



# **Environmental Impact Assessment (Revision V)**

## **Nassau Cruise Port – New Providence, Bahamas**



**Submitted by:**

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**To:**

The BEST Commission  
Charlotte House, 1<sup>st</sup> Floor  
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**On behalf of:**

Nassau Cruise Port



21 July 2020



## Contents

Executive Summary.....	1
1. Project Background.....	2
1.1. Project Details.....	2
1.2. Project Proponents.....	3
1.3. Site Selection process.....	3
1.3.1. Description of why the site was selected.....	3
1.3.2. Discussion of availability of land and water resources, etc.....	4
1.4. Size and scope of the project.....	7
1.5. Project's relationship with others.....	11
1.6. Proposed total budget and the status of financing for the project.....	11
1.7. Project Schedule.....	11
1.7.1. Proposed start and completion dates for the construction process.....	11
1.7.2. Expected life of the project and its components.....	11
2. Legal and Administrative Framework.....	15
2.1. Relevant national and local laws, regulations, and international conventions.....	15
2.2. Internationally recognized regulations and industry codes.....	20
2.3. Project's safety, health, & environmental management design philosophy.....	22
2.4. Project's port & vessel security management plan, & ISPS code compliance strategy.....	23
3. Existing Environment.....	24
3.1. Definition of the extent of the project on land and sea.....	24
3.2. Description of the data acquisition and analysis process.....	24
3.2.1. Baseline comprehensive monitoring program.....	24
3.2.2. Background/preliminary studies conducted including public participation.....	24
3.2.3. Data quality control strategy.....	35
3.3. Geographical & physicochemical characteristics in project's area of influence.....	35
3.3.1. Geographical location.....	35
3.3.2. Current land use in the project's area of influence.....	39
3.3.3. Meteorology and climatic conditions.....	42

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3.3.4.	Existing drainage patterns .....	44
3.3.5.	Ground water resources .....	44
3.3.6.	Marine water resources .....	45
3.3.7.	Ambient air quality.....	55
3.3.8.	Ambient noise levels .....	57
3.4.	Biological resources characteristics of the project’s area of influence .....	61
3.4.1.	Aquatic/marine biological resources .....	61
3.4.2.	Terrestrial biological resources.....	68
3.5.	Socio-economic & cultural characteristics of the project’s area of influence .....	73
3.5.1.	Demographic patterns and occupations.....	73
3.5.2.	Economic activities and employment .....	76
3.5.3.	Characterization of tourism activities .....	78
3.5.4.	Regional infrastructure .....	80
3.5.5.	Sites of historical and cultural significance .....	83
4.	Proposed Project Facilities, Infrastructure, & Operations .....	86
4.1.	Description of facilities, infrastructure, and operations.....	86
4.1.1.	Port and harbor facilities layout .....	86
4.1.2.	Materials mass balance.....	95
4.1.3.	Water and wastewater mass balance.....	95
4.1.4.	Land clearing methodologies .....	95
4.1.5.	Dredging plans, construction phase and operational phase .....	95
4.1.6.	Seasonality of operations.....	97
4.1.7.	Support shops and services .....	97
4.1.8.	Fueling facilities and fuels management .....	97
4.1.9.	Air pollution prevention and control systems and procedures .....	97
4.1.10.	Odor control.....	97
4.1.11.	Noise control.....	97
4.1.12.	Waste oil and solvent management facilities and operations.....	97
4.1.13.	Wash water containment, collection, treatment, disposal facilities and operations.....	97
4.1.14.	Solid waste management.....	98
4.1.15.	Hazardous materials, including biocides and hazardous waste management plan .....	98
4.1.16.	Coordination with Bahamas Government entities, such as law enforcement .....	98
4.1.17.	Port, facilities, and vessel security management plans .....	98

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4.2.	Complete set of preliminary engineering and architectural plans. ....	98
4.3.	Utilities and basic infrastructure.....	99
4.3.1.	Potable water system .....	99
4.3.2.	Process water system .....	99
4.3.3.	Sewerage collection, treatment, and disposal system .....	99
4.3.4.	Liquid waste collection, containment, treatment, and disposal system .....	99
4.3.5.	Storm water management.....	99
4.3.6.	Solid waste collection, containment, treatment, and disposal system .....	99
4.3.7.	Electrical system.....	99
4.3.8.	Transportation .....	99
4.3.9.	Security .....	99
4.3.10.	Housing .....	100
4.3.11.	Buildings and other support structures designed in accordance with criteria that ensure their structural integrity.....	100
4.4.	Sustainability.....	100
4.4.1.	Consideration of the carrying capacity of the site in the financial feasibility analysis .....	100
4.4.2.	Project competition with other demands, existing and planned .....	101
4.4.3.	Potable and process water conservation considerations .....	101
4.4.4.	Strategy to monitor and prevent impacts on biological resources .....	101
4.4.5.	Process pollution prevention strategies, waste reuse and recycling considerations .....	101
4.4.6.	Potable conservation considerations.....	101
4.4.7.	Energy efficiency considerations (fuels and electricity) .....	101
4.4.8.	Vulnerability assessment for port and industrial operations; consider natural, human, and technological threats .....	101
4.4.9.	Worker health & safety program particularly and waste management operations. ....	101
5.	Identification and Assessment of Potential Environmental Impacts.....	103
5.1.	Screening/scoping process to identify & assess potential environmental impacts. ....	103
5.2.	Impact identification and assessment methodology.....	103
5.2.1.	Assessment of potential environmental impacts .....	104
5.3.	Public/community participation activities conducted.....	106
5.4.	Potential environmental impact matrices for various phases of the project.....	106
5.4.1.	Early development activities.....	106
5.4.2.	Development/construction activities .....	106



5.4.3.	Operation/maintenance activities .....	106
5.5.	Description of positive potential environmental impacts of the proposed project. ....	108
5.6.	Description of negative potential environmental impacts .....	109
5.6.1.	Land clearing or reclamation: .....	109
5.6.2.	Potential impact on physical resources .....	109
5.6.3.	Potential impacts on socio-economic and cultural resources .....	110
6.	Impact Mitigation Measures.....	112
6.1.	Description of mitigation measures.....	112
6.1.1.	Measures developed in response to the potential environmental impacts.....	112
6.1.2.	Measures developed in response to the potential socioeconomic impacts .....	113
7.	Conclusion.....	114
Appendix A: Nassau Cruise Port Traffic Impact Assessment .....		115
Appendix B: Demolition Hazards Assessment .....		116
Appendix C: Port Warehouse Demolition Environmental Management Plan.....		117
Appendix D: Utilities Maps.....		118
Appendix E: GPH Port and Terminal Facilities Security Code - Table of Contents.....		119
Appendix F: Bathymetric Survey.....		120
Appendix G: Currents in Nassau Harbour Report .....		121
Appendix H: Wave Climate and Dredging Impacts Report .....		122
Appendix I: Geotechnical Exploration Report.....		123
Appendix J: Topographic Survey .....		124
Appendix K: Noise Protection Report .....		125
Appendix L: Stakeholder Meeting Schedule .....		126
Appendix M: Nassau Cruise Port Maintenance Plan Outline .....		127
Appendix N: Basis of Design Report.....		128
Appendix O: Nassau Cruise Port Health & Safety and Environmental Manual .....		129
Appendix P: Flushing Study.....		130

Document Name	Date Submitted
EIA Submission I	December 4, 2019
BEST Response Letter to EIA Submission I/General	January 23, 2020
BEST Response Letter to EIA Submission I/Appendix M	March 24, 2020
CCS Response Letter to BEST	April 16, 2020
EIA Submission II	April 16, 2020
EIA Submission III	June 3, 2020
EIA Submission IV	June 29, 2020
EIA Submission V	July 21, 2020

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## Executive Summary

Nassau Cruise Port Ltd. (NCP) proposes to redevelop and update the current cruise terminal in Nassau Harbour and the surrounding areas of Woodes Rodgers Walk. The redevelopment plan not only includes an expansion of the Harbour, but also the development of several new attractions for both locals and tourists that incorporates the history of the city and modern architecture. New features include a waterfront park, an amphitheater, retail shops, restaurants, a Junkanoo museum, and an impact theatre. The scope of the project includes both marine and terrestrial components. This report presents the results of the Environment Impact Assessment (EIA) for the Harbour's redevelopment and the surrounding terrestrial areas. Preliminary studies supplementing the EIA process were conducted, the results of which were used to help develop this report.

There are limited anticipated negative environmental impacts during the construction and operation of the new port. With the appropriate management applied, these impacts should be sufficiently mitigated. During operation NCP will work towards the Eco-Management and Audit Scheme (EMAS) to reduce and eliminate negative environmental impacts and will work closely with the relevant government agencies to help ensure compliance with national environmental standards.

Initial mitigation measures will involve multiple aspects but will be adapted as construction progresses and NCP transitions to full operations. For example, during construction, noise will be mitigated for construction workers and surrounding pedestrians. Expected turbidity associated with dredging and land reclamation activities will be mitigated with the appropriate turbidity barriers.

Focused invasive species removal will begin in the early phases of construction. Through landscaping maintenance, invasive species should not return to the site. Invasive species will be replaced in the landscaping with native plants. Cruise operators will be notified effective January 2020 that The Bahamas banned the importation of single use plastics and Styrofoam materials. As a result, NCP will become a designated single use plastic and Styrofoam free zone. Information about the significance of the ban will be made available to visitors disembarking from their various vessels. Solid waste collection sites will be set back from the coast and docks to prevent transfer of waste to the marine area.

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# 1. Project Background

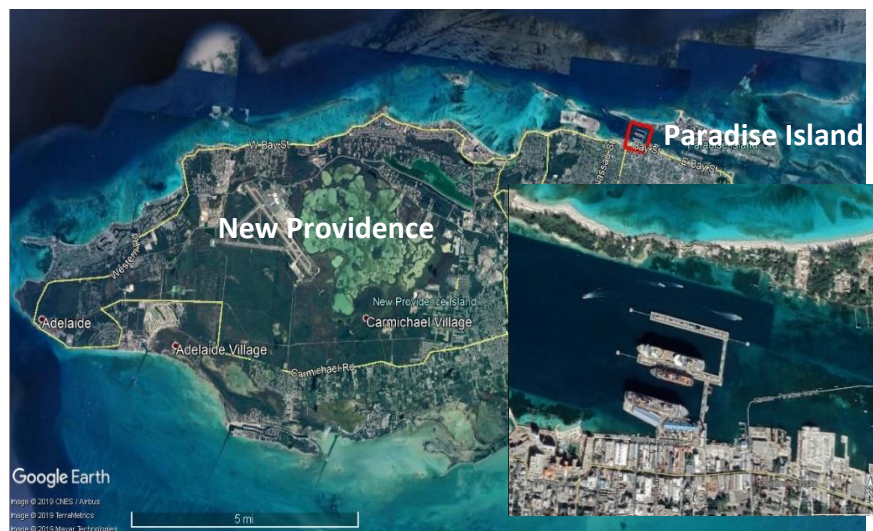
## 1.1. Project Details

The Commonwealth of The Bahamas is a limestone based archipelago with over 700 islands and cays located in the North Atlantic Ocean. The country is a renowned tourist destination with its shallow turquoise waters and warm tropical environment. According to the Ministry of Tourism, in 2018 The Bahamas welcomed almost 7 million visitors to its shores. Tourism, the main economic driver for the country, provides 60% of the national GDP and employs about 50% of the workforce<sup>1</sup>. Nassau, the country's capital city, is located on New Providence island and has historically received the most visitors in the archipelago. Many ports within the Caribbean are modifying to accommodate the larger cruise ships being developed by cruise operators. To maintain its position as a top cruise ship destination, the current cruise ship terminal must be modified to accommodate larger vessels.

[Nassau Cruise Port Ltd.](#) (NCP) proposes to reinvigorate the current tourism infrastructure in Nassau by boosting the cruise ship arrivals and drawing visitors from the vessels into Nassau. The current cruise terminal functions as an official port of entry and is located near the western entrance of Nassau Harbour (the Harbour), a naturally formed harbor between New Providence and Paradise Island (Figure 1). The latitude and longitude at a central location in the Nassau Cruise Port site is 25°4'55.48"N and 77°20'40.19"W. The current project focuses on expanding the capacity of the Harbour, which aligns with several prior efforts of the Government of The Bahamas to modernize the cruise ship terminal. In addition to extending and repairing Piers to accommodate larger cruise ships, NCP will transform the terminal to accommodate the increased arrivals and enhance the Woodes Rodgers Walk by constructing a state of the art retail space. Additional elements of the project include the development of an amphitheater, impact theater, and a Junkanoo museum.

NCP anticipates “the project will offer an iconic design respecting and reflecting the richness and uniqueness of the traditional Bahamian culture. The Project will create recreational, entertainment, shopping and food & beverages spaces for Bahamians, tourists and other visitors.”

**Figure 1.** Location of Nassau Harbour (Google Earth, 2019).



<sup>1</sup> <https://www.worldatlas.com/articles/the-richest-caribbean-countries.html>

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## 1.2. Project Proponents

The consortium consists of three entities:

- (i) Global Ports Holding Plc. (49%): the world's largest cruise port operator with an established presence in the Caribbean, Mediterranean, Asia-Pacific regions, including extensive commercial port operations in Turkey and Montenegro.

Global Ports Holding (GPH) was established in 2004 as an international port operator with a diversified portfolio of cruise and commercial ports. As an independent cruise port operator, the group holds a unique position in the cruise port landscape, positioning itself as the world's leading cruise port brand, with an integrated platform of cruise ports serving cruise liners, ferries, yachts and mega-yachts. GPH operates 17 ports in 9 countries and continues to grow steadily. GPH provides services for 8.4 million passengers reaching a market share of 24% in the Mediterranean annually. The group also offers commercial port operations which specialize in container, bulk and general cargo handling.

A portfolio of award-winning ports and terminals allows GPH to transfer best practices to its subsidiaries. With a strong focus on operational excellence, enhanced security practices and customer-oriented services, GPH aims to contribute to the development of the cruise industry.

- (ii) Bahamas Investment Fund (49%): As part of the financing strategy and to increase the Bahamian participation, Bahamians will have the opportunity to invest in the Bahamas Investment Fund (BIF or the Fund). The Fund administrator will be Colina Financial Advisors.
- (iii) YES Foundation (2%): a charitable organization that will be established to support Youth, Sports, and Education for Bahamian youth.

## 1.3. Site Selection process

### 1.3.1. Description of why the site was selected

The cruise terminal in Nassau Harbour is an existing destination for many cruise visitors. It is a culturally and economically important site that both visitors and locals enjoy. Without modification, the cruise terminal will not be able to support the expanding cruise ship industry because it cannot accommodate the larger cruise ships currently produced by cruise operators. Additionally, highly visible parts of the current terminal are dilapidated and an eyesore as evidenced in Figure 2. As a result, the current proposed project includes marine and terrestrial components.

