

Environmental Management Plan/Environmental Baseline Assessment

Brickell Square 9-Acre Parcel

Baha Mar Boulevard, New Providence, The Bahamas

August 2025



P.O. Box N4805
Nassau, The Bahamas

Submitted on Behalf of: Brickell Square Commercial Ltd.

Submitted to: Department of Environmental Planning and Protection (DEPP)

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Baha Mar Boulevard, New Providence, The Bahamas

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1 Executive Summary

This Environmental Management Plan (EMP) pertains to the proposed construction of an office complex and retail development by Brickell Square Commercial Ltd.. An Environmental Management Plan is a guide that identifies relevant management techniques, including Best Management Practices (BMPs) and Emergency Response Plans, based on site-specific physical and biological conditions.

The EMP is a key component of the overall project management and, as such, activities and procedures described herein are to be integrated with other construction planning, quality assurance, site safety, and project management processes. The EMP is to provide planning for site activities that may occur during construction and later during operations. The EMP is presented as a “living document” that is adapted to incorporate changes during the progression of the project due to increased available information, including items such as the contractor awarded the project, construction phasing, construction methodology and the selection, and final site configuration.

The development by Brickell Square Commercial Ltd. includes 94,000sqft of space for retail shopping (40+ retail spaces and anchor tenant), a 35,100sqft Class A office building, a performing stage, and commercial space for showrooms over 9 acres. Activities include site clearing and grading, and excavation for installation of utilities and structures. The 9-acre parcel is part of a larger 30-acre development as Phase 1. The project site is located east of Baha Mar Boulevard, north of MacFit 360 fitness, and south of the Skyline Lakes Subdivision. The property is separated from the subdivision by a 150ft BPL reservation.

At present, the 9-acre site is primarily characterized as interior upland with two vegetative classes, Dry Broadleaf Evergreen Formation and Human-Altered. While the property perimeter maintains a vegetated buffer, the interior portions of the site have been recently cleared. Biological baseline surveys performed by JSS Consulting included 3 plots for protected tree surveys within the undisturbed vegetation; Plots 1 and 2 on the 9-acre northern perimeter and Plot 3 immediately east of the 9-acre parcel. Thatch palm (*Leucothrinax morrisii*) was the most prevalent across all three plots.

Impacts pertain to the loss of remaining vegetation along the property boundaries where mature fruiting trees attract fauna. The removal of this vegetation along the high relief ridgeline also presents the potential for sediment and erosion impacts without proper consideration for drainage during construction and operation. The use of silt fencing and other sediment control products is paramount to manage runoff during inclement weather and to retain the natural accumulation of leaf litter and more humic soil for use on site.

As New Providence continues to develop, interior upland areas comprising primary and secondary forests are dwindling. To mitigate this loss of intact forest, the development landscaping program should include protected trees, specifically, those identified as endangered, threatened, or endemic to the Bahamas such as the *Thouinia discolor* (Quicksilver bush) observed within the larger 30-acre parcel. To support avifauna use, landscaping should include floral species such Darling Plum (*Reynosa septemtrionalis*), Black Torch (*Erithalis fruticose*), and Chaney Briar (*Smilax havanensis*).

Overall, the entirety of the Brickell Square Commercial parcel supports 82 vascular species including 12 protected tree species and 5 invasive species, and 19 species of avifauna. Where feasible, the developer should consider preserving upland forest along the 9-acre parcel perimeter and broader development. It would be appropriate to remove all individuals of invasive species identified to prevent further establishment on the site and neighboring areas. The 150ft wide BPL right-of-way north of the property provides separation from the Skyline Lakes subdivision, any preservation of a vegetative buffer by Brickell Square Commercial Ltd. would further mitigate the potential for noise and aesthetic impacts.

Construction activities will be undertaken in phased stages, beginning with site preparation and land clearing, followed by foundation work, structural development, and interior fit outs.

- **Sediment and Erosion Controls.** Land clearing activities require use of best management practices (BMPs) to limit impacts to the environment. BMPs reduce the potential for sediment transport during storm events and entry into subsurface caverns and marine environment. Potential best management practices to consider include a drainage plan, silt fencing, vegetative buffers and dewatering away from wetland features.
- **Removal of Litter and Solid Waste.** An accumulation of litter is apparent along and within vegetation fringe and previously disturbed areas. The project will remove the litter and indiscriminate dumping and discard at a DEHS approved landfill such as the New Providence Ecology Park.
- **Vegetation Management.** To mitigate this loss of intact forest, the development landscaping program should include protected trees, specifically, those identified as endangered, threatened, or endemic to the Bahamas such as the *Thouinia discolor* (Quicksilver bush) observed within the larger 30-acre parcel. To support avifauna use, landscaping should include floral species such Darling Plu (*Reynosia septentrionalis*), Black Torch (*Erithalis fruticose*), and Chaney Briar (*Smilax havanensis*). Invasive species identified on-site will be managed according to the Bahamas National Invasive Species Strategy 2013. Where feasible, mature protected trees will be avoided and/or saved and utilized for replanting. A permit to Harvest a Protected Tree species will be filed with the Forestry Unit.

2 Purpose and Scope

An Environmental Management Plan (EMP) is a guide that identifies relevant management techniques, including BMPs and Emergency Response Plans, based on site-specific physical and biological conditions. The purpose of this EMP is to control environmental impacts associated with construction, build-out, and operation of the development.

Environmental management is a systematic approach that integrates environmental, health and safety policies with continuous monitoring to ensure environmental compliance. These policies entail international best management practices to avoid and minimize known and unforeseen adverse impacts stemming from the project. Hazards to human health and safety and the environment can be managed through careful planning, vigilance and strong communication during works, and continual improvement to the overall environmental management program.

As such, an EMP should be consulted during construction planning and used during construction and operation. The preferred management approach is to avoid, minimize, and control adverse impacts to human health, safety, and the environment. Where adverse impacts cannot be avoided, best management practices should be employed to mitigate human and environmental harm. This EMP shall not be considered a full-scale human health and safety program to be implemented by the Contractor, the purpose of the EMP is to control environmental impacts associated with the construction and build-out.

The EMP shall be continually revised to reflect any changes on site. The EMP outlines measures that are to be implemented in order to minimize potential adverse environmental and social impacts and safety hazards. A copy of the DEPP approved EMP will be available on site at all times.

3 Geographical Setting & Present Land Use

The Bahamas is an archipelagic nation comprising 700 islands and cays situated over 100,000 square miles of the Atlantic Ocean. Located east of Florida and north of Cuba, The Bahamas has a population of 398,165 persons of which 74.5% reside on New Providence. According to the Official Census Count 2022, 296,732 persons reside on New Providence; it is the most populated island of The Bahamas. Collectively New Providence, Grand Bahama, and Abaco represent 90% of the population.

3.1 Geographic Location

The Brickell Square Commercial Ltd. project is located to the east of Baha Mar Boulevard in the Western District of New Providence Island at 25°3'33.65"N and 77°23'45.70"W. A residential neighborhood, Skyline Lakes, is located north of the 150ft BPL right-of-way.

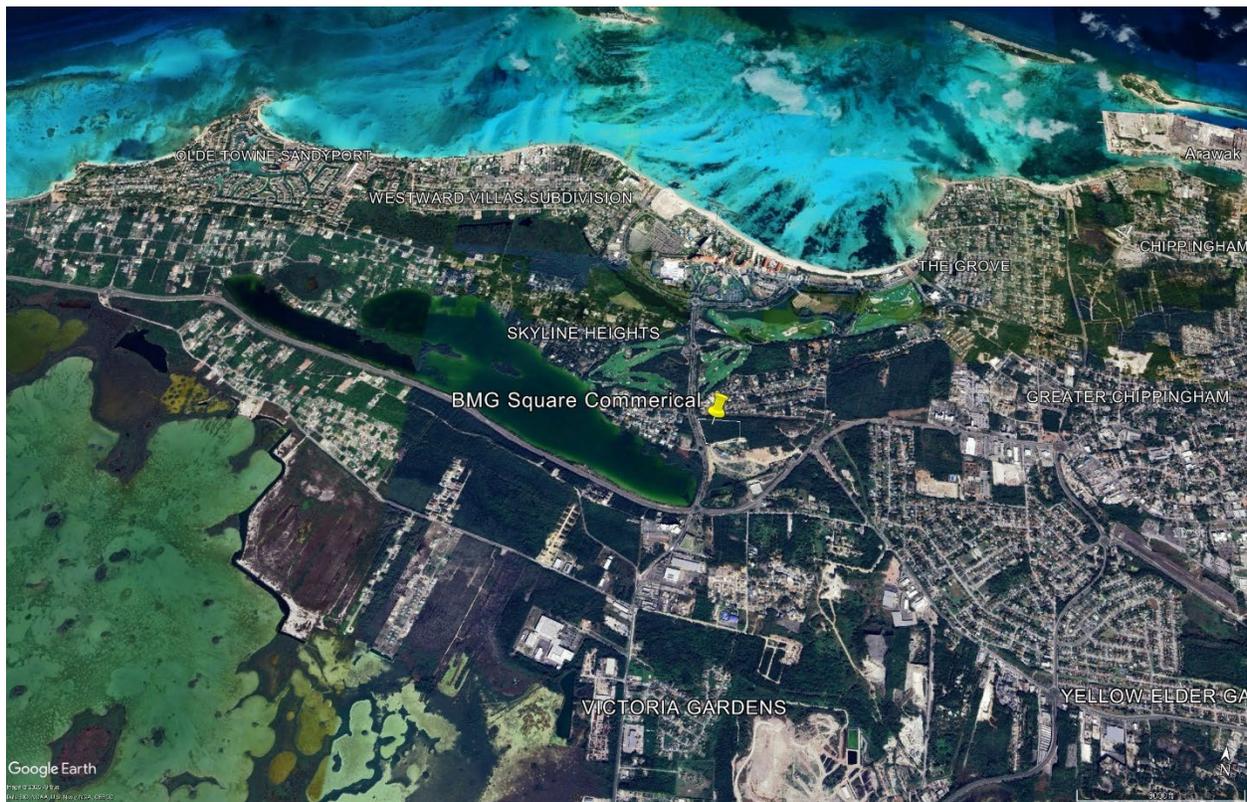


Figure 3-1 BMG Square Commercial, Baha Mar Boulevard, New Providence, The Bahamas

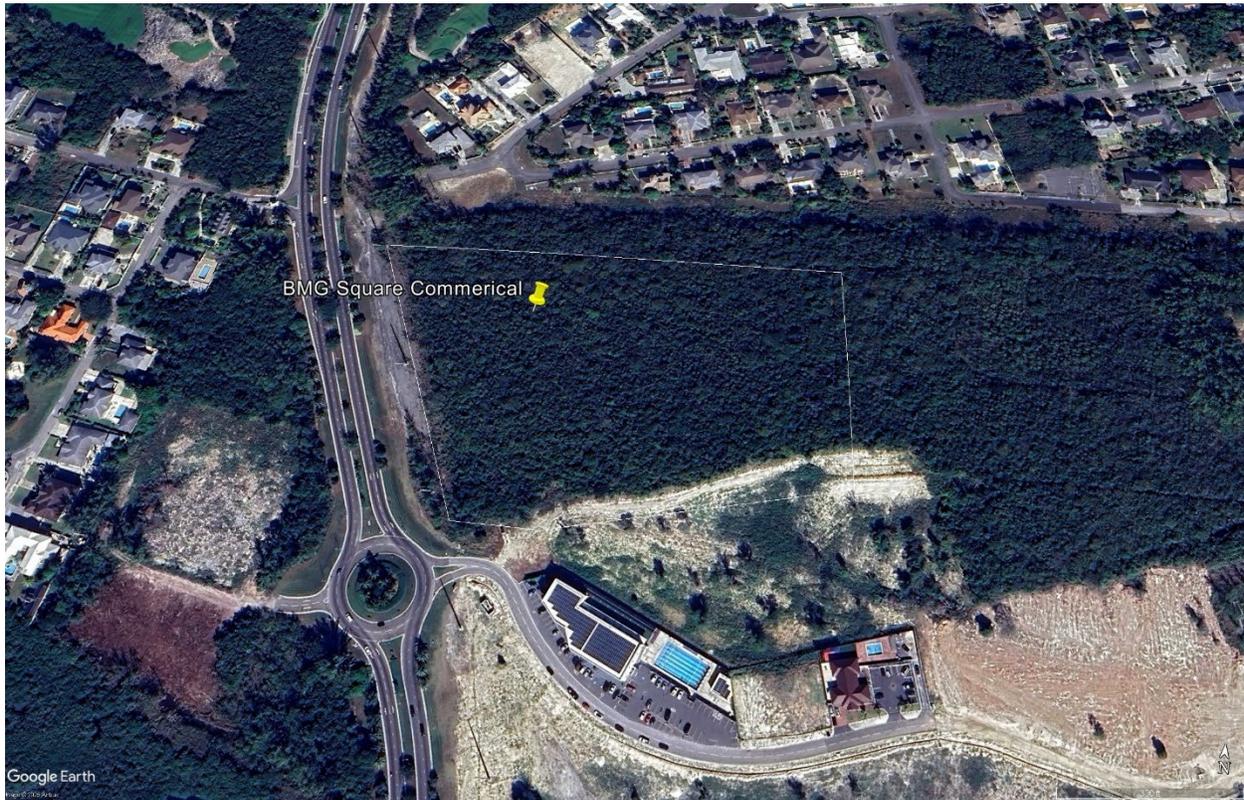


Figure 3-2 Google Earth Image, BMG Square Commercial

3.2 Present and Past Use

At present, the 9-acre site is undeveloped though recently cleared within the interior. Adjacent properties include Macfit 360 fitness club to the immediate south, a 150ft BPL right-of-way to the north, and Skyline Lakes, a residential neighborhood, north of the BPL right-of-way. Farther north is the Baha Mar Blue Golf Course. The western portion of the 30-acre parcel was formerly the Prospect Ridge Hospital.



Figure 3-3 Human-Altered Area Recently Cleared

3.3 National Parks

There are no National Parks in the immediate vicinity of Brickell Square Commercial Ltd. The closest protected area is the Perpall Tract National Park which is located one (1) mile to the northeast.

4 Project Description

The development by Brickell Square Commercial Ltd. includes 94,000sqft of space for retail shopping (40+ retail spaces and anchor tenant), a 35,100sqft Class A office building, a performing stage, and commercial space for showrooms over 9 acres. Activities include site clearing and grading, and excavation for installation of utilities and structures.

Please see next page for site plan.

Figure 4-1 Site Plan, Brickell Square Commercial Ltd.



OVERALL SITE PLAN

Brickell Square

NASSAU, BAHAMAS

5 General Site Characteristics

5.1 Existing Conditions

The 30-acre parcel is considered an interior upland ecosystem with two vegetation classes: Dry Broadleaf Evergreen Forest and Human-Altered environments. The property is situated along a high relief ridge with the southern perimeter experiencing a rapid decline in elevation. Soil is consistent with limestone substrate with a thin layer of leaf litter at the surface ranging 3 to 4 inches in depth.

5.2 Biological Baseline Objective

A biological baseline survey was performed by JSS Consulting from July 29 through July 31, 2025. This baseline covered the extent of the Brickell Square Commercial Ltd. 30-acre property. A copy of the complete report is provided in the Appendix. This EBA/EMP pertains only to the 9-acre parcel, however, some commentary may refer to the overall 30-acre for context.

The objective of an Environmental Baseline Assessment is to document existing biological and physical conditions in order to facilitate impacts analysis and associated appropriate measures to mitigate those impacts.

5.2.1 Biological Terrestrial Summary

According to the JSS report, there is a single terrestrial ecosystem: Interior Upland, with two vegetation classes: Dry Broadleaf Evergreen Forest and Human-Altered Environment. A single type of DBEF was observed: *Cocoloba swartzii-Vachellia chorophylla-Lysiloma latisiliquum* Forest Alliance. Overall, the 30-acre site has a floristic species diversity of 82 inclusive of 12 protected species and 5 invasive species.



Figure 5-1 DBEF *Cocoloba swartzii-Vachellia chorophylla-Lysiloma latisiliquum* Forest Alliance.

While the property perimeter maintains a vegetated buffer, the interior portions of the site have been recently cleared. Biological baseline surveys performed by JSS Consulting included 3 plots for protected tree surveys within the undisturbed vegetation; Plots 1 and 2 on the 9-acre northern perimeter and Plot 3 immediately east of the 9-acre

parcel. Thatch palm (*Leucothrinax morrisii*) was the most prevalent across all three plots. Other protected trees identified within these plots include Gum Elemi, Wild Tamarind, and Horseflesh.



Figure 5-2 Horseflesh (*Lysiloma sabicu*), Protected Tree

Please refer to the figures below for the overall vegetation map and protected tree survey plot locations.

