure their lanyards independent of the manila float support lines.

10) Materials being hoisted onto a scaffold shall have a tagline.

11) In addition to the above, all scaffolds shall be in compliance with 29 CFR 1926. Subpart L.

Silica Protection

In the event that protection from silica is needed, reference the *AB Silica Exposure Control Plan,* (See Exhibits Section).

Steel Erection

1) A firm, properly graded, drained area, shall be maintained that is readily accessible to the work with adequate space for the safe storage of materials and safe operation of equipment.

2) Routes of suspended loads shall be preplanned to ensure that no employee is required to work directly below a suspended load, except for employees engaged in the initial erection, or employees necessary for hooking or unhooking the load.

3) Erection plans shall be followed so that structural stability shall be maintained at all times during the erection process.

4) Shear studs shall not be attached to the top flanges of stringers until after the decking or other walking/working surface has been installed.

5) During the final placement of solid web structural members, the load shall not be released from the hoist line until the members are secured with at least 2 bolts per connection, of the same size and strength as shown in the erection drawings, drawn up wrench tight or the equivalent as specified by the project structural engineer of record. (A competent person shall determine if more than two bolts are necessary to ensure the stability of cantilevered members; if additional bolts are necessary, they shall be installed.)

6) All materials, equipment, and tools, which are not in use while aloft, shall be secured against accidental displacement.

7) Storage of Structural Steel
   a. Steel members shall be piled safely and proper blocking used. Piles should never exceed a safe height.
   b. Large structural members stored upright shall be secured as soon as landed to prevent tipping.

8) Safety latches on hooks shall not be deactivated or made inoperable.

Tool Safety

Hand Tools

1) The use of unsafe hand tools, including tools that may be furnished by employees or employers is not permitted. All hand tools must be properly maintained.
2) Wrenches shall not be used when jaws are sprung to the point that slippage occurs.
3) Impact tools shall be kept free of mushroomed heads.
4) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.
5) Electric power operated tools shall either be approved double-insulated, or be properly grounded.

Grinders

1) Grinders are to be equipped with an approved guard.
2) Grinding wheels shall be closely inspected for cracks and defects before using the portable grinder. Do not use defective grinding wheels. Remove damaged wheels from service so that someone else does not use the defective wheel.
3) Avoid dropping grinders. A wheel that has been dropped should be checked for damage.
4) Make smooth grinding contact with the work. Avoid "bumping" or impact action. Do not jam a portable grinder into corners, etc. – the wheel may shatter.
5) Allow the wheel to run idle a few seconds before applying to work.
6) Never force grinding so that the motor slows noticeably.
7) When grinders are not used, they shall be stored in a safe place.
8) Most causes of wheel breakage are:
    - Improper mounting of the wheel.
    - Improper speed.
    - Abusive operation.
    - Careless handling and storage
9) Additional usage requirements can be found in AB Safety Bulletin No. 14 Portable Grinders **(See Exhibits).**

Air Tools

As a minimum, pneumatic tools will be used on the project when knocking out rivets and when impacting bolts.

1) Pneumatic power tools shall be secured to the hose in a positive manner to prevent accidental disconnection.
2) Safety clips or retainers shall be securely installed and maintained on pneumatic impact tools to prevent attachments from being accidentally expelled.
3) The use of hoses for hoisting or lowering tools shall not be permitted.
4) All ¾" air hose connections shall be positively secured with clips, tie-wire or whip checks.
5) Bull hose sections shall be secured with safety chains or equivalent.

Walking/Working Surfaces

Access/Egress

Access and egress should be controlled, safe, suitably constructed, kept free of obstructions and well maintained. Serious injury can result from hazards such as fires, slips and trips, contact with moving vehicles, unauthorized entry into hazardous work areas, falls into floor openings and falls into water.

Before work begins, plan the access and egress for the job site. Separate vehicle traffic from pedestrian traffic with barriers and/or delineation. Set up designated loading/unloading and turn around areas. Do not store materials in the access/egress area. If this is not possible, ensure all stored material and equipment are clear of the access.

Emergency Services

When the access/egress is set up, contact the local area emergency services for a site visit. Show the intended area to emergency services so that they are familiar with the access/egress in case of an emergency and make any adjustments that may be needed.

Site Access

It is important to always know who is on site at any given time, and aware of personnel present in a particular work area. Have all Visitors and Subcontractors sign in before entering the site. In the event of an emergency, such as a fire, it will then be possible to determine whether anyone has been unable to evacuate the site. It will also be possible to direct rescue services to the appropriate work area. You should, therefore, always follow the appropriate access control procedures every time you enter or exit a site or a controlled work area.

Access/Egress Routes

In most all cases, Access and Egress routes are the same area. Access/Egress routes need to be clearly marked out and well lit, when feasible. The area shall be unobstructed and well maintained to allow personnel and others on site to enter/exit quickly in the event of an emergency. For these reasons, you should never lay down or store tools, equipment, work pieces or other items on routes of access/egress. Operations should be planned so that they do not damage routes and any accidental damage should be rectified immediately.

Maintenance/Repair

Holes should be repaired, covered, or guarded and reported. Contain and report any spills that are likely to affect Access/Egress routes. Project Staff should consider whether any waste water runoff produced as a result of your operations is likely to affect the routes.

Site Personnel

Make all site Personnel familiar with the access/egress route from their work area and from the site, so that you can quickly and safely exit the work place in the event of an emergency. Each work area Superintendent and Foreman shall review the access/egress with their crew in their area at beginning of work in a new area, when the access changes and when new Employees are added to the crew.

Gangways

A gangway shall be no less than 20 inches in width, of adequate strength, maintained in safe repair and safely secured on one end. If an extension ladder is used it must extend at least 36 inches above the upper landing surface and be safely secured against shifting or slipping.

Each side of the Gangway shall have a hand rail with a minimum height of 33 inches from rail to walking surfaces at the stanchion, with a mid-rail. Rails shall be of wood, pipe, chain, wire, rope or materials of equivalent strength and shall be kept taut. Portable stanchions supporting railings shall be supported or secured to prevent accidental dislodgement.

The gangway shall be kept properly trimmed. Check the gangway often to ensure proper trim as the tide changes or if a crane is in use on the barge.

When a fixed flat tread gangway is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.

When the gangway overhangs the water so that there is danger of employees falling between the ship and the dock, a net or suitable protection shall be provided to prevent employees from receiving serious injury from falls to a lower level.

If the foot of a gangway is more than one foot above the deck, the space between them shall be bridged by a firm walkway equipped with a hand rail with a minimum height of approximately 33 inches with mid-rails on both sides.

Gangways shall be kept clear of other obstructions, to provide unobstructed passage. If the tripping hazard cannot be moved, then the hazard shall be properly marked to alert employees of the danger.

Obstructions shall not be laid on or across the gangway. If rigging is used to hoist the Gangway in place, the rigging shall be removed to prevent a tripping hazard.

Handrails and walking surfaces of gangways shall be maintained in a safe condition to prevent employees from slipping or falling. Replace or repair any damaged treads to avoid a tripping hazard or fall.

Ramps

Ramps shall be as flat as conditions will permit. Where the slope exceeds 1 ft.: 5 ft., traverse cleats shall be applied to the working surface.

Ramps used solely for personnel access shall be a minimum width of 4 ft. and provided with standard guardrails.

When used in lieu of steps, ramps shall be provided with cleats to ensure safe access.

Vehicle ramps on which foot traffic is permitted shall be provided with a walkway and guardrail outside the roadway. The roadway structures shall be provided with wheel guards, fender logs, or curbs not less than 8 in high placed parallel and secured to the sides of the runway.

Ramps used for equipment access shall be a minimum width of 12 ft. Curbs not less than 8-in x 8-in Timbers or equivalent protection shall be provided. Equipment ramps shall be designed and constructed by an engineer.

Ramps for access of equipment and vehicles to or between vessels shall be of adequate strength, be provided with sideboards, and be well maintained.

When work stands is being performed near ramps where a fall to a different level could occur, guardrails or other fall protection shall be provided.

Ramps with at least two means of rapid exit, with standard guardrails shall be provided for personnel and equipment working on cofferdams.

Where personnel are required to enter excavations/trenches over 4 ft. in depth, ramps shall be provided to require no more than 25 ft. of lateral travel.