**Figure 2.** Dilapidated Cruise Terminal and Tower located on Prince George Wharf.



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The combined marine and terrestrial effort of the proposed redevelopment by NCP aims to attract visitors to the country and into downtown Nassau to provide unique opportunities for both locals and visitors. The marine component proposes to expand and modernize the cruise terminal in Nassau Harbour. This expansion will increase the capacity of the Harbor and the terminal. The terrestrial component of the project proposes to support the national effort to revitalize the city of Nassau by merging colonial old world architecture with contemporary and environmentally friendly technology. The retail space and amphitheater will be designed to draw cruise ship visitors into downtown Nassau.

**Marine Component** – Several iterations were considered for the design of Nassau Harbour. Global Port Holding representatives met with various stakeholders to present the options. The final plan was approved by stakeholders for the three main reasons described below.

1. Extending Pier 1 to add another berth would decrease the size of the turning basin in the western part of the Harbour.
2. Additional dredging would be required to accommodate a ship on the western side of the Harbour.
3. Extending Pier 3 would not reduce the aesthetic value of The Pointe development adjacent to Nassau Harbour.

**Terrestrial Component** – Additional parking will be required near the Nassau Cruise Port because the terrestrial component of the project includes developing attractions for both locals and visitors and expanding the capacity of the Harbour. The Traffic Impact Study (TIS) by the Caribbean Civil Group Ltd. discusses the increased parking demand (Appendix A). The cruise terminal will eventually be demolished and replaced with a modern hurricane proof terminal. The proposed timeframe for demolition of Festival Place is August 2021-November 2021. The Port Warehouse will be demolished first. To attract visitors into the newly developed retail space, the streets running north from Woodes Rodgers Walk to main Bay Street will be landscaped.

### 1.3.2. Discussion of availability of land and water resources, etc.

#### 1.3.2.1. Requirements for solid and liquid waste disposal;

The current standing structures are connected to the Water and Sewerage Corporation (WSC) network. Nassau Cruise Port will remain connected to the network during construction and operation.

During demolition contractors will be aware of the utilities infrastructure and will make every effort to avoid disrupting water and power supply to the surrounding buildings that will remain in operation during demolition. A Demolition Hazard Assessment was conducted by CCS to assist with identification of hazardous material in the Port Warehouse to be demolished. Appendix B shows the Demolition Hazard Assessment. An Environmental Management Plan (EMP) was developed by Bahamas Marine for the Port Warehouse building. The Demolition EMP is shown in Appendix C. A map showing the location of current utilities in the project area of impact was developed by Atametrics Ltd. and was consulted during the development of the Demolition EMP. The utilities map is located in Appendix D. Solid and liquid waste disposal requirements during demolition, construction, and operation will be guided by the Department of Environmental Health Services (DEHS), Department of Environmental Planning and Protection (DEPP), and the Demolition EMP.

The best volume estimate of demolished material from the Port Warehouse was determined by Atametrics Ltd. to be 21,900 cubic feet (ca. 620 m<sup>3</sup>). This assumes that there are no internal structures, and accounts for an estimate of the exterior walls and roof combined. Based on the size of the containers with petroleum product identified in the Port Warehouse during the Demolition Hazard Assessment, total quantities of petroleum product are estimated to be 600 liters. An Asbestos Survey Report was produced by Island Site Development Ltd. and Bahamas Marine Construction Co. Ltd. It shows Roof Panels contained 25% Chrysotile, a type of asbestos commonly used in Galbestos roof coatings. The coatings on the roof beams “paint” was shown to be non-asbestos. A hazardous waste management plan will be established per procedure only as NCP does not anticipate receiving any hazardous materials at the Port.

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*1.3.2.2. Transportation and energy infrastructure availability;*

Because the proposed project is a redevelopment of the Nassau Harbour and standing structures, energy infrastructure currently exists in the project's area of impact. Festival Place Welcome Center is connected to Bahamas Power and Light Company Ltd. (BPL) and a Photovoltaic System located on the eastern portion of Pier 2. BPL will remain the main power supply during construction and operation. NCP aims to install additional Photovoltaic System to reduce its energy consumption while in operation. See section [4.3 Utilities and basic infrastructure](#).

*1.3.2.3. Future project expansion;*

Nassau Harbour has always been a dynamic environment having undergone several modifications to help maintain its position as a top cruise destination. While there are no expansions planned beyond the current conceptual plan, Nassau Cruise Port will remain in contact with the Government of The Bahamas during operations to help ensure the cruise ship terminal continues to meet national and international demands.

*1.3.2.4. Loss of natural ecosystems, including productive habitats (e.g., mangroves);*

There will be limited loss of natural ecosystems during the redevelopment of the Nassau Harbour and Woodes Rodgers Walk. During terrestrial assessments and marine surveys natural mangrove habitats were not observed. Mangroves were also not documented in the 2008/2009 Nassau Harbour Port Improvement Project: Environmental Impact Assessment. Section 5. [Identification and Assessment of Potential Environmental Impacts](#) describes the impact of the redevelopment of the Harbour and its associated sites.

*1.3.2.5. Loss of basic natural framework;*

The marine environment, previously dredged to accommodate larger cargo and passenger ships, has altered the basic natural framework in the project's area of impact prior to the current proposal for the redevelopment of Nassau Harbour. The current proposed development includes dredging along a previously dredged channel near Pier 3. Section 5 discusses these impacts in detail. Similarly, the primary vegetation was removed in the project's terrestrial areas of impact prior to the current project. The terrestrial impacts will be focused on the demolition of Port Warehouse located on Prince George Wharf.

*1.3.2.6. Impact on listed species and their habitat;*

The species observed during the site assessments are listed in section [3.4 Description of the biological resources characteristics of the project's area of influence](#). Species confined to the benthos would be primarily impacted by dredging and land reclamation works as these project activities will significantly alter that area.

*1.3.2.7. Population displacement;*

The project's area of impact lies within the Central Business District (CBD) in Nassau. As a result, some businesses may be impacted during construction but not displaced, while others will be displaced. The impact on businesses were classified as direct or indirect based on displacement. Businesses that will be displaced will be directly impacted. Businesses that will not be displaced, but will experience some negative impacts associated with the redevelopment of the Harbour, will be indirectly impacted. Indirect impacts could include the temporary decrease in customers because pedestrians and vehicle traffic will be redirected during construction. Communications through stakeholder engagement meetings are ongoing with these stakeholders to help mitigate the negative impacts of the redevelopment. Both direct and indirect impacts are expected to be temporary because these impacts are associated with construction and demolition. Once the redeveloped Port is fully operational, the relocated businesses should also be fully operational as well. Mitigation for these businesses will be described in the EMP and will be developed in accordance with the traffic impact study.

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Displaced businesses or businesses that will be directly impacted by displacement include the following:

- Twenty-four (24) tour boat operators and twenty-nine (29) ferry boat operators currently using the eastern and western berth areas in the Harbour will be temporarily displaced during the expansion of the connecting bridge between Piers 1 and 2.
- Twenty-two (22) surrey operators and taxi drivers lining the Festival Place boundary fence.
- Sixty-three (63) vendors within Festival Place boundary including food and beverage vendors, scooter operators, taxi operators and tour guides.

Tour Bus operators will not be displaced during the construction of the Port. NCP has met with the Ministry of Tourism to discuss the need for tour bus operators to implement a better call up system.

#### *1.3.2.8. Nuisance buffers;*

There are no known residences in the project's area of impact. Nuisance buffers will focus on mitigating impacts to businesses in the CBD and will be described in detail in the EMP. The EMP will include methods to address noise, dust and debris, and lighting during demolition, construction, and operation. For example, construction will not take place during peak business hours or at night, where possible, to decrease the impact of sound and traffic congestion on businesses in the CBD. Site lights will be used when and if construction will take place during the night.

#### *1.3.2.9. Hurricane and flooding vulnerability;*

The project site is susceptible to impacts from hurricanes because it is located in a coastal zone and appears to be vulnerable to flooding due to its low-lying nature. Figure 3 is adapted from a map produced by Atametrics Ltd. showing areas within the project site that are most likely to experience initial flood affects in periods of heavy rain due to their elevations and locations. The full map was reviewed in conjunction with the topographic survey before final design decisions were made. It can be found on page 3 in Appendix D. See [Section 4.4.8](#) for flood vulnerability.

**Figure 3.** Blue spot areas are most likely to be impacted by cloudbursts in the project 's area of influence.



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#### 1.4. Size and scope of the project

The scope of the project includes both marine and terrestrial components. The marine component will be bounded by the seabed lease of 80.08 acres adjacent to Woodes Rodgers Walk. Figure 4 shows the marine redevelopment plan for the marine component of the project. The terrestrial component will include Prince George Wharf and Pier 1 which is 13.11 acres. The marine component includes 6 cruise ship berthing piers in Nassau Harbour. There will be approximately 5,000 lineal feet of pier improvements and or new construction. The terrestrial component includes approximately 9 acres (400,000 Square Feet) of upland improvements proposed as shown in the Terrestrial Site Plan in Figure 5. The Retail/Commercial and Office will be ±100,000 square feet (0.93 ha), the planned capacity of the Amphitheater is 3,000 spectators, and the anticipated total square footage of the landscaped and hardscaped open spaces is ±300,000 square feet (2.79 ha).

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Figure 4A. Nassau Harbour redevelopment plan for the marine work.

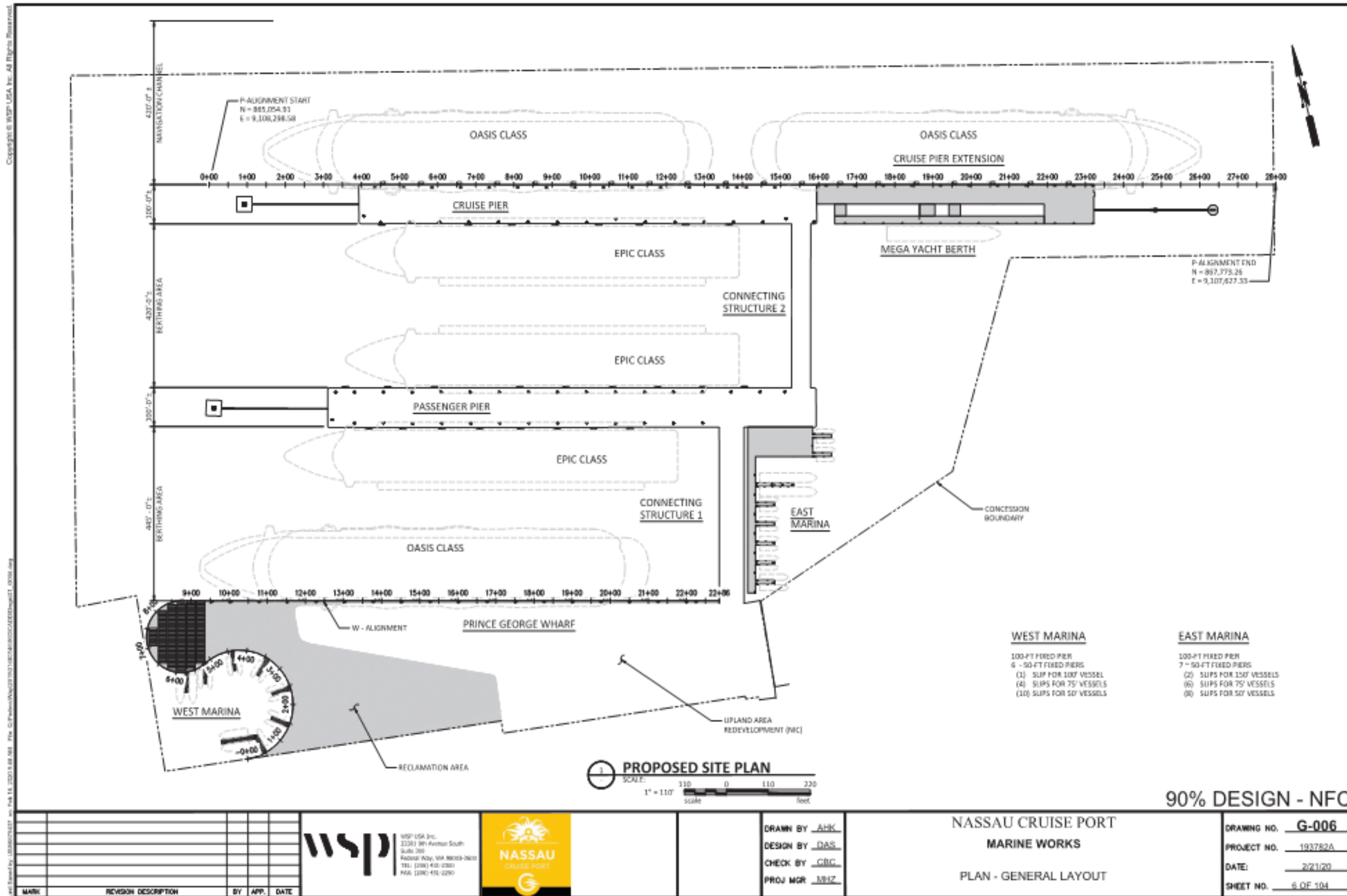
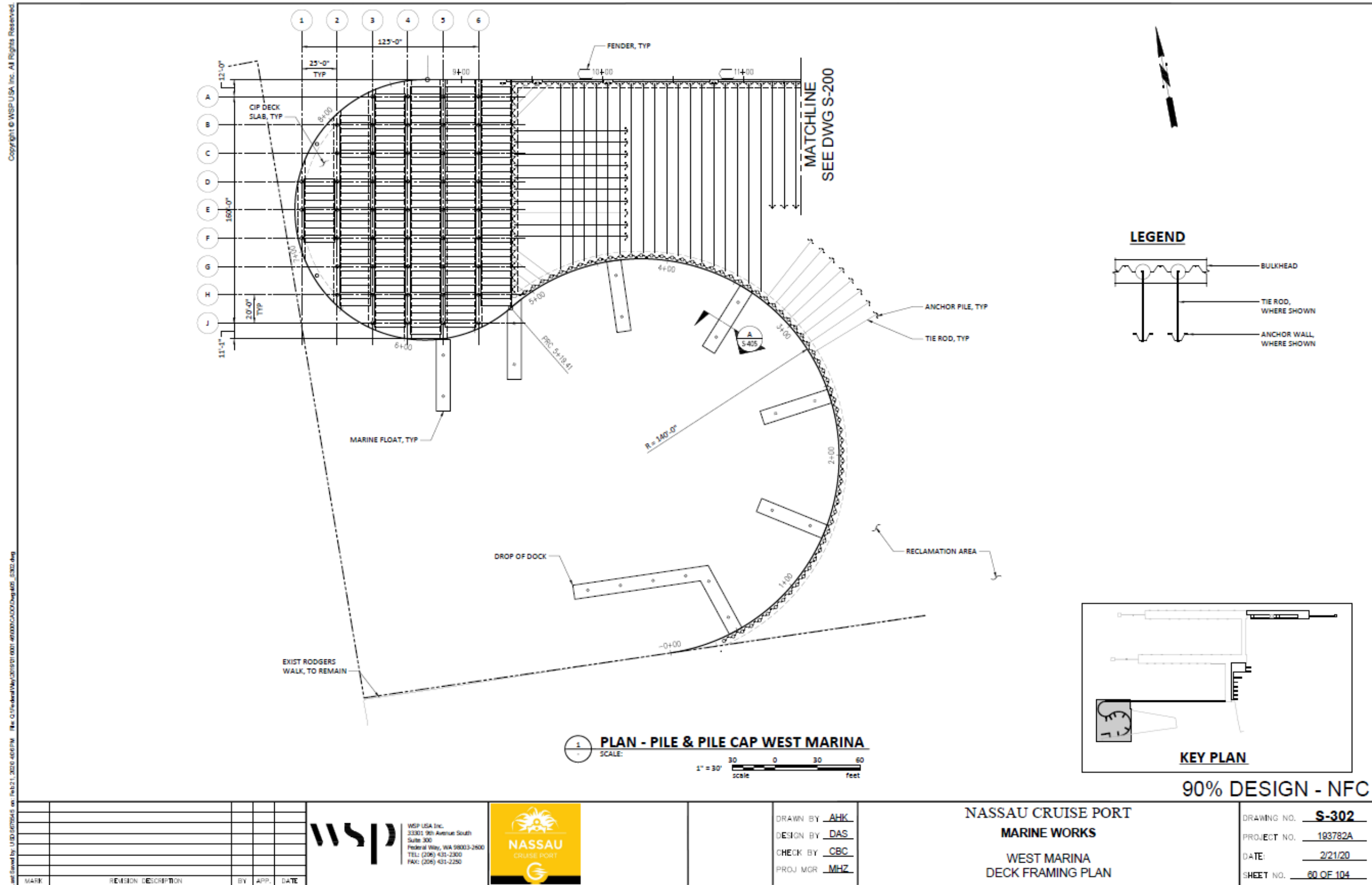