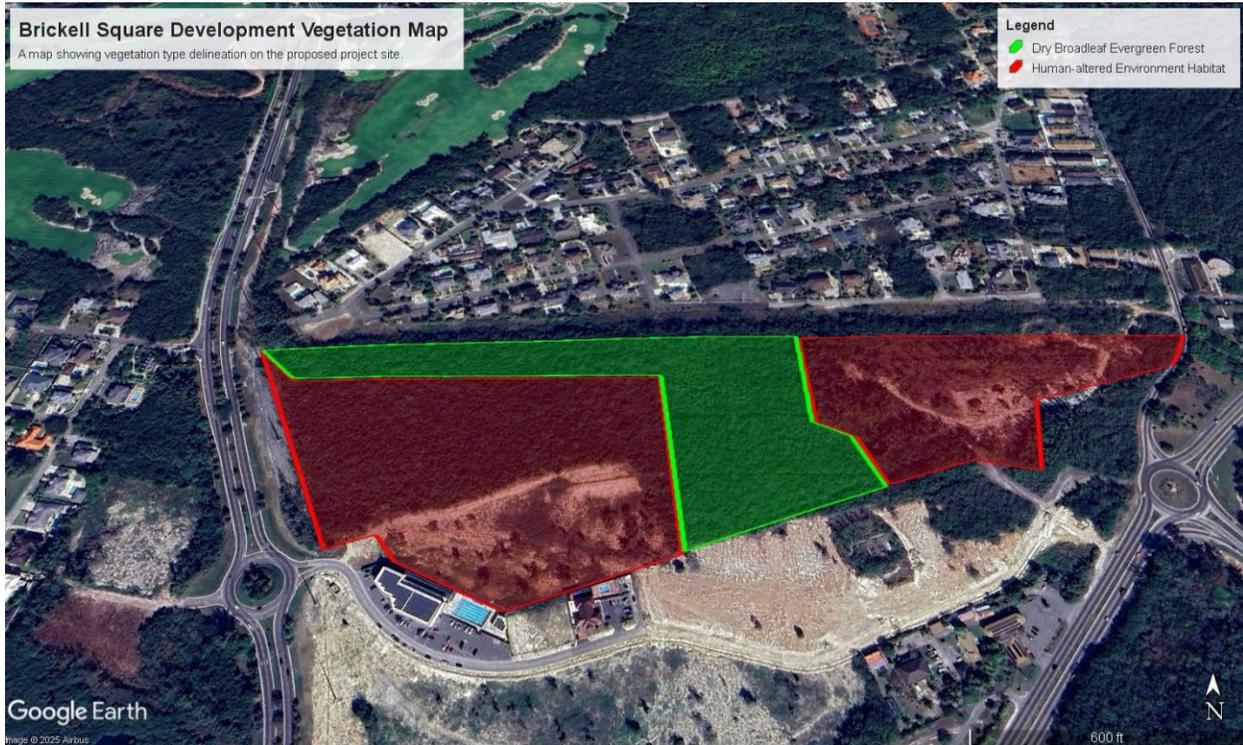


Figure 5-3 Vegetation Map, Brickell Square Commercial Ltd



Figure 5-4 Vegetation Map with Protected Survey Tree Plots

5.2.1.1 Botanical Mitigation Strategies

To mitigate this loss of intact forest, the development landscaping program should include protected trees, specifically, those identified as endangered, threatened, or endemic to the Bahamas such as the *Thouinia discolor* (Quicksilver bush) observed within the larger 30-acre parcel. To support avifauna use, landscaping should include floral species such Darling Plum (*Reynosa septemtrionalis*), Black Torch (*Erithalis fruticose*), and Chaney Briar (*Smilax havanensis*).

Additionally, it would be appropriate to retain to the extent feasible, the vegetated buffer along the northern periphery of the site. While the Skyline Lakes community is separated from the development by a 150ft BPL right-of-way, a buffer would also mitigate aesthetic and noise impacts.

5.2.2 Avian Survey Summary

JSS Consulting performed 10 hours of active avian and ecological observations between July 29th and July 31st. The avian survey is considered a Summer Avian Survey having occurred during April to August season. A total of 19 avian species were recorded during the summer avian survey. Unsurprisingly, 16 or 84% of avifauna are permanent resident breeding species (PRB). Elsewhere, two species, Antillean Nighthawk and Gray Kingbird, are summer resident breeding migrants, and 1 species, the Northern Parula, is a winter resident non-breeding resident. Of these, 32% or 6 species are endemic and subspecies to the Bahamas. The White Crown Pigeon is listed as a near-threatened species on the IUCN Red List.

All the species observed are protected under the Wild Birds Protection Act Chapter 249 (Statue Law of The Bahamas). None of the species recorded are classed as endangered. Birds listed as “Least Concern on the IUCN Red List are not included in this list.



Figure 5-5 Antillean Nighthawk (Summer Breeding Resident) and Northern Parula (Winter Resident Non-breeding)

5.2.2.1 Mitigation Options

To support avifauna use, landscaping should include floral species such Darling Plum (*Reynosa septemtrionalis*), Black Torch (*Erithalis fruticose*), and Chaney Briar (*Smilax havanensis*). Additionally, preclearance activities can review areas for nests. Consideration for lighting that meets dark skies guidelines would also mitigate impacts due to light pollution.

5.2.3 Fauna Survey Summary

JSS Consulting performed fauna surveys between July 29 and July 31, 2025. The site contains reptiles, amphibians, mollusks (gastropods), and myriad arthropods (arachnids, insects, crustaceans, and hymenoptera).



Figure 5-6 Bark Anole (Left) and Caribbean Meadow Katydid (Right)

5.2.4 Fauna Mitigation

Similar to techniques to mitigate impacts to avifauna, fauna use native trees, shrubs, and leaf litter as habitats. Using a native landscaping program, retaining native vegetation and/or establishing corridors, and light pollution reduction, will provide habitat for fauna.

6 Impact Summary

Baseline studies facilitate review of proposed project features for impacts determination being positive, negative, or neutral over the short and long term.

Overall, the entirety of the Brickell Square Commercial parcel supports 82 vascular species including 12 protected tree species and 5 invasive species, and 19 species of avifauna. Impacts pertain to the loss of remaining vegetation along the property boundaries where mature fruiting trees attract fauna. Where feasible, the developer should consider preserving upland forest along the 9-acre parcel perimeter and broader development. It would be appropriate to remove all individuals of invasive species identified to prevent further establishment on the site and neighboring areas.

The removal of this vegetation along the high relief ridgeline also presents the potential for sediment and erosion impacts without proper consideration for drainage during construction and operation. The use of silt fencing and other sediment control products is paramount to manage runoff during inclement weather and to retain the natural accumulation of leaf litter and more humic soil for use on site.

As New Providence continues to develop, interior upland areas comprising primary forest are dwindling. To mitigate this loss of intact forest, the development landscaping program should include protected trees, specifically, those identified as endangered, threatened, or endemic to the Bahamas such as the *Thouinia discolor* (Quicksilver bush) observed within the larger 30-acre parcel. To support avifauna use, landscaping should include floral species such Darling Plum (*Reynosa septemtrionalis*), Black Torch (*Erithalis fruticose*), and Chaney Briar (*Smilax havanensis*).

The site will require grading and excavation to establish roads and building foundations; this EMP details sediment and erosion BMPs to control the potential for adverse impacts. Additionally, landscaping should incorporate protected and native trees.

6.1 Construction Environmental Procedures

6.1.1 Summary of Environmental Impact Considerations

The purpose of the EMP is to provide measures to eliminate or reduce environmental damage caused by the project during construction and operations. The table below outlines key activities, potential project effects and recommended mitigation measures that will reduce the impacts associated with various project activities.

Table 7-1- Environmental Impact Considerations

Environment	Project Activity	Potential Impact Effects	Recommended Mitigation Measures
Upland areas	Land clearing, grubbing, and tree removal	Sediment, erosion, and turbidity runoff from disturbed areas.	Sediment & Erosion Controls Stormwater Management Plan
Upland areas	Land clearing, grubbing, and tree removal	Loss or impact to native plant communities. Impact to native fauna.	Landscaping with Native Species

Environment	Project Activity	Potential Impact Effects	Recommended Mitigation Measures
Upland areas	Land clearing, grubbing, and tree removal	Introduction of or the creation of conditions that allow for invasive or exotic species	Invasive Species Management
Upland areas	General construction	Litter & Pollution	Good housekeeping Waste Management Practices Maintenance & Fuel Storage
Air quality	All	Pollution from equipment Dust Control	Air Quality Control Preventative Maintenance Good Housekeeping
Discovery of Antiquities	All	Disturbance of cultural resources	Protocol for Discovery of a Antiquity
Offsite – adjacent and nearby communities	All	Impacts to neighboring areas due to increased traffic flow, workers, material storage and movement, etc.	Communication with Local Stakeholders Grievance Redress

7 Environmental Laws, National Environmental Policies and International Conventions

Brickell Square Commercial Ltd. is located within the constituency of Killarney represented by Member of Parliament, Dr. Hubert Minnis, O.N., M.P.

7.1 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.
Antiquities, Monuments, and Museum Regulations, 1999	To establish the National Register of Historic Places and provide application for permits and licences	Regulations to establish the National Register of Historic Places, and provide procedures for application for a permit, application for a licence, fees for permits and renewal application.
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. The 2019 Amendment expands the duties of The Bahamas National Trust; to revise the constitution of the council; and to expand its authorized capital investments; and for connected purposes.
The 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).
Biological Resources and Traditional Knowledge Act, 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.
Conservation and Protection of the Physical Landscape of The Bahamas, 1997 Chapter 260	Excavation, Landfill, Quarrying, Mining,	This Act makes provisions for the regulation of activities including excavation, landfill, quarrying, and mining in The Bahamas for the purpose of conservation of maintenance of the environment.
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 Law, Regulation, Policy	Subject	Summary
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 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 or 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 impact assessments and environmental reporting requirements for protection of natural resources.
Environmental Impact Assessment Regulations, 2020	To provide procedures for a Certificate of Environmental Clearance (CEC).	The Regulations provide procedures for the review proposed projects inclusive of monitoring and compliance requirements. The Regulations dictate the requirements for a Certificate of Environmental Clearance (CEC).
Environmental Planning and Protected (Extension of Application Order), 2020	To extend the Act	The Environmental Planning & Protection Act, 2019 shall apply throughout the territory of The Bahamas including every island and cay.
Environmental Planning and Protection (Amendment) Act, 2024	To amend the EPPA 2019	The 2024 Amendment 1) defines an ‘environmentally sensitive area’ as ‘in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which may easily be disturbed or degraded by human activities and developments; 2) amends fines; and 3) defines exemptions for certain activities.
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.
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.
Forestry Amendment 2023	To amend fees	To amend the <i>Second Schedule</i> in the Forestry Act 2014 by substituting fees for a permit.
Health and Safety at Work Act 2002 Health and Safety at Work Amendment, 2015	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.
Planning and Subdivision Act, 2010 Planning and Subdivision Regulations	To regulate the built environment	This Act regulates the development of the built environment through 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

Environmental Law, Regulation, Policy	Subject	Summary
(Application Requirements), 2011		project including the preparation of an Environmental Impact Assessment/Statement.
Plant Protection Act 2016	To protect and promote plant health	An Act to protect and promote plant health; to prevent the introduction and spread of plant diseases and pests and to provide for appropriate phytosanitary measures for their control; to facilitate trade in plants and plant products; and to regulate other matters connected thereto.
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
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.

7.2 National Environmental Policies & Recommendations

Relevant National Policies	Subject	Summary
National Policy for the Adaptation to Climate Change 2005	Climate change assessment for the immediate and project adaptation techniques for The Bahamas	The National Policy for the Adaptation to Climate Change outlines a national framework to meet the goals and objectives of the United Nations Framework Convention on Climate Change (UNFCCC). The Bahamas is committed to reduce greenhouse gases and address climate change impacts.
National Invasive Species Strategy for The Bahamas, 2013	Identifies and recommends a management framework for the control and eradication of invasive species.	The National Invasive Species Strategy for The Bahamas originally published in 2003, was updated in 2013 as part of the Global Environment Facility funded project, Mitigating the Threats of Invasive Alien Species in the Insular Caribbean (MITIASIC). It sets forth a management framework for the control and eradication of invasive species.
National Biodiversity Strategy and Action Plan, 1999	A plan to maintain biodiversity through sustainable development for a small island developing nation.	The Bahamas Government is committed to conserve biodiversity and to pursue sustainable development. This document highlights the role of biodiversity in the Bahamian social and environmental context and recommends measures to ensure its compatibility with future development.
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.

7.3 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. Three technical agreements support the Convention which include: - Protocol for Co-Operation in Combating Oil Spills - Protocol for Specially Protected Areas and Wildlife (SPAW) - Protocol Concerning Pollution from Land-based Sources and Activities (LBS)
Convention on Biological Diversity Signed: 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 diversity b) The sustainable use of components of biological diversity c) The fair and equitable sharing of the benefits arising out of the utilization of genetic resources
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. 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. 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.”
Convention to Combat Desertification & Drought Signed: Nov. 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; Entered into Force: November 4, 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 UNFCCC which entered into force in March 1994. The UNFCCC 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 Kyoto Protocol was developed under the UNFCCC to provide emissions targets and timetables for developed countries. The Paris Agreement as put forth at the Conference of the Parties (COP21) in December 2015. The agreement has not yet come into force as it requires at least 55 parties to have ratified the agreement.

7.4 Government Departments and Local Non-Governmental Organizations

- Ministry of Works
- Ministry of the Environment and Natural Resources
- Forestry Unit
- Department of Environmental Planning and Protection
- Department of Physical Planning

- Department of Environmental Health Services
- Water and Sewerage Corporation
- Bahamas Power & Light
- Antiquities Monuments, and Museums Corporation

8 Environmental Management & Mitigation

Environmental management is a systematic approach that integrates environmental policy and planning with continuous monitoring of implementation techniques to improve environmental compliance in order to achieve the goals of sustainable development. Hazards to human health and safety and the environment can be managed through careful planning, vigilance and strong communication during works, and continual improvement to the overall environmental management program.

The preferred management approach is to avoid, minimize, and control adverse impacts to human health, safety, and the environment. Where adverse impacts cannot be avoided, best management practices should be employed to mitigate human and environmental harm.

Mitigation is considered when a project component is known to generate an adverse impact. To offset this unavoidable impact, mitigation techniques may include the creation, restoration, enhancement, or preservation of the natural habitat. Where feasible, avoidance of impacts is pursued as a priority mitigation strategy. Where avoidance is not an option, strategies are presented to mitigate known and unknown impacts.

8.1 Pre-Construction Best Management Practices

Pre-construction best management practices pertain to protocols to minimize and avoid potential impacts in advance of construction activities.

8.1.1 Construction Planning

The most effective environmental management practices utilize proper implementation tied to construction scheduling. At this time, the construction schedule for much of the project is yet to be finalized. Therefore, the following section discusses general construction planning with respect to BMP development and implementation.

Once a contractor has been selected and a contract issued, the EMP should be revisited so that BMP planning can be incorporated into the Contractor's schedule prior to finalization of schedules and contracts.

8.1.2 EMP Implementation Planning

As part of the typical pre-construction meetings with the Contractors, EMP implementation will be included on the agenda. In addition to reviewing the plans, permits, schedules and other contract documents, the EMP implementation portion of the meeting will include discussion of the following:

Following the EMP meeting, a project walkthrough with all concerned parties will be conducted to review and discuss BMP measures and their practical application on the site. Environmentally sensitive areas will be inspected and discussed during the site walkthrough.

8.1.3 Construction Sequencing and Schedule

Table 9-1 Considerations for Construction Scheduling

Aspect	Construction Activity	Schedule Consideration	Phase
Vegetation	Identify and mark sensitive environmental features	Pre-construction vegetation survey. All protected trees, if any, to be relocated and/or avoided should be marked accordingly before construction starts.	Pre-Construction

Aspect	Construction Activity	Schedule Consideration	Phase
Site Access	Construction Site Entrance/Exit	Traffic Management Plan. Identify the construction entrance and exit before construction starts.	Pre-Construction
Water Quality	Sediment traps and barriers. Basin traps, sediment fences, and outlet protection (Necessary for areas outside of the perimeter controls).	Sediment & Erosion Control. Place silt curtains and barriers near wetland and sensitive areas before construction start, particularly grading and excavation. Identify drainage areas and keep additional equipment on site. Review and maintain throughout construction.	Pre-Construction
Materials Storage	Construction of laydown area	Vegetation removed after pre-construction survey, then grading to allow for materials storage and laydown area. Laydown area should be cleared and ready before materials arrive	Pre-Construction/ Construction
Landscaping	Grassing, landscaping and final soil stabilization: contouring, top soil spreading, tree/shrub planting, permanent seeding, mulching, sodding,	Stabilize all open areas including borrow pits and exposed sediments.	Post-Construction

8.1.4 BMP Implementation

In accordance with this EMP and all regulatory requirements, all Contractors will adhere to a monitoring program, assuming clear responsibilities in implementing the prescribed methodologies, practices, and corrective measures outlined in the EMP document, which will be considered part of the Contractors agreement to perform the work.

Successful implementation of BMPs are dependent on the following components:

- Effective training of staff and contract employees working in construction efforts, maintenance and operational facilities, as well as landscaping and marine operations;
- Regular inspections of fixed facilities, field programs, and treatment controls;
- Maintenance of treatment controls as needed to ensure proper functioning;
- Periodic evaluation/monitoring of BMP performance to be consistent with EMP guidelines;
- Prompt follow-up action to correct deficiencies in BMP implementation noted during inspections; and
- Accurate record keeping that tracks training, inspections, monitoring, and BMP maintenance.