EXHIBITS

- **Safety Orientation Documents:**
  - Vision, Mission, Values Statement
  - Construction Work Rules
  - Code of Safety Practices
  - Hazard Communication Info
  - Employee Indoctrination Acknowledgement Form
  - Your Harness & Safety Lanyard
  - Anchorage Points
  - Retractable Lifelines
  - What Not to Use as an Anchorage Point
  - General Foreman/Foreman Safety Responsibilities
  - Craft Worker Safety Responsibilities
- **Postings, Inspections, and Reference Forms**
  - Notice – Access to SDS & Medical Records (Post on Bulletin Board)
  - Notice – Field Absenteeism Policy (Post on Bulletin Board)

- Notice – In Case of Emergency (Post on Bulletin Board)
- Notice – Report all Injuries (Post on Bulletin Board)
- Pre-Job Safety Survey Form
- Daily Hazard Analysis (DHA) Instructions and Form
- Job Hazard Analysis (JHA) Instructions and Form
- Hydraulic, Mobile, Crawler Crane Inspection Form
- Mobile Elevated Work Platform (MEWP) Inspection Form
- Forklift Inspection Form
- Assembly/Disassembly Director Requirements
- Land Cranes on Barges Reference Sheet

- **Safety Bulletins**
  - #3 – Life Jackets & Ring Buoys
  - #14 – Safe Procedure for the use of Portable Grinders
  - #16 – Crane Suspended Personnel Platform
  - #26 – Lockout/Tagout Procedures
  - #28 – Safety Boat Operations
- **Incident Investigation Forms (Reference Only – incidents will be logged in Procore)**
  - Accident Investigation Form
  - Near Miss Form
  - Witness/Injured Statement
  - Root Cause Analysis Form
  - Motor Vehicle Accident Report
  - Equipment Damage Form
- **Supporting Site-Specific Plans and Procedures**
  - Mobile Elevated Work Platform (MEWP) Safe Use Plan
  - Respiratory Protection Plan
  - Silica Exposure Control Plan
  - Hazard Communication Program
  - Safety Discipline Procedure
  - Vehicle Use Program
  - Man-Overboard Procedure
  - Hot Work Program
  - Critical Lift Plan

Appendix U

Emergency Response Plan

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Purpose

The Environmental Response Plan is a component of the Environmental Management System, which is developed as an effective tool in protecting personnel, property, and the environment. Environmental Emergency Response Plans (ERP) will identify the potential environmental emergencies during construction and how to prevent, prepare, respond and recover from the associated adverse environmental impacts. Potential environmental emergencies and response plans for the operational phase of the project will be included as part of the Operational EMP and will be completed prior to the opening of the Project. This Operational Environmental Emergency Response Plan will address appropriate contacts and organizational structure for operations of the Project following project completion.

The purpose of the ERP is to eliminate, reduce and/or mitigate the health, safety and environmental impact of any uncontrolled, unplanned or accidental incidents. The ERP addresses requirements for prevention, preparedness, response, recovery and reporting of various incidents.

The ERP provides measures covering the following areas of an environmental emergency:

1. Prevention – actions taken to reduce or eliminate the probability of an emergency occurring.
2. Preparedness – measures taken prior to an emergency to ensure an effective response.
3. Response – actions taken to respond to an actual emergency. These actions provide a controlled, effective and timely response.
4. Recovery – actions taken to recover from an emergency that could be short-term or long-term activities. The aim is to return all systems to normal operations.
5. Reporting – provides protocol for notifying the appropriate agencies.

Potential impacts of not planning and preparing for environmental emergencies are threats to the health and safety of workers and the public, air contamination, soil, surface water or groundwater contamination, destruction of wildlife habitat, damage to property, equipment and resources and result in legal infractions and penalties.

During the project it may be necessary to call upon emergency services or evacuate the project site of all personnel – American Bridge Company, subcontractors, owner, and or visitors. The primary objective of the Emergency Response Plan is to outline American Bridge's management of an emergency which involves emergency services. This program is outlined as follows:

SECTION I RESPONSIBLE PERSONS

A. Safety Manager is responsible for the overall creation, maintenance, and oversite of the Emergency Response Plan. This includes but is not limited to the following items:

- Identify outside emergency support personnel.
- Analyzing the emergency and deciding how to respond in the most efficient and effective manner.
- Act as the project's primary coordinator with emergency services organizations; to include but not limited to police, fire protection and rescue, ambulance providers, right of way utility owners, and the owner.
- Directing the efforts of various internal response personnel.
- Coordinating with the response efforts with the owner and outside agencies.

B. Superintendents and Foremen are responsible for implementing the Emergency Response Plan at the field level. This includes contacting the necessary individuals in the event of an emergency. Informing their employees of the location of their assigned emergency assembly area in the Daily Hazard Analysis (DHA) meeting, and as necessary as the crew progresses through the days planned work activities. During an evacuation, they are also responsible for taking prompt action in ensuring that all personnel move to the designated assembly area and are accounted for in a timely manner.

C. **Employees** have a responsibility during an emergency evacuation to promptly proceed to the designated assembly area in an orderly manner. After arriving at the assembly area employees will partake in an organized head count and remain in the assembly area until directed by the Construction Manager or Safety Manager.

The onsite emergency management personnel include:

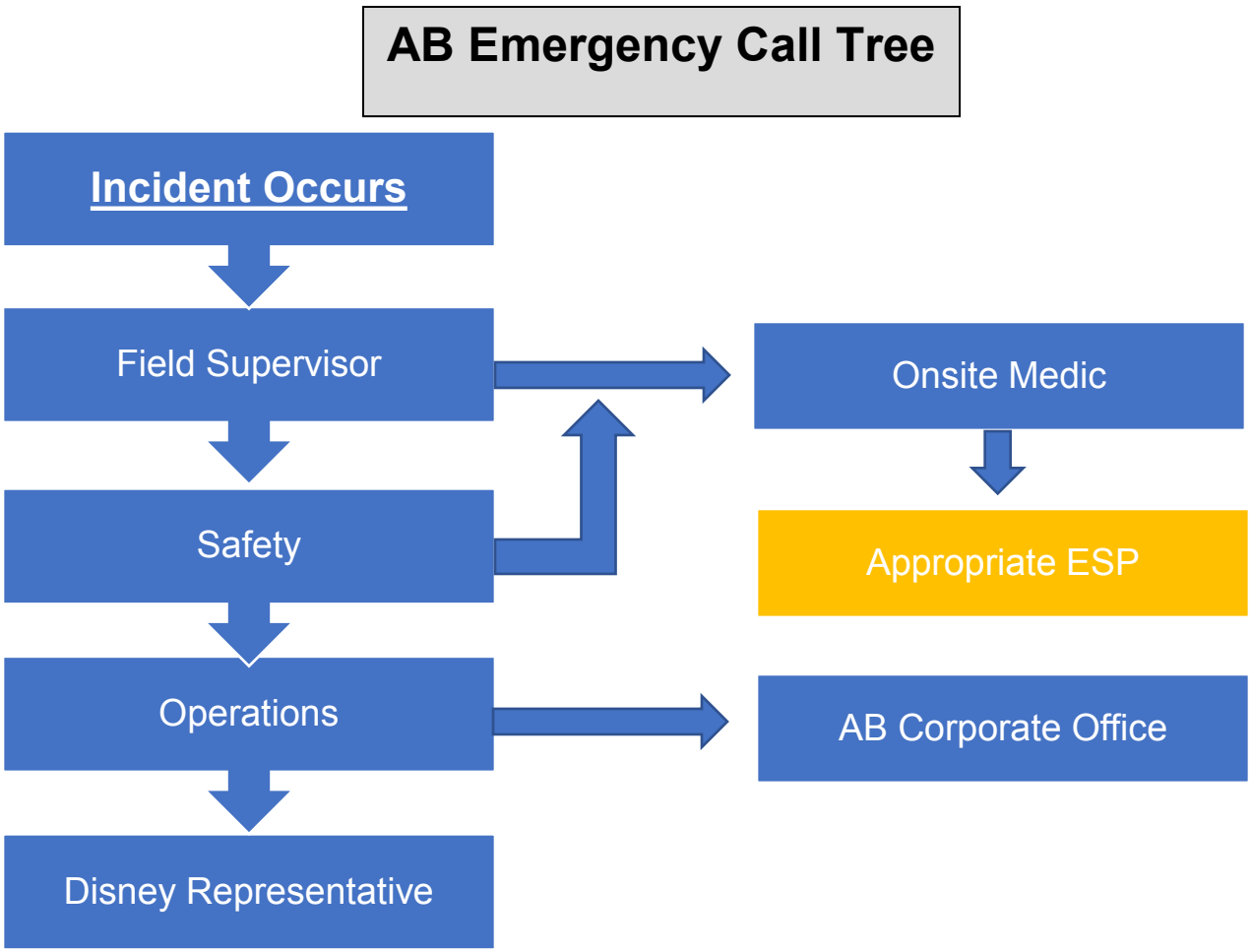
• ORGANIZATIONAL STRUCTURE		Phone Numbers
Project Manager	Jon Yates	813-538-8012
Construction Manager	Rob Conroy	813-477-9487
Superintendent		
Safety	Ron Fontenot	757-561-6027
Safety	John Wilson	917-991-1281
Project Engineer		
Field Engineer		

SECTION II DESIGNATED EMERGENCY SERVICES PROVIDERS

This portion of the plan has been developed to help ensure that all service providers in the vicinity of the project can provide timely and effective response during construction. These types of emergency services include fire rescue, police, and medical assistance. Service providers are subject to change based on service ability and availability. All changes will be updated on the list below and any applicable site postings. Changes in service will be discussed with the crews at Weekly Toolbox Talks and Daily Hazard Analysis meetings.

The following service providers have been identified for the project:

EMERGENCY SERVICES PROVIDERS		
SERVICE PROVIDER	**LOCATION**	**PHONE NUMBERS**
Police (Site Security)	Main Gate	
Ambulance	Tarpum Bay	1(242) 334-4630/470-3677
Fire	Tarpum Bay	1(242) 334-4630/470-3677
Hospital - Princess Margaret	Nassau, Bahamas	1 (242) 332-2861
University of Miami	Miami, Florida	1 (305) 325-5511
Clinic	Rock Sound Clinic	1 (242) 255-4599
Spill Response	Project Office	



In the event of an emergency, all employees in the work area must be assigned a designated Muster area to proceed. Employees will be notified of an Emergency Muster by Radio, Cell Phone and/or Three blasts of an air horn, three seconds each blast. Muster areas may remain the same for several weeks or months or may change with regularly frequency. Maps that will show the project separated into named blocks with the Muster areas labeled will be posted throughout the site and common areas. These maps will be updated and reposted as required.