Figure 4B. Pile & Pile Cap West Marina



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Figure 5. Terrestrial Site Master Plan



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## 1.5. Project's relationship with others

GPH is not working on other projects in the area during this time.

## 1.6. Proposed total budget and the status of financing for the project

Section [1.2 Project Proponents](#) describes the shareholding structure of NCP. The project's total budget is two hundred and fifty million US dollars (USD 250,000,000) plus interest to be incurred under the financing terms. Both GPH and BIF will participate in the debt and/or equity financing of the Project on a 50% basis respectively.

The Bahamas Investment Fund (BIF) is incorporated as a company under the provisions of the Companies Act, 1992 on 6 December 2018. BIF will apply for a standard investment fund license from the Securities Commission of The Bahamas. BIF will initiate a public offering to Bahamians and Bahamian residents, two classes of Investor Shares (namely, Class A and Class B) on a "bottom-up" basis design to achieve the widest Bahamian public participation by approximately 20,000 investors.

BIF will be an equity investor class and a debt investor class. Class A Investor Shares will represent an investment in equity and the Class B Investor Shares will represent an investment in debt. The minimum investment for the Class A Investor Shares will be \$1,000 and for the Class B Investor shares the minimum investment will be \$50,000. The Company already initiated the bridge and long-term financing discussions with local and international lenders.

## 1.7. Project Schedule

### 1.7.1. Proposed start and completion dates for the construction process

Construction will begin once the EIA and Environmental Management Plan (EMP) approvals are received from the Department of Environmental Planning and Protection. Subsequent approvals from other government agencies such as a Demolition Permit from the Ministry of Works will also be secured prior to the start of the construction.

Marine debris identified during the benthic surveys will be removed prior to dredging and the land reclamation activities. The proposed start date for marine debris removal is June 2020. Debris will be removed and disposed of at the designated solid waste disposal site. Solid waste will be removed daily from the site by a contracted waste management company to the dump site. The solid waste management during construction and operation will be described in detail in the EMP

The commissioning date for the Arrivals building is January 2022 and the anticipated date of completion for the full project is April 2022.

### 1.7.2. Expected life of the project and its components

The cruise terminal and port area will be in operation under the management of NCP for 25 years after the project construction is complete. The company may request an extension of 15 years after the initial 25-year contract is completed. The project's schedule is summarized in Table 1 and Table 2. The drafting, submission and approval of the EMP commenced in May 2020 and is slated to be completed, submitted and approved by August 2020.

**Note:** The proposed timeframe for demolition of Festival Place is August 2021 - November 2021. Demolition of the Port Warehouse is described in the Demolition Management Plan.

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Table 1. Nassau Cruise Port Redevelopment Project Schedule.

Task Name	Duration	Start	Finish
<b>NASSAU CRUISE TERMINAL PROJECT</b>	<b>752 days</b>	<b>07 Oct '19</b>	<b>01 Mar '22</b>
<b>MILESTONES</b>	<b>752 days</b>	<b>07 Oct '19</b>	<b>01 Mar '22</b>
Coordination Meeting (Base date for the rest of the Project)	0 days	07 Oct '19	07 Oct '19
EIA Submission	0 days	23 Dec '19	23 Dec '19
Contract Finalization with CONTRACTOR	0 days	01 Apr '20	01 Apr '20
Handover of Area (Warehouse Building Demolished by Client)	0 days	01 Apr '20	01 Apr '20
Submission of Performance and Advance Payment Security	0 days	17 Apr '20	17 Apr '20
Advance Payment Client	0 days	04 May '20	04 May '20
EIA Approval - by GOBH	0 days	30 Apr '20	30 Apr '20
EMP Approval for MARINE - by GoBH	0 days	22 Aug '20	22 Aug '20
Dredging Permit Approval - by GOBH	0 days	21 Jul '20	21 Jul '20
Construction Permit (MARINE) Approval - by GOBH	0 days	04 Jul '20	04 Jul '20
Construction Permit (LANDSIDE) Approval - by GOBH	0 days	01 Jan '21	01 Jan '21
Notice to Proceed for PGW Part 1 by Client	0 days	04 Jul '20	04 Jul '20
Notice to Proceed (NTP) Marine Works	0 days	22 Aug '20	22 Aug '20
Notice to Proceed (NTP) Land Side Works	0 days	01 Jan '21	01 Jan '21
Marine Works Completion	0 days	15 Feb '22	15 Feb '22
Landside Completion	0 days	01 Mar '22	01 Mar '22
<b>PRELIMINARIES</b>	<b>389 days</b>	<b>07 Oct '19</b>	<b>01 Jan '21</b>
Geotechnical Investigation inc Report - by CCS	56 days	07 Oct '19	10 Dec '19
Topographic Survey - by CCS	28 days	07 Oct '19	07 Nov '19
Preparation of EIA documentation	56 days	19 Oct '19	23 Dec '19
Approval of EIA by Bahamas Government	111 days	24 Dec '19	30 Apr '20
<b>Marine Works Design and Permitting</b>	<b>276 days</b>	<b>07 Oct '19</b>	<b>22 Aug '20</b>
30% Design Marine Works - by WSP	60 days	07 Oct '19	14 Dec '19
60% Design Marine Works - by WSP	37 days	16 Dec '19	27 Jan '20
90% Design Marine Works - by WSP	23 days	28 Jan '20	22 Feb '20
100% Final Design Marine Works - by WSP	30 days	24 Feb '20	28 Mar '20
Marine Works Cost and Schedule Finalization as per 90% - by COI	11 days	24 Feb '20	06 Mar '20
Contract Negotiation and Finalization (CLIENT-CONTRACTOR) for	22 days	07 Mar '20	01 Apr '20
Preparation of EMP Documentation for MARINE	56 days	01 May '20	04 Jul '20
Approval of EMP by Bahamas Government for MARINE	42 days	06 Jul '20	22 Aug '20
Construction Permit Application and Review for MARINE	56 days	01 May '20	04 Jul '20
Dredging Permit Application and Review	70 days	01 May '20	21 Jul '20
<b>Landside Works Design and Permitting</b>	<b>289 days</b>	<b>31 Jan '20</b>	<b>01 Jan '21</b>
Schematic Design - Landside Works - by B&A	38 days	31 Jan '20	14 Mar '20
Schematic Design - Landside Works CLIENT Review and Approval	28 days	16 Mar '20	16 Apr '20
Design Development - Landside Works - by B&A	39 days	17 Apr '20	01 Jun '20
Design Development - Landside Works CLIENT Review and Appro	30 days	02 Jun '20	06 Jul '20
Construction Documents (Foundations) - Completion and Permit	109 days	07 Jul '20	10 Nov '20
Construction Documents (Structure) - Completion and Permitting	154 days	07 Jul '20	01 Jan '21
Construction Documents (Interiors) - Completion and Permitting	154 days	07 Jul '20	01 Jan '21
Landside Works Cost&Schedule Fin. as D.Development - by CONT	30 days	07 Jul '20	10 Aug '20
Contract Addendum Finalization (CLIENT-CONTRACTOR) for LAN	14 days	11 Aug '20	26 Aug '20
Preparation of EMP Documentation for Landside Works	42 days	11 Aug '20	28 Sep '20
Approval of EMP by Bahamas Government for Landside Works	42 days	29 Sep '20	16 Nov '20
Construction Permit Application and Review for Landside Works	56 days	29 Oct '20	01 Jan '21
<b>PROCUREMENT &amp; DELIVERY</b>	<b>556 days</b>	<b>02 Apr '20</b>	<b>10 Jan '22</b>
<b>MARINE WORKS</b>	<b>238 days</b>	<b>02 Apr '20</b>	<b>04 Jan '21</b>
Contract Neg & PO Placement with Vendors	15 days	02 Apr '20	18 Apr '20
Tubular Piles Manufacturing	90 days	05 May '20	17 Aug '20
Tubular Piles Delivery	52 days	18 Aug '20	16 Oct '20
Sheet Piles Piles Manufacturing	90 days	05 May '20	17 Aug '20
Sheet Piles Delivery	52 days	18 Aug '20	16 Oct '20
Other Miscellaneous items (fender, bollard etc.)	210 days	05 May '20	04 Jan '21
<b>LAND SIDE WORKS</b>	<b>320 days</b>	<b>02 Jan '21</b>	<b>10 Jan '22</b>
Materials for Buildings & Landscaping & Utilities	320 days	02 Jan '21	10 Jan '22
<b>MOBILIZATION</b>	<b>75 days</b>	<b>02 Apr '20</b>	<b>27 Jun '20</b>
Mobilization of Pioneer Team & Equipment	30 days	02 Apr '20	06 May '20
Temporary Site Offices and Facilities	75 days	02 Apr '20	27 Jun '20
<b>CONSTRUCTION</b>	<b>518 days</b>	<b>06 Jul '20</b>	<b>01 Mar '22</b>
<b>MARINE WORKS</b>	<b>506 days</b>	<b>06 Jul '20</b>	<b>15 Feb '22</b>
<b>Dredging and Reclamation</b>	<b>298 days</b>	<b>05 Mar '21</b>	<b>15 Feb '22</b>
Dredging & Reclamation	10 days	05 Mar '21	16 Mar '21
Levelling & Compaction up to 1ft	80 days	17 Mar '21	17 Jun '21
Levelling & Compaction up to Final Level	45 days	18 Jun '21	09 Aug '21
Seabed leveling in front of Prince George Wharf	20 days	24 Jan '22	15 Feb '22
<b>Precast Manufacturing</b>	<b>158 days</b>	<b>10 Oct '20</b>	<b>13 Apr '21</b>
<b>Pier Extension</b>	<b>148 days</b>	<b>10 Oct '20</b>	<b>31 Mar '21</b>
Precast Pile cap manufacturing	30 days	10 Oct '20	14 Nov '20
Precast slab manufacturing	110 days	24 Nov '20	31 Mar '21
<b>West Marina</b>	<b>66 days</b>	<b>13 Jan '21</b>	<b>31 Mar '21</b>
Precast Pile cap manufacturing	30 days	13 Jan '21	17 Feb '21
Precast slab manufacturing	30 days	21 Jan '21	25 Feb '21
Precast deck manufacturing for Finger	30 days	24 Feb '21	31 Mar '21
<b>East Marina</b>	<b>55 days</b>	<b>08 Feb '21</b>	<b>13 Apr '21</b>
Precast slab manufacturing	40 days	08 Feb '21	26 Mar '21

Table 1. Nassau Cruise Port Redevelopment Project Schedule continued.