8.2 Good Housekeeping Practices

Good housekeeping practices help to maintain a safe and healthy workplace by eliminating hazards. While seemingly simple, a well-kept site improves productivity and worker health thereby aiding in accident and fire prevention. A tidy work site, free of clutter and organized, allows for more effective use of the site.

General housekeeping should keep the work areas free of litter and ad-hoc construction debris. All solid waste materials will be placed in a designated dumpster or bin to be regularly emptied on schedule and disposed of at a facility as indicated by the Department of Environmental Health Services (DEHS). Sanitary conveniences will be emptied at regular intervals by an approved sewage disposal company. Hazardous materials such as contaminated soils with hydrocarbons will be identified, remediated, and disposed of in coordination with DEHS.

General guidelines for good housekeeping practices include but are not limited to the following:

- Identification and marking of physical hazards, such as open trenches
- A designated materials storage area with adequate space and organization for supplies
- Preventive maintenance on tools and machinery to reduce the threat of spills and accidents
- A waste management program that provides and frequently empties bins for litter, dumpsters, and a designated area for construction debris

8.2.1 Site Safety and Health

Personnel on site will have access to sanitary conveniences, potable water, and personal protective equipment (PPE).

General site safety and health practices include:

- Sanitary conveniences will be available for use on site and regularly emptied.
- Hazards such as open trenches and utilities, will be marked by caution tape.
- All personnel will undergo an initial site safety and health training followed by weekly tool-box talks.
- A first aid kit and emergency contact list will be available at all times.
- Security and signage will identify hazards to public safety.
- Potable drinking water will be available on site at all times.
- Activities will cease during inclement weather.

Additional PPE will be available for work sites near water and will include ladders, safety harnesses, and training. PPE shall be inspected and maintained in good condition. If PPE becomes worn or broken, new PPE shall be distributed and used.

PPE may include but is not limited to the following:

- Steel toed boots
- Safety Vests
- Hard hats
- Gloves
- Eye Protection
- Boats
- Life jacket/preserver
- Ladders

8.3 Materials Storage & Site Security

Materials stored according to best management practices prevent spills through hazard avoidance.

Materials shall be stored in a designated and secured area. Every material requires specific handling procedures as materials differ by composition, size, and weight. Materials shall be handled and stored according to specifications found in the Material Safety Data Sheet (MSDS). MSDS shall be kept on site at all times.

All fuel shall be stored away from waterbodies in a designated area. Fuel drums shall be elevated and placed in contained area. Flammable materials will be stored away from ignition sources to prevent fire. The Contractor shall have fire extinguishing equipment on site at all times.

8.3.1 Construction Site Laydown Area

The Construction site laydown area will be away from coastal areas and secure.

8.3.2 Site Security

All employees shall wear PPE appropriate for their tasks and have completed a site induction training including environmental and safety protocols. Visitors shall be escorted by responsible parties. All individuals participating in induction training will be logged.

Locations for the arrival and departure of daily employees/visitors will be clearly marked and secured. No individuals shall arrive at undesignated points of entry. Any violations shall be reported to the Site Supervisor and escalated to the Royal Bahamas Police Force (RBPF), if necessary. Additionally:

- Signage will alert residents and visitors to points of interests and away from construction egress/ingress
- Fencing may be used to secure certain portions of the site
- All trenches left overnight will be marked.

8.4 Transportation and Traffic Management

For human, health, and safety, BMPs will be employed for adequate signage, flagmen, speed control, and designated heavy vehicle entry and exit. Works will take place during normal hours unless directed otherwise. Workmen will be on site whenever heavy-duty vehicles are approaching and leaving the site.

General BMPs for traffic management include:

- **Signage.** Site access entry and exit will be identified by a visible sign. One way roads, if any, will be marked.
- **Flagmen.** Entry and exit on to roadways with vehicle traffic will be provided with a flagman as necessary.
- **Overhead Clearance.** For areas with overhead obstruction, i.e. powerlines, a clearance trap will be provided prior to the obstruction for oversized heavy vehicles and equipment.
- **Drainage and Wet conditions.** Weather events may flood roadways and create dangerous operating conditions. Areas that do not have adequate drainage will be identified and graded with additional fill.
- **Equipment Maintenance.** Routine maintenance deters machinery malfunctions during use. Routine maintenance should include checks for oil leaks, hydraulic fluid leaks, tire pressure, back-up alarms, lights and indicators, and other inspections required for roadworthiness.

8.5 Waste Management

8.5.1 Solid Waste Management

The solid waste that is generated by the development will be stored onsite in dumpsters or compactors. The waste will be recycled, composted or baled with other waste and transferred offsite to an approved landfill and in coordination with the Department of Environmental Health Services (DEHS). Incineration is a waste disposal method that will also be evaluated. Waste management identifies a project's waste streams, makes provision for timely and effective removal, and allocates responsibility for waste disposal. General housekeeping should keep the work areas free of litter and ad-hoc construction debris.

Additionally:

- Burning of debris other than non-hazardous construction waste shall include be performed by incineration
- Debris may not be buried other than stated above.
- Transport of materials to the designated landfill or transfer presents an opportunity for debris to enter the environment. All waste materials will be secured and covered, if possible, prior to marine and/or land transport. Record keeping will document the chain of command of waste movement to ensure proper disposal to the designated landfill or waste facility as determined by DEHS.

8.5.2 *Liquid Waste Management*

Liquid wastes includes wastewater, fuels, oils, lubricants, chemicals, and other contaminants that can enter the soil, ground water and surface water. Sanitary conveniences will be emptied at regular intervals by an approved sewage disposal company.

- Liquid waste on the property must be identified prior to construction.
- Any pipes or drains carrying liquid waste must be closed and drained prior to construction.
- All UST/ASTs must be emptied prior to removal.
- Designated wash-down area for equipment with possible reuse of water with employment of recycler.
- No discharge of liquid wastes to waterbodies.
- Proper storage and disposal of oil products.

8.5.3 *Hazardous Waste Materials*

For the purpose of this EMP, hazardous materials are defined by the United States Environmental Protection Agency (US EPA) under the Resource Conservation and Recovery Act of 1976 (RCRA) as “a solid waste, or combination of solid wastes which because of its quantity, concentration, or physical, chemical, or infectious characteristics may – (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.”

No hazardous materials are anticipated. Hazardous materials, if any, will be identified prior to construction to ensure implementation of best management practices during construction activity, debris storage, and debris removal.

8.6 Prevention of Pollution of Groundwater Resources

Employment of best management practices will minimize adverse impacts to natural resources and ensure viability of sensitive environmental features such as wetlands and nearshore habitats. Erosion and sediment control measures will minimize sedimentation impacts and constitute a form of pollution control.

Spill prevention practices include

- Designated fuel storage area; with adequate containment measures (110% of capacity).
- Pump out of all UST/AST contents prior to container removal.
- Preventive heavy vehicle and machinery maintenance and designated wash-down area.
- A waste management program.
- Spill clean-up kits on site.

The Contractor shall ensure that hydrocarbons and sediment are prevented from entering groundwater or surface water.

8.6.1 *Stormwater*

Vegetation clearing and construction increase the amount of impervious surface areas which increases the rate of surface water runoff. These high stormwater flow rates can lead to erosion and flooding. Stormwater may be contaminated with oil and grease, metals, particulate matter, and other pollutants released by vehicles.

Stormwater management practices slow peak runoff flow, reduce sediment load, and increase infiltration. Infiltration is increased via vegetated swales, filter strips, terracing, detention ponds or basins, infiltration trenches/basins, and constructed wetlands.

General stormwater management practices:

- Methods to reduce/slow peak runoff flow
- Regular maintenance of erosion and runoff control measures

8.6.2 *Equipment Refueling & Maintenance*

Equipment should be kept in good working order with regularly scheduled maintenance. Preventative maintenance reduces the likelihood for unintentional spills or leaks during operation on site.

All fuel shall be stored away from waterbodies in a designated area. The tanks will be stored in a bermed area designed to hold 110% of the fuel tanks capacity. During construction the bermed area will be fully lined with impervious 30mil PVC; HDPE or RPE liner. This bermed area location will be converted after construction into the permanent fuel storage location with concrete berm walls and slabs. During construction ISO double wall tanks will be stored in the lined berm area. A designated refueling area shall be identified on site away from sensitive environmental features such as wetlands. Impervious sheeting should be on hand with a spill kit. Any spills should be cleaned according to the spill prevention plan.

Any heavy equipment stored on site will be monitored for oil leakage to mitigate potential contamination to the water lends.

8.6.3 *Spill Contact*

In the event of a major oil spill, i.e. oil escapes a 55-gallon drum, DEPP and DEHS should be notified immediately. The spill response plan including remediation is found in Spill Response Plan appended to this document. Major incidents such as large fuel spills are to be reported to the BESTPROTECT242 APP and notify DEPP of the incident via telephone at 1-242-322-4546.

8.7 Erosion and Sediment Control

Sediment and erosion control measures such as silt fencing, and revegetation will be deployed as required. Sediment impacts may occur during heavy storm events where flash flooding may erode surfaces and transfer suspended sediments to another location.

BMPs for erosion and sediment control include but are not limited to the following:

- Dewatering hoses will be placed away from sensitive environmental features and allow time for suspended sediment to fall out.
- Installation and on-going maintenance for sediment and erosion control devices such as silt fencing, mulching, and/or turbidity curtains.
- Revegetation and/or sodding of a cleared area.
- Construction debris will be placed away from surface waters and with containment measures.

- Excavated materials, if any, and/or fill stockpiles will be stored in pre-approved locations.
- Equipment wash-down will occur in a pre-approved location to capture runoff.

8.7.1 Controls for Elevated Site Conditions – Brickell Square Commercial Ltd.

Engineering controls will stabilize the land with runoff prevention BMPs such as silt fencing and a vegetation buffer to reduce runoff during storm events. Additional controls include use of sediment logs for soil retention, filtration and runoff control. Sediment logs reduce hydraulic energy and reduce sediment transfer. Retaining vegetation cover will reduce the potential for runoff during construction and operation.

8.7.2 Sediment and Erosion Control Examples

Silt Fencing

Silt fencing is likely to be used most frequently on site to prevent silt and sediment transfer and runoff to and into coastal, wetland, and/or karst formations. Please see images below from the US Environmental Protection Agency.



Figure 1. A silt fence at the perimeter of a construction site.
Photo Credit: USEPA/Wikimedia

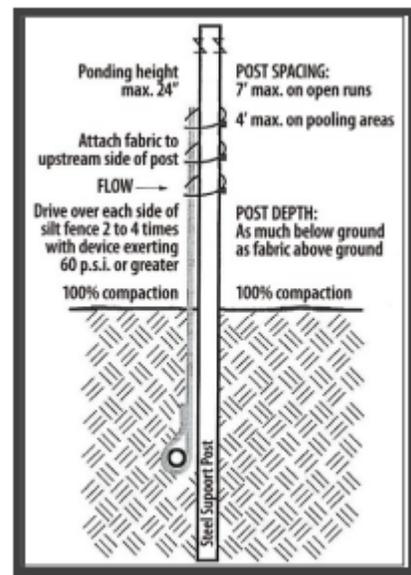


Figure 14. Silt fence installation using the static slicing method

Figure 8-1 US EPA Silt Fence Examples¹

8.8 Dust and Air Quality

The Contractor shall implement measures to maintain ambient air quality. Fine sediment may become airborne during the dry season which typically begins in November and ends in late May. Dust mitigation strategies include periodic dampening of construction access roads.

Additional practices for management of air quality include but are not limited:

- Tarpaulins used on dump trucks
- Vehicle speed restrictions
- Frequent site watering during the dry season

¹ U.S. EPA. Stormwater Best Management Practice. Silt Fences. EPA-832-F-21-028AA <https://www.epa.gov/npdes>.

8.9 Noise Nuisance and Vibration Management

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 project in relation to the significance of potential disturbance.

Noise prevention and mitigation begins at the source of noise. Noise reduction at the source prevents extraneous noise output. Noise reduction options include but are not limited to the following:

- Selecting equipment with lower sound power levels
- Installing suitable mufflers on engine exhaust and compressor components
- Installing acoustic enclosures for equipment casing radiating noise
- Installing vibration isolation for mechanical equipment
- Limiting hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas
- Maintaining equipment in good working order.

The Bahamas does not have national noise standards but noise meters may be used to monitor levels on site, especially those activities that may exceed 70dB to ensure that proper hearing protection is being utilized. 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.

8.10 Fire and Hurricane Risks

The North Atlantic tropical cyclone season begins June 1st and ends November 30th. However, tropical disturbances may form prior to the start and after the close of this time period. The Bahamas lies within the hurricane zone, it is expected that tropical disturbances, tropical depressions through Category 5 Hurricane, may periodically make landfall. Risks associated with tropical cyclones include storm surge, high winds, and heavy rainfall. Given the low elevation of the site and the surrounding areas, the drainage system must be able to effectively dispose runoff during heavy storm events.

Fire-fighting equipment such as a fire extinguisher must be available on site at all times. The inventory of materials shall dictate any substances requiring additional specialty fire-fighting equipment. A list of emergency numbers should be available on site at all times.

Refer to the Inclement Weather protocol within the Appendix.

8.11 Vegetation Management

Environmental due diligence performed early in the site planning guided the overall land use design, complimenting scenic vistas and seascapes. Additionally, a native landscaping palette will increase biodiversity through the control, removal, and eradication of invasive species. Trees grown in the nursery will be evaluated for replanting potential and overall integration into the design aesthetics and architecture. The Developer intends to use native and native-adapted trees, shrubs and grasses, either revegetated from site or commercially procured for landscape needs.

8.11.1 *Clearing & Grubbing*

There will be an unavoidable loss of vegetation in areas slated for development. The developer shall take care to ensure that vegetation removal is kept at the minimum required. Clearing and grubbing prepares the site for construction. Clearing removes the above-surface foliage and trees, whereas grubbing removes the roots that remain in the soil. This process requires heavy machinery and adherence to BMPs for sediment and erosion control, prevention of pollution to groundwater resources, and protection of sensitive environmental features.

Construction BMPs:

- Protection of Sensitive Environmental Features.
 - Environmental controls shall be placed along sensitive environmental features such as wetlands and barriers shall be installed around fully mature protected trees, to protect from encroachment, and damage from machinery.
 - Heavy machinery will undergo routine maintenance to prevent leaks, spills, and/or other mechanical failure that may cause environmental harm.
- Cleared Vegetation.
 - Vegetation that is cleared may be mulched and used for other beneficial purposes. Invasive species should be separated from any mulching operation and disposed of separately.
- Landscaping & Planting
 - All areas cleared for construction should be temporarily stabilized (environmental controls, temporary seeding, etc) until such time that they are ready for final stabilization in order to mitigate sediment and erosion impacts.

8.12 Protection of Natural Resources

Employment of best management practices will minimize adverse impacts to natural resources and ensure viability of sensitive environmental features such as caves, wetlands and nearshore habitats.

- Erosion and sediment control measures will minimize sedimentation impacts and constitute a form of pollution control.
- Spill prevention practices include designated refueling and fuel storage areas with adequate containment measures, preventive heavy vehicle and machinery maintenance, and spill clean-up kits on site, and waste management.

8.12.1 *Special Environmental Conditions*

Employment of best management practices will minimize adverse impacts to natural resources and ensure viability of sensitive environmental features such as the adjacent intact forested parcel. Erosion and sediment control measures will minimize sedimentation impacts and constitute a form of pollution control. Spill prevention practices include designated refueling and fuel storage areas with adequate containment measures, preventive heavy vehicle and machinery maintenance, and spill clean-up kits on site, and waste management. Equipment washdown will take place in a designated area with adequate environmental controls to avoid pollution of surface and subsurface groundwater.

9 Grievance Redress

Grievance redress is a management tool to identify, assess, and provide resolution of complaints during a project cycle. Implementing a system of grievance redress early in a project's cycle allows for resolution of minor issues before escalation to high-profile and expensive disputes at the local and national level. Support is garnered from local communities which have access to a system for complaint filing and resolution. Grievance redress mechanisms (GRMs) are a core component of managing project operational risk. A system to receive, catalogue, and respond to community concerns is important.

According to the *World Bank's Approach to Grievance Redress in Projects* the following steps should be taken:

Step 1 Assessment of Risks and Potential Grievances and Disputes

Step 1 is the identification of potential issues, stakeholders, and existing institutional capacity for dispute resolution.

Step 2 Capacity Assessment

Step 2 reviews the capacity for local and national institutions to address and resolve project concerns. Institutions will be reviewed through a credibility assessment with the following criteria: legitimacy, accessibility, predictability, fairness, rights compatibility, transparency, and capability.

Step 3 Action Plan

Step 3, the Action Plan, creates tangible steps to be implemented during project planning and execution to enable effective grievance management for dispute resolution. Successful grievance management systems contain the following components:

- Access Point(s) for Complaints, i.e. Help Desk
- Grievance Log Database
- Assessment, Acknowledgement, and Response to Complaint(s)
- Appeals Process
- Resolve and Follow-Up

9.1 Grievance Redress Communication Protocol

During the construction, members of the public will be able to submit comments and questions to the project representative. These comments will be acknowledged and responded to in an appropriate timeframe.