New areas will be discussed during the Daily Hazard Analysis meetings and Weekly Toolbox Meetings with work crews. The assembly areas will be located at strategic places, close enough to work areas for access, but far enough away from potential disaster areas to afford protection to personnel. Alternate areas will be considered in case of inclement weather and other possible conditions. Muster Areas will provide a definite destination for an orderly evacuation, allow for grouping so that instructions can easily be conveyed to all affected personnel, and expedite the search for missing personnel if need be.

Muster Area Marine	
Assembly Area	**Location**
Muster Area 1:	Head of the Pier
Muster Area 2:	Trestle work area (crane)
Muster Area 3:	Assigned Crane Barge
Muster Area 4:	Project office
Muster Area 5:	
Muster Area Uplands	
Assembly Area	**Location**
Muster Area 1:	Public Beach Road BOH intersection
Muster Area 2:	FOH Round a bout
Muster Area 3:	Pier Departure Area

SECTION III NON-MEDICAL / MEDICAL EMERGENCIES

Local emergency services will be contacted, and a site visit will be arranged to get familiar with the routes and areas of the Project before work begins. All emergency calls to the Project Site will be escorted to the incident area.

Non-Medical Emergencies- (fire, ambulance) shall be reported in accordance with the Emergency Call Tree above.

When calling emergency response personnel make sure to give them the project location.
Also be sure to provide them with your cell phone (or project office) number. After calling, ensure someone is waiting at the Front Gate to meet/escort the emergency response team to the incident location. Front gate security should also be notified to assist in coordination of the response and provide maps/direction for emergency services if required.

Medical Emergencies- Medical emergencies shall be reported in accordance with the Emergency Call Tree above. Injuries that require treatment beyond site or local services will be coordinated through the Safety Manager and the Onsite Medical. Coordination for transportation to the clinic or Air Ambulance will be arranged by Onsite Medical.

Tiered Treatment Steps

Tier 0	Treat at jobsite
Tier 1	Treatment by Onsite Medical
Tier 2	Transport and Care Rock Sound Clinic
Tier 3A	Evacuate to Nassau for Bahamians
Tier 3B	Evacuate to Miami for US Citizens

Depending on the extent of injury and treatment required, tiered treatment steps will be used to ensure the best care for an injury. For each case, Onsite Medical and the Safety Manager will manage any injuries that may occur. Investigation reports, medical reports and photos will be filed in the incidents folder for the project in Procore. Each incident folder heading will show the tier used for treatment.

Ex. INJ- John Doe- right index finger (Tier 0)

SECTION IV INCLEMENT WEATHER

Heavy rain, hail, lighting, high winds, and tornadoes may accompany a thunderstorm. For these

reasons, a thunderstorm can be very destructive. Since thunderstorms are difficult to foresee, it is important that employees be educated in the safety precautions to take in the event of a thunderstorm.

Employees should seek shelter indoors during a thunderstorm when possible. When indoors, it is important employees avoid contact with electrical appliances, conductive surfaces, and structures.

When outdoors, they shall seek shelter in vehicles, if possible. Lightning will strike the easiest source to ground, not necessarily the highest. Conductive objects such as trees, telephone poles, crane booms, and flagpoles shall be avoided. A safe distance from a conductive object is twice the object's height. Objects that may carry electric current from a remote thunderstorm should also be avoided. These objects would include telephone lines, pipelines, and fences. An employee shall not use electric tools outdoors if a thunderstorm is in the immediate area.

Employees shall not be permitted to work on cranes during a thunderstorm. To prevent damage or injury, cranes shall be grounded. The crane's boom shall be lowered when winds exceed Manufacturer's recommendations.

The rains accompanying a thunderstorm may create flooding conditions. The Safety Manager and Construction Manager shall monitor national Weather Bureau advisories for flash flood warnings. Employees should be instructed to avoid flood plains, drainage ditches, and dried creek beds when a flash flood warning is issued. Additionally, employees that are assigned a company vehicle must take certain precautions while driving during a thunderstorm. When poor visibility is encountered, the employee should pull over at a safe location and stop the vehicle until visibility improves.

In the event a named Storms is predicted to impact the area, action will be taken in accordance with the Site-Specific Hurricane Plan.

SECTION V FIRE

Fires could become a serious problem in many areas of the project. For this reason, the Safety Manager, Superintendent, and Foreman will monitor operations to ensure welding cutting and hot work safety controls are fully implemented.

In addition to the above actions, the Safety Manager shall:

- Ensure that all emergency response numbers are posted next to the job phone in the main office, employee bulletin board, and employee job shacks.
- Communicate with the designated fire departments and advise project personnel of the potential for inadvertent fires.
- Coordinate necessary training activities to emergency response situation with outside personnel.

Fire Management Plan

The Project Manager (PM) determines the fire prevention and protection policies. The PM will provide adequate controls to provide a safe workplace and will provide adequate resources and training to its employees to encourage fire prevention and the safest possible response in the event of a fire emergency. In responding to fire emergencies, employees shall not fight fires beyond the incipient stage.

Plan Administrator

The Construction Supervisor (CS) shall manage the Fire Prevention Plan for Star Construction and shall maintain all records pertaining to the plan. The Plan Administrator shall also:

- Develop and administer the Star Construction fire prevention training program.
- Ensure that fire control equipment and systems are properly maintained.
- Control fuel source hazards.
- The CS shall be responsible for posting fire rules visible to employees.

Employees

All employees shall:

- Complete all required training before working.
- Conduct operations safely to limit the risk of fire.
- Report potential fire hazards to their supervisors.
- Follow fire emergency procedures.

Good Housekeeping

To limit the risk of fires, employees shall take the following precautions:

- No Smoking except in designated safe smoking areas which include cleared areas with no combustible vegetation or materials and approved butt receptacles.
- Minimize the storage of combustible materials.
- Make sure that all exits are kept free of obstructions.
- Dispose of combustible waste in accordance with the solid waste management plan.
- Use and store flammable materials in areas away from ignition sources.
- Keep incompatible (i.e., chemically reactive) substances away from each other.
- Perform “hot work” (i.e., welding or working with an open flame or other ignition sources) in controlled areas. Hot work permits are required for all hot work.
- Keep equipment in good working order (i.e., inspect electrical wiring and appliances regularly and keep motors and tools free of dust and grease.
- Ensure that heating units are safeguarded.
  Report all fuel leaks immediately. The Site Mechanic shall ensure that all leaks are repaired immediately upon notification.
- Repair and clean up flammable liquid leaks immediately.
- Keep work areas free of combustible materials.
- Do not rely on extension cords if wiring improvements are needed and take care not to overload circuits with multiple pieces of equipment.
- Turn off electrical equipment when not in use.

Maintenance

The Site Mechanic will ensure that equipment is maintained according to manufacturers' specifications. Fire extinguishers should be inspected once a year.

Type of Risk

The following sections address the major workplace fire risks and the procedures for controlling those risks.

Electrical Fire Hazards

- Electrical system failures and the misuse of electrical equipment are leading causes of workplace fires. Fires can result from lose ground connections, wiring with frayed insulation, or overloaded fuses, circuits, motors, or outlets.
- To prevent electrical fires, employees shall:
- Make sure that worn wires are replaced.
- Use only appropriately rated fuses.
- Never use extension cords as substitutes for wiring improvements.
- Check cords and equipment in hazardous locations where the risk of fire is especially high.
- Check electrical equipment to ensure that it is either properly grounded or double insulated.

Office Fire Hazards

- Fires in offices have become more likely because of the increased use of electrical equipment, such as computers and fax machines. To prevent office fires, employees shall:
- Avoid overloading circuits with office equipment.
- Turn off nonessential electrical equipment at the end of each workday.
- Keep storage areas clear of rubbish.
- Ensure that extension cords are not placed under carpets.
- Ensure that trash and paper set aside for recycling is not allowed to accumulate.
- Equipment that indicates that it is beginning to malfunction, such as a noisy cooling fan on a computer or similar on copy machines and other office equipment, will result in replacement of the equipment in a timely fashion

Cutting and Welding

- Cutting and welding are done by trained personnel in designated cutting and welding areas whenever possible.
- Torches, regulators, pressure-reducing valves, and manifolds are good working condition.

- Oxygen-fuel gas systems are equipped with listed and/or approved backflow valves and pressure-relief devices.
- Cutters, welders, and helpers are wearing eye protection and protective clothing as appropriate.
- Cutting or welding is prohibited in areas where explosive atmospheres of gases, vapors, or dusts could develop from residues.
- Small tanks, piping, or containers that cannot be entered are cleaned, purged, and tested before cutting or welding on them begins.

Flammable and Combustible Materials

The CS shall regularly evaluate the presence of combustible materials at all jobsite locations. Certain types of substances can ignite at relatively low temperatures or pose a risk of explosion if ignited. Such substances obviously require special care and handling.

Class A Combustibles

These include common combustible materials (wood, paper, cloth, rubber, vegetation and plastics) that can act as fuel and are found in non-specialized areas such as offices. To handle Class A combustibles safely:

- Empty waste receptacles daily.
- Store rags in metal bins with self-closing lids.
- Do not order excessive amounts of combustibles.
- Make frequent inspections to anticipate fires before they start.

Class B Combustibles

These include flammable and combustible liquids (oils, greases, tars, oil-based paints, and lacquers), flammable gases, and flammable aerosols.

To handle Class B combustibles safely:

- Use only approved pumps, taking suction from the top, to dispense liquids from tanks, drums, barrels, or similar containers (or use approved self-closing valves or faucets).