Precast Pile cap manufacturing	11 days	10 Mar '21	22 Mar '21
Precast deck manufacturing for Finger	30 days	09 Mar '21	13 Apr '21
<b>Pier Extension</b>	<b>235 days</b>	<b>17 Oct '20</b>	<b>17 Jul '21</b>
<b>Cruise Pier</b>	<b>235 days</b>	<b>17 Oct '20</b>	<b>17 Jul '21</b>
Pile Driving	130 days	17 Oct '20	17 Mar '21
Pile Cap for batter piles	98 days	18 Dec '20	10 Apr '21
Pile Plug Concreting	158 days	03 Nov '20	05 May '21
Precast Pile cap Installation	120 days	17 Dec '20	05 May '21
Precast slab installation	120 days	02 Jan '21	21 May '21
Insitu Beam	120 days	19 Jan '21	07 Jun '21
Topping Concrete	60 days	23 Apr '21	01 Jul '21
Bollard Installation	120 days	19 Jan '21	07 Jun '21
Fender Installation	30 days	14 Jun '21	17 Jul '21
Cathodic Protection Wrapping	50 days	21 May '21	17 Jul '21
<b>Mooring Dolphin</b>	<b>55 days</b>	<b>18 Mar '21</b>	<b>20 May '21</b>
Pile Driving	14 days	18 Mar '21	02 Apr '21
Pile plug concreting	11 days	03 Apr '21	15 Apr '21
Cathodic Protection Wrapping	2 days	19 May '21	20 May '21
Stage 1 Deck Concreting	21 days	16 Apr '21	10 May '21
Stage 2 Deck Concreting	7 days	11 May '21	18 May '21
Bollard Installation	2 days	19 May '21	20 May '21
Cat walk Installation	2 days	19 May '21	20 May '21
<b>West Marina</b>	<b>255 days</b>	<b>11 Nov '20</b>	<b>03 Sep '21</b>
<b>Combiwall Installation</b>	<b>98 days</b>	<b>11 Nov '20</b>	<b>04 Mar '21</b>
Front wall - from 0+00 to 5+00	53 days	11 Nov '20	11 Jan '21
Front wall - from 5+00 to 12+00	45 days	12 Jan '21	04 Mar '21
<b>Deck on Pile</b>	<b>90 days</b>	<b>05 Mar '21</b>	<b>17 Jun '21</b>
Tubular Pile driving	35 days	05 Mar '21	14 Apr '21
Pile Plug Concreting	48 days	13 Mar '21	07 May '21
Precast Pile cap Installation	48 days	22 Mar '21	15 May '21
Precast slab installation	48 days	30 Mar '21	24 May '21
Insitu Beam	48 days	07 Apr '21	01 Jun '21
Cathodic Protection Wrapping	17 days	29 May '21	17 Jun '21
Topping Concrete	21 days	25 May '21	17 Jun '21
<b>Tie Rod and Anchor Wall</b>	<b>27 days</b>	<b>15 Apr '21</b>	<b>15 May '21</b>
Anchor Piles DB SP installation	12 days	15 Apr '21	28 Apr '21
Tie rods Installation to DB SP	15 days	29 Apr '21	15 May '21
<b>Caping Beam</b>	<b>95 days</b>	<b>17 May '21</b>	<b>03 Sep '21</b>
Caping Beam from 0+00 to 5+00	45 days	17 May '21	07 Jul '21
Caping Beam from 5+00 to 12+00	50 days	08 Jul '21	03 Sep '21
<b>Finger Deck</b>	<b>28 days</b>	<b>29 Apr '21</b>	<b>31 May '21</b>
Tubular Pile driving	12 days	29 Apr '21	12 May '21
Precast Concrete Cap	18 days	03 May '21	22 May '21
Topping Concrete	18 days	11 May '21	31 May '21



**Table 1.** Nassau Cruise Port Redevelopment Project Schedule continued.

<b>East Marina</b>	<b>72 days</b>	<b>03 Apr '21</b>	<b>25 Jun '21</b>
<b>Deck on Pile</b>	<b>72 days</b>	<b>03 Apr '21</b>	<b>25 Jun '21</b>
Pile Driving	33 days	03 Apr '21	11 May '21
Pile plug concreting	44 days	12 Apr '21	01 Jun '21
Cathodic Protection Wrapping	20 days	03 Jun '21	25 Jun '21
Precast Pile cap Installation	44 days	20 Apr '21	09 Jun '21
Precast slab Installation	44 days	28 Apr '21	17 Jun '21
Topping Concrete	21 days	02 Jun '21	25 Jun '21
<b>Finger Deck</b>	<b>28 days</b>	<b>12 May '21</b>	<b>12 Jun '21</b>
Tubular Pile driving	12 days	12 May '21	25 May '21
Precast Concrete Cap	18 days	15 May '21	04 Jun '21
Topping Concrete	18 days	24 May '21	12 Jun '21
<b>Prince George Wharf Bulkhead Strengthening Works</b>	<b>486 days</b>	<b>06 Jul '20</b>	<b>22 Jan '22</b>
Installation of temporary arrival hall, fencing around festival building	45 days	06 Jul '20	26 Aug '20
Demolition of first 70 m of festival building	45 days	27 Aug '20	17 Oct '20
<b>Prince George Wharf Bulkhead Strengthening Works (0 -70 m)</b>	<b>59 days</b>	<b>19 Oct '20</b>	<b>25 Dec '20</b>
Combi Wall Front Wall Driving	20 days	19 Oct '20	10 Nov '20
Coredrill existing Bulkhead	30 days	24 Oct '20	27 Nov '20
Tie Rod and Waler Installation	30 days	30 Oct '20	03 Dec '20
Anchor Wall Sheet Pile driving	20 days	30 Oct '20	21 Nov '20
Coping Beam Construction	35 days	07 Nov '20	17 Dec '20
Gravel infill	21 days	02 Dec '20	25 Dec '20
<b>Prince George Wharf Bulkhead Strengthening Works (70 -330 m)</b>	<b>206 days</b>	<b>28 May '21</b>	<b>22 Jan '22</b>
Combi Wall Front Wall Driving	100 days	19 Jul '21	11 Nov '21
Coredrill existing Bulkhead	100 days	05 Aug '21	29 Nov '21
Tie Rod and Waler Installation	100 days	13 Aug '21	07 Dec '21
Anchor Wall Sheet Pile driving	50 days	28 May '21	24 Jul '21
Coping Beam Construction	120 days	25 Aug '21	11 Jan '22
Gravel infill	109 days	18 Sep '21	22 Jan '22
Fender & Bollard Installation	16 days	04 Jan '22	21 Jan '22
<b>PCC &amp; Paver for Existing Piers</b>	<b>230 days</b>	<b>13 Apr '21</b>	<b>05 Jan '22</b>
PCC & Paver for Existing Piers	230 days	13 Apr '21	05 Jan '22
<b>LANDSIDE WORKS</b>	<b>369 days</b>	<b>26 Dec '20</b>	<b>01 Mar '22</b>
Relocation of Temporary Arrival Hall into Festival Building	30 days	26 Dec '20	29 Jan '21
Demolition of Administration Building Incl. Tower	70 days	30 Jan '21	21 Apr '21
Construction of New Terminal Building	262 days	30 Apr '21	01 Mar '22
Relocation of Temporary Arrival Hall to New Location	15 days	13 Aug '21	30 Aug '21
Demolition of festival building (second stage)	60 days	31 Aug '21	08 Nov '21
Demolition of existing facilities at land side	10 days	09 Nov '21	19 Nov '21
Transportation Area Shelters and Parking	240 days	02 Jan '21	08 Oct '21
West Marina Theme Restaurant	160 days	18 Jun '21	21 Dec '21
Amphitheater	60 days	20 Nov '21	28 Jan '22
Museum and Impact theater	60 days	20 Nov '21	28 Jan '22
Landscaping, irrigation and pavement	75 days	04 Dec '21	01 Mar '22

**Table 2.** Nassau Cruise Port Redevelopment Project Schedule additional activities.

Activity	Start Date	End Date
EMP Preparation & Submission	May 2020	September 2020
<b>Contractor</b>		
Marine Debris Removal	Jun 2020	July 2020
Coral Relocation	Jun 2020	July 2020
<b>Operations</b>		
Commissioning		
Arrivals Building	Jan 2022	Apr 2022
Marina Restaurant	Dec 2021	Apr 2022
Midfield Buildings	Oct 2021	Apr 2022

## 2. Legal and Administrative Framework

### 2.1. Relevant national and local laws, regulations, and international conventions

**Office of the Prime Minister** - coordinates ministries, government and parliamentary business. Specific related departments and agencies are listed below.

**Department of Lands and Surveys** - This department is responsible for planning, mapping and monitoring of crown land (i.e. where beaches begin and end, high-water marks etc.).

**National Emergency Management Agency (NEMA)** - NEMA aims to reduce life and property loss in the event of a natural disaster.

**Antiquities Monuments and Museum Corporation (AMMC)** - The mission of AMMC is “to protect, preserve, and promote the Historic Cultural Resources of The Bahamas, and to be the number one conservation Agency in the world. We will do this while protecting our environment, encouraging research and archaeology, and by protecting, preserving, and promoting our Historical Sites.”

#### **Relevant Acts and Regulations**

**Disaster Preparedness and Response Act, 2006 (Ch. 34A)** - “An Act to provide for a more effective organization of the mitigation of, preparedness for, response to and recovery from emergencies and disasters.” This Act contains parts regarding the Director of NEMA, Advisory Committee, policy review and plan; emergency operation centers and shelters; obligations of other public officers; specifically, vulnerable areas; disaster alerts and emergencies; and miscellaneous entries.

**Antiquities, Monuments and Museum Act, 1998 (Ch. 51)** - “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”, where, section 3 speaks to the declaration of a monument by reason of its historical, anthropological, archaeological or paleontological significance.

**Ministry of Transport and Local Government** – “Ministry responsible for matters related to road traffic, port department, and inter-insular mailboats, the Bahamas Maritime Authority and Local Government.”

**Port Department** – “It is headed by a Port Controller, who carries out the daily administrative functions that are enacted under the Port Authorities Act of 1961; the Boat Registration Act of 1961 and the Water Skiing and Motor Boat Control Act, of 1970. Under these Acts, this Department is mandated to:

- Inspection and licensing of boats and boat masters, under the Boat Registration Act, 1961. (commercial registration)
- Salvaging of wrecks
- Control of shipping traffic and the logging of shipping data through radio communications from its Harbour Control Office
- Collection of all revenue from commercial and private docks, mooring, groins, causeway, etc.
- Patrol of the harbor and outlying Cays
- Registration of boats under the Water Skiing and Motor Boat Control Act, 1970. (private registration)”

#### **Relevant Acts and Regulations**

**Ports Authorities Act, 1962** – “An Act to provide for the constitution and appointment of port authorities for New Providence and the Out Islands whereby the various ports and harbours of The Bahamas and the pilots and pilotage thereof and therein may be better regulated and controlled. The

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Ports Authorities will be responsible for the use of dredgers, tugs, and other vessels operating in the harbor and issuing licenses and certificates.”

**Road Traffic Act, 1958** – “An Act to declare, amend and codify the law relating to motor vehicles, and to provide for the regulation of traffic on roads and of motor vehicles; to provide for the establishment of a Road Traffic Authority; to provide for the protection of third parties against risks arising out of the use of motor vehicles; to amend the law with respect to the licensing of motor vehicles plying for hire or reward, and to provide for the regulation of public transport services; and to make provision for matters connected with the matters aforesaid.” Where Part VII speaks Street and Traffic Regulation.

**Road Traffic Regulations, Section 92, 1959** – (further to Sections 2, 3 & 4) with reference to road closures.

**Ministry of Agriculture, Marine Resources and Local Government** - The Ministry is responsible for the implementation, monitoring and evaluation of policies related to agricultural lands and marine resources. The Ministry serves as the Management and Scientific Authority for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in The Bahamas.

**Department of Marine Resources (DMR)** - DMR is primarily responsible for the administration, management, and development of fisheries in The Bahamas. The department was created to administer, manage, and develop the fisheries sector as stipulated by the Fisheries Resources (Jurisdiction and Conservation) Act. The department is also tasked with enforcement of Fisheries Regulations, Marine Mammal Regulations and the Seafood Processing and Inspection Regulations.

### **Relevant Acts and Regulations**

**Agriculture and Fisheries Act, 1964** - “An Act to provide for the supervision and development of agriculture and fisheries in The Bahamas,” where section 4. The Minister may make rules for all or any of the following purposes, (a) to define areas hereinafter called “protected areas” within which it shall be unlawful for any person except a licensee especially licensed in that behalf to plant, propagate, take, uproot or destroy any species of plant...”.

**Fisheries Resources (Jurisdiction and Conservation) Act** – “An Act to make provision with respect to the conservation and management of the fishery resources of The Bahamas and to extend the limits of the jurisdiction of The Bahamas over such fishery resources and for matters connected therewith or incidental thereto.”

**Ministry of Public Works** - maintains the physical infrastructure and natural environment of The Bahamas by providing quality services to its client agencies.

**Department of Public Works** - The Department of Public Works maintains public infrastructure inclusive of government buildings, roads, docks, bridges and cemeteries.

**Department of Physical Planning** - The Department of Physical Planning manages town, physical, country and land use planning, zoning, private roads and subdivisions for New Providence and the Family Islands.

**Water and Sewerage Corporation** - The Water and Sewerage Corporation is entrusted with managing, maintaining, distributing and developing the water resources of The Bahamas.

### **Relevant Acts and Regulations**

**Town Planning Act, 1961 (Ch. 255)** - “An Act relating to town planning”, where, section 7 speaks to committee sanctioned development activities.

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**Planning and Subdivision Act, 2010**- “An Act to combine, consolidate and revise the law related to town planning and law relating to the development of subdivisions and to provide for matters connected thereto”, where, section 3 speaks to the purpose of this Act which includes:

- to provide planning for a controlled development system led by policy, land use designations and zoning;
- the prevention of indiscriminate division and development of land;
- to ensure the efficient and orderly provision of infrastructure and services to the built environment;
- promoting sustainable development in a healthy natural environment;
- to maintain and improve the quality of the physical and natural environment;
- to protect and conserve the natural and cultural heritage of The Bahamas;
- provide for planning processes that are fair by making them open, accessible, timely and efficient;
- to recognize the decision-making authority and accountability of the Government in land use planning; and
- to plan for the development and maintenance of safe and viable communities.

**Buildings Regulation, 1971 (Ch. 200)** - “An Act to regulate the construction, alteration and repair of buildings, to provide for the re-instatement or removal of dangerous or dilapidated buildings, to authorize the publication of a building code and for purposes connected therewith.”

Section 2. (c) speaks to the interpretation of ‘building’ including “any dock, bulkhead, pier and any works for the protection of land against encroachment by, or for the recovery of land from, fresh or salt water;” and Section 17 speaks to the Building Code.

**Water and Sewerage Corporation Act, 1976** - “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.” where, section 3 speaks to government control of the production, extraction and use of water in the public interest.

**Buildings Regulation (General) Rules, 1971** - (further to Section 19 of Ch. 200) and Section 9 speaks to the execution of permitted works.

**Ministry of Environment & Housing** - serves to protect, conserve and manage the environment of The Bahamas. This ministry focuses on environmental control, solid waste management, public sanitation and the beautification of public areas such as parks and beaches.

**The Bahamas Environment Sciences Technology (BEST) Commission** - manages international environmental conventions and evaluates environmental impact assessment (EIA) and environmental management plans (EMP) for development projects within The Bahamas.

**Department of Environmental Health Services (DEHS)** - DEHS manages the disposal of all wastes and management of environmental pollution (on land or in water). This department also promotes planning and approves various measures designed to ensure wise use of the environment.

**Department of Forestry (Forestry Unit)** - The Forestry Unit’s mandate is “to develop the forest resources of The Bahamas to their maximum potential by applying sound, scientific and sustained yield forest management principles and concepts.”

**Bahamas National Trust (BNT)** - The mission of the BNT is “Conserving and protecting the natural resources of The Bahamas, through stewardship and education, for present and future generations.”

**Bahamas Public Parks and Public Beaches Authority** (see Bahamas Public Parks and Public Beaches Authority Act, 2014)

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**Department of Environmental Planning and Protection** – “The functions of the Department are to provide for and ensure the integrated protection of the environment of The Bahamas and ensure the sustainable management of its natural resources” *from Environmental Planning and Protection Bill, 2019.*

### ***International Environmental Conventions (see BEST Commission)***

**Stockholm Convention on Persistent Organic Pollutants** - “As set out in Article 1, the objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants.”