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11 Emergency Response Plans

11.1 Spill Prevention, Control, and Countermeasure (SPCC) Plan

A Spill Prevention, Control, and Countermeasure Plan (SPCC) implements best managements to prevent the discharge of pollutants and/or petroleum products. It is a proactive measure to manage the storage, use in order to avoid a release of a pollutant into the environment. Key preventative measures include proper materials storage, material use, and equipment preventative maintenance.

At its core, SPCC is part of the environmental management system such as ISO14001 of Plan, Do, Check, Act.

Key SPCC Procedures:

1. Operating BMPs to Prevent Spills. Environmental awareness training and toolbox talks shall incorporate spill prevention practices to educate employees about standard operating procedures to avoid a spill event. These BMPs include:

- **Materials Storage Information.** Materials should be stored according to MSDS. Petroleum products should be stored on elevated surfaces or with an impervious layer separating the container from the ground. Appropriate containment and if needed, secondary containment should be capable of 110% storage. Oil sources shall not be stored near floor drains or sensitive environmental features, such as wetlands. Petroleum products should be stored in a secured area.
- **Product Transfer and Refueling.** Refueling and fuel transfer should use pads, drip pans, and/or funnels when using petroleum products. Any refueling done on site shall be in a previously agreed designated area with employed spill prevention techniques to prevent the release of a petroleum product to the environment. Tanks should be filled to no more than 90-95% due to the potential for overflow from expansion in hot weather. No smoking during equipment refueling or any fueling exercise.
- **General Housekeeping.** General housekeeping principles to keep a site clean and free of debris can contribute to culture of cleanliness and vigilance for storage and handling practices that may cause a release.

2. Control Measures - Spill Clean-up Kit. In the event of a spill, spill-kits should be easily identified and readily available on site. These kits should include absorbent products such as pad, sawdust, kitty litter, pillow and booms. All personnel on site should be aware of the spill clean-up kit location. All spills shall be reported immediately to the Environmental Manager or On-Site Manager.

3. Oil Spill. When an oil product is released to the environment, employees should be trained in first-response measures.

The following steps should be followed:

- Utilize oil spill response training prior to spill
- Immediate use of spill kit or measures to contain spill safely
- Contact Environmental Manager or On-site Manager at the time of spill
- Notification to DEPP within 24 hours or in the event of major spill (release from a 55 gallon drum), notification to DEPP immediately.
- Major incidents such as large fuel spills are to be reported to the BESTPROTECT242 APP and notify DEPP of the incident via telephone at 1-242-322-4546. The Contractor's EM 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 the environmental binder.

4. Clean up. Clean-up efforts are most effective when employed quickly following a spill.

- If a spill occurs on a paved surface, it is best to keep the spill contents away from drains. Use absorbent pads or socks to contain the spill.

- If a spill occurs on soil, it is best to keep the spill away from waterways. Use absorbent pads or socks to contain the spill. Spills to soils should be excavated immediately. All contaminated soils, by visual and odour detection, should be placed on an impervious surface such as a tarp and covered. DEHS should be contacted to determine proper method for disposal. The contractor should keep receipt of the disposal of contaminated materials by DEHS.
- Large spills may require sampling to determine extent and prolonged monitoring during remediation efforts. Major spills, release from a 55 gallon drum, will require clean-up in coordination with DEHS. Efforts using the spill kits including absorbent materials and containment measure should be employed while waiting instruction.

11.2 Inclement Weather & Hurricane Plan

The North Atlantic tropical cyclone season begins June 1st and ends November 30th. However, tropical disturbances may form prior to the start and after the close of this time period. The Bahamas lies within the hurricane zone, it is expected that tropical disturbances, tropical depressions through Category 5 Hurricane, may periodically make landfall. Risks associated with tropical cyclones include storm surge, high winds, and heavy rainfall. Given the island setting, the drainage system must be able to effectively dispose runoff during heavy storm events.

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preparatory measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. This affects one or more U.S. territories (i.e. Guam and the Mariana Islands).

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	<ul style="list-style-type: none"> • 74-95 mph • 64-82 kt • 119-153 km/h 	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	<ul style="list-style-type: none"> • 96-110 mph • 83-95 kt • 154-177 km/h 	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	<ul style="list-style-type: none"> • 111-129 mph • 96-112 kt • 178-208 km/h 	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	<ul style="list-style-type: none"> • 130-156 mph • 113-136 kt 	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential

	<ul style="list-style-type: none"> • 209-251 km/h 	<p>areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.</p>
5 (major)	<ul style="list-style-type: none"> • 157 mph or higher • 137 kt or higher • 252 km/h or higher 	<p>Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.</p>

Tropical disturbances can also produce storm surge; an abnormal and dangerous rise of water pushed onto the shore by strong winds. Storm surges can increase the normal high tide by 15 ft or more which necessitates evacuations of low-lying lands and areas prone to surge.

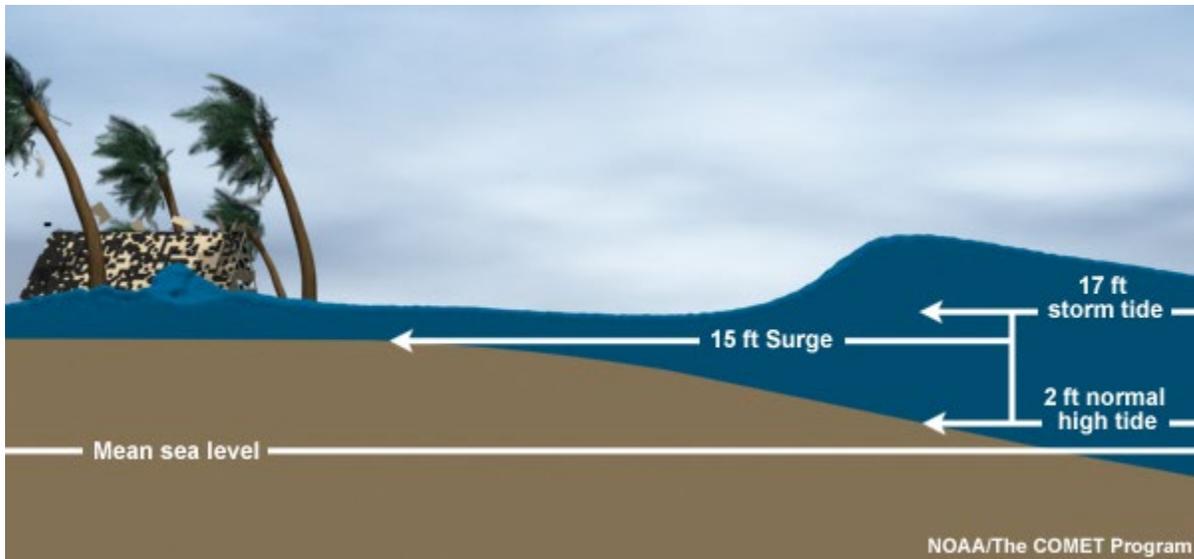


Figure 11-1 Storm Surge, NOAA

11.2.1 Hurricane History

The Bahamas is situated in the hurricane zone. Hurricane season begins June 1 and ends November 30, although tropical cyclones may form outside this period. According to the coastal dataset of the NOAA Coastal Service Center, 80 tropical disturbances (tropical storms and hurricanes) have come within 60 nautical miles of New Providence between 1859 and 2020.²

² Hurricane history tracker and database can be found at this link: <http://coast.noaa.gov/hurricanes/>

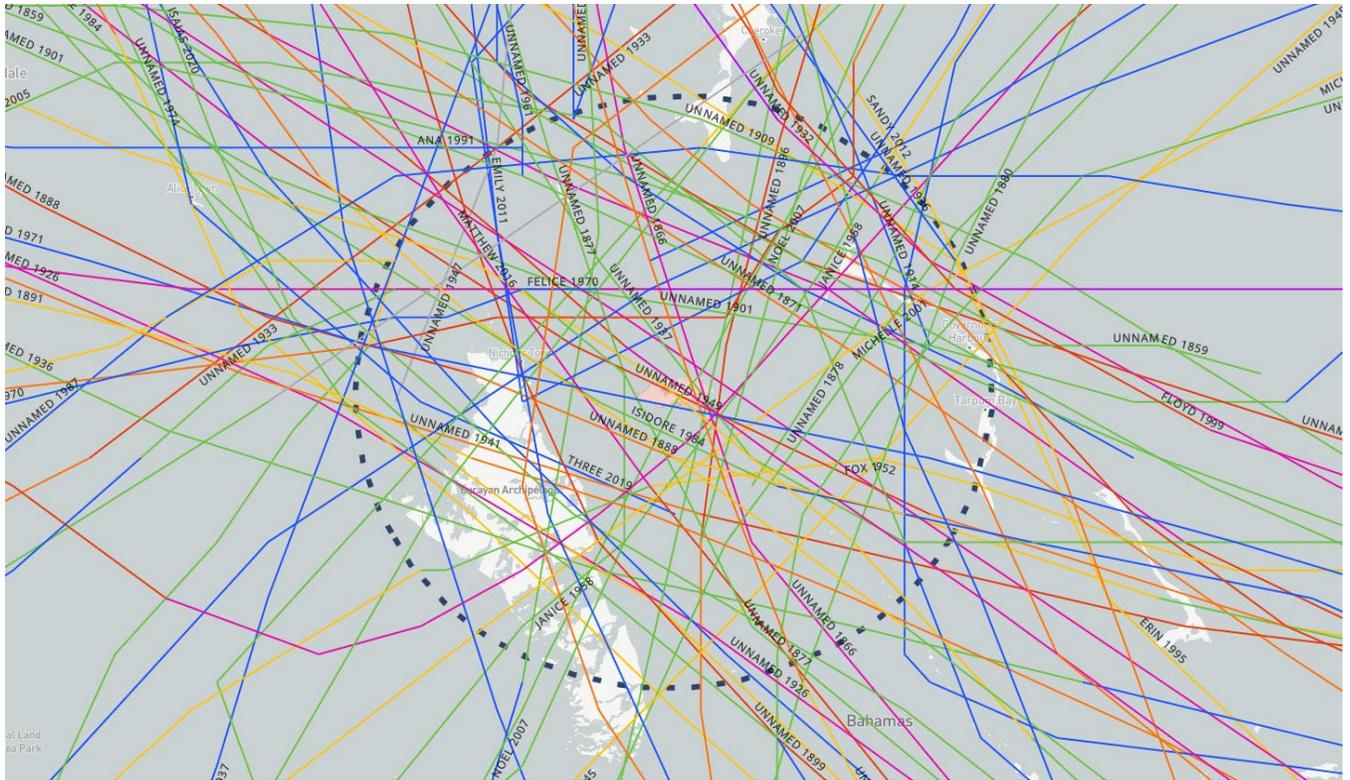


Figure 11-2 NOAA Historical Hurricanes within 60 Nautical Miles of New Providence, The Bahamas

11.2.2 Preparedness & Planning

Being prepared for inclement weather and tropical storms is important. The potential threat posed by a hurricane requires a prepared response of all site and project personnel. Keep in mind that no emergency follows a script.

The Contractor will monitor weather developments, communicate all required hurricane-related activity and oversee hurricane damage assessment and remediation. Participation will be required from each project unit. Managers will be responsible for requesting participation of their subordinates as needed. **COMMUNICATION IS PARAMOUNT.**

In addition to having evacuation plans in place, it is important to be familiar with the warning terms used for hurricanes, as well as your local community's emergency plans, warning signals, and shelters. **Hurricane/Tropical Storm watches** mean that a hurricane or tropical storm is possible in the specified area. **Hurricane/Tropical Storm warnings** mean that a hurricane or tropical storm is expected to reach the area, typically within 24 hours.

11.2.2.1 Prior to Hurricane Season (Before June 1st)

Preparation planning entails reviewing the procedures prior the start of hurricane season.

1. Identify the Crisis Management Team (CMT) and organizational chart for responsibilities. Ensure contractors are aware of the plan and provide training. The Crisis Management Team will also designate a Damage Survey Team for post hurricane recovery efforts.
2. Review the Hurricane Preparedness & Response Plan. Verify and update the list of emergency telephone numbers for the CMT.
3. Review weather-monitoring resources including satellite television (Bahamas Department of Meteorology, The Weather Channel), AM/FM Radio, weather radio, and other communication resources as directed by the Government of the Bahamas. Ensure devices have extra batteries and/or power sources to charge communication devices. Satellite phones are recommended.

4. Verify emergency equipment is ready to use and in normal operating condition.
5. Check inventory and emergency supplies stockpiled for the hurricane season including fuel for generators, potable water, and food.
6. Survey all buildings and grounds to identify windstorm or flood related exposures that can be mitigated by repair or emergency measures before a storm. Repairs should be completed before June 1st.
7. Identify resources that would be needed if the site was flooded. Verify sandbag need and placement to protected possible water entry points and vital protection equipment.
8. Develop a Damage Survey and Repair Team that will be the first on site to assess damage and make the site safe enough for the return of the workforce.

11.2.2.2 Preparing for Tropical Disturbance After Formation Pre-Weather Arrival (24-72 Hours)

1. Activate Plan. Prepare for securing of personnel, equipment, and general facility/site.
2. Monitor media outlets for announcements by NEMA and the Bahamas Department of Meteorology.
3. Ensure that all loose scrap material is gathered up and disposed of in the dumpsters. Empty all dumpsters prior to storm conditions; otherwise cover to prevent debris from becoming airborne.
4. Ensure equestrian and livestock areas are secure and animals housed in an appropriate setting to withstand hurricane force winds and are away from flood risk.
5. Chemicals, fertilizers, and other toxic materials should be stored in secure buildings and according to MSDS.
6. Ensure dewatering, standby, and diesel-powered equipment is ready to operate.
7. Perform landscaping preparation. Remove objects with potential to become airborne, such as coconuts. Check the conditions of trees within 25-75ft of buildings and prune/trim any trees with rotting limbs or posing the potential to cause harm.
8. Remove all unsecured items including trash bins, portable toilets, scaffolding, etc.
9. Identify vehicle access routes and diversions due to flooding.
10. Secure all documentation and work records.
11. Review the evacuation plan and evacuate.

11.2.3 Evacuation Plan

It is important to have an evacuation plan in place to ensure that workers can get to safety in case a hurricane may affect the area. Only designated essential workers will remain on the island, or the island be evacuated in its entirety depending on storm category. A shelter will be designated in an elevated and protected area with provisions to accommodate hurricane conditions. The shelter will adhere to the Bahamas Building Code.

A thorough evacuation plan should include:

- Conditions that will activate the plan
- Chain of command
- Emergency functions and who will perform them
- Specific evacuation procedures, including routes and exits
- Procedures for accounting for personnel, customers and visitors
- Evacuated personnel let the CMT know location and contact information
- Equipment for personnel
- List of Shelters on New Providence

Be prepared to follow instructions from the local authorities and to evacuate if instructed to do so.

- Ensure that all workers know what to do in case of an emergency.
- Practice evacuation plans on a regular basis.
- Update plans and procedures based on lessons learned from exercises.

In advance of storm conditions, all non-essential personnel must be evacuated by either plane or sea to where safe shelter is available or outside the anticipated storm path.

11.2.4 Emergency Numbers

The following are emergency numbers provided by the Royal Bahamas Police Force.

MEDICAL SUPPORT

PMH HOSPITAL AND AMBULANCE- 322-2861
 ACCIDENT & EMERGENCY (PMH)- Tel. (242) 326-7014
 AIR AMBULANCE- 327-7077
 AAS LIFE FLIGHT (Air Ambulance)- Tel. (242) 377-1606 or (242) 323-2186
 MED EVAC- Tel. (242) 322-2881
 DOCTORS HOSPITAL AMBULANCE SERVICES- Tel. (242) 302-4747
 BAHAMAS HYPERBARIC CENTER- Tel. (242) 362-5765 OR (242) 422-2434
 NATIONAL EMERGENCY MEDICAL SERVICES- Tel. 911, 919, (242) 323-2586
 BASRA- 646-6395 / 359- 5561/4
 RED CROSS- Tel. (242) 323-7370

POLICE

POLICE- Tel. 911, 919, (242) 322-4444
 CRIME STOPPERS- Tel. (242) 328-8477
 FIRE- Tel. 919

DOMESTIC VIOLENCE AND ABUSE

THE BAHAMAS CRISIS CENTRE- Tel. (242) 328-0922
 CHILD ABUSE HOTLINE- Tel. (242) 322-2763
 SOCIAL SERVICES- Tel. (242) 326-0526
 v ABUSE SUPPORT- Tel. (242) 325-8864, (242) 322-741, (242) 727-4888, (242) 359-4888
 NEMA- Tel. (242) 322-6081

UTILITIES

WATER AND SEWERAGE- Tel. (242) 325-0505 or (242) 325-4504 (24 hours)
 BEC POWER OUTAGE- Tel. (242) 323-5561/4
 BTC TELEPHONE REPAIRS- Tel. (242) 225-5282

11.2.5 During the Storm

- 1. STAY INSIDE. NO WORK TO OCCUR.**
- 2. MONITOR WEATHER AND MEDIA OUTLETS.**
- 3. MAINTAIN CONTACT BETWEEN CMT AND DESIGNATED INDIVIDUALS IN NON-AFFECTED AREAS.**

11.2.6 After the Storm

Employees return will only be allowed upon the All Clear given by the Government of The Bahamas and the CMT. In coordination with the CMT, the Damage Survey Team will assess the state of the island post-hurricane.