- Do not dispense Class B flammable liquids into containers unless the nozzle and container are electrically interconnected by contact or by a bonding wire. Either the tank or container must be grounded.
- Store, handle, and use Class B combustibles only in approved locations where vapors are prevented from reaching ignition sources such as heating or electric equipment, open flames, or mechanical or electric sparks.
- Do not use a flammable liquid as a cleaning agent inside a building or tool van (the only exception is in a closed machine approved for cleaning with flammable liquids).
- Do not use, handle, or store Class B combustibles near areas normally used as exits.
- Do not weld, cut, grind, or use unsafe electrical appliances or equipment near Class B combustibles.
- Water should not be used to extinguish Class B fires caused by flammable liquids.
- Water can cause the burning liquid to spread, making the fire worse. To extinguish a fire caused by flammable liquids, exclude air around the burning liquid.
- Do not generate heat, allow an open flame, or smoke near Class B combustibles.

Fuel Storage Refueling Area

Class B fuel storage:

- See Spill Prevention Plan for details on fuel storage.
- No smoking signs shall be posted on each tank and smoking prohibited within 20 ft. of the storage/refueling area.
- All engines shall be shut off during refueling operations.
- No portable electrical generators shall be operated within the storage area.

Smoking:

Smoking is prohibited on site unless within an enclosed vehicle. With approval of the Project Manager certain outdoor areas may be designated as smoking areas.

Protection capability and response times are limited to the following factors:

- The project will be equipped with a water truck. Each truck will be equipped with hose.
- Additionally, first-aid kits, fire extinguishers and shovels shall be made available.
- Estimated response time to a fire emergency would be 3 minutes minimum and 5 minutes maximum.
- The laydown area will serve as the project muster point.
- Personnel are not trained firefighters and are not to fight fires beyond the incipient or initial stages. Personnel have been trained to summon professional help and evacuate to designated zones of safety.
- Personnel have not been equipped with or trained in the use of professional firefighting equipment.
- During hot work operations, a fire watch equipped with a fire extinguisher will be in position whose sole job will be to watch for fire during hot work operations. The fire watch shall maintain watch for 1 hour after hot work stops.
- In the event of any fire incident the 919 or 322-1225 Emergency System will be activated and professional assistance summoned. The Fire Agencies have statutory responsibilities to track ignition trends in the jurisdictions and develop mitigations to reduce said ignitions.

Excavation in Case of Fire on Site

Routes for Evacuation:

Dependent upon the degree of emergency, weather and/or localized site conditions roadways the laydown on the site map will be used as a muster point for evacuation. Once assembled an account of all staff should conducted.

Training:

Site Safety Coordinator and or Field Engineers shall present basic fire prevention training to all employees upon employment, and shall maintain documentation of the training, which includes:

- This Fire Prevention Plan;
- Good housekeeping practices;
- Proper response and notification in the event of a fire;

- Instruction on the use of portable fire extinguishers;
- Recognition of potential fire hazards.

The Site Safety Coordinator shall review this Fire Prevention Plan at least annually for necessary changes.

Fire Prevention on Construction Work Training

Fire hazards on construction projects are a constant source of danger. This is largely due to lack of firefighting facilities, the presence of combustible materials, and poor control over heat sources.

Serious fires endanger workmen, damage material and equipment, delay the work, and may do structural damage which requires removal and reconstruction. Even the smallest accidental fire results in some loss, if only the time required to put it out, but seldom is the loss so minor.

In all fire prevention methods, the most important factor is to control the source. From the American Bridge Construction viewpoint, the principle sources of fires are welding and burning operations, outside salamanders, stoves for heating change shanties and uncontrolled smoking.

Proper precautionary measures, as follows, will keep fire losses to a minimum:

(1) Good housekeeping tends to remove fire sources and provides easier control when emergencies arise. Make a daily check of tool houses, change shanties. Office, etc., to eliminate any accumulation of rubbish, oily rags, combustible scrap, etc.

(2) Install the proper type extinguisher in each shanty or office and make periodic checks to insure they are in good order. Remember that the Ansul (powder type) extinguisher must be recharged after each use.

(3) All stoves must have protection against fire, either by a sheet iron floor pan with a protecting edge, or a layer of sand kept confined by a 2” wood strip. Provide a metal shield at the side and of the ' shanty where stoves are located near the framework. Stoves must have the flue protected at the ceiling and roof line with fire proof material or tin, with an air space between flue and installation.

(4) Never attempt to start fires in stoves, salamanders, etc., with gasoline, kerosene, or any other inflammable liquid and never pour such inflammable liquid on a fire that is already burning.

(5) Make a periodic check on the wiring and connections in all tool rooms, shanties, office, etc.

(6) Make certain that all fires are out in coal stoves-before leaving the, job at the end of a shift. If hot coals remain, they should be removed and placed in a metal container outside the building and "wet down". (This should be the responsibility of the Superintendent or his delegated authority.)

(7) All clothing must be kept to a minimum of three feet (3'-0") from the nearest edge of the stove.

(8) Instruct all workmen to make a thorough inspection of their work clothing at the end of the shift so as to locate and remove any hot slag, molten metal, etc.

(9) Provide metal containers partially filled with sand or s lag in each shanty for cigar or cigarette butts. Clean these out periodically as necessary.

(10) Clothing that is soiled with oil, grease or paint should not be left in confined places but should be hung out in the open air.

(11) Never store paint, oil, lubricants or other highly flammable materials in heated shanties. Keep such material in a separate shanty isolated somewhat from other buildings. Establish a definite procedure for handling flammable liquids.

(12) Prohibit smoking in highly flammable areas. Provide limited smoking areas, if necessary.

(13) Instruct as many of the workmen as possible, particularly key employees and watchmen, in the proper use of firefighting equipment.

(14) Establish regular inspections to detect fire hazards and take immediate corrective action upon detection of such hazard.

(15) Establish a regular schedule for servicing and maintaining fire extinguishers. Relocate extinguishers as the job progresses. Remember that water extinguishers must be protected with anti-freeze solutions in -winter weather.

(16) Be certain that key personnel know the location of the nearest fire alarm and are familiar with the method of sounding such an alarm.

(17) See that salamanders are constructed with a stable base so .as not to easily overturn. Provide protection against hot ashes, sparks, etc. See that fires are extinguished at the end of the shift or when the area is vacated.

(18) Before starting any burning or welding, look around to make certain that flames, sparks, or hot metal will not be-likely to start a fire. Remember that fires resulting from this type of work are often delayed in starting. Inspect the area thoroughly after the operation is completed.

(19) A suitable fire extinguisher should always be ready for instant use where welding or burning is done. Where combustible materials are present near the operation; a helper or extra man, if necessary, should be on hand to guard against fires.

(20) One Ansul extinguisher, in good operating condition, must be in place on each crane.

(21) Never attempt to fuel any equipment while it is in operation or the engine is running. Avoid spilling any fuel on a hot engine.

(22) When working in highly flammable areas, it is necessary to contain the sparks from exhaust on engines.

(23) Use only approved type containers for storage or transporting of gasoline, fuel oil, solvents, paint thinner, etc. Flame retarding safety cans (painted red) only are to be used for storing or transporting small quantities of gasoline and other inflammable liquids. These cans are electrically welded one-piece construction, air tested, and the spout is equipped with double-perforated flame arrestor. The cap is spring loaded for tight closure and provides automatic pressure relief.

(24) Remember that the first few seconds are most important. A few seconds saved at the start of a fire may make the difference between something comparatively minor and a major loss.

(25) When working in the vicinity of vegetation the following are prohibited:

a. Smoking
b. Cooking
c. Refueling
d. Debris disposal

Fire Extinguisher Management and Use

1) Firefighting equipment shall be conspicuously located and readily accessible at all times, shall be periodically inspected, and be maintained in operating condition.
2) Monthly Inspections - Fire extinguishers shall be visibly inspected each month for defects and to make certain that extinguishers are fully charged. Monthly inspections shall be documented on each extinguisher's tag.
3) At least one portable fire extinguisher, having the rating of no less than 20-B units, shall be located outside of, but no more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.
4) At least one portable fire extinguisher, having the rating of not less than 20-B units, shall be located not less than 25 feet from, nor more than 75 feet, from any flammable liquid storage area located outside.
5) At least one portable fire extinguisher having a rating of not less than 20-B:C units shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable

or combustible liquids.

6) An accessible fire extinguisher of 5BC rating, or higher, shall be available at all crane cabs.
7) LP-Gas storage locations shall be provided with have at least one approved portable fire extinguisher rated not less than 20-B: C.
8) A water truck or trailer shall be accessible in the event of a vegetation fire.
9) Extinguishing the fire should be attempted only if there is a portable fire extinguisher available and the fire is in its incipient (initial or beginning) state and can be safely controlled or extinguished with the available equipment. If the size of the fire presents an immediate danger to life or health, evacuation, not firefighting, should be the primary objective.
10) Fire Extinguisher Use:
    a) The fire extinguisher should be discharged approximately eight feet from the fire with the wind at your back if possible.
    b) The fire should be attacked as you advance.
    c) Quick work is important because the discharge time to empty the contents of extinguisher is usually about one minute.
    d) With the water type extinguisher, the stream should be directed at the base of the fire and moved forward.
    e) When using dry-chemical extinguishers, the nearest edge of the fire should be attacked, and the user should move forward moving the nozzle rapidly with a side-to-side sweeping motion.
11) Employee training:
    a) Utilize weekly tool-box safety meetings to discuss fire prevention and protection procedures.
    b) Explain the proper use of each type of fire extinguisher available.
    c) Explain the fire reporting/alarm procedures

SECTION VI SPILLS / ENVIRONMENTAL INCIDENTS

Spill Prevention and Response Plan

The American Bridge team will need to use equipment and processes that will have the potential for spills of various fluids and chemicals. It is American Bridge's number one priority to ensure there are no leaks or spills and if there is a spill, be able to mitigate and minimize the impact on the surroundings.