<http://www.pops.int/TheConvention/Overview/tabid/3351/Default.aspx>

**Commission on Sustainable Development** - “The United Nations Commission on Sustainable Development (CSD) was established by the UN General Assembly in December 1992 to ensure effective follow-up of United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit.”

<https://sustainabledevelopment.un.org/intergovernmental/csd>

**Kyoto Protocol** - The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets. The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005.

[http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)

**Basel Convention on the Control of Transboundary Movement of Hazardous Wastes** – “The Basel Convention is a global agreement between countries to protect human health and the environment against the adverse effects of hazardous wastes.” <http://www.basel.int/>

**Ramsar Convention on Wetlands** – “the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. The Convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975.” <https://www.ramsar.org/>

**Minamata Convention** – “The Minamata Convention on Mercury is a global treaty to protect human health and the environment from the adverse effects of mercury... by addressing mercury throughout its life cycle from its mining to its management as waste.

<http://www.mercuryconvention.org/Convention/Text/tabid/3426/language/en-US/Default.aspx>

### ***Relevant Acts and Regulations***

**Bahamas Public Parks and Public Beaches Authority Act, 2014** – An Act to establish the public parks and public beaches authority, to provide for the property rights and liabilities of the public parks and public beaches authority and to identify, regulate, maintain, develop and conserve public parks and public beaches and for connected purposes.” Where section 5 speaks to functions of the Authority.

**Environmental Health Service Act, 1987 (Ch. 232)**- “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”, where, section 5 speaks to functions of the Department of Environmental Health.

**Environmental Health Services (Collection and Disposal of Waste) Regulations, 2004 (Ch. 232)** - “These Regulations may be cited as the Environmental Health Services (Collection and Disposal of Waste) Regulations, 2004”, where, section 18 speaks to removal of construction waste and section 19 speaks to industrial waste disposal.

**Coast Protection Act, 1968 (Ch. 204)** - “An Act to make provision for the protection of the coast against erosion and encroachment by the sea and for purposes connected therewith”, where, section 8 speaks to approval for coastal protection work and section 9 speaks to the excavation of materials that compose of the seashore.

**Conservation and Protection of the Physical Landscape of The Bahamas Act, 1997 (Ch. 260)**- “An Act to make provision for the conservation and protection of the physical landscape of The Bahamas. The Act contains parts regarding administration, regulation of excavation and landfill operations, provisions governing dangerous excavations, landfill operations, quarries or mines, zoning of The Bahamas for the purposes of quarrying and mining operations, protected trees, and general entries.

**Conservation and Protection of the Physical Landscape of The Bahamas Regulations, 1997 - (further to Section 27 of Ch. 260)**. The Act contains parts regarding applications, permits and licenses, appeals, fees, offences and penalties.

**Forestry Act, 2010** – An Act to provide the conservation and control of forests and for matter related thereto.

**Forestry Regulations, 2014** – “5. Application for Permit to harvest protected tree. An application for the grant of a permit under section 12 of the Act to harvest a protected tree, shall be made to the Director and shall contain all the relevant particulars set out in Form No. 3 (A) in the First Schedule including the payment of the prescribed fee as set out in the Second Schedule.” and

“6. Permit to harvest protected tree. A permit granted under section 11 of the Act to harvest a protected tree shall be made in the manner set out in Form No. 3 (B) in the First Schedule, shall be accompanied by the payment of the prescribed fee as specified in the Second Schedule and shall be valid for six months from the date of the grant unless otherwise prescribed in the permit.” and

“Construction or modification of road in a forest estate. A person shall not construct or modify a road or trail in a forest estate unless the construction or modification has been authorized by the Director of Forestry in writing, and the road, - a) or trail has been identified in an approved forest management plan; and b) layout has been approved by the Director of Forestry.”

**The Bahamas National Trust Act, 1959**- “An Act to incorporate and confer powers upon The Bahamas National Trust for Places of Historic Interest or Natural Beauty.”

**The Bahamas National Trust (amendment) Act, 2010** – An act to amend section of the principal Act. “The Bahamas National Trust shall be at liberty from time to time to advise both the Government of The Bahamas and the private sector generally on development issues and policies relating to conservation, the environment, biodiversity, natural and cultural heritage and resource management.”

**Bahamas National Wetlands Policy** – see Ramsar Convention.

**Ministry of Labour** - The Ministry of Labour oversees and regulates labour relations within The Bahamas.

**Department of Labour** - The Mission of the Department of Labour promotes good industrial relations between employer and employee, while promoting a high level of employment.

### **Relevant Acts and Regulations**

**Health and Safety Work Act, 2002 (Ch. 321C)** - “An Act to make provisions relating to health and safety at work and for connected purposes.” where, Section 4 speaks to general duties of employers to their employees and where, Section 7 speaks to general duties of employees at work.

**Health and Safety at Work (Amendment) Act, 2015** (repeal and replacement of Section 17 of Ch. 321C) Contains parts regarding applications, permits and licenses, appeals, fees, offences and penalties.

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## 2.2. Internationally recognized regulations and industry codes

NCP will work towards achieving the following International Organization for Standardization (ISO) to help guide the operation of Nassau Harbour. These International Standards do not alter GPH's legal requirements in The Bahamas. The EMP will also be used to guide the operation as Construction Best Management Practices will be included in the Plan.

**ISO 9001:2015 Quality Management Systems<sup>2</sup>** - ISO 9001 can “help provide a sound basis for sustainable development initiatives. The potential benefits to an organization of implementing a quality management system based on this International Standard are:

- the ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements;
- facilitating opportunities to enhance customer satisfaction;
- addressing risks and opportunities associated with its context and objectives;
- the ability to demonstrate conformity to specified quality management system requirements.

This International Standard employs the process approach, which incorporates the Plan-Do-Check-Act (PDCA) cycle and risk-based thinking. The process approach enables an organization to plan its processes and their interactions. The PDCA cycle enables an organization to ensure that its processes are adequately resourced and managed, and that opportunities for improvement are determined and acted on.

Risk-based thinking enables an organization to determine the factors that could cause its processes and its quality management system to deviate from the planned results, to put in place preventive controls to minimize negative effects and to make maximum use of opportunities as they arise (see [Clause A.4](#)).

Consistently meeting requirements and addressing future needs and expectations poses a challenge for organizations in an increasingly dynamic and complex environment. To achieve this objective, the organization might find it necessary to adopt various forms of improvement in addition to correction and continual improvement, such as breakthrough change, innovation and re-organization.”

**ISO 14001:2015 Environmental Management Systems<sup>3</sup>** - ISO 14001 “provides organizations with a framework to protect the environment and respond to changing environmental conditions in balance with socio-economic needs”. It specifies requirements that enable an organization to achieve the intended outcomes it sets for its environmental management system.

A systematic approach to environmental management can provide top management with information to build success over the long term and create options for contributing to sustainable development by:

- protecting the environment by preventing or mitigating adverse environmental impacts;
- mitigating the potential adverse effect of environmental conditions on the organization;
- assisting the organization in the fulfilment of compliance obligations;
- enhancing environmental performance;
- controlling or influencing the way the organization's products and services are designed, manufactured, distributed, consumed and disposed by using a life cycle perspective that can prevent environmental impacts from being unintentionally shifted elsewhere within the life cycle;
- achieving financial and operational benefits that can result from implementing environmentally sound alternatives that strengthen the organization's market position;
- communicating environmental information to relevant interested parties.”

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<sup>2</sup> <https://www.iso.org/obp/ui/#iso:std:iso:9001:ed-5:v1:en>

<sup>3</sup> <https://www.iso.org/obp/ui/#iso:std:iso:14001:ed-3:v1:en>

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**Eco-Management and Audit Scheme (EMAS)<sup>4</sup>** – The EMAS is a voluntary environmental management scheme developed by the European Commission that connects with the ISO 14001 and the European Union regulation 1221/2009. EMAS members must comply with standards developed and monitored by the five main stakeholders listed below.

- European Union Commission - provides the regulatory framework for EMAS.
- Competent Bodies of the Member States - appointed by national environmental authorities in order to perform the registration process.
- Accreditation/Licensing Bodies of the Member States-appointed by national environmental authorities in order to provide accreditation and supervision of environmental verifiers.
- Environmental Verifiers-external auditors and verifiers for environmental statements.
- Organizations which want to be or already are registered with EMAS.

The three premises of EMAS are as follows<sup>5</sup>.

1. Performance – EMAS supports organizations in finding the right tools to improve their environmental performance. Participating organizations voluntarily commit to both evaluations and reducing their environmental impact.
2. Credibility – Third party verification guarantees the external and independent nature of the EMAS registration process.
3. Transparency – Providing publicly available information on an organization's environmental performance is an important aspect of EMAS. Organizations achieve greater transparency both externally through the environmental statement and internally through employees' active involvement.

A list of additional international regulations and policies that will guide the operation of the Nassau Cruise Port operations are listed below.

**International Convention for the Safety of Life at Sea (SOLAS)<sup>6</sup>**– The SOLAS Convention was adopted in 1914 as a result of the Titanic disaster and has since been amended several times. The purpose of the Convention is to set minimum standards for the construction, equipment and operations of ships.

**International Ship and Port Facility Security (ISPS) Code<sup>7</sup>** - The ISPS code was developed by the International Maritime Organization (IMO) as a response to the September 9, 2001 terrorist attacks at the World Trade Center in the United States. The main objectives of the code are:

- Establishment of an international framework that fosters cooperation between Contracting Governments, Government agencies, local administrations and the shipping and port industries, in assessing and detecting potential security threats to ships or port facilities used for international trade, so as to implement preventive security measures against such threats;
- Determining the respective roles and responsibilities of all parties concerned with safeguarding maritime security in ports and on-board ships, at the national, regional and international levels;
- To ensure that there is early and efficient collation and exchange of maritime security-related information, at national, regional and international levels;
- To provide a methodology for ship and port security assessments, which facilitates the development of ship, company and port facility security plans and procedures, which must be utilized to respond to ships' or ports' varying security levels; and

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<sup>4</sup> <https://www.emas.de/meta/english-summary/>

<sup>5</sup> [https://ec.europa.eu/environment/emas/index\\_en.htm](https://ec.europa.eu/environment/emas/index_en.htm)

<sup>6</sup> [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-\(SOLAS\)-1974.aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS)-1974.aspx)

<sup>7</sup> [http://www.imo.org/en/OurWork/Security/Guide\\_to\\_Maritime\\_Security/Pages/SOLAS-XI-2%20ISPS%20Code.aspx](http://www.imo.org/en/OurWork/Security/Guide_to_Maritime_Security/Pages/SOLAS-XI-2%20ISPS%20Code.aspx)

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- To ensure that adequate and proportionate maritime security measures are in place on board ships and in ports.

**International Conventions for the Prevention of Pollution from Ships “MARPOL”<sup>8</sup>** - The Convention was developed in response to a series of tanker accidents in 1976 to 1977. MARPOL includes six Annexes that aim to prevent and minimize accidental and or deliberate pollution from ships. Information in the Annexes will be used to develop the Environmental Management Plan. The Annexes are listed below.

- Annex I Regulations for the Prevention of Pollution by Oil (entered into force 2 October 1983)
- Annex II Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (entered into force 2 October 1983)
- Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (entered into force 1 July 1992)
- Annex IV Prevention of Pollution by Sewage from Ships (entered into force 27 September 2003)
- Annex V Prevention of Pollution by Garbage from Ships (entered into force 31 December 1988)
- Annex VI Prevention of Air Pollution from Ships (entered into force 19 May 2005)

Decommission activities will be described in detail in the EMP and regular updates will be provided to the Department of Environmental Planning and Protection by the Environmental Manager. The Environmental Manager will collaborate with the Environmental Monitor approved by the Commission.

### 2.3. Project’s safety, health, & environmental management design philosophy

GPH has a vision of reducing harmful effects of the cruise industry by improving clean energy usage and raising awareness on resource utilization. This project is committed to high environmental standards and aims to achieve the same through its Green Port Policy. For such purposes, GPH intends to appoint a qualified consultant to advise on environmental matters. While promoting sustainability, the best available technology will be used to avoid or reduce environmental impacts.

Renewable energy technologies, other self-generation systems, controls, and energy storage will be installed to the extent possible to allow the Port to run in an energy efficient and environmentally conscious way. GPH will endeavour to source 30% of its electricity from renewable resources in alignment with the Government of The Bahamas’ 2030 national renewable objective. Accordingly, the project will work to create a strategy for sustainable energy modernization which will ensure reliability of the energy systems and conduct activities to reduce energy use and increase energy efficiency in all stages of its operations. Once the NCP renewable energy system is operational, a computer software system will be used to integrate BPL and NCP, the two energy supply streams, with a user-friendly interface so that supply and consumption can be tracked and monitored efficiently.

Environmentally friendly building materials will be at the core of the project. These include recycled, repurposed and locally sourced items such as rubber tyres, plastics and timber. Environmentally preferable purchasing practices shall be put in effect for every item purchased in the Port, which means each contractor will be required to purchase environmentally friendly resources. Some examples that will be used within the Port boundaries are lead-free paints, non-hazardous cleaning and landscaping products, reusable bags and containers, and biodegradable disposables.

The GPH Operations Manager and Environmental Monitor will monitor operations to ensure it complies with the policies of the International Conventions for the Preventions of Pollution from “[MARPOL](#)” and in accordance with the Laws, if any. The Company will apply the best management practices in accordance

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<sup>8</sup> [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx)

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with GPH's Health, Safety and Management Manual (ISO 14001:2015 Environmental Management System serves as a Normative Reference).

The Port aims to be in compliance with [Eco-Management and Audit Scheme \(EMAS\)](#). All audit results will be undertaken by an independent agency approved by the Department of Environmental Planning and Protection or an environmental agency with such responsibilities and all results of the audit will be publicly published.

#### 2.4. Project's port & vessel security management plan, & ISPS code compliance strategy

The security management for the Port aims to prevent anything that may directly or indirectly affect daily operational activities. GPH acknowledges and agrees that it will maintain the security at the Nassau Harbour. Also, that it will ensure all procured personnel and contractors affiliated with the Project will comply with the [International Ship and Port Facility Security \(ISPS\) Code](#).