1. The Damage Survey Team will inspect the job site, identify and document the damage, prioritize repairs, complete Job Hazard Analysis and Site Plans of Action, and then initiate repairs.
2. Assess island access locations. Review damage to the runway and all dock locations. Designate a safe point of entry if emergency services are required.
3. Class A hazards will have priority and must be abated before the return of the entire workforce.
4. Do not touch loose or dangling wires. Report such damages to an electrician, the utility company, or Royal Bahamas Police Force.
5. Stay clear of disaster areas where first responders are providing aid. Be prepared to aid with equipment.
6. Stay alert for fires. Check water lines for pressure servicing hydrants and make note of available of firefighting capabilities.
7. Inform employees to return to work. Some employees may need additional care; contact the Bahamas Red Cross: 1-242-323-7370.
8. Recommence work and operational activities
9. Assess the effectiveness of the plan and response activities.
10. Revise plan as necessary to increase effectiveness.

11.3 Stormwater Management Plan

Construction increases the amount of impervious surface areas which increases the rate of surface water runoff. These high stormwater flow rates can lead to erosion and flooding. Stormwater may be contaminated with oil and grease, metals, particulate matter, and other pollutants released by vehicles.

Stormwater management practices slow peak runoff flow, reduce sediment load, and increase infiltration. Infiltration is increased via vegetated swales, filter strips, terracing, detention ponds or basins, infiltration trenches/basins, and constructed wetlands.

General stormwater management practices:

- Methods to reduce/slow peak runoff -flow
- Installation of oil/water separators
- Regular maintenance of erosion and runoff control measures

11.3.1 *Erosion and Sediment Control*

Sediment and erosion control measures such as silt fencing, turbidity curtains, and revegetation will be deployed as required. Sediment impacts may occur during heavy storm events where flash flooding may erode surfaces and transfer suspended sediments to another location. Turbid conditions may adversely affect light penetration through the water column impairing photosynthesis for marine species.

BMPs for erosion and sediment control include but are not limited to the following:

- Dewatering hoses will be placed away from sensitive environmental features and allow time for suspended sediment to fall out.
- Installation and on-going maintenance for sediment and erosion control devices such as silt fencing and/or turbidity curtains
- Revegetation and/or sodding of a cleared area
- Turbidity barriers selected are appropriate for water conditions
- Construction debris will be placed away from surface waters and with containment measures
- Excavated materials, if any, and/or fill stockpiles will be stored in pre-approved locations
- Equipment wash-down will occur in a pre-approved location to capture runoff

12 CVs

CONTACT

Melissa Alexiou
P.O. Box N4805
Nassau, The Bahamas

1 (242) 376-1448
malexiou@waypoint.bs

NATIONALITY & LANGUAGE

Citizenship: United States of America
Residency: Spousal Permit with Right to Work – Bahamas
Languages: English

EDUCATION

Master of Science, Environmental Science and Policy, The Johns Hopkins University
Bachelor of Arts, Environmental Studies, Rollins College
Certificate, Geographic Information Systems (GIS), The Johns Hopkins University

PROFESSIONAL CERTIFICATION & TRAINING

Project Management Professional (PMP), Project Management Institute
National Association of Environmental Professionals (NAEP)
ASTM E1527 Phase I & II Environmental Site Assessments for Commercial Real Estate
OSHA 10-Hour Certification

EXPERIENCE

2012 – Present

Waypoint Consulting Ltd., Environmental and Project Management Consulting, Director, Nassau, Bahamas

- Environmental Impact Assessments, Environmental Management/Mitigation Plans
- Climate Change, Vulnerability, Risk & Adaptation
- Project management and administration services for permitting
- Construction Monitoring for Environmental Management
- Research analyst, advisory consulting services, and technical writing

Selected Projects

Environmental, Social, and Geotechnical Study for Resilient Micro-Grids projects in East Grand Bahama, IDB BH-L1048

Waypoint prepared the Environmental and Social Impact Assessment and Environmental and Social Management Plan for the East Grand Bahama Micro-Grid Project. This project is part of the InterAmerican Development Bank program titled “Reconstruction with Resilience in the Energy Sector in The Bahamas”. The project strives to rebuild Grand Bahama with energy resilience following Hurricane Dorian in 2019.

Environmental Impact Assessment & Environmental Management Plan, ADH Ltd, (Children’s Bay Cay, Williams Cay, Madam Daus Cay), Exuma, The Bahamas

Waypoint Consulting prepared the environmental documentation to secure a Certificate of Environmental Clearance (CEC) for the luxury resort and residential development by ADH Ltd. The development includes a marina, ultra luxury residences, spa and other amenities, private docks, and back-of-house infrastructure.

Environmental Impact Assessment & Environmental Management Plan, Cotton Bay Holdings Limited, Cotton Bay Resort, Eleuthera, The Bahamas

Waypoint Consulting prepared the environmental documentation to secure a Certificate of Environmental Clearance (CEC) for the luxury resort and residential development by Cotton Bay Holdings Limited. The project expands on the former Cotton Bay Club to include a branded hotel and branded residences, unbranded residence, road relocation, and rehabilitation of the existing golf course.

Environmental Impact Assessment & Environmental Management Plan, Sandals International, Fowl Cay Resort & Overwater Bungalows, Fowl Cay, Exuma, The Bahamas

Waypoint Consulting prepared the environmental documentation to secure a Certificate of Environmental Clearance (CEC) for the Fowl Cay Resort expansion inclusive of overwater bungalows. Fowl Cay Resort was the first project to receive a CEC for overwater bungalows.

Environmental Management Plan, Demolition of Simm's Point (Nygard Cay), New Providence, The Bahamas

Waypoint Consulting prepared the environmental documentation to secure a Certificate of Environmental Clearance (CEC) for the demolition of the property formerly referred to as Nygard Cay. Best management practices for demolition considered the highly exposed site, high volume of debris, and the project's social and political sensitivities.

Environmental Baseline Data Collection, BPL LNG Facility, Clifton Pier, New Providence, The Bahamas

Waypoint was subcontracted by DHI Group as the lead local environmental consultant to perform environmental consulting services including environmental baseline data collection for a proposed BPL LNG facility on a greenfield site adjacent to its Clifton Pier operations. Waypoint facilitated the CEC Application, environmental permitting process, marine benthic surveys and water quality data collection. The project was suspended by the Government of The Bahamas and never completed.

Environmental Impact Assessment & Environmental Management Plan, Venetian Village, New Providence, The Bahamas

Waypoint Consulting prepared the environmental documentation to secure a Certificate of Environmental Clearance (CEC) for the multi-purpose commercial, retail, hotel, and residential development of Venetian Village. Venetian Village is scheduled to open the retail spaces in late 2024.

Environmental Impact Assessment & Environmental Management Plan, Torch Cay (Hog Cay), Exuma, The Bahamas

Waypoint Consulting prepared the environmental documentation to secure a Certificate of Environmental Clearance (CEC) for the luxury resort and residential development on Torch Cay, Exuma. The 707-acre island includes a runway, expansive exterior marina, golf course, residences, hotel, amenities, and back-of-house infrastructure.

Environmental Impact Assessment & Environmental Management Plan, Disney Cruise Line, Lighthouse Point, Eleuthera, The Bahamas

Waypoint Consulting was the lead local environmental consultant for Disney's Cruise Destination and Entertainment Facility at Lighthouse Point, Eleuthera. This \$250+ million project features a cruise ship pier, marina, and associated facilities for cruise passengers. The project completed the environmental permitting process under the Environmental Planning and Protection Act 2019 and Environmental Impact Assessment Regulations 2020 including public consultation. The project welcomed its first cruise ship in June 2024.

Environmental Legislative Review for Offshore Petroleum Industry

Waypoint reviewed existing and proposed legislation for relevance to the offshore petroleum industry. International Conventions and National Environmental Policies were also included in the assessment.

Env. & Social Analysis – Climate-Resilient Coastal Mgmt. & Infrastructure Program – IDB BH-L1043

The purpose of the ESA was to identify environmental and social aspects including risks, evaluate site-specific aspects, and provide recommendations for measures to mitigate identified impacts for projects proposed on Long Island, Grand Bahama, Andros, and New Providence. Stakeholder consultation was a critical element for site specific project evaluation.

Environmental Site Assessment, Philautia, Eleuthera, The Bahamas

Waypoint prepared an Environmental Site Assessment to document existing site conditions at the former U.S. Naval Facility, Eleuthera. Decommissioned in 1980, quarters and general infrastructure including larger generators and catchment basin exist in deteriorated conditions.

Environmental Impact Assessment: Cruise Line, Private Island Development, The Bahamas

Waypoint provided local environmental consulting expertise to assist a major cruise line with identifying a suitable location for a new cruise ship destination facility. In association with ATM, Waypoint prepared an EIA and liaised with government officials.

A Comprehensive Strategy for the Optimization of Family Island Airports - IDB BH-L1027, Bahamas

Waypoint was subcontracted to provide support in the review and application of existing environmental regulations and guidelines for The Bahamas Civil Aviation Department (BCAD). Review of BCAD schedules combined with a review of national parks and important bird areas was part of a gap analysis to strengthen environmental understanding and commitment by the aviation authority.

Environmental Manager. North Abaco Port Project, Great Abaco, The Bahamas

Waypoint was the designated Environmental Manager for the completion of the North Abaco Port Project which included opening the port basin to the Sea of Abaco. Waypoint provided oversight of the Environmental Monitor and submitted weekly environmental reporting to the BEST Commission.

Environmental Management Plan: Commercial Forestry Project, The Bahamas

Waypoint was subcontracted to provide research, and technical writing and editing for an Environmental Management Plan (EMP) related to a potential commercial forestry project in The Bahamas. EMP best management practices highlighted fire management, wildlife management, and management protocols for sensitive environmental features, preservation of water quality and soil quality.

Environmental Impact Assessment: Children's Bay Cay, Exuma, The Bahamas

Waypoint in coordination with Applied Technology Management (ATM) provided technical writing services, environmental analysis, and consultation for local project permitting. Waypoint is the local environmental consultant of record and liaises directly with government.

Phase 1 Big Pond Landfill Remediation/Restoration IDB Mitigation for Roadworks, New Providence,

Melissa provided environmental monitoring services to the Contractor through Islands By Design Ltd. for remediation efforts at Big Pond, a former landfill and important urban mangrove ecosystem. Remediation of the former landfill served as the mitigation component for the New Providence Road Improvement Project. Mitigation included the demolition of two buildings, removal of contaminated soils, removal of surface waste, and the implementation of a boardwalk, trails, and basketball courts.

2010 – 2012

Islands By Design, Environmental Scientist, Nassau, Bahamas

Selected Projects

BEC Abaco 69kV Transmission Line, Abaco, EIA

As a high priority project, environmental and socio-economic analysis was performed under a tight schedule with significant implications for residents of the Greater Abacos.

South Beach Township Project, Nassau

The South Beach Township Project was an initiative to rehabilitate a low-income area through planning for an area of southeastern New Providence. A key component of the plan was to identify existing environmental issues, namely flooding and limited beach access, and to rectify these issues to create a mixed-use sustainable community.

Sports Centre Redevelopment Project, Nassau- Environmental Monitor

As the Environmental Monitor, I performed twice weekly site visits to document contractor compliance to the EMP and monthly reports to evaluate overall contractor compliance and provide recommendations for improvement.

2007 – 2008

Farkas Berkowitz & Company, Associate, Washington, DC

A Strategic Management Consulting Firm where Melissa performed market research and analysis for top Engineering News Record, Fortune 500 firms

2005 – 2007

Protection Strategies Incorporated, Environmental Scientist, Arlington, VA

Government Contractor to U.S. Environmental Protection Agency (EPA) for the Water Contaminant Information Tool (WCIT)

CONTINUING EDUCATION AND CONFERENCES

- National Association Environmental Professionals Project Management Series (4 modules), 2024
- Results-Based Project Management, Professional Certificate, IADB, December 2021
- Climate Change: Financial Risks and Opportunities. Imperial College Business School (Imperial X) March 2021
- National Association of Environmental Professionals (NAEP) Virtual Conference, Aug 2020/May 2021
- Management for Environmental Results with Performance Based Measurement, Johns Hopkins U., 2019
- Coastal and Marine Spatial Planning Advancement Training, Duke University and Battelle, Spring 2015
- Creation and Restoration of Wetlands, Everglades Wetland Research Park, October 2014
- Sponsor, Bahamas Natural History Conference, March 2014 & 2016 & 2018

SKILLS

- Geographic Information Systems (GIS)
- MS Word, MS Excel, MS PowerPoint, MS Publisher, MS Visio, MS Project

COMMUNITY INVOLVEMENT

- Bahamas Society of Engineers, Associate Member
- Bahamas Engineers, Architects, and Allied Professionals, Board Member, 2016-2021
- Bahamas Chamber of Commerce, Energy and Environment Committee, 2015-2016

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EXPERIENCE

2011 – PRESENT

ENVIRONMENTAL SPECIALIST, PRINCIPAL OF JSS CONSULTING LTD

- On The Bahamas Department of Planning and Protection approved Environmental Consultant list (2019-present).

PROJECTS

- Disney Lighthouse Point Cruise Port Development, Eleuthera, Bahamas Environmental Management (EM)
- Adelaide Creek Development Project; Nassau, The Bahamas
- Environmental Impact Assessment (EIA), Environmental & Social Baseline Assessment (ESBA), Environmental & Social Management Plan (ESMP), and Marine Assessment of the Exuma International Airport Infrastructure Project, Exuma, The Bahamas
- North Eleuthera International Airport Infrastructure Project ESBA & ESMP
- Community Based Conch Management in the Family Islands, Conch Farm Feasibility Study and Environmental Baseline Assessment (EBA)
- Rose Island Development; Rose Island, The Bahamas Marine Assessment for EIA
- Paradise Island, Royal Caribbean, The Bahamas, Marine Assessment for EIA
- Coco Cay Island Development, Coco Cay, The Bahamas Environmental Management (EM), Botanical, Marine and Avian Assessment EIA, EBA), Environmental Management Services (EMS) and EMP
- Ocean Cay, Bimini, The Bahamas; EMS, Coral Relocation Monitoring, Public Outreach, Rapid Ecological Assessment (REA)
- Big Pond National Park Development, EMP & EMS Conducts Residential and Commercial house plans.
- The Harbor View Marina Project, Nassau, The Bahamas EBA, EMP
- The Staniard Creek Bridge and Causeway Replacement Central Andros, The Bahamas, EMP
- Briland Residence and Marina, Harbour Island, The Bahamas, and Marine Assessment for EIA
- South Andros and Cat Island Water Improvement Project, EMP, EMS
- Barbuda Airport, Antigua and Barbuda, Herpetological Assessments for EIA
- North Windermere Island, Eleuthera, The Bahamas; Marine Assessment for EIA
- The Pointe Marina Development: Nassau, The Bahamas; EMP, EMS
- The Big Pond Park Development Project, New Providence, The Bahamas EMS
- Orchid Bay; Abaco, The Bahamas; Marine Assessment for EIA
- Airport Gateway Project, New Providence, The Bahamas; EMS

- White Bay Cay, Exuma Cays, The Bahamas; Marine Assessment
- Stocking Island, Exuma Cays, The Bahamas; Botanical, Avian and Marine Assessment for EIA
- February Point, Exuma, The Bahamas; Avian and Marine Assessments for EIA
- Deep Water Cay, Grand Bahama, The Bahamas; Wetland Assessment
- Matt Lowe Cay, Abaco Cays, The Bahamas; Avian Assessment for EIA
- Governor's Harbour Army Base, Eleuthera, The Bahamas; Avian for EIA
- Abaco Forestry, Abaco, The Bahamas; Botanical Assessment for EIA
- The Pointe, New Providence, The Bahamas; Marine Assessment for EIA
- Norman's Cay, Exuma Cays, The Bahamas; Botanical and Avian Assessment for EIA
- Ocean Cay, Bimini, The Bahamas, Avian Assessment for EIA & EMS
- LNG Pipeline, New Providence, The Bahamas; Marine Assessment for EIA
- White Bay Cay, Exuma, The Bahamas; Marine Assessment for EIA
- Old Fort Bay Town Center, New Providence, The Bahamas; Avian Assessment, EIA and EMP
- Bimini Bay, Bimini, The Bahamas, Marine Assessment for EIA
- Hurricane Hole Marina, Paradise Island, The Bahamas; Marine and Stakeholder Assessment, EBA, oral relocation and monitoring & EMS
- Sandals, Exuma, The Bahamas, Avian Assessment for EIA
- Finley Cay, New Providence, The Bahamas; Marine Assessment EIA
- Elbow Cay, Abaco, The Bahamas, Marine Assessment for EIA
- Hermitage, Exuma, The Bahamas; Botanical and Avian Assessment for EIA
- Governor's Harbour Army Base, Eleuthera, The Bahamas; Avian Assessment for EIA
- Bahamar Back of House, New Providence, The Bahamas; Botanical Assessment and Protected Trees Survey
- Witches Point, Abaco, The Bahamas, Marine Assessment for EIA
- Buttonwood Reserve, Eleuthera, The Bahamas, Botanical assessment for EIA
- Master Harbor, Exuma, The Bahamas, Botanical Assessment for EIA
- Hog Cay, Exuma, The Bahamas; Botanical and Avian Assessment for EIA
- Exuma Highway, Exuma, The Bahamas; Botanical Assessment for Highway Feasibility Study
- University of the Bahamas, New Providence, The Bahamas, Avian Assessment for EIA
- Caribbean Global Timber, Abaco and Andros, The Bahamas, EIA

PROJECT COORDINATOR,

- Cane Toad Eradication, Lyford Cay, Nassau, The Bahamas
- Cane Toad Eradication, Marsh Harbour Abaco, The Bahamas

2006 – 2011

PARKS PLANNER AND COMMUNITY LIASION OFFICER, BAHAMAS NATIONAL TRUST, NASSAU, BAHAMAS DUTIES

- Develop proposals to government for the establishment of new National Parks.
- Grant writing
- Develop General Management Plans for existing National Parks.
- Work with surrounding communities to gain support for the importance of establishing new National Parks.