The storage and use of fuels and other hazardous material will be required during the construction phase to carry out works. The Spill Prevention and 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, Health and Safety regulations.

Spill are releases of pollutants into the natural environment from a structure, vehicle or other container that is abnormal in quality or quantity.

Types of Pollutants that may be found on site

Some examples of spills of pollutants that may occur on the project include, but are not limited to:

- Petroleum oils;
- Gasoline;
- Diesel; and
- Kerosene.

All diesel, gasoline, hydraulic fluid, and Lubricants will all arrive in manufacturer and EPA approved containers. Other than the large bulk fluids, most products will arrive is sealed 5-gallon buckets and stored in a designated sea container. The bulk fluids such as diesel and gas will be delivered in 6000-gallon ISO tanks on a trailer chassis and transloaded into smaller 500 and 1000 gallon double walled tanks. The 6000 gallon ISO tank are double walled and used specifically for transporting fuels over water to remote locations (see Photo 1). These tanks will be swapped out as they are emptied and replaced with full tanks from the States and delivered via a Ro-Ro ship. There could be up to 6 tanks in total at any given time onsite and at different fullness levels.

Photo 1: Example of a 6000-gallon ISO tank

Once the ISO tanks arrive onsite, they will be stored in our laydown yard where the 500 gallon and 1000-gallon tanks will be brought to a centralized location and filled from the ISO tanks (see Photos 2 and 3). The smaller tanks will then be distributed to where the equipment is working i.e. barges, trestle, etc. This ensures there isn't a large amount of fuel in each area outside of the laydown area but enough to provide a substantial amount of run time for the equipment.

Photo 2: Typical 1000-gallon double walled fuel tank. These tanks will be on the barges and used for filling the equipment running at a given operation.

Photo 3: Typical 500-gallon double walled fuel tank. These tanks will be dispersed around the project to service any of the equipment working in each area. This could be on the trestle or in the upland areas.

Tanks on the barges will be moved using a crawler crane. The smaller 500 gallon tanks will be moved using a RT fork lift. The tanks will be stored onboard the barges and used for refueling of equipment. Spill kits will be available and stored on the barges for future use.

All fuel tanks will be approved containers and double walled to ensure the potential for accidental spillage in minimized. All tanks will be inspecteddaily by the environmental staff and yearly professional inspections. Care will be taken any time the pumps are used to fill a separate conatiner and all safety protocol for pumping will be adhered to which includes the automatic shut off valves, fire extinguisers and spill kits at ever location there is transfer.

Potential Impacts

The presence of fuel and other hazardous material and the handling onsite has the potential to have the following negative impacts:

- Groundwater contamination may occur from fuel and hazardous material being spilled onsite. Due to the porous geological makeup of the Bahamas spills have the potential to permeate the limestone rock and travel into the groundwater system.
- Spills into the waterways can adversely impact marine life and ecosystems. This may occur during refueling, concrete works and the storage of fuel and other materials near the coast.
- Fires may occur as fuels and other materials are highly flammable. Fires may be ignited by smoking and other flames.
- Spills also pose a risk to site health and safety and may cause slips and falls resulting in injuries and other medical issues such as eye, nose and throat irritation, headaches, dizziness, nausea, vomiting, confusion, and respiratory problems.

How to Prevent a Spill

The best way to avoid spills is to recognize all potential environmental exposures and correct potential problems before an accident occurs. The following is a list of potential problem areas with suggested methods of spill prevention during upland works and on floating vessels:

- Only authorized personnel shall fuel the equipment. Personnel performing these operations will have all appropriate safety and environmental measures in place before filling operations begin.
- Daily the equipment will be inspected prior to use and any leaks found will need to be repaired at that time or the equipment will be flagged as inoperable until such repairs can be made. Leaks are also considered a spill.

- All equipment will be brought onsite via ocean transport or possibly equipment already in use on Eleuthera.
- Prior to shipping or loading the equipment and transporting to the project, the equipment will be inspected for leaks. The leak will be repaired or if bad enough the piece of equipment will be deemed not acceptable and a replacement piece of equipment that does not leak, shipped instead. Once onsite, a mechanic will provide an additional inspection prior to the equipment going into use.
- All waste oil will be collected in a suitable container such as a 55-gallon drum with a sealable lid to prevent spillage in the event of tipping during removal form the site. An authorized disposal contractor will take all waste oil to an approved Treatment Storage and Disposal Facility. This facility will have a proper used oil reclamation procedure. Most likely the waste oil will be collected and stored onsite and shipped back to the US for collection by a licensed disposal facility. Records of the disposal will be kept and submitted to DEPP.
- When using hydraulic power packs, all hose connections and hoses should be checked daily before commencing operations. Avoid kinking or twisting lines as this can lead to rupture.
- Hydraulic equipment over the water will use “Clarity” or similar environmentally friendly hydraulic fluid. Product information is included.
- On diesel engines, check all seals, hoses and oil traps to insure there are no areas which are leaking and in need of repair. If leaks are found, repair leak immediately.
- When oil absorbent materials are used in clean up or spill control, they are to be removed in a timely manner to prevent any waste materials from being washed into the water.
- Do not overfill equipment with fuel. Check all fittings periodically for leaks by looking at the filling for cracks, leaks, dry rot, looseness, etc.
- Make sure all liquids are properly stored and capped to prevent any leakage. Lubricants should be stored in a suitable container and properly marked to prevent accidental use of wrong lubricant. Liquids will not be transferred to other containers for convenience, and all appropriate SDS sheets will be always kept on-site.
- When fueling a rig, assign a competent person to assist the fuel supplier. Never leave a fueling operation unattended and establish a clear line of communication between all involved persons and the fuel person. In case of an accidental spill be ready to shut to fuel off at the supply source. Prior to lube oils, all equipment shall be checked for damage and

proper connection of piping and hoses. When using hose make sure it is the right type for the product to be transferred.

- When storing oil drums or fuel tanks, ensure there is an impervious berm built around the tanks or pan underneath to catch any spills. Pans should have flashing or roof as required.
- Berms or pans must be capable of holding 110% of volume of the drum or tanks they enclose.
- Properly instruct personnel in the operation and maintenance of equipment handling oil to prevent possible discharges of oil and make them aware of applicable pollution laws, rules, and regulations
- Schedule and conduct spill prevention briefing for operating personnel at intervals frequent enough to assure adequate understanding of spill prevention. Such briefing should highlight and describe known spill events precautionary measures. Furthermore, AB and subcontractor employees should be made aware of the need to report all spills of petroleum products to their supervisors.

Appropriate containment, diversionary structures, or equipment to prevent spills from reaching navigable to protected waterways, or equivalent should be used as a minimum:

a. Impervious dikes, berms or retaining walls
b. Weirs, booms, or other barriers
c. Absorbent material
d. Floating booms, or fences, which can be deployed to keep contaminates form spreading
e. Drip pans, and collection system.

All spill control equipment will be kept in a designated weather-proof marked drum with sealed cover on site where a spill could occur. These spill response kits shall contain: one (1) bale of 18”x18” oil absorbent pads, one (1) 8” absorbent boom, and one (1) 50lbs bag of absorbent dry sweep for small response purpose. These items will be eased by employees in their small cleanups or as a first response to any spill that is beyond project ability to handle.

Figure 1: Examples of typical spill kits to be used onsite for clean up in case of a spill. 5 gallon kits will be placed throughout the project and the 30 gallon spill kits will be where a large amount of petroleum product is stored. Locations of spill kits will be marked with corrosponding signage.

Material Storage

To reduce the risk of leaks and spills the following best management practices will be implemented:

- Fuel storage is to be located on a cement containment pad or an area prepared with impermeable material.
- The containment area is to be bermed.
- The storage areas are to be fitted with fire extinguishers, spill kits and no smoking signage.
- All materials should be stored in primary containers or containers specifically designed for storage.
- The storage area on-board a floating vessel will be dry and contained.
- Fuel is to be stored in secondary containment.
    - Secondary containment will have overflow space to contain any spillage from the primary container.
    - Secondary containment should be constructed of materials such as concrete, concrete block, plastic, or steel.
    - The secondary containment should be covered to prevent rainwater collecting and overflowing. The covering may be permanent or temporary and include a tarpaulin, fitted lid or roof.