Additional European Union (EU) implementation directives to ISPS Code and GPH-PTFS code are given below:

- Maritime Security Regulation 725 / 2004
- Port Security Directive 2005 / 65
- AEO Regulations 648 / 2005

Security Procedures/Instructions shall be prepared based on GPH – PTFS Code as well as relevant international and national legislation by taking into consideration the particular circumstances of each GPH port and terminal; and they shall be updated periodically. All ports/terminals shall have an updated and approved Security Assessment and Security Plan in accordance with the ISPS Code. Particular care shall be given to ensure that security measures and implementations are of deterrent and preventive quality. Operating in coordination and cooperation with local security forces shall be of essence. Necessary information exchange, coordination and cooperation on matters of security shall be ensured with other elements of ports/terminals as well as with ships. When required in the local legislation, Protection and Security Plans shall be prepared consistent with the principles of relevant legislation. Practices required as well as all security equipment, gears, materials and instruments to be procured to ensure integration and standardization among GPH facilities shall be submitted to GPH port and terminal security committee.

GPH security rules regarding construction related commitments, states that each of the Parties will be responsible for the adequacy, stability and safety of any site construction operations and methods of construction for works carried out by such Party (including any dredging by or on behalf of the Government of The Bahamas). Each Party will in respect of any works carried out by or on behalf of such Party:

- take care for the safety of all persons entitled to be on the relevant construction sites in line with the Good Industry Practice and in compliance with Bahamian standards under the applicable Laws;
- provide fencing, lighting, guarding and watching of their respective sites and works that is compliant with applicable Laws and the relevant requirements hereunder for the respective sites; and
- be responsible for keeping unauthorized persons off its respective sites.

Appendix E shows the Table of Contents for the Global Ports Holding Port and Terminal Facilities Security Code (GPH-PTFS Code).

GPH acknowledges and agrees that it will maintain the security at the Port and will be in compliance and procure that the Company Personnel and its contractors will comply the International Ship and Port Facility Security (ISPS) Code.

### 3. Existing Environment

#### 3.1. Definition of the extent of the project on land and sea

The project site is located in downtown Nassau, along Woodes Rogers Walk and north of Rawson Square. The physical footprint encompasses an area of reclaimed land, approximately ±2 acres in total. The marine area is approximately 80.08 acres compared to a land area of approximately 13.11 acres.

The marine area at the site is where cruise ships, mega yachts, charters and other vessels to moor; allowing patrons and crew to embark and disembark. The direct footprint of the marine area features Prince George Wharf, which has approximately 28 berths around three main piers connected by two bridging piers.

The land area at the site is where buildings and other structures that facilitate port operations are situated. The buildings, located south of the piers, include the Port Authority building, Festival Place Welcome Center, and the Port Warehouse. Other structures include vendor and security booths, as well as a sheltered area for surrey horses. In addition to these features of the direct footprint, the indirect footprint also features Woodes Rogers Walk itself, which is a promenade that extends west from the site to Navy Lion Road. Along Woodes Rogers Walk is a host of other vendors, taxi and tour operators, shops, restaurants and the historical Nassau Straw Market.

#### 3.2. Description of the data acquisition and analysis process

##### 3.2.1. Baseline comprehensive monitoring program

A baseline comprehensive monitoring program for the project will be established based on monitoring requirements from the Department of Environmental Planning and Protection, as well as recommendations from analyses of data collection exercises. It will be detailed in the EMP.

##### 3.2.2. Background/preliminary studies conducted including public participation

Preliminary studies included a [Bathymetric Study](#) conducted by Cummins Cederberg Inc. (Appendix F), Geotechnical Exploration conducted by ENCO International (Bahamas) Ltd. (Appendix I), Topographic Survey conducted by Atametrics Ltd. (Appendix J), [Noise Protection Report](#) produced by Enka (Appendix K), and a Flushing Study Report.

The Topographic map shows the ground surface contours for the project site and surrounding area. Additional features such as bollards and fenders, trees, signs, roads, underground and above ground utilities were also included in the map. Piers 1 through 3 and the bridge connectors were generally 6 ft (1.83 m) and the planters were 7 ft (2.13 m). The elevation decreased to 5 ft (1.52 m) in the area between Festival Place and the Surrey Operator waiting area and the area east of the Port building. The elevation along Woodes Rodgers Walk near the western harbor was 4 ft (1.22 m). This decrease in elevation was expected because a step was constructed to ease guest access to ferry and tour boats. The highest elevation in Rawson Square was 9ft (2.74 m), which was in the center of the Square. The ground contours in Parliament Square range from 10 ft (3.05 m) – 13 ft (3.96 m). This is the highest elevation in the area. The layout of the topography of the area provides an idea of those areas that would likely inundate during heavy rainfall events by observing the undulations that indicate where the elevation decreases.

A summary of the highlights from the public participation process was prepared by Blue Orchid Advertising Agency. The summary of highlights is below Table 3. The process involved conducting stakeholder meetings and public consultations in Q4 2018 through Q2 2020. Stakeholder meeting participants from those meetings are listed below, and publicized community meetings are shown in Table 3.

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- Access Accelerator Small Business Development Centre Bahamas
- Bahamas Contractors Association
- Bahamas Retail Federation
- Bahamas Society of Engineers
- Bahamas Taxi Cab Union
- Chamber of Commerce
- Downtown Nassau Partnership
- Festival Place Tenants Association
- Influential Members of the Art Community (including Doongalik Studios, Junkanoo World, Saxon Superstars)
- Lend-A-Hand Bahamas (Over-The-Hill Community Center)
- National Art Gallery of The Bahamas
- Organization for Responsible Governance (ORG)
- Prince George Wharf Taxi Drivers Association
- Straw Business Persons Society
- University of The Bahamas (School of Hospitality & Tourism Management)

**Table 3.** *Publicized community meetings.*

<b>Dates</b>	<b>Location</b>	<b>Stakeholder Groups</b>
December 2018	Various	<ul style="list-style-type: none"> <li>• Bahamas Chamber of Commerce</li> <li>• Bahamas Federation of Retailers</li> <li>• Straw Business Persons Society</li> <li>• Bahamas Retail Federation</li> <li>• Prince George Wharf Taxi Drivers Association</li> <li>• Access Accelerator Small Business</li> <li>• Downtown Nassau Partnership</li> <li>• Organization for Responsible Governance (ORG)</li> </ul>
January 7- 8 2019	Various	<ul style="list-style-type: none"> <li>• National Art Gallery of the Bahamas</li> <li>• Doongalik Studios</li> <li>• Junkanoo World</li> <li>• University of The Bahamas</li> </ul>
March 5, 2019	Various	<ul style="list-style-type: none"> <li>• Bahamas Contractors Association</li> <li>• Professional Engineers Board (Bahamas Society of Engineers)</li> <li>• Lend A Hand Bahamas</li> <li>• Saxon Superstars (Percy Francis)</li> <li>• Bahamas Taxi Cab Union</li> <li>• Prince George Wharf Taxi Drivers Association</li> </ul>
June 3 - 4 2019	British Colonial Hilton	<ul style="list-style-type: none"> <li>• Festival Place Tenants Association &amp; Committee Leaders (see list for groups and names)</li> <li>• Bahamas Federation of Retailers</li> <li>• Bahamas Tour Operators Association: Michael Symonette + sons, BJ Saunders, Kevin and Juan Moss</li> <li>• Downtown Nassau Partnership Executives</li> <li>• Straw Market Business Persons Society (approx. 25 senior leaders and members)</li> <li>• Bahamas Taxi Cab Union Members (15- 20 executives and members)</li> </ul>
June 4, 2019		<ul style="list-style-type: none"> <li>• Festival Place Vendors – Pre Leadership Meeting</li> </ul>

		<ul style="list-style-type: none"> <li>• Festival Place Leadership Meeting</li> <li>• Straw Market Leadership Meeting</li> <li>• Television Appearance</li> </ul>
June 5, 2019		<ul style="list-style-type: none"> <li>• Executives of the Bahamas Retail Federation</li> <li>• Meet &amp; Greet with Downtown Property Owners</li> <li>• Executives of the Bahamas Taxi Cab Union (BTCU)</li> <li>• Bahamas Association of Tour Operators</li> </ul>
June 6, 2019		<ul style="list-style-type: none"> <li>• Festival Place Membership Meeting</li> <li>• Straw Market Vendors Membership Meeting</li> </ul>
June 18, 2019	British Colonial Hilton	<ul style="list-style-type: none"> <li>• Bahamas Taxi Cab Union</li> </ul>
August 7 - 9 2019	British Colonial Hilton	<ul style="list-style-type: none"> <li>• Festival Place Tenants (Owners/Owner Representatives)</li> <li>• Festival Place Food &amp; Beverage Tenants</li> <li>• Executives of the Bahamas Taxi Cab Union</li> <li>• Executives of Tour Operators Association</li> <li>• Bermello Ajamil + Various Stakeholders</li> </ul>
August 7 2019		<ul style="list-style-type: none"> <li>• Scooter Association (Leadership) + Other Owners</li> </ul>
August 8 2019		<ul style="list-style-type: none"> <li>• Executives of Tour Operators Association</li> <li>• Executives of Bahamas Taxi Cab Union + Prince George Dock Taxi Committee Members</li> <li>• Festival Place Food and Beverage Tenants</li> <li>• Festival Place Tenants</li> <li>• Festival Place Tenants Group</li> <li>• Festival Place Tenants</li> </ul>
August 9 2019		<ul style="list-style-type: none"> <li>• Festival Place Tenants</li> </ul>
May 8, 2020 May 11, 2020 May 13, 2020 May 15, 2020 May 18, 2020	Paradise Island	<p>David Kosoy and Ryan McAllister, Dr. Randy &amp; Annie Hall, David Hall, and Robert Hall, Colleen Kosoy, Christian Murray, and Swami Brahmananda / The Yoga Retreat.</p> <ul style="list-style-type: none"> <li>• There were no concerns expressed by these stakeholders at the time, and they were informed of the NCP Grievance Response Mechanism.</li> </ul>

Stakeholder meetings will be ongoing throughout the planning and construction of the project. Appendix L shows the proposed schedule for Meetings with Festival Place Individual Tenants and an update will be provided in the EMP. As a result of the COVID-19 Pandemic and the Government of The Bahamas Emergency Orders, continued stakeholder consultations will likely be virtual and will be guided by procedures set forward by the Government of The Bahamas.

Grievances can be emailed to [info@nassaucruiseport.com](mailto:info@nassaucruiseport.com). The NCP Communication Manager will forward grievances to respective departments within NCP. Grievances will be addressed within a two-week time period. Both grievances expressed by stakeholders and the response plan will be shared with the Department of Environmental Planning and Protection.

**SUMMARY OF HIGHLIGHTS FROM STAKEHOLDER MEETINGS  
PREPARED BY BLUE ORCHID ADVERTISING AGENCY**

*“NCPL Stakeholder Meetings (December 2018 – August 2019)*

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## Feedback Highlights

The following information provides an overview of conversations held with key stakeholders in the Nassau Cruise Port redevelopment process between December 2018 and August 2019. It includes general concerns (e.g. national economic improvement, small business empowerment, investment opportunities for downtown, etc.) and more specific details by stakeholders who provided more information.

### **Access Accelerator Small Business Development Centre Bahamas**

- How will GPH/NCPL ensure that Small Business Owners are included in the planning and development process?
- SBDC Team is excited about GPH/NCPL's pledge to assist the SBDC in extending its outreach to support more existing and aspiring entrepreneurs
- Team is very interested in learning more about the project and participating where possible

### **Bahamian Contractors' Association**

The executive leadership team of the association wanted to know more about:

- How much business Bahamian contractors would potentially earn from the project.
- They wanted to ensure that GPH/NCPL is aware of the number of Bahamian contractors that exist and the various specialties that they are capable of
- They wanted to GPH/NCPL to be aware that Bahamian contractors are quite capable of doing the work required to construct and complete the original design (we shared video featuring initial renderings during our meeting with them)

### **Bahamas Retail Federation**

- Interested in learning about how GPH/NCPL can support infrastructure upgrades to help revitalize the downtown core (to the extent possible e.g. lack of parking, lack of family-friendly activities, nightlife, etc.)
- Hoping that this project will serve as a catalyst that will create opportunities for current landlords and business owners to reinvest in the area
- Seeking increased spending by cruise ship passengers based on the port's ability to bring in more ships and ships of various classes
- Discussed the rumors of cruise ships speaking negatively about Bahamian retail stores (prices (VAT), quality of products, behavior of sales staff)
- Wants to ensure that their concerns will be considered and that they will be permitted to actively participate in any process involving the redevelopment of downtown

### **Bahamas Society of Engineers**

- Interested in the vision for the port
- Interested in learning more about the selection process for project engineering firms and engineers
- Want to ensure that GPH/NCPL is aware of the caliber of engineers that exist locally and the high quality of the work that they can and have produced.

### **Bahamas Taxi Cab Union + Prince George Wharf Taxi Drivers Committee**

- Focused on fulfillment of a 2017 partnership agreement between the Downtown Nassau Partnership, the Ministry of Transport and Local Government and the Ministry of Tourism and Aviation (to the extent possible, where still relevant) regarding:

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- *Creation of a holding area for all public transportation vehicles at the Kelly dock, which presently park on Charlotte Street North, Frederick Street North, East Street North, and Prince George Wharf (east of Frederick Street)*
  - *Construction of a recreation and bathroom facility on site*
  - *Provision of an electronic call up system (this is already in place)*
  - *That they would not be required to pay a charge to access the system*
- *That they would not be required to move from the existing parking spot until the holding facility and recreation building and bathrooms are completed*
- *Aims to ensure that taxi union members are included in the port redevelopment process and appreciate the fact that the Global Ports Holding is keeping step with informing and involving the Union*
- *Taxi Union executive leadership members also met with two of the lead architects on the project to discuss the potential flow of pedestrian and vehicular traffic in and out of 1) terminal building, 2) port area, and 3) surrounding streets, locations and number of parking bays for taxi cabs, potential desk locations in the terminal building,*
- *They have concerns about taxi hackers stealing business and want regulation of the port area to discourage this practice*
- *Interested in the integration and use of technology to help them improve operations and perception of the local taxi “brand”*
- *Concerned about the implications of weather when attempting to load passengers or drop them off – need for shelter*

#### **Bahamas Tour Operators Association**

- *Interested in:*
  - *Passenger traffic flow*
  - *Staging areas for buses*
  - *Terminal access*
- *Project details (design, entertainment, potential increase in passenger numbers, provisions to be made for increased visitor traffic to port and downtown core, etc.*
  - *Interested in participating in port redevelopment process*

#### **Bay Street Scooter and Taxi Association**

- *Need testing area to train passengers to use vehicles before releasing them into the streets*
- *Would like a Scooter desk in the terminal area to all vendors to access, creation of collaborative system to manage customer engagement*
  - *Would like to have a separate staging area from other transportation vendors*
- *Would like to be separated from each other with some space (currently all stationed in one straight line next to each other)*
  - *Each vendor needs more space than they currently have*
    - *Need on-site vehicle storage area*
- *Need utilities integrated into area to facilitate use credit card machines and other equipment*
  - *Interested in temporary relocation details when available*

#### **Chamber of Commerce**

*The Chamber of Commerce team was generally concerned about:*

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- *How much opportunity the project would generate for its members and other Bahamian business owners, including members of the Downtown Nassau Partnership and the Bahamas Retail Federation*
- *The team was pleased to see the potential for the revitalization of downtown and the potential for investment opportunities that the project will bring*

#### **Downtown Nassau Partnership**

- *Interested in establishing a partnership with GPH/NCPL to support the redevelopment and revitalization of downtown to support its medium to long-term initiatives including:
 
  - o *Public transportation shuttle system for downtown*
  - o *Construction of a 12ft (3.66 m)wide boardwalk that will run from East Street to Potter's Cay Dock*
  - o *the transformation of the area surrounding Fort Charlotte and the Fish Fry into a "Central Park" concept**
- *Improving downtown infrastructure to stimulate investment opportunities for the area
 
  - *Development of downtown Nassau into a living city with residential spaces**
- *Interested in discussing marketing and promotional opportunities for businesses downtown*

#### **Festival Place Tenants Association**

- *Would like to confirm re-location area as quickly as possible, with relevant details (length of time, number of booths, etc.)*
- *Would like to confirm that they will be in full view and easily accessible by cruise passengers during temporary relocation*
- *Need shelter for vendors and guests due to poor weather conditions (rain, extreme heat, wind, etc.)
 