- Project Management for the establishment of the Leon Levy Native Plant Preserve, Eleuthera, The Bahamas.
- Manage all daily details and education of staff for educational programs.
- Organize all special events for the Education Department.
- Liaise with corporate sponsors to further fund educational programs.
- Develop marine education lesson plans and activities (on and off site) for grade levels K-12 and college students.
- Attendance and professional presentations at events both locally and abroad.
- Development of the National High School Marine Science Curriculum.

2001 – 2004

RESEARCH ASSISTANT, TUSKEGEE UNIVERSITY, TUSKEGEE, ATLANTA

- Developed and maintained research projects in conjunction with Tuskegee University and NASA.
- Aided in the daily maintenance and running of a greenhouse.
- Organized and taught Environmental and General Biology courses.

1999 – 2001

MARINE MAMMAL TRAINER, DOLPHIN ENCOUNTERS, BLUE LAGOON, NASSAU, BAHAMAS

- Trained Atlantic Bottlenose Dolphins in educational and interactive programs.
- Assisted in developing marine conservation and educational programs.

EDUCATION

2004

MS.: BIOLOGY (CONCENTRATION IN PLANT AND SOIL SCIENCE), TUSKEGEE UNIVERSITY

Thesis:

- The Effects of Superoptimal Co2 on the Growth, Yield, Gas Exchange, Stomatal Conductance and Starch of Sweet Potato and Peanut.

1999

BS: MARINE BIOLOGY, TUSKEGEE UNIVERSITY

AUTHOR

- Conch Farming Feasibility Study (Present)
- The Bahamas Sixth National Report on Biological Biodiversity to The Convention on Biological Diversity (2019)
- Co-Author of the “Andros Sustainable Development Masterplan” (2014)
- Author of the “Critical Situation Analysis of Invasive Alien Species for The Bahamas” (2013)

PROFESSIONAL TRAINING

- 2019 IDB Principles of the Review of Environmental Impact Assessments
- 2019 The Perry Institute of Marine Science, AGRRRA Benthic Survey Techniques
- 2018 Georgia Tech Professional Education Center – OSAHA Approved Trainer
- 2017 Conservation Training Introduction to Resilience for Development
- 2017 Inter-American Development Bank Project Management Techniques for Development Professionals
- 2015 IICA, Efficient use of Rainwater and Runoff in Agricultural Activities, Chitre, Panama
- 2015 IICA, Agro-Eco Tourism Training Workshop
- 2014 Commercial Training Center of Department of Commerce, Hainan Province, China Climate Change on Tropical Island and Economic Development for Developing Countries
- 2013 The Nature Conservancy, Coral Reef Restoration
- 2013 The Nature Conservancy, AGRRRA Coral Surveys
- 2010 The Bahamas National Trust, Business Writing 2010 The Bahamas National Trust, Public Presentation
- 2009 The Nature Conservancy, Invasive Species Management
- 2009 College of The Bahamas, Mangrove Forest Ecology, Management and Restoration
- 2008 International Fund for Animal Welfare, Certificate of Completion for Whale Watch Guide Training
- 2006 National Association of Interpretation, Certified Interpretive Guide 2006 Tuskegee University, 1st Place Graduate Oral Presentation Sigma Xi
- 2005 Tuskegee University, Certificate of Effective Leadership
- 1995 Auburn University, NAUI Scuba Certified

PROFESSIONAL AFFILIATIONS

- SEEDS-Ecological Society of America
- Sigma Xi Scientific Research Society
- Beta Kappa Chi Honor Society National Association for Interpretation
- National Marine Educators Association Name of Organization

PRESENTATION AND INVITED LECTURES

- Policies, Strategies and Best Practices for Managing Invasive Alien Species (IAS) in the Insular Caribbean March 31st – April 4th, 2014, Trinidad. Port of Spain, Trinidad & Tobago. The Cane Toad Invasion: Its Origin, Status and The Bahamas’ Response to prevent spread.
- Policies, Strategies and Best Practices for Managing Invasive Alien Species (IAS) in the Insular Caribbean March 31st – April 4th, 2014, Trinidad. Port of Spain, Trinidad & Tobago.
- Developing a National IAS Strategy focused on IAS prevention – a case study of The Bahamas’ 2003 -2013 experience.
- Bahamas Natural History Conference 2016 The Cane Toad Invasion: Its Origin, Status and The Bahamas’ Response to prevent spread.
- Bahamas Natural History Conference 2018 Citizen Science and Community Involvement can help! Invasive Cane Toads (*Rhinella marina*) control in The Bahamas continues.

REFERENCES

- Available Upon Request



BRICKELL SQUARE DEVELOPMENT

Terrestrial Baseline Assessment

Prepared by: JSS Consulting
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Document History

Company	Description	Name	Date
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1.0 Introduction

1.1 Site Description

The Brickell Square (BS) project is a thirty (30) acre proposed commercial project on Prospect Ridge, New Providence, The Bahamas (See Figure 1). The site is located immediately south of the Silk Cotton Drive Roadway, west of the Prospect Ridge Roadway, east of the Baha Mar Boulevard Roadway and northeast of the Macfit 360 Fitness & Performance Center. The site is currently not inhabited but contain remnant structures from a decommissioned hospital and derelict abandoned vehicles (See Appendix 1). Additionally, illegally dumped garbage and construction debris was observed in the northeastern section of the site (See Photo 1). The proposed works for this project include housing units and a commercial center inclusive of needed utilities and additional infrastructure.



Figure 1: Brickell Square project site location.



Photo 1: Illegally dumped garbage and construction debris in the northeastern section of the project site.

1.2 Protected Area

The Brickell Square (BS) development does not fall within the boundary of a national park but is located 1.17 miles southwest of the Perpall Tract National Park (PTNP) and 1.44 miles northwest of the Harold & Wilson Ponds National Park (HWPNP) (See Figure 2). The Perpall Tract National Park (PTNP) is one hundred and seventy-six and six-tenths (176.6) acres of protected terrestrial habitat. Zoning and designation to a management agency is currently not established for this national park. The Harold & Wilson Ponds National Park (HWPNP) is two hundred thirty-seven and forty-five hundredths (237.45) acres of protected interior wetland habitat managed by the Bahamas National Trust (BNT).

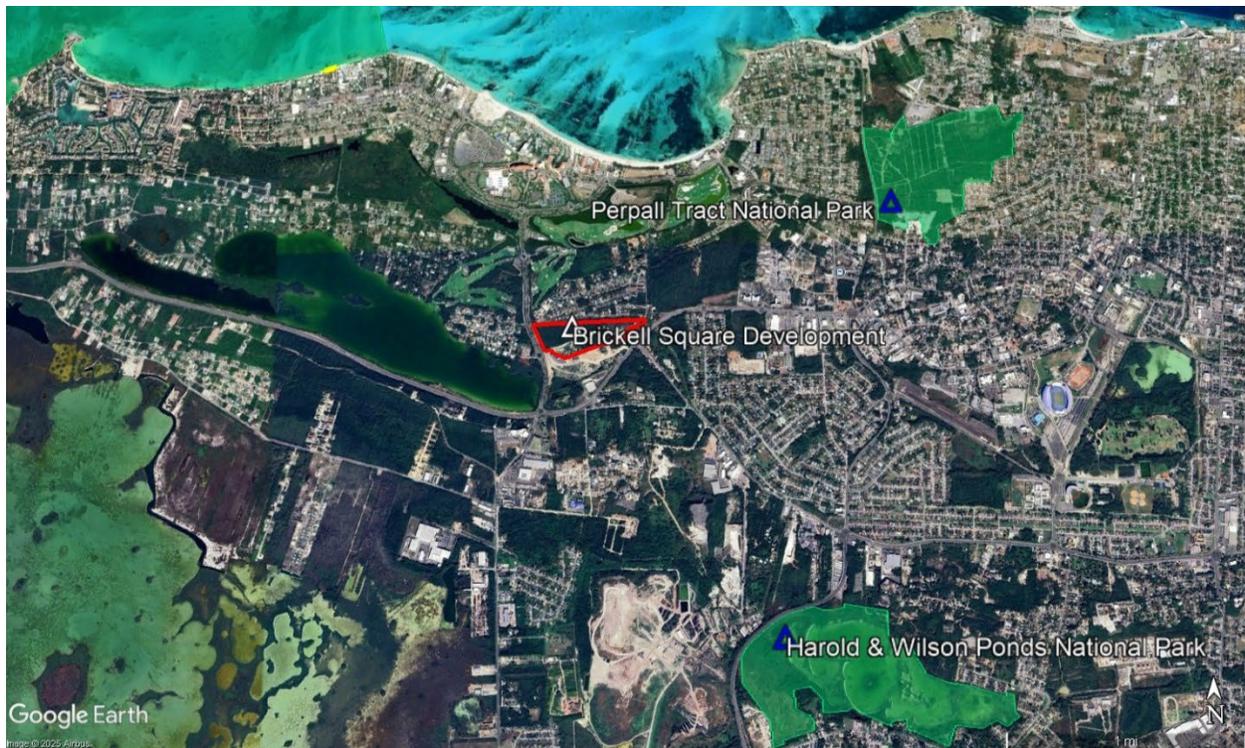


Figure 2: Project site location southwest of the Peripall Tract National Park (PTNP) and northwest of the Harold & Wilson Ponds National Park (HWPNP).

2.0 Botanical Survey

Field studies were conducted from July 29th through July 31st, 2025. The study's purpose was to map vegetation types, determine floristic diversity, identify the presence and abundance of invasive species, and conduct a survey of protected species.

2.1 Methodology

Vegetation types were mapped and verified by walking along the site's interior and perimeter using existing footpaths and surveyor transects. Vegetation Type taxonomy was based on Areces et al. (1999). Vascular plant species occurring in each vegetation type were recorded and used to compile a floral list (See Table 1). Plant taxonomy was based on Correll and Correll (1982). The presence, location, and abundance of vascular species listed under the National Invasive Species Strategy for The Bahamas (2013) and the Protected Trees Order (2021) were noted when encountered.

The primary objective of protected species potential estimations is to estimate the total protected species potential across the site as per DEPP regulations. The Department of Forestry requirements for conducting a protected species survey in The Bahamas stipulate that one (1) 0.1-acre plot must be surveyed for every ten (10) acres of vegetation to be impacted, assuming that the vegetation is homogenous across those ten (10) acres. To assess the relative abundance of protected species recorded, Google Earth software was used to select three (3) 66ft x 66ft square sampling plots on the site (See Figure 4). The plots were sized using a string line on a reel and a 100-meter measuring tape. Once the plot was established, the number of protected species observed within the plot was recorded (See Table 4). Logger's tape was used to determine the mature trees' diameter at breast height, and a hypsometer was used to determine each tree's height. To avoid double-counting or missing a plant, flagging tape was placed on each plant during counting. In areas with a high number of small species, inappropriate for flagging, the botanist counted per quadrant to avoid double-counting or missing a plant.

2.2 Habitat Description

The terrestrial site spans thirty (30) acres and contains one (1) terrestrial ecosystem, an Interior Upland. There are two (2) vegetation classes observed on the site: Dry Broadleaf Evergreen Forest and Human-Altered Environment. The site is on an east-west Pleistocene ridge and its topography can be described as generally even except for a steep decline on its southern perimeter. Soil type can be described as limestone substrate throughout the project site. Vegetation growth can be described as both primary growth in the undisturbed portions of the site and secondary growth in areas disturbed by human activity or natural disturbances.

2.2.1 Interior Upland

There are two (2) interior upland vegetation types observed on the Brickell Square Development project site: A Dry Broadleaf Evergreen Forest, and a Human-altered Environment Habitat.

2.2.1.1 Dry Broadleaf Evergreen Forest

Dry Broadleaf Evergreen Formations are interior upland vegetation types consisting of deciduous plants on sandy and limestone substrates. These formations are classified by the trees' height and a well-defined canopy. There was one (1) type of DBEF observed on the project site, a *Coccoloba swartzii-Vachellia choriophylla-Lysiloma latisiliquum* Forest Alliance.

***Coccoloba swartzii-Vachellia choriophylla-Lysiloma latisiliquum* Forest Alliance**

This vegetation subtype has trees with a 30-35 feet canopy and diameter at breast height ranging from 10-40 centimeters in the interior of the site. This area tapers at the southern edge of the site to a shrub-dominated system with a canopy height of 15-20 feet. Soil in this habitat can be described as a dark Pleistocene limestone substrate with 3-4 inches of detritus and leaf litter above the topsoil. Flora species observed in the over story include *Coccoloba diversifolia* (Pigeon Plum), *Simarouba glauca* (Paradise Tree), *Ardisia escallonioides* (Marlberry), *Guapira obtusata* (Big Leaf Blolly), and *Tabebuia bahamensis* (Five Finger). Species observed in the understory include *Psychotria ligustrifolia* (Smooth Wild Coffee), *Randia aculeata* (Box Briar), *Chiococca alba* (Snow Berry), *Citharexylum spinosum* (Fiddle Wood), *Lasiacis divaricata* (Wild Bamboo), *Eulophia maculata* (African Spotted Orchid), *Tradescantia spathacea* (Oyster Plant), *Tillandsia balbisiana* (Cuttle Fish), and *Scleria lithosperma* (Slender Nut). This vegetation class extends to a human-altered environment.



Photo 2: *Coccoloba swartzii*-*Vachellia choriophylla*-*Lysiloma latisiliquum* Forest Alliance.

2.2.1.2 Human-altered Environment Habitat

Human-altered environments are defined as areas in which the natural habitat has been altered or degraded by human activities. Vegetation growth in these areas can be described as secondary growth, due to these areas consisting mainly of pioneer, regenerating native species, and invasive species. A human-altered environment exists in the site's eastern and western section, the site's interior, and along its southern and northern perimeters in the form of manicured landscapes, unpaved roadways, and cleared spaces. The unpaved roadways are predominantly non-vegetated; however, some areas were sparsely vegetated with ground cover species and invasive species such as *Dichromena floridensis* (White-top sedge), *Bidens alba* (Shepherd's Needle), *Waltheria indica* (Sleepy Morning), *Stemodia maritima* (Pond Bush), and *Casuarina equisetifolia* (Australian Pine).

In contrast, the manicured landscapes and cleared spaces (former & current) consist of a mosaic of regenerating and mature native, horticultural and invasive plant species such as *Bursera simarouba* (Gum Elemi), *Lysiloma latisiliquum* (Wild Tamarind), *Erithalis fruticosa* (Black Torch), *Cassytha filiformis* (Love Vine), *Baccharis dioica* (Brooms Bush), *Canavalia rosea* (Bay Bean), *Delonix regia* (Poinciana), *Muntingia calabura* (Jamaican Cherry), *Abelmoschus esculentus* (Okra), *Ceiba pentandra* (Silk Cotton), *Leucaena leucocephala* (Jumbay), and *Scaevola taccada* (White-ink Berry). Additionally, there is a section within this system due to lack of maintenance that have become dominated by *Casuarina equisetifolia* (Australian Pine) forming a *Casuarina equisetifolia* Woodland Alliance.



Photo 3: Human-altered Environment Habitat-Remnant Unpaved Roadway.



Photo 4: Human-altered Environment Habitat-Cleared Space/Area.



Photo 5: Human-altered Environment Habitat-*Casuarina equisetifolia* Woodland Alliance.

2.2.2 Vegetation Map



Figure 3: Vegetation type distribution on the Brickell Square Development project site.

2.2.3 Vascular Diversity

Species diversity and richness on the site align with what is expected of a site that consists of one (1) terrestrial ecosystem and two (2) vegetation classes. A total of eighty-two (82) species were recorded on the site, including twelve (12) protected species, and five (5) invasive species (See Table 1). * Denotes protected species observed on the site.