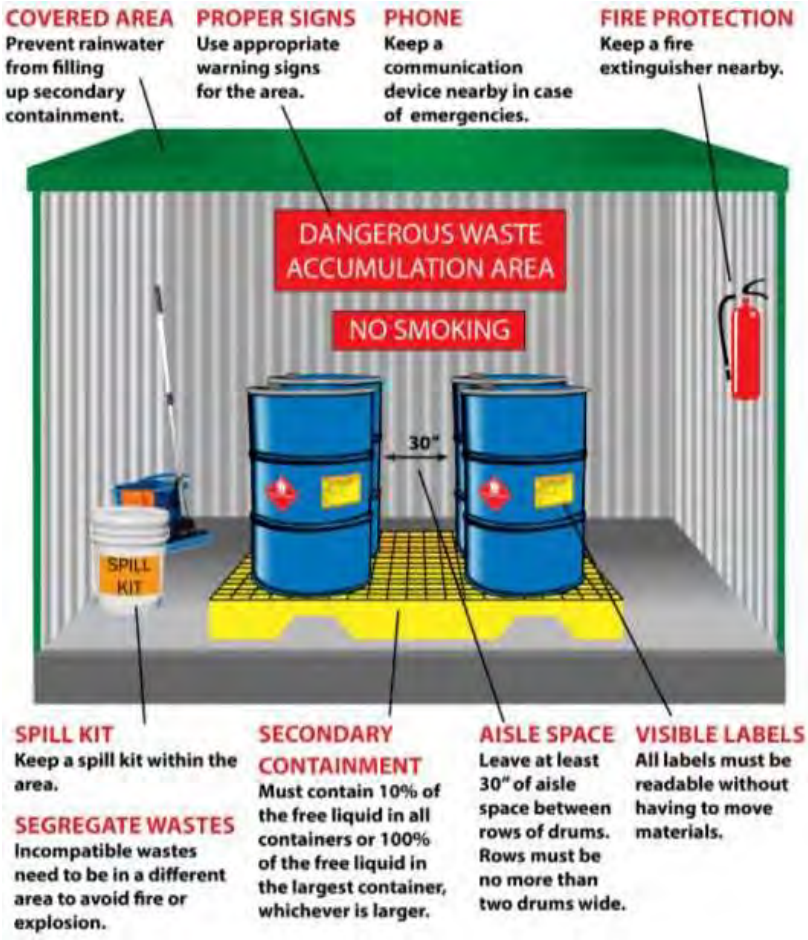


Figure 2: Example of roof cover secondary containment.

If there is a spill:

<u>What to Do</u>:

In the event of a spill or an environmental incident the following steps shall be taken.

1) Wear required personal protective equipment (e.g., rubber gloves, rubber apron, rubber boots, safety goggles, and appropriate respirator).
2) Contain and/or control the spill (e.g., dikes and spill control agents such as sand or absorbent booms).
3) Clean up the material using the spill kits located on the project site. Using a large hand tool (i.e., non-sparking shovel) ensuring all the liquid has been exposed and mixed with the absorbent material.
4) When required notify the customer and appropriate agencies.
5) On a floating vessel the spill will be contained to ensure there is no spillage overboard.

When to Report:

A spill or environment incident must be reported if it:

- Harms or causes material discomfort to any person.
- Injures or damages property or animal life.
- Impairs the quality of the natural environment air, water, or land.
- Causes adverse health effects.
- Presents a safety risk.
- Renders property, plant, or animal life unfit for use.
- Leads to the loss of enjoyment of the normal use of property.
- Interferes with the normal conduct of business.

Who Must Report:

By law, a spill must be immediately reported if you:

- Cause or permit the release.
- Had control of the substance just before the spill occurred.

Where to Report:

A spill must be immediately reported to:

- The Project Environmental Specialist
- The person in control of the substance if known and not already aware.

What to Report:

When reporting the incident provide following information:

- Caller name and phone number
- Name of company or individual responsible for the spill
- Time and location of the spill
- Type and quantity of material spilled (if you know)
- Status of the spill, including actions being taken to control the spill

Minor Spill:

Minor spills shall also be immediately cleaned up. A minor spill is one that usually presents little or

no hazard to person or property and is small enough to be safely cleaned up using the emergency spill kit.

Major Spill:

A major spill presents a potential for damage or injury to the surrounding environment or personnel. The response will require a combined effort for immediate containment and clean up and may require specialized equipment or materials.

Disposal:

The disposal of waste material resulting from a spill or leak is of extreme importance. All disposal actions must be in accordance with the project specific Environmental Management Plan. The following steps should be followed to clean up a spill or leak in a safe and secure manner once the spill has been contained:

- Mechanical Containment or Recovery
    - Booms and Barriers
    - Natural and synthetic sorbent materials
    - Mechanical containment to capture and store
- Physical Methods
    - Wiping with sorbent materials
    - Pressure washing
    - Raking and bulldozing

How to Clean-up:

- Once the spill has been contained, a clean-up and decontamination plan should be established. Those steps should include but not limited to:
    - Wearing PPE to clean-up
    - Use spill kit equipment as needed including absorbent material, pads, or booms
    - Use a pump when necessary, for large amounts of fluid to pump materials into a sealable container
    - Used clean-up material should be placed in a designated hazardous material bin
    - Contaminated soil should be excavated to a depth where the soil has no visible signs of a spill and backfilled with clean material. The contaminated soils should be placed in a secured and labelled container.

  - Photographs of the spill and clean-up should be taken for reporting
  - Proof of disposal from the waste handling facility is to be provided for reporting.
- The spill of incident report template should be completed with all the details and photographs of the event.
- An analysis should be completed to determine the cause of the spill and the necessary adjustments are to be made and may include additional training, storage or handling method etc.

All clean-up supplies are to be replenished.

SECTION VII EVACUATION

In the event of an emergency, all employees in the work section must be assigned a definite location to assess. Assembly areas may remain the same for several weeks or months or may change regularly. New areas will be discussed during the daily Safety Huddle meetings with work crews. The assembly areas will be located at strategic places, close enough to work areas for access, but far enough away from potential disaster areas to afford protection to personnel. Alternate areas will be considered in case of inclement weather and other possible conditions. Assembly areas will provide a definite destination for an orderly evacuation, allow for grouping so that instructions can easily be conveyed to all affected personnel, and expedite the search for missing persons.

This section of the plan deals with the movement of project personnel from an area believed to be at risk, to a safe area in the event of an emergency. The Safety Manager and Construction Manager will coordinate all evacuations with the assistance of the Foremen. In an emergency, each Foreman shall immediately proceed to the designated assembly area previously established in the Daily Hazard Analysis (DHA) meeting and start taking a head count of his/her personnel. The head count total will be passed onto the Superintendent who will report the collective head count to the Project Manager.

Foremen who are responsible for mobile or heavy equipment shall determine whether the equipment will remain where it is at, at the time of the emergency, or if it will be moved to a predetermined area. Unless otherwise directed, subcontractors shall make this decision regarding their equipment.

Employees, upon notification, shall shut down all equipment, extinguish smoking materials, and assist with securing the jobsite as directed by their supervisor. Required personal protective equipment is to remain in use. Employees shall proceed quickly to their assigned assembly areas and shall remain there pending further instructions from the Project Manager, Superintendent, and/or outside emergency services providers. Employees will remain in the assembly area pending instructions from their supervisor. American Bridge and subcontractor supervisors should inform employees with respect to the type of emergency and plans for the resumption or suspension of work.

Should worker(s) be determined missing, a responsible worker aware of the pending dangers is to return to the work area to look for missing worker(s). A method of communication such as a two-way radio is mandatory for workers performing a search. NO WORKER IS TO PERFORM A SEARCH IF THERE IS A RISK OF INJURY.

SECTION VIII TRAINING

The overall effectiveness of the Emergency Response Plan is based on employee training and the execution of practice of emergency response drills. Due to the length of the project, and possible employee turnover, it will be necessary to review this plan at least once per calendar quarter. American Bridge Project Management will ensure that the plan is initially discussed in the new hire employee orientations and in scheduled Daily Hazard Analysis (DHA) meetings along with providing updated maps, detailing the coordination points to all supervisors as needed.

Appendix V

Inclement Weather Policy and Hurricane Preparedness Plan

INCLEMENT WEATHER POLICY

The following inclement weather policy should be adhered to ensure employee safety and should be communicated throughout the site to all employees and contractors:

Strong winds, hurricanes, lightning, rough seas are common occurrences in the Bahamas and these events can create significant risks to construction personnel on site. Hurricane preparedness and response is addressed under a separate plan.

Site Managers are responsible for regularly monitoring job site weather conditions in an effort to avoid hazardous conditions caused by severe weather. In the event of severe weather conditions, procedures need to begin in a timely manner to reduce job-site danger. This plan is to be used for all areas of a project.

The Project Management team (or a designee) is responsible for monitoring the weather conditions and informing the Project Superintendent of weather conditions which may adversely affect the project or the safety of employees. Severe weather such as lightning, heavy rain, and high winds (less than tropical high wind force) which could present potentially hazardous conditions for employees will be addressed per the below procedures.

The Project Management Team (or a designee) will monitor weather forecasts daily to identify potential severe weather.

In all severe weather conditions, the Project Superintendent is responsible for ensuring that all affected employees are notified.

Lightning

Severe weather can adversely affect the safety of personnel working in exposed areas and near metal structures, buildings and around water. Planning for these events can greatly reduce the risk of serious injury or death.

During instances of weather conditions where lightning storms are possible, project management shall monitor the available weather information and be ready to implement precautions as required for personnel safety.

Calculating the distance lightning is striking from our location will be done by simply using what NOAA refers to as the “flash-to-bang” method. From the lightning flash begin to count. The distance is calculated as 1 mile for every 5 seconds until the thunder is heard.

Work on the Project is to be suspended when:

1. Lightning is calculated to be within 10 miles (for crane operations and aerial lifts)
2. Lightning is calculated to be within 5 miles of the work area.
3. Other web based applications, such as WeatherBug, may be used for assessing the risk of potential approaching lightning hazards, pending cellular or internet capabilities.

Once work has been suspended, it will not be resumed until at least 30 minutes has elapsed from the last lightning strike or thunderclap observed.

Employees shall seek shelter during times when work is suspended or other exposed areas.