  - *Concerned about impact of bad weather on business (currently port "shuts down")
 
    - *Some vendors interested in working in air-conditioned units**
  - *Initially interested in how prominent their final retail spaces will be within the new facility**
- *Who will determine where vendors are located throughout the facility (i.e. which vendor in which spot) and how will this be determined?
 
  - *Interested in**
- *Some vendors interested in the idea of separating vendors by product type (e.g. food sold in one section, beverages sold in another section)*
- *Interested in food and retail product storage area (i.e. need more space and security for storing items overnight to curb nightly booth breakdown)*
- *Would like more space for food preparation and to conduct food demonstrations (e.g. conch salad preparation)*
- *Would like to see more seating for passengers and guests (to eat, drink, lounge in the retail area, possibly bar stools)
 
  - *Discussed management of the port area
 
    - *Discussed presentation of products
 
      - *Would like clarity about which items should and should not be sold**
    - *Would like someone to mandate sale of more Bahamian products in the port area
 
      - *Would like opportunity to make product deliveries to cruise ships****
- *Need a loading zone and assigned parking spaces to transfer products, food, etc. to and from the port area + need to create a delivery system
 
  - *Would like parking for tenants*
  - *Discussed the idea of other retailers entering the port retails space**

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- *Would like to see an increase in nightlife in the port area and to participate in this change, including nighttime food and beverage options*
- *Discussed the idea that visitors to downtown area who are not cruise passengers cannot currently access retail vendors (need ID)*
  - *Discussed restroom management*
  - *Interested in flow of traffic into and out of port area to ensure high visibility*
  - *Interested in entertainment ideas*
- *Discussed alleged rumors that cruise lines have discouraged passengers from purchasing straw products because they might have the Red Mite bug in them*
  - *Rental Fees (what changes will be implemented)*
  - *Interested in reimbursement for Festival Place construction costs*

***Influential Members of the Art Community (including Doongalik Studios, Junkanoo World, National Art Gallery of The Bahamas, Saxon Superstars)***

- *Interested in contributing to the overall design to ensure that the port area is distinctively Bahamian*
  - *Interested in consulting regarding the development of the Junkanoo Museum*
- *Interested in bringing more Junkanoo and other elements of Bahamian culture to the port area*

***Lend-A-Hand Bahamas (Over-The-Hill Community Center)***

- *Interested in creating employment opportunities for community members*
- *Interested in creating tours and programs to educate visitors to downtown about the history and culture of the Over-The-Hill area*

***Organization for Responsible Governance (ORG)***

- *Discussed the highlights of the project and the importance of ensuring transparency about the project*

***Straw Business Persons Society***

- *Interested in the potential increases in passenger spending that will be generated from this investment*
  - *Interested in improved economic performance of entire downtown core*
- *Interested in details of the proposed flow of pedestrian traffic in the downtown area, particularly around the Straw Market*
- *Discussed state of Straw Market facilities (e.g. broken lighting fixtures, traffic flow issues)*
- *Interested in opportunities to partner to increase marketing efforts to promote businesses found in the downtown core*

***University of The Bahamas (School of Hospitality & Tourism Management)***

- *Interested in potential for student internships with NCPL*
- *Interested in potential for opportunities for student exchanges*
- *Interested in sustainability of the project i.e. recycling and reuse initiatives”*

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## **Marine and Terrestrial Site Assessments**

To help characterize the environment marine benthic surveys and terrestrial site assessments were conducted by the Caribbean Coastal Services Ltd.

**Marine Benthic Survey Summary** - Benthic surveys were conducted in Nassau Harbour on October 31<sup>st</sup>, 2019, during low tide at 8:32 a.m. and high tide at 3:35 p.m., via roving diver method. Dives were executed by two divers, using full scuba gear, inclusive of a surface support system with an attached dive flag as a safety precaution to mariners. Roving surveys were completed within the survey area by swimming parallel and perpendicular to Woodes Rodgers Walk, as well as the piers and platforms at the Nassau Harbour. The average duration of the dives lasted approximately thirty-one (31) minutes with maximum depths of 27ft (8.23 m) – 33ft (10.06 m). This benthic survey occurred in three (3) areas within and near the vicinity of the Nassau Harbour (Figure 6). There were no caves or blue holes observed during the dives. The 3 dive locations are identified in Figure 6 as 'Pier 3' (~18,644 sq. ft.), 'Tour Boat Operation' (~24,376 sq. ft.) and 'Woodes Rodgers Walk' (~131,132 sq. ft.). Vertebrate and invertebrate species were recorded and assigned one of four abundance categories based on their species count within the three (3) survey areas (Single = 1, Few = 2 – 11, Many = 11- 100, and Abundant = > 100).

**Terrestrial Site Assessments Summary** – On October 18<sup>th</sup>, 25<sup>th</sup> & 30<sup>th</sup>, 2019, and November 7<sup>th</sup>, 2019 terrestrial site assessments were conducted within the boundaries of the Port, along Woodes Rodgers Walk, and Rawson Square (Figure 7 and 8). Flora and fauna were identified to species level, where possible, within these areas of impact.

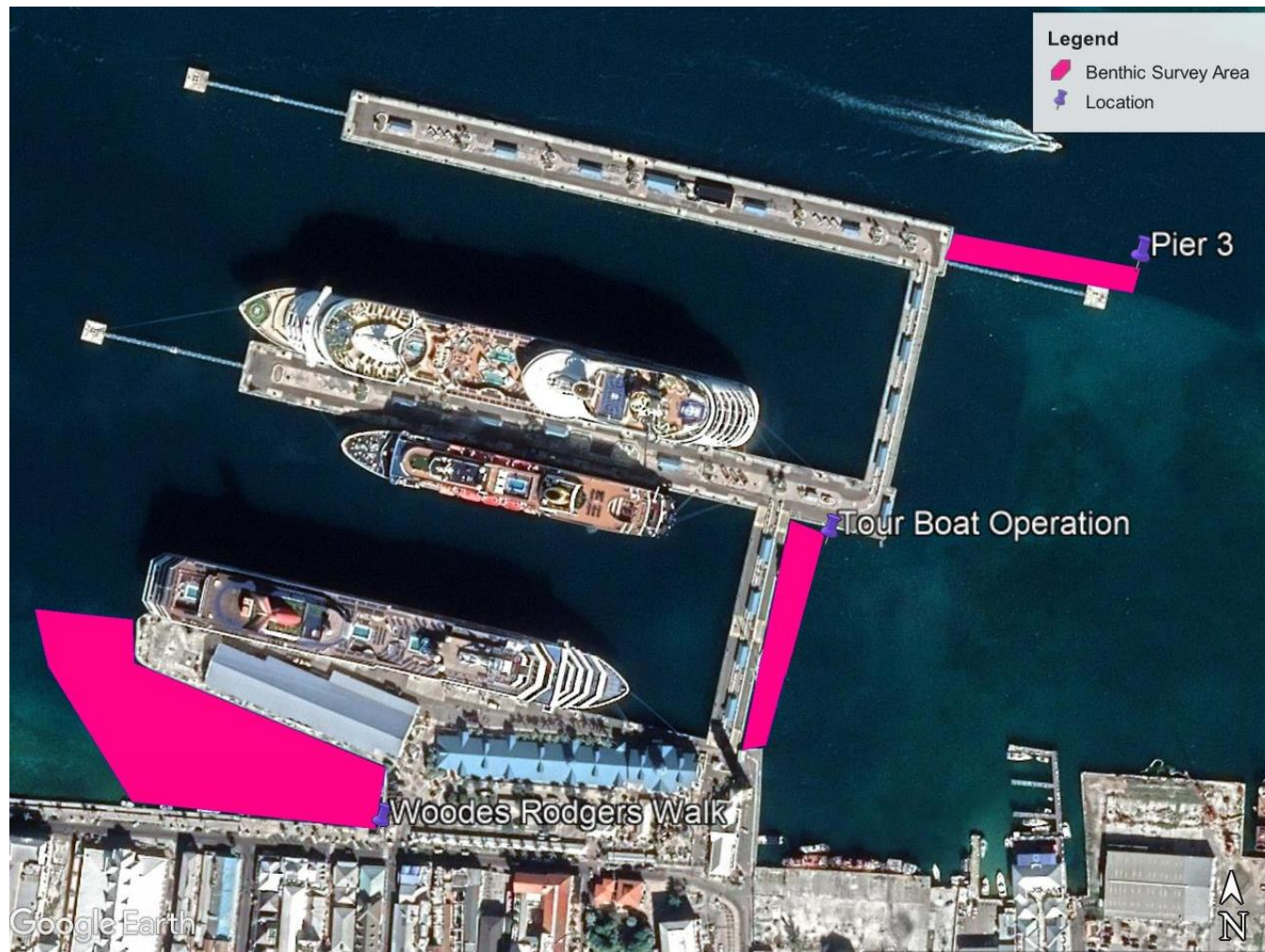
Ambient Air Quality and Ambient Noise Levels were measured on November 7<sup>th</sup>, 2019. The path surveyed is shown in Figure 7. Results of both assessments can be found in [3.3.8 Ambient Air Quality](#) and [3.3.9 Ambient Noise Levels](#).

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Figure 6. Nassau Harbour Benthic Survey locations conducted on October 31st, 2019.



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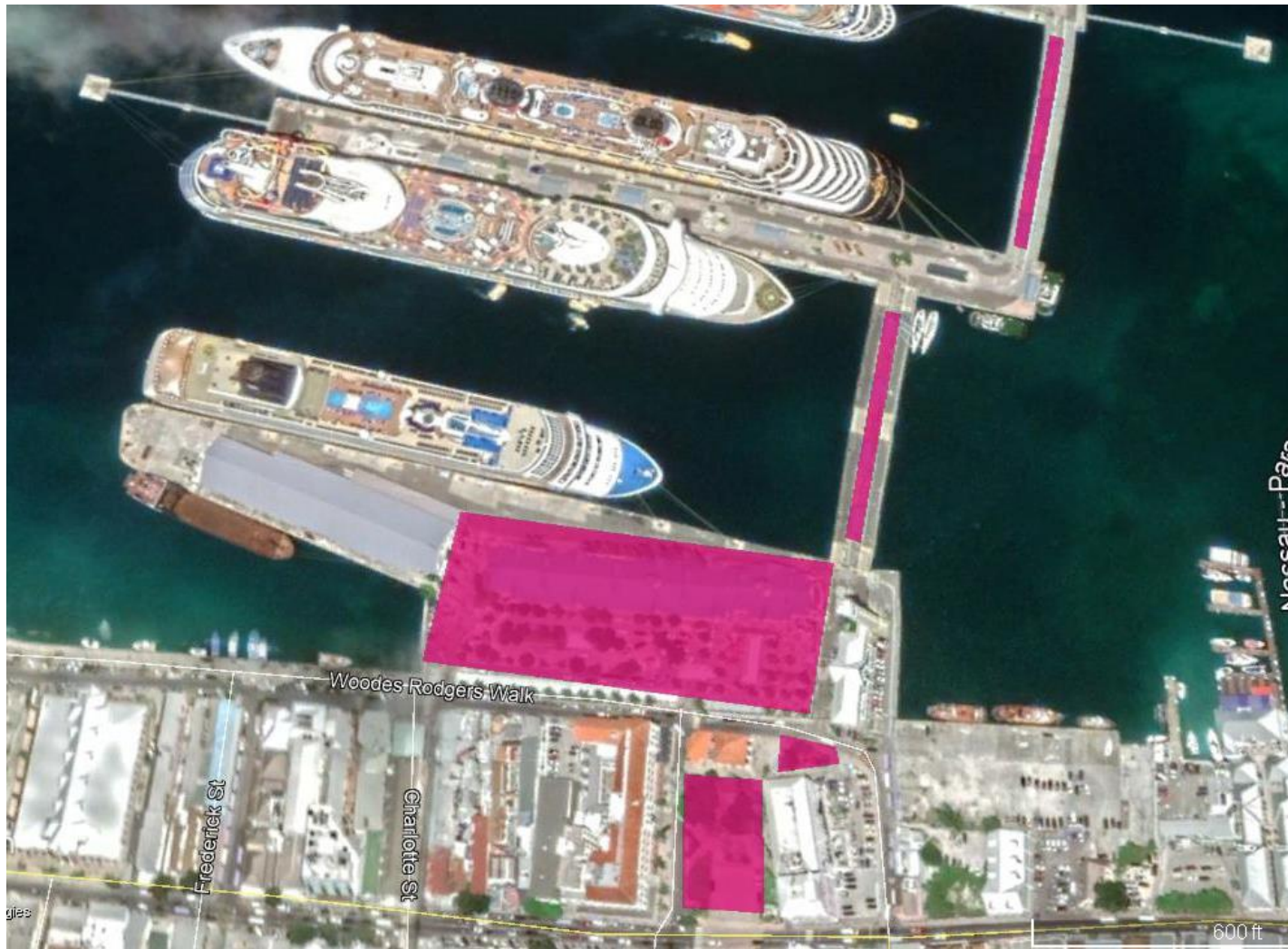


Figure 7. Terrestrial Site Assessment sound and air quality measurement paths.



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Figure 8. Terrestrial Site Assessment botany assessment locations.