Table 1: Vascular plant species recorded on the Brickell Square Development project site, Prospect Ridge, New Providence, The Bahamas

Table 1 Key: DBEF = Dry Broadleaf Evergreen Forest, HAE = Human-Altered Environment Habitat

Family	Botanical Name	Common Name	Location	
			DBEF	HAE
Simaroubaceae	<i>Alvaradoa amorphoides</i>	Alvaradoa	✓	

Family	Botanical Name	Common Name	Location	
			DBEF	HAE
Malvaceae	<i>Abelmoschus esculentus</i>	Okra		✓
Primulaceae	<i>Ardisia escallonioides</i>	Marlberry	✓	
Asteraceae	<i>Baccharis dioica</i>	Brooms Bush		✓
Asteraceae	<i>Bidens alba</i>	Shepherd Needle		✓
Boraginaceae	<i>Bouerreria succulent</i>	Strongback	✓	✓
Burseraceae	<i>Bursera simarouba*</i>	Gum Elemi	✓	✓
Fabaceae	<i>Canavalia rosea</i>	Bay Bean		✓
Casuarinaceae	<i>Casuarina equisetifolia</i>	Australian Pine		✓
Lauraceae	<i>Cassytha filiformis</i>	Love Vine	✓	✓
Malvaceae	<i>Ceiba pentandra*</i>	Silk Cotton		✓
Rubiaceae	<i>Chiococca alba</i>	Snow Berry	✓	
Rubiaceae	<i>Chiococca parvifolia</i>	Pineland Snow Berry		✓
Sapotaceae	<i>Chrysophyllum oliviforme</i>	Satin Leaf	✓	
Verbenaceae	<i>Citharexylum spinosum</i>	Fiddle Wood	✓	
Polygonaceae	<i>Coccoloba diversifolia</i>	Pigeon Plum	✓	
Polygonaceae	<i>Coccoloba swartzii</i>	Tie Tongue	✓	
Arecaceae	<i>Cocos nucifera</i>	Coconut Palm		✓
Tiliaceae	<i>Corchorus hirtus</i>	Wooly Booger		✓
Celestraceae	<i>Crossopetalum rhacoma</i>	Poison Cherry	✓	

Family	Botanical Name	Common Name	Location	
			DBEF	HAE
Lauraceae	<i>Damburneya coriacea</i>	Lance Wood	✓	
Fabaceae	<i>Delonix regia</i>	Poinciana		✓
Cyperaceae	<i>Dichromena floridensis</i>	White Top Sedge	✓	✓
Dioscoreaceae	<i>Dioscorea microphylla</i>	Wild Yam	✓	
Asparagaceae	<i>Dracaena hyacinthoides</i>	Mother In Laws	✓	✓
Rubiaceae	<i>Erithalis fruticosa</i>	Black Torch	✓	✓
Erythroxylaceae	<i>Erythroxylum aerolatum</i>	False Cocaine	✓	
Myrtaceae	<i>Eugenia axillaris</i>	White Stopper	✓	
Myrtaceae	<i>Eugenia foetida</i>	Spanish Stopper	✓	
Orchidaceae	<i>Eulophia maculata*</i>	African Spotted Orchid	✓	
Sapindaceae	<i>Exothea paniculata</i>	Butterbough	✓	
Moraceae	<i>Ficus aurea</i>	Golden Fig	✓	
Nyctaginaceae	<i>Guapira discolor*</i>	Small-leaved Blolly	✓	
Nyctaginaceae	<i>Guapira obtusata</i>	Big Leaf Blolly	✓	
Rubiaceae	<i>Guettarda scabra</i>	Rough Leaf Velvet Seed	✓	
Euphorbiaceae	<i>Gymnanthes lucida</i>	Crab Wood	✓	
Malvaceae	<i>Helicteres jamaicensis</i>	Cowbush	✓	
Boraginaceae	<i>Heliotropium angiospermum</i>	Rooster Comb		✓
Convolvulaceae	<i>Ipomoea indica</i>	Morning Glory		✓

Family	Botanical Name	Common Name	Location	
			DBEF	HAE
Rhamnaceae	<i>Krugiodendron ferreum</i>	Ironwood	✓	
Verbenaceae	<i>Lantana involucrata</i>	Wild Sage	✓	
Poaceae	<i>Lasiacis divaricata</i>	Wild Bamboo	✓	
Fabaceae	<i>Leucaena leucocephala</i>	Jumbay	✓	✓
Arecaceae	<i>Leucothrinax morrisii*</i>	Thatch Palm	✓	
Fabaceae	<i>Lysiloma latisiliquum*</i>	Wild Tamarind	✓	✓
Fabaceae	<i>Lysiloma sabicu*</i>	Horseflesh	✓	
Sapotaceae	<i>Manilkara bahamensis</i>	Wild Dilly	✓	
Sapotaceae	<i>Manilkara zapota</i>	Sapo-Dilly	✓	✓
Anacardiaceae	<i>Metopium toxiferum</i>	Poisonwood	✓	
Muntingiaceae	<i>Muntingia calabura</i>	Jamaican Cherry		✓
Myrtaceae	<i>Myrcia zuzygium</i>	Spicewood	✓	
Acanthaceae	<i>Oplonia spinosa</i>	Prickly Bush	✓	
Apocynaceae	<i>Pentalinon luteum</i>	Wild Allamanda	✓	
Peraceae	<i>Pera bumeliifolia*</i>	Black Ebony	✓	
Lamiaceae	<i>Petitia domingensis</i>	Fowl Berry	✓	✓
Phyllanthaceae	<i>Phyllanthus epiphyllanthus</i>	Rock Bush	✓	
Nyctaginaceae	<i>Pisonia aculeata</i>	Haul Back	✓	
Fabaceae	<i>Pithecellobium keyense</i>	Ram's Horn	✓	✓
Verbenaceae	<i>Priva lappulacea</i>	Cat's Tongue		✓

Family	Botanical Name	Common Name	Location	
			DBEF	HAE
Rubiaceae	<i>Psychotria ligustrifolia</i>	Smooth Wild Coffee	✓	
Rubiaceae	<i>Randia acueleata</i>	Box Briar	✓	
Rhamnaceae	<i>Reynosa septentrionalis</i>	Darling Plum	✓	
Cyperaceae	<i>Scleria lithosperma</i>	Slender Nut	✓	✓
Goodeniaceae	<i>Scaevola taccada</i>	White-ink Berry		✓
Fabaceae	<i>Senna chapmanii*</i>	Bahama Senna		✓
Sapotaceae	<i>Sideroxylon salicifolium</i>	Willow Busic	✓	
Simaroubaceae	<i>Simarouba glauca</i>	Paradise Tree	✓	
Smilacaceae	<i>Smilax havanensis</i>	Chaney Briar	✓	
Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Blue Vervain		✓
Meliaceae	<i>Swietenia mahagoni*</i>	West Indian Mahogany	✓	
Bignoniaceae	<i>Tabebuia bahamensis</i>	Five Finger	✓	
Bignoniaceae	<i>Tabebuia rosea</i>	Pink Poui		✓
Thelypteridaceae	<i>Thelypteris reptans</i>	Walking Wood Fern	✓	
Sapindaceae	<i>Thouinia discolor*</i>	Quicksilver Bush	✓	
Bromeliaceae	<i>Tillandsia balbisiana</i>	Cuttle Fish	✓	
Boraginaceae	<i>Tournefortia volubilis</i>	Soldier Vine	✓	
Commelinaceae	<i>Tradescantia spathacea</i>	Oyster Plant	✓	✓
Celtidaceae	<i>Trema lamarckiana</i>	Pain In Back		✓
Passifloraceae	<i>Turnera ulmifolia*</i>	Bahamian Buttercup		✓

Family	Botanical Name	Common Name	Location	
			DBEF	HAE
Fabaceae	<i>Vachellia choriophylla</i>	Cinnecord	✓	
Sterculiaceae	<i>Waltheria indica</i>	Sleepy Morning		✓
Rutaceae	<i>Zanthoxylum fagara</i>	Wild Lime		✓

2.2.4 Invasive Species Survey

Five (5) invasive species were observed on the site. These species are outlined below, along with their occurrence, abundance on the site, and recommendations for control (See Table 2). Species that are recommended for control are species whose richness and distribution are too enormous to eradicate, but whose spread can be stifled through various measures. Whereas species recommended for eradication are species whose richness and distribution are relatively small and hence can be eradicated.

Table 2: Invasive species recorded on the Brickell Square Development project site, Prospect Ridge, New Providence, The Bahamas

Species	Occurrence & Abundance	*Recommendations
<i>Casuarina equisetifolia</i> , Australian Pine.	3-10ft seedlings and 10-20ft mature trees within the HAE on the proposed project site.	Control
<i>Delonix regia</i> , Poinciana.	3-5ft seedlings and 12-15ft mature trees within the HAE on the proposed project site.	Control
<i>Ipomoea indica</i> , Sleepy Morning	Clusters of vines are distributed throughout the HAE on the proposed project site.	Control

Species	Occurrence & Abundance	*Recommendations
<i>Leucaena leucocephala</i> , Jumbay.	1-8ft tall herbaceous shrubs within the HAE and DBEF on the proposed project site.	Control
<i>Scaevola taccada</i> , White-ink Berry	1-3ft tall herbaceous shrubs within the HAE on the proposed project site.	Eradication

*Recommendations as per the National Invasive Species Strategy for the Bahamas, 2013.



Photo 6: *Delonix regia* (Poinciana).



Photo 7: *Ipomoea indica* (Sleepy Morning).



Photo 8: *Scaevola taccada* (White-ink Berry).

2.2.5 Protected Species Survey

There were twelve (12) protected species observed on the proposed project site. Eleven (11) of the twelve (12) are listed in the Forestry Act Declaration of Protected Trees Order 2021, and one (1) of the twelve (12) species observed on the project site were listed in Appendices I, II, or III of the Convention on International Trade in Endangered Species of Wild Fauna & Flora (CITES).

2.2.5.1 Local/National Legislation & Policy

The Forestry Act Declaration of Protected Trees Order 2021 lists one hundred and twenty-seven (127) vascular plant species as protected. Eighty-six (86) species are listed as Endemic or Endangered, or Threatened, and forty-one (41) are listed as Cultural or Historical and Economic. Endemic species are native and restricted to the archipelago, island groupings, or specific islands. Cultural or historical species are species of historical or cultural importance, such as those utilized for boat building and straw work. Eleven (11) species observed were listed on the Forestry Act Declaration of Protected Trees Order 2021 and were recorded at the site (See Table 3).

Endemic, Endangered, or Threatened Protected Trees

One (1) species, *Thouinia discolor* (Quicksilver Bush), observed on the project site, is listed under the subsection of Endemic, Endangered, or Threatened Species (Schedule 1) in the Act.

Cultural, Historical, or Economic Protected Trees

Ten (10) species, *Bursera simarouba* (Gum Elemi), *Ceiba pentandra* (Silk Cotton), *Guapira discolor* (Small-leaved Blolly), *Leucothrinax morrisii* (Thatch Palm), *Lysiloma latisiliquum* (Wild Tamarind), *Lysiloma sabicu* (Horseflesh), *Pera bumeliifolia* (Black Ebony), *Swietenia mahagoni* (West Indian Mahogany), *Turnera ulmifolia* (Bahamian Buttercup), and *Senna chapmanii* (Bahama Senna) are listed under the subsection Cultural or Historical and Economic (Schedule 2) in the Act.



Photo 9: *Lysiloma sabicu* (Horseflesh).



Photo 10: *Turnera ulmifolia* (Bahamian Buttercup).

2.2.5.2 International Legislation, Policy & Agreements

The Convention on International Trade in Endangered Species of Wild Fauna & Flora (CITES) is a multilateral treaty aimed at conserving and protecting endangered flora and fauna from the threats posed by international trade. CITIES have three (3) appendices (I, II, III) that contain lists of species that are provided with distinct types of protection from overexploitation. One (1) species observed on the project site, *Eulophia maculata* (African Spotted Orchid) is listed in CITES Appendix II.

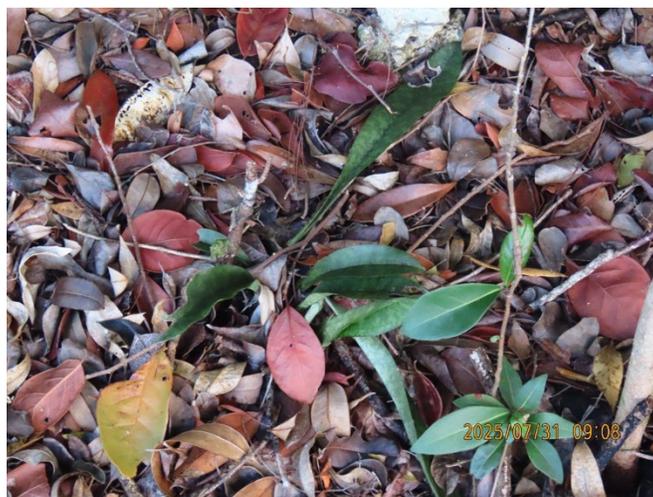


Photo 11: *Eulophia maculata* (African Spotted Orchid).

Table 3: Protected Species recorded on the Brickell Square Development project site, Prospect Ridge, New Providence, The Bahamas

#	Species Recorded		Location
	Botanical Name	Common Name	
1	<i>Bursera simarouba</i>	Gum Elemi	1-10ft seedlings/saplings and 10-35ft mature trees within the DBEF on the project site.
2	<i>Ceiba pentandra</i>	Silk Cotton	1-5ft seedlings and 15-25ft tall mature trees within the HAE on the proposed project site.
3	<i>Eulophia maculata</i>	African Spotted Orchid	Numerous epiphytic plants are on the ground throughout the DBEF on the project site.
4	<i>Guapira discolor</i>	Small-leaved Bolly	1-3ft seedlings/saplings and 4-15ft mature trees within the DBEF on the project site.
5	<i>Leucothrinax morrisii</i>	Thatch Palm	12-31in seedlings and 32-120in tall mature trees within the DBEF on the project site.
6	<i>Lysiloma latisiliquum</i>	Wild Tamarind	1-10ft seedlings and saplings within the DBEF on the project site. 10-35ft mature trees within the DBEF and HAE on the project site.
7	<i>Lysiloma sabicu</i>	Horseflesh	1-10ft seedlings and saplings, and 10-35ft mature trees within the DBEF on the project site.
8	<i>Pera bumeliifolia</i>	Black Ebony	1-10ft seedlings and saplings within the DBEF on the project site.

#	Species Recorded		Location
	Botanical Name	Common Name	
9	<i>Senna chapmanii</i>	Bahama Senna	1-3ft herbaceous plants within the HAE and along the edges of the DBEF on the project site.
10	<i>Swietenia mahagoni</i>	West Indian Mahogany	1-3ft seedlings within the DBEF on the project site.
11	<i>Thouinia discolor</i>	Quicksilver Bush	1-6ft herbaceous plants within the DBEF on the project site.
12	<i>Turnera ulmifolia</i>	Bahamian Buttercup	1-3ft herbaceous plants within the HAE and along the edges of the DBEF on the project site.

2.2.5.3 Protected Species Count

Three (3) 66 x 66 feet plots were established to determine the number of protected species on the project site (See Figure 4). This detailed assessment included the tagging and counting of all protected species encountered. The recorded data was later compiled and tallied (See Table 4). This tallied data was utilized to determine the number of protected trees per acre and the number of protected trees across the thirty (30) acres on the proposed project site (See Table 5).



Figure 4: Brickell Square Development Protected Species Plot Map.

Table 4: Protected species survey results recorded on the Brickell Square Development project site, Prospect Ridge, New Providence, The Bahamas

Plot	Location	Species	#
1	25°03'34.40"N 77°23'46.91"W	<i>Bursera simarouba</i> , Gum Elemi.	5
		<i>Leucothrinax morrisii</i> , Thatch Palm.	47
		<i>Lysiloma latisiliquum</i> , Wild Tamarind.	7
2	25°03'35.02"N 77°23'43.72"W	<i>Bursera simarouba</i> , Gum Elemi.	12
			33

Plot	Location	Species	#
		<i>Leucothrinax morrisii</i> , Thatch Palm.	
		<i>Lysiloma latisiliquum</i> , Wild Tamarind.	6
3	25°03'32.60"N 77°23'35.51"W	<i>Bursera simarouba</i> , Gum Elemi.	4
		<i>Leucothrinax morrisii</i> , Thatch Palm.	32
		<i>Lysiloma sabicu</i> , Horseflesh	2

Table 5: Estimated number of protected species potential on the Brickell Square Development project site, Prospect Ridge, New Providence, The Bahamas

Protected Species	Total # Recorded	Average per survey plot #/3)	Total potential per acre (average x 10)	Total potential on site (# per acre x 30)
<i>Bursera simarouba</i> , Gum Elemi	21	7	70	2,100
<i>Leucothrinax morrisii</i> , Thatch Palm	112	37.33	373.3	11,199
<i>Lysiloma latisiliquum</i> , Wild Tamarind	13	4.33	43.3	1,299

Protected Species	Total # Recorded	Average per survey plot #/3)	Total potential per acre (average x 10)	Total potential on site (# per acre x 30)
<i>Lysiloma sabicu</i> , Horseflesh	2	0.67	6.7	201

Note: Table five (5) provides estimated calculations based on the results of random sampling plots across the project site. However, the actual (more likely) abundance of protected species throughout the site might be lower due to the removal of native vegetation by human activities.

3.0 Avian Survey

An avian survey was conducted to identify the presence, abundance, and habitat utilization of avian species within the site's boundaries.