Safe shelters will include:

1. Fully enclosed vehicles with all windows up
2. Substantial buildings
3. Low lying ground.

Places to Avoid:

1. Trees
2. Water
3. Open Fields
4. High Ground

The following operations will cease when visible lightning strikes are identified/observed:

- Crane Operations
- Welding
- Structural Steel Connection and other elevated work activities
- Roofing

- Other activities which are exposed to the elements and present potential grounding opportunities for lightning

All other activities in progress and the severity/frequency of the lightning strikes will be evaluated by the Project Team to determine if work stoppage is necessary. The safety of exposed workers will be given priority over all other considerations.

Heavy Rain

The following operations will cease when heavy rain may present potential hazards to exposed employees.

- Crane Operations
- Welding
- Structural Steel Connection and other elevated work activities
- Roofing
- Work inside or in close proximity to shallow or deep excavations
- Concrete placing or finishing work
- Work involving power tools

All other activities in progress and the severity of the rain will be evaluated by the Project Team to determine if a reduction in visibility or potential loss of traction or slipping establishes a need for a work stoppage is necessary. The safety of exposed workers will be given priority over all other considerations.

High Winds

The following operations will cease when high winds may present potential hazards to exposed employees.

- Crane Operations will stop based on the Manufacturers Recommendations for the crane in its current configuration, including adjustments in operations for the material that is being hoisted. This may be reduced in marine or trestle based applications depending on allowances of specialty engineer for barge mounted crane list charts
- Aerial lifts (28 MPH) or the manufacturers' recommendation posted on the equipment or in the equipment owner's manual.

- Personnel hoisting with Cranes (20 MPH at the Platform)
- Generally, marine work may require stoppage if winds are forecasted to be in excess of 20 MPH (Beaufort State 5) and from a direction of open water (i.e. NW, W, SW, S, SE), as marine conditions will likely deteriorate beyond this level. The Project Team shall evaluate current and forecasted wind and swell direction for safe working conditions.

All other activities in progress will be evaluated to determine if a work stoppage is necessary. The safety of exposed workers will be given priority over all other considerations.

The below contingency plan outlines the procedures, notifications, and actions to be taken in the event of high wind evacuation orders. The actions are based upon different levels of high winds and include consultation with the Hurricane Preparedness Plan, if required.

Actions: High Wind Condition of Readiness

If sustained winds of 30 mph (48 km/hr.) or greater expected within 72 hours, the following actions should be taken:

- Normal daily jobsite cleanup and good housekeeping practices.
- Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each workday.
- Maintain the construction site including storage areas, free of accumulation of debris.
- Stack form lumber in neat piles less than one meter high.
- Remove all debris, trash, or objects that could become missile hazards.
- Inspect all barges and secure material and equipment for rough seas.
- Move all unnecessary barges to safe harbor or sheltered location if sustained winds of 30-39 mph are anticipated.
- Prepare watercraft and barges for heavy winds/water. Close hatches and secure deck equipment. Move to safe harbor, if necessary, depending on forecasted wind velocity and direction. If winds are expected to be in excess of 39 mph (tropical storm force), the Hurricane Preparedness Plan should be consulted and followed accordingly.
- Locate pumps and hoses in readily accessible positions.
- Ensure all boats, generators and pumps are topped off with fuel.

- Ensure sub-contractors are making similar preparations and protecting their personnel.

Upland or nearshore non-crane related work may continue in winds exceeding 30 mph if deemed safe by the Project Team, dependent on wind speed and direction, and/or scope of work proposed to be performed.

Training

All employees will be given emergency action training. This training will be given on the precautionary actions that should be taken to prepare the job site for the levels of high wind intensity.

All employees will be provided with information on evacuation routes, and their responsibilities in the event of a high wind evacuation order.

All employees will be trained in the location of the Safe Area, and emergencies requiring the employee to assemble at the Safe Area.

Notifications

In the event of high wind alerts or evacuations, the Project Superintendent will ensure all employees are notified and accounted for. Procedures for notifying employees of the return to work or "All Clear" will be established and disseminated to the employees.

TROPICAL STORM AND HURRICANE PREPAREDNESS PLAN

I General

The project's Construction Manager in conjunction with the Safety Manager will be responsible for maintaining a general state of readiness to respond to a major storm event. They will also be responsible for managing preparations immediately prior to a storm event as outlined below.

Each subcontractor is responsible to make all necessary precautions to protect facilities, equipment, and material in his work areas. These areas will be subject to inspection by AB personnel for approval of hurricane preparations.

This plan should be worked in conjunction with the inclement weather plan.

II Personnel Evacuation

The timing of evacuation of personnel will depend on the number of people on site at the time of the event. When the labor force is at its peak, it is anticipated that it could take up to 3 days to evacuate all personnel and then remobilize. This will be done as required to meet the needs to secure operations for the storm. Efforts will be made to evacuate non-critical personnel last and bring them back first.

HURRICANE CATEGORY	PERSONNEL EVACUATION
Tropical Storm (39-74MPH)	No need to vacate the Island
Category 1 (74-95MPH)	No need to vacate the Island
Category 2 (96-110 MPH)	Employees given the option to stay, or leave based on family or personal property needs
Category 3 (111-129 MPH)	Evacuate the Work Camp. Expats are given the option to leave the Island. Assist employees with getting to home island.
Category 4 (130-156 MPH)	All Employees are evacuated off the Island
Category 5 (over 156 MPH)	All Employees are evacuated off the island

III Preparation of the Project Site

A. STORM CONDITION IV: Represents a condition wherein a tropical storm or hurricane is projected by local weather officials to reach Lighthouse Point within 6-7 Days.

1. A general state of readiness will be assessed. Normal work will proceed.
2. Inform all personnel of a potential hurricane condition and to evaluate their work sites to determine at what point the work must be secured for a storm.
3. If evacuation is a possibility, begin planning though commercial or charter flights. Coordinate with the airport to understand when they will be stopping air traffic.
4. Survey the area for loose objects and plan for their security or removal.
5. Evaluate emergency supplies, report and request on what will be needed to support hurricane preparation for their work site.
6. Determine which personnel, if any must remain as a hurricane crew and inform them of their status and duties.

7. Notify the Project Owner of any condition, which may prevent completion of preparations for protection of personnel and property.
8. Ensure adequate material to support hurricane preparations.
9. Evaluate the marine fleet in accordance with the safe harboring plan.
10. Begin preparations of marine equipment, cranes and barges for the storm event. Secure loose materials and begin lashing down major equipment not being used Secure water-based construction materials for storm impacts not in active use (i.e. pile driving jigs/templates, formwork, etc.).
11. Contact local towing companies to determine what tugboats could be made available in the event of an emergency or mechanical failure of one of the on-site tugboats. Use this information to schedule the safe harboring of the marine fleet.

B. STORM CONDITION III: Represents a condition wherein a tropical storm or hurricane is projected by local weather officials to reach the Lighthouse Point Project area within 2-5 days.

1. Hurricane preparations will take precedence over all other work. Most of the securing work will be performed during this period. During this period, meetings will be held by field management daily to ensure preparations for the storm event are on schedule.
2. Remove or secure all loose objects in the area.
3. Begin stopping and securing the work in the order designated by the Construction Manager. If leaving work uncompleted puts certain elements in jeopardy, coordinate with the Engineer of Record and the Owner on the best possible circumstances.
4. Continue Condition IV items that are not completed.
5. Move all material or equipment off the floor that might be damaged by water.
6. Move all desks and filing cabinets, including parts bins, away from windows and doors. If there is danger of the floor being flooded, all documents should be stored in upper drawers. Secure all critical material in the top drawers of safe files.
7. Install storm shutters or other protection, if required for all windows and doors.
8. Properly shelter and lash equipment safely secured in the open.
9. Store all machinery in Field Office Compound. Store stake bodied trucks nearest the construction gates in case they may be required for emergency use.
10. In evacuation conditions exist, dismiss non-critical employees to leave the island, through their established organizational channels. Combination of commercial and

chartered flights may be utilized depending on forecasted strength of hurricane and size of work force at the jobsite at that time.

11. Advise the Owner of any condition which prevents completion of preparations for the protection of people and property.
12. Inventory Hazardous Materials and secure for the storm event.
13. Verify all loose objects have been secured or removed; equipment that can be safely secured in the open is properly covered and lashed, all windows and doors are secured and protected; windows are taped to reduce the possibility of flying glass; sandbags are used to secure roofs, sheds, flex lines, sheet metal, etc., as required.
14. Complete all concrete pours and secure the batch plant and raw materials for the storm event.
15. Subcontractors shall inspect their work areas with an American Bridge Project Team representative.
16. Stop all marine work during this time. Finalize any securement of cranes or other equipment and construction materials on barges with tie downs and bracing as needed. Begin demobilization of marine equipment to safe harbor (see locations in Section III).

C. **STORM CONDITION II:** Represents a condition wherein a tropical storm or hurricane is projected by local weather officials to reach The Lighthouse Point project area within 2-1 Days.

1. Daily meetings will continue by project staff and final site conditions will be documented and communicated to the Owner.
2. The Construction Manager will establish the Site Restoration Team (SRT) and assign duties. A properly staffed SRT will consist of personnel that are qualified to repair electrical, mechanical, plumbing and fire protection systems. In addition, an adequate complement of personnel for general cleanup will be required.
3. Final effort will be devoted to checking and documenting the security of the site and field office complex.
4. If the storm warrants an evacuation event, all remaining non-critical personnel should be evacuated at this time. All remaining critical personnel will be dismissed within 12 hours in order that proper security and evacuation measures may be accomplished at their residences. Employees sent home from work are not to return to work until they receive instruction from an American Bridge supervisor advising them to report to work.