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### 3.2.3. Data quality control strategy

Per standard scientific method, all methodologies used in data acquisition are replicable. All instruments used were calibrated in accordance with instruction manuals, and all results obtained were within detection limits of the instruments. Data acquisition and analyses were performed by experienced professional firms on the Client's project team who were vetted by The Bahamas Environment Science & Technology (BEST) Commission, prior to the preparation of this report.

Following internal reviews to ensure comprehensiveness, this report will be submitted to the Department of Environmental Planning and Protection to satisfy the environmental compliance process and commence various permit applications required through other government agencies.

## 3.3. Geographical & physicochemical characteristics in project's area of influence

### 3.3.1. Geographical location

The project's area of influence includes both marine and terrestrial areas. The marine area is Nassau Harbour and is located on the north northeastern coastline of the island of New Providence. The terrestrial areas are located along the coastline near the Harbour on Woodes Rodgers Walk.

**Marine Components** – Nassau Harbour is geographically positioned within shallow waters at the southeast margin of the Northeast Providence Channel. The Harbour has an eastern and western entrance. The development will take place closer to the western end of the Harbour at the existing cruise ship docking location locally called Prince George Wharf. The surrounding marine habitat within the benthic survey area at Nassau Harbour is Sandy Bottom (Figure 9). Coral reefs surround the entrance to the Harbour as shown in Figures 10 and 11, but are not located within the project's designated dredge or land reclamation areas. The dredger will use the same route as the cruise ships and will not impact coral reefs en route to the project site. Junkanoo Beach is west of the project site and will not be impacted by turbidity during the land reclamation phase of the project. Tiles will be installed in the land reclamation area to prevent transfer of sediment from the project site to Junkanoo Beach. Considering the coral reefs are even further away from the project site than Junkanoo Beach, risk of sedimentation impacts due to dredging is very low.

**Sandy Bottom Habitat** - The Sandy Bottom habitat was observed at the three (3) benthic survey areas. At Pier 3 the sand sediment is considered coarse due to its density when suspended in the water column and the presence of calcareous deposits. The sand observed at the Tour Boat Operation and Woodes Rodgers Walk sites are considered fine due to the smaller grain size and its slow descent when suspended in the water column. A considerable amount of marine debris exists within and around the three (3) benthic survey areas.

**Hard Bottom Habitat** - In Figure 9 Benthic Habitat Map, the Hard Bottom area south of the gangway between Pier 3 and the Tour Boat Operation areas was observed from the surface. This habitat is considered hard bottom due to the flat pavement-like surface and species identified growing on the substrate.

**Terrestrial Components** – The areas identified in Figures 7 and 8 are the terrestrial sites in downtown Nassau area that will be impacted. Businesses and the Straw Market located on the Woodes Rodgers Walk also included in the area of impact during construction of the Nassau Cruise Port.

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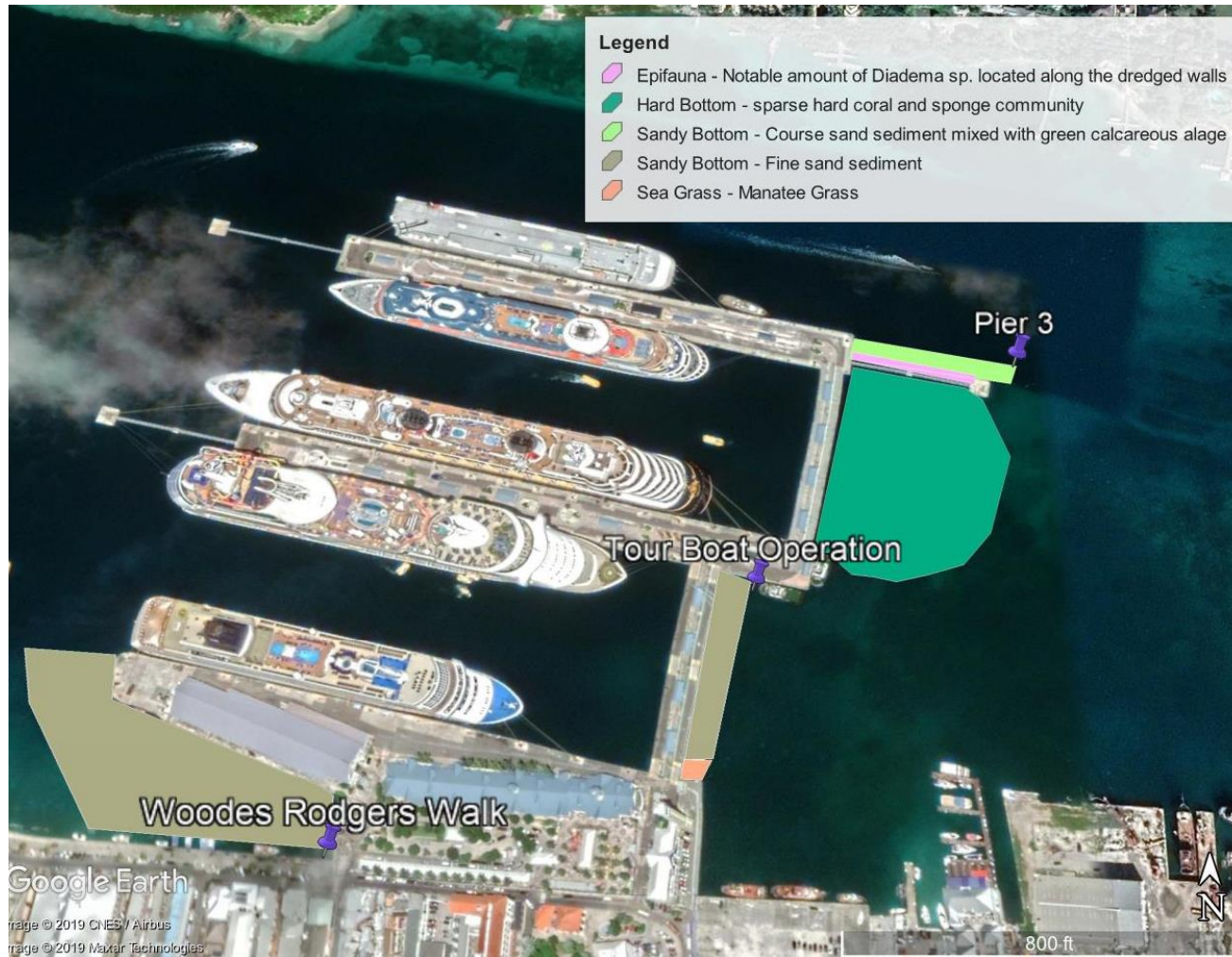
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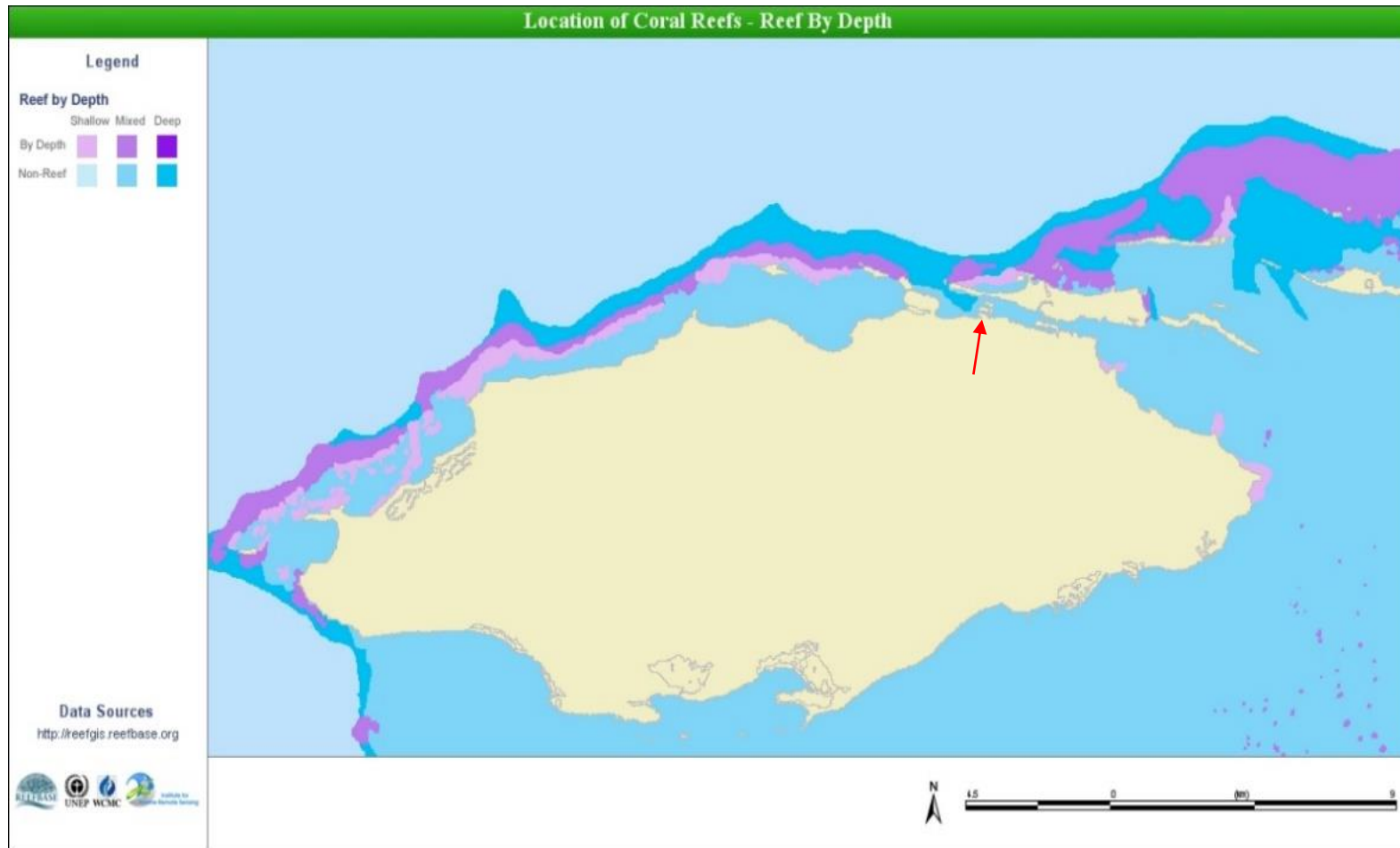


Figure 9. Nassau Harbour Benthic Habitat Map.



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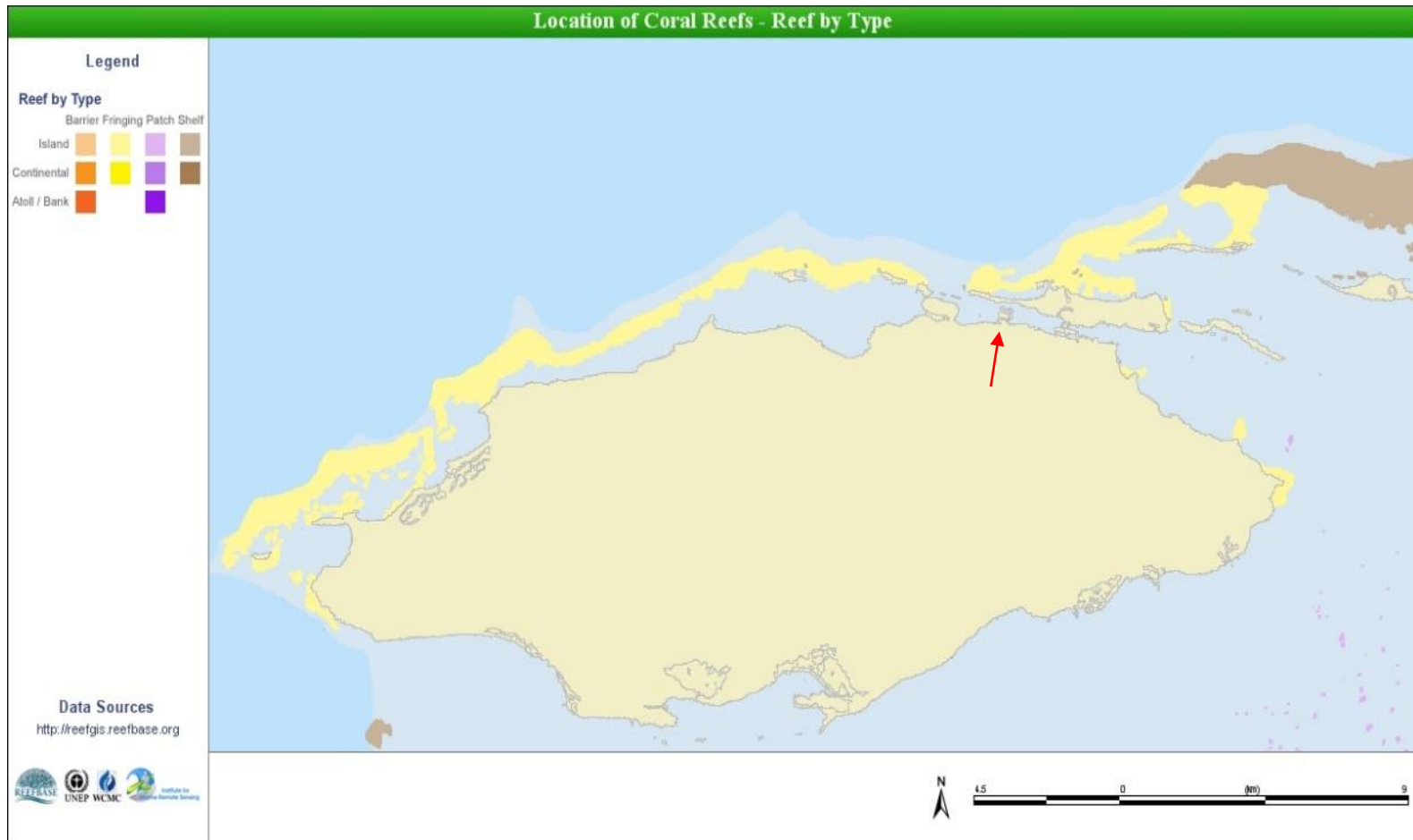
**Figure 10.** Depth of coral reef systems located north of New Providence and Paradise Island. The project site is indicated with a red arrow. The blue color at the project site is classified as Non-Reef.



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**Figure 11.** Reef type located north of New Providence and Paradise Island. The project site is indicated with a red arrow. There is no reef structure identified in the project site.



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### 3.3.2. Current land use in the project's area of influence

**Nassau Harbour & Prince George Wharf** is an official port of entry for The Bahamas. In order to maintain national security, the Port Department, Customs Department and Immigration Departments are all located on the property to process arrivals of vessels, crew and passengers at the Harbour. The Port Department will be temporarily relocated during the construction phase of the redevelopment to their offices at