3.1 Methodology

The assessment comprised 10 hours of active avian and ecological observations. Field studies consist of a summer avian survey (April-August). The survey was conducted on the 29th of July 2025 between the hours of 9 am – 11 am, and 6 pm-7 pm, on the 30th of July between 8 am – 12 pm, and on the 31st of July between 7am – 10am. The area's avifauna was assessed and recorded by walking along the site's perimeter and within its interior, using established footpaths, roadways and surveyor transects. Avifauna and fauna taxonomy is based on Currie et al (2019). Species numbers were recorded in the abundance categories: Single (1), Few (2-10), and Many (11-100). Species recorded were compiled for final abundance estimates. Status is based on the International Union for Conservation of Nature (IUCN).

3.2 Findings

3.2.1 Species Diversity

There were nineteen (19) species recorded during the summer avian survey (See Table 6).

Table 6: Avifauna observed during the avian survey on the Brickell Square Development project site, Prospect Ridge, New Providence, The Bahamas

Table Key:

Range	Status
PRB = Permanent Resident Breeding LC = Least Concern (Conservation-IUCN)	
SRB = Summer Resident Breeding	
WRN = Winter Resident Non-Breeding	
E = Endemic Species	IUCN = International Union of Conservation of Nature
e = Endemic Subspecies	
NT = Near Threatened	

Family	Scientific Name	Common Name	Master Observation	Range/Conservation Status
Thraupidae	<i>Coereba flaveola bahamensis</i>	Bananaquit	Few	PRB/e/LC
Cuculidae	<i>Coccyzus minor</i>	Mangrove Cuckoo	Few	PRB/LC
Charadriidae	<i>Charadrius vociferous</i>	Killdeer	Few	PRB/LC
Caprimulgidae	<i>Chordeiles gundlachii</i>	Antillean Nighthawk	Single	SRB/LC

Family	Scientific Name	Common Name	Master Observation	Range/Conservation Status
Columbidae	<i>Columbina passerina bahamensis</i>	Common Ground-Dove	Few	PRB/e/LC
Cuculidae	<i>Crotophaga ani</i>	Smooth-billed Ani	Few	PRB/LC
Falconidae	<i>Falco sparverius sparveroides</i>	American Kestrel	Single	PRB/LC
Laridae	<i>Leucophaeus atricilla</i>	Laughing Gulls	Many	PRB/LC
Thraupidae	<i>Melopyrrha violacea violacea</i>	Greater Antillean Bullfinch	Single	PRB/e/LC
Mimidae	<i>Mimus polyglottos polyglottos</i>	Northern Mockingbird	Many	PRB/LC
Trochilidae	<i>Nesophlox evelynae</i>	Bahama Woodstar	Single	PRB/E/LC
Columbidae	<i>Patagioenas leucocephala</i>	White Crown Pigeon	Many	PRB/NT
Parulidae	<i>Setophaga Americana</i>	Northern Parula	Single	WRN/LC
Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis	Single	PRB/LC

Family	Scientific Name	Common Name	Master Observation	Range/Conservation Status
Thraupidae	<i>Tiaris bicolor</i>	Black-faced Grassquit	Single	PRB/LC
Turdidae	<i>Turdus plumbeus plumbeus</i>	Red-legged Thrust	Few	PRB/e/LC
Tyrannidae	<i>Tyrannus dominicensis</i>	Gray Kingbird	Few	SRB/LC
Vireonidae	<i>Vireo crassirostris crassirostris</i>	Thick-billed Vireo	Few	PRB/e/LC
Columbidae	<i>Zenaida macroura</i>	Mourning Dove	Few	PRB/LC

3.2.2 Range

A species' range is the geographic areas where the birds can be consistently found, e.g., migrant birds have seasonal ranges while restricted-range species remain on the same island or in the same region year-round.

3.2.2.1 Permanent Resident Breeding

Permanent Resident breeding (PRB) species refers to the resident species that live and breed year-round throughout the Bahama Islands. There were sixteen (16) PRB species (approximately 84%) of the species recorded during the survey.



Photo 12: *Falco sparverius sparveroides*
(American Kestrel).



Photo 13: *Charadrius vociferous* (Killdeer).

3.2.2.2 Summer Resident Breeding

Summer Resident Breeding (SRB) species refers to summer migrants from North & South America that utilize the Bahama Islands as their breeding/nesting grounds. Two (2) species, *Chordeiles gundlachii* (Antillean Nighthawk), and *Tyrannus dominicensis* (Gray Kingbird), approximately 11% of the species recorded on the site were SRB.



Photo 14: *Chordeiles gundlachii* (Antillean Nighthawk).

3.2.2.3 Winter Resident Non-breeding

Winter Resident Non-breeding (WRN) species refers to the winter migrants to the Bahama Islands from North America. One (1) *Setophaga americana* (Northern Parula), of the species observed, approximately 5%, was WRN.



Photo 15: *Setophaga americana* (Northern Parula).

3.2.2.4 Endemic Species and Subspecies

Endemic species and subspecies are birds that exist only in The Bahamas. There was one (1) endemic species, *Nesophlox evelynae* (Bahama Woodstar), and five (5) endemic subspecies, *Coereba flaveola bahamensis* (Bananaquit), *Melopyrrha violacea violacea* (Greater Antillean Bullfinch), *Turdus plumbeus plumbeus* (Red-legged Thrust), *Vireo crassirostris crassirostris* (Thick-billed Vireo), and *Columbina passerina bahamensis* (Common Ground Dove) observed on the site. Endemic species and subspecies are approximately 32% of the avifauna observed on the proposed project site.



Photo 16: *Melopyrrha violacea violacea*
(Greater Antillean Bullfinch).



Photo 17: *Turdus plumbeus plumbeus*
(Red-legged Thrust).

3.2.3 Conservation Status

3.2.3.1 Protected Species

All species observed during the site assessment are protected under the Wild Birds Protection Act Chapter 249 (Statute Law of The Bahamas).

3.2.3.2 Near Threatened Species

One (1) species recorded, *Patagioenas leucocephala* (White-crowned Pigeon), is listed as a near-threatened species.

3.2.4 Additional Observations

Terrestrial ecosystems support a myriad of other fauna besides avifauna. These species depend on and aid in the overall health of the ecosystem. The proposed project site contains reptiles, amphibians, mollusks (gastropoda), and a myriad of arthropods (arachnids, insects, crustaceans, and hymenopterans) (See Table 7).

Table 7: Additional terrestrial fauna observed on the Brickell Square Development project site, Prospect Ridge, New Providence, The Bahamas

Family	Scientific Name	Common Name
Polychrotidae	<i>Anolis sagrei ordinatus</i>	Brown Anole

Family	Scientific Name	Common Name
Nymphalidae	<i>Agraulis vanilla insularis</i>	Gulf Fritillary
Polychrotidae	<i>Anolis distichus distichus</i>	Bark Anole
Araneidae	<i>Argiope argentata</i>	Silver Garden Spider
Papilionidae	<i>Battus devilliersii</i>	De Villers' Swallowtail
Elateridae	<i>Chalcolepidius sibermanni</i>	No Common Name
Tettigoniidae	<i>Conocephalus cinereus</i>	Caribbean Meadow Katydid
Cicadidea	<i>Diceroprocta bonhotei</i>	Bahamian Cicada
Nymphalidae	<i>Dryas iulia carteri</i>	Julia
Araneidae	<i>Eriophora ravilla</i>	Tropical Orb Weaver
Libellulidae	<i>Erythemis simplicicollis</i>	Eastern Pondhawk
Libellulidae	<i>Erythrodiplax umbrata</i>	Band-winged Dragonlet
Nymphalidae	<i>Euptoieta hegesia hegesia</i>	Mexican Fritillary
Pieridae	<i>Eurema दौरा</i>	Barred Yellow
Araneidae	<i>Gasteracantha cancriformis</i>	Crab Spider
Nymphalidae	<i>Heliconius charithonia ramsdeni</i>	Zebra Heliconian
Nymphalidae	<i>Junonia evarete zonalis</i>	Caribbean Buckeye
Libellulidae	<i>Libellula needhami</i>	Needham's Skimmer
Erebidae	<i>Melipotis famelica</i>	No Common Name
Papilionidae	<i>Papilio andraemon</i>	Bahamian Swallowtail
Pieridae	<i>Phoebis sennae sennae</i>	Cloudless Sulphur
Teiidae	<i>Pholidoscelis auberi thoracica</i>	Blue-tailed Lizard
Ranidae	<i>Rana grylio</i>	Pig Frog
Rhinotermitidae	<i>Reticulitermes sp.</i>	Termite

Family	Scientific Name	Common Name
Acrididae	<i>Schistocerca Americana</i>	American Bird Grasshopper
Araneidae	<i>Trichonephila clavipes</i>	Banana Spider



Photo 18: *Schistocerca Americana* (American Bird Grasshopper).



Photo 19: *Anolis distichus distichus* (Bark Anole).



Photo 20: *Trichonephila clavipes* (Banana Spider).



Photo 21: *Conocephalus cinereus* (Caribbean Meadow Katydid).

3.2.5 Habitat Utilization

Avifauna and other terrestrial fauna were observed utilizing the terrestrial habitats in a myriad of ways. Avifauna was observed perching, foraging, and feeding on the project site, but there was no active nesting observed. However, juvenile species of *Mimus polyglottos polyglottos* (Northern Mockingbird), *Chordeiles gundlachii* (Antillean Nighthawk), *Coereba flaveola bahamensis* (Bananaquit), and *Vireo crassirostris crassirostris* (Thick-billed Vireo) were observed in multiple areas across the site. In addition, the site contains floral species such as *Reynosa septentrionalis* (Darling Plum), *Erithalis fruticosa* (Black Torch), and *Smilax havanensis* (Chaney Briar) that contain flowers, fruits, and buds that can provide and attract food for avifauna. Furthermore, the site contains herbaceous weeds and vines that are in bloom, which provide niche habitats for a variety of other fauna. The site does not provide seasonal habitats utilized by wading birds (Inland Freshwater Wetland/Pond, Seasonal & Salt Ponds) or contain habitats for sea birds (isolated rocks, intertidal zone). Additional avian field studies repeated over a period are likely to record other species on the site; these species would utilize the site for perching, nesting, and feeding.



Photo 22: Juvenile *Coereba flaveola bahamensis* (Bananaquit) lacking fully matured beak.



Photo 23: Juvenile *Mimus polyglottos polyglottos* (Northern Mockingbird) lacking fully matured beak.

3.2.5.1 Interior Upland

Fauna was observed utilizing both vegetation types within the interior upland. Arachnids such as *Eriophora ravilla* (Tropical Orb Weaver), *Argiope argentata* (Silver Garden Spider), and *Trichonephila clavipes* (Banana Spider) were dominant within the dry broadleaf evergreen forest habitat. Additionally, avifauna such as *Turdus plumbeus plumbeus* (Red-legged Thrust) and *Coccyzus minor* (Mangrove Cuckoo) were observed foraging and feeding in both the overstory and understory of the forest. Whereas, the herbaceous weeds in the human-altered environment supported a myriad of arthropods, reptiles, and avifauna such as *Euptoieta hegesia hegesia* (Mexican Fritillary), *Eurema daira* (Barred Yellow), *Agraulis vanilla insularis* (Gulf Fritillary), *Junonia evarete zonalis* (Caribbean Buckeye), *Pholidoscelis auberi thoracica* (Blue-tailed Lizard), *Columbina passerina bahamensis* (Common-Ground Dove), and *Zenaida macroura* (Mourning Dove). Lastly, avifauna such as *Leucophaeus atricilla* (Laughing Gull) and *Plegadis falcinellus* (Glossy Ibis) were observed as flyovers, as they move further inland in search of food and other resources.



Photo 24: Species of Araneidae hatchlings observed within the human-altered environment on the project site.



Photo 25: *Euptoieta hegesia hegesia* (Mexican Fritillary) feeding on the nectar of from a flower of a *Bidens alba* (Shepherd's Needle).



Photo 26: *Eriophora ravilla* (Tropical Orb Weaver) with trapped food in web in the dry broadleaf evergreen forest.



Photo 27: *Pholidoscelis auberi thoracica* (Blue-tailed Lizard) foraging within the understory of the *Casuarina equisetifolia* Woodland Alliance.

4.0 Environmental Impacts and Mitigation Measures, Fox Cable Beach Development

4.1 Environmental Impacts

4.1.1 Native Vegetation

Native vegetation, inclusive of protected botanical species, will be impacted by this development due to the clearing that is needed for the establishment of the structures, associated features, and utilities.

4.1.2 Landscape and Soil

The physical landscape and soil will be impacted by this development due to the expected land clearing. Land clearing due to the removal of topsoil and plants can lead to flooding, which in turn can lead to soil erosion during weather events.

4.1.3 Avifauna and Other Terrestrial Fauna

All fauna recorded and any other species that may utilize the site currently or during other times of the year will be impacted by this development. This development will impact key resources necessary for the survival and reproductive success of species that depend on and

are interlinked with native non-fragmented forests. Additional impacts, such as noise pollution and water contamination, may also deter native fauna.

4.2 Mitigation Measures

4.2.1 Native Vegetation and Protected Species Management

Native vegetation, inclusive of protected species, is pivotal to maintaining and preserving biodiversity. These natural spaces play a pivotal role in providing food and protection for native fauna. Land clearing should be limited to the structural footprint and what is necessary for the utilities. In areas in which construction is unavoidable, to mitigate the loss, mature protected trees that fall outside the footprint of a structure or feature should be left in place. An additional recommended mitigation action is the harvesting of seedlings and saplings of pertinent protected species to later re-use in the landscape palette. Lastly, it is recommended that native species, inclusive of all protected species, be incorporated into the project landscape design. This should include species that can provide food for terrestrial fauna, such as *Coccoloba uvifera* (Sea Grape), *Ardisia escallonioides* (Marlberry), *Bursera simarouba* (Gum Elemi), *Leucothrinax morrisii* (Thatch Palm), and *Conocarpus erectus* (Buttonwood).

4.2.2 Invasive Species Management

There were five (5) invasive species observed on the project site: *Casuarina equisetifolia* (Australian Pine), *Delonix regia* (Poinciana), *Ipomoea indica* (Morning Glory), *Jasminum fluminense* (Jasmine Vine), *Leucaena leucocephala* (Jumbay), and *Scaevola taccada* (White-ink Berry). These plants should be completely removed, including the root system, and disposed of properly when appropriate. The invasive species should not be reused as mulch to reduce the spread of seeds and potential regrowth.

4.2.3 Flood and Soil Management

To manage flood risk, the project site should employ modern construction methods, inclusive of an elevated foundation, the utilization of permeable material for the parking lot, and drainage wells to alleviate flooding. Soil erosion can be negated by the placement of silt

fencing in sensitive areas during the construction phase and the reforestation of cleared areas in the aftermath of the construction phase.

4.2.4 Wildlife Management

Fauna that has adapted to or has become accustomed to Human-Altered Environments, such as *Columbina passerina bahamensis* (Common Ground Dove), will return after the construction phase. However, species such as *Vireo crassirostris crassirostris* (Thick-billed Vireo) that prefer native forested habitats may seek those habitats elsewhere. Green corridors and hedges containing native botanical species should be included in the landscape design to aid in the re-establishment of native fauna on the site. A winter avian survey (September-March) should be conducted to determine whether other pertinent avifauna utilized the proposed site during that period.

4.2.5 Waste/Trash Management

All human waste and garbage should be removed from the project site and disposed of in a landfill to negate soil and water contamination.

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Appendices

Appendix A: List of Structures-Photos and GPS Coordinates



Structure 1: Remnant Warehouse

GPS: 25°03'34.89"N 77°23'23.81"W



Structure 2: Remnant Structure (Possibly originally apart of old hospital complex).

GPS: 25°03'31.69"N 77°23'40.62"W



Structure 3: Remnant Structure
(Unfinished House).

GPS: 25°03'36.20"N 77°23'39.65"W



Structure 4: Slave Wall

GPS: 25°03'30.23"N 77° 23'35.63"W



Structure 5: Derelict Vehicle

GPS: 25°03'35.90"N 77° 23'33.17"W



Structure 6: Derelict Vehicle

GPS: 25°03'33.04"N 77° 23'33.71"W

Appendix B: List of Prominent Flora-Photos & GPS



Flora: Wild Tamarind

GPS: 25°03'34.73"N 77° 23'45.06"W

Appendix C: Additional Photos of Avifauna and Other Terrestrial Fauna



Photo 28: *Plegadis falcinellus* (Glossy Ibis).



Photo 29: *Zenaida macroura* (Mourning Dove).



Photo 30: *Crotophaga ani* (Smooth-billed Ani).



Photo 31: *Vireo crassirostris crassirostris* (Thick-billed Vireo).



Photo 32: *Diceroprocta bonhotei* (Bahamian Cicada).



Photo 33: *Erythrodiplax umbrata* (Band-winged Dragonlet)



Photo 34: *Libellula needhami* (Needham's Skipper).



Photo 35: *Erythemis simplicicollis* (Eastern Pondhawk).



Photo 36: *Melipotis famelica* (No Common Name).



Photo 37: *Argiope argentata* (Silver Garden Spider).