5. Fuel all vehicles and secure in the parking areas/lots with keys in the ignition for emergency use.
6. All marine equipment should be secured in safe harbor at this time. All equipment remaining on access trestles shall be secured as required. All cranes shall be boomed down for the event. All cranes, tugboats and other necessary equipment shall be fueled for early response after the storm event.
7. Information Systems will power down all computer equipment.
8. All power supplies will be turned off and unplugged.
9. All computer equipment that remains on site will be covered and secured with plastic off ground to prevent water damage
10. All routers will be taken down, and power removed.

D. STORM CONDITION I: Represents a condition wherein a tropical storm or hurricane is projected by local weather officials to reach the Lighthouse Point Project area within twelve (12) hours.

1. If conditions allow, a minimum number of critical personnel shall remain on site to monitor and manage the storm event.
2. Inspect the marine fleet and verify it is secured for the storm in accordance with the safe harboring plan. Ensure emergency tug boats are available if necessary.
3. Monitor predicted storm path.

E. SAFE HARBORING PLAN AND MARINE EQUIPMENT PREPARATION

1. The number of marine assets on the project at any one time will vary but could be up to ten (10) material barges, crane barges, and tug boats. Therefore, when Condition IV is achieved, the marine fleet will be evaluated to determine the level of effort required to safe harbor the fleet. That evaluation will dictate when certain work operations must stop and what must be done for the storm in question.
2. The project staff will coordinate with the AB engineering department to determine if the forecasted sea conditions will require any specific engineered tie downs or mooring configuration unanticipated to provide the most shelter and least risk to the marine assets or permanent materials being stored on barges or partially put in place during the storm event.

3. Tugboats towing more than a single barge (tandem tow) will travel at approximately 4 NM/hr., resulting in a four-plus hour voyage to store the barges and another 2.5 hours for the tug to return for the second fleet of barges.
4. Location #1 is the primary Safe Harbor location. 17 NM North of the Project. Round trip travel time for the tug to secure two barges at this location is 8 hours round trip. This location should be able to store all barges at any one time.
5. Location #2 is the secondary Safe Harbor location. 19 NM North of the Project. Round trip travel time for the tug to secure two barges at this location is 9 hours round trip.
6. Location #3 Rock Sound is a backup location if there is an issue with the first two. This will be the last choice since the distance adds considerable time to the process and the decision to move the equipment there must be made much earlier.
7. After the barges have been secured in one of the three locations, the tugboat and push boat will be brought to the bulkhead in Cape Eleuthera and secured. This location allows proximity to the barges in case there is an emergency and will provide for shorter response times. The tug will be manned for lesser grade storms and will be evaluated on a case-by-case basis.
8. During final design of the permanent and temporary marine works, it will be determined what storm conditions that cranes can remain on the temporary trestles at their work locations. It is possible that a given storm event will require the cranes and all temporary trestle to be removed from the permanent piles prior to storm. If that is necessary, this process will likely need to begin during Condition IV.

IV RE-ESTABLISHING THE SITE AFTER THE STORM EVENT

1. Once the storm has passed, the SRT will return to the site and evaluate the conditions and determine how to remobilize the site.
2. If the site was not evacuated, workers will be utilized to clean up the areas, return the materials and equipment, and resume work. If workers were evacuated, determine a plan for remobilizing personnel that prioritize repairs and starting up critical activities.
3. Areas will be inspected for damage and unsafe conditions prior to any work or clean up starting.
4. Notify insurance carriers of any damage or conditions that may warrant coverage.
5. Fully inspect all marine equipment. If necessary, evaluate barge internal structure.

6. Fully inspect all permanent work to determine if damage has occurred. Document the conditions and inform the client and designers if mitigations or rework is required.

Figure 1: Overview of Lighthouse Point Safe Harbor Locations

Safe Harbor Site No. 1

Western Cape Eleuthera

Safe Harbor Site – Tug Boat Only

Cape Eleuthera Marina

Safe Harbor Site No. 2

NE Cape Eleuthera

Safe Harbor Site No. 3

Rock Sound

Figure 2: Lighthouse Point Safe Harbor Locations

SEVERE WEATHER PREPARATION CHECKLIST – General

YES	NO	NA	
□	□	□	Ensure that all materials, tools, tool sheds, gang boxes and small equipment can be picked up by the wind or damaged by rising water, are removed or protected.
□	□	□	Ensure that all motorized equipment is removed or securely parked in an elevated area where it will be not damaged by possible flooding.
□	□	□	Ensure that all construction trailers, office trailers, sheds, etc., on the project site are tied down according to code. If proper securing is not possible they should be removed from the job site.
□	□	□	Have all trash dumpsters consolidated and covered with plywood so that debris does not fly out of them. Incinerate all possible waste.
□	□	□	Generally police the construction site and remove, weigh or tie down all potential flying objects.
□	□	□	Have all temporary port-o-lets pumped out, tied down or removed from site.
□	□	□	Top off all equipment with fuel in the event that the fuel supply becomes short. This will also serve to keep water out of the equipment.
□	□	□	Duct tape in X taping windows, if boarding them up is not possible.
□	□	□	Disconnect all office electrical equipment (computers, copiers, fax machines, etc.)
□	□	□	Update emergency contact list. This includes cellular phone numbers and digital pagers for project management personnel.
□	□	□	Secure any material that may be damaged or could become a flying object during high winds.
□	□	□	Ensure that the job site has emergency power capabilities through the use of generators in the event that power is disabled by severe weather.
□	□	□	Place pumps in strategic locations, if applicable, to minimize the potential for flooding.
□	□	□	Lower all lattice booms cranes to the ground.
□	□	□	Take numerous photographs of the jobsite, inside and outside, prior to the arrival of the severe weather.
□	□	□	Ensure that any emergency crews remaining on site have non-perishable food, first aid supplies, lighting equipment, two-way radios, adequate potable

water containers, a supply of batteries of various sizes for battery operated equipment, and generators with a minimum of 10 gallons of reserve fuel.

SEVERE WEATHER PREPARATION CHECKLIST – Marine Equipment

YES	NO	NA	
□	□	□	Conduct a preliminary barge and crane survey.
□	□	□	Tie down and secure all equipment and materials on each barge.
□	□	□	All equipment on trestles secured as required.
□	□	□	Anchor systems engaged and mooring lines inspected
□	□	□	Tug boats, cranes, and critical equipment fueled
□	□	□	Safe harbor area and mooring footprint established per plan
□	□	□	Weather buoys and floating markers removed as required
□	□	□	Land-based cranes and equipment moved to high ground, if necessary
□	□	□	All crane booms (land-based and barge) lowered and secured
□	□	□	Photographs taken

POST STORM EVENT CHECKLIST

The SRT leader should verify the following items are completed:

YES	NO	NA	
□	□	□	Immediate damage assessment should be completed by the SRT and action plans developed to address priorities
□	□	□	Look for safety hazards such as downed power lines, exposed electrical wires, leaking gas, etc.
□	□	□	If crews were evacuated, determine a remobilization plan that prioritizes restoration and critical activities.
□	□	□	Assess impaired fire protection equipment and alarms.
□	□	□	Complete temporary repairs and minimize hazards to ensure personnel can safely access the site
□	□	□	Prioritize reestablishing the critical work activities so they begin at the earliest opportunity
□	□	□	Appraise buildings for structural damage or undermining of building foundations. Have engineer check the structure if required before you begin to start work again.

□	□	□	Establish a procedure and resources for removing debris brought by the storm and as a result of any reconstruction efforts.
□	□	□	Any holes or other penetrations in the building walls should be temporarily repaired.
□	□	□	Assess and prioritize building contents that have been damaged and can be salvaged.
□	□	□	Photograph and/or videotape any damage to equipment or permanent work.
□	□	□	Assess and service fire pumps/fire protection equipment that was submerged. All equipment should be tested and before being placed back in service.
□	□	□	Assess the integrity of fire protection alarm circuits. Fully test and repair as needed.
□	□	□	Assess the integrity of security alarm circuits and cameras. Fully test and repair as needed.
□	□	□	Physically test any sprinkler control valves that were submerged to verify they are operational. Conduct main drain tests for the sprinkler system(s).
□	□	□	Notify the local emergency services of any extended impairments that will be required for the above systems.
□	□	□	Evaluate and restore all electrical service.
□	□	□	Notify insurance carriers as required and provide any requested documentation
□	□	□	Electric motors, switch gear and cables should be thoroughly inspected, cleaned and dried as needed before energizing. Even if it has not been immersed, electrical equipment can absorb sufficient moisture to reduce its insulation resistance to a dangerously low level. While electrical leakage may be too small to blow fuses or trip the circuit breakers, it may be sufficient to cause heating and fires.

Appendix W

Decommission Plan

In the event the Lighthouse Point Project does not move forward, DCL Island Development, Ltd. is committed to completely demobilize any equipment and materials from the project site; the demobilization will be inclusive of both the marine and landside scopes. As for any clearing that has taken place on land, those areas will be restored to native pallet within reason.

Disney has included a 50-year design life for both the pier and the landside buildings as part of the Project scope. The Back of House (BOH) facilities will be built on Disney owned property and a determination will be made on next steps for the property at the end of its useful life. As for the pier, the Seabed lease will be instituted for 50 years per the Heads of Agreement (HOA) which states that the Developer can also elect to extend an additional 50-year lease after expiration of the existing.

Appendix X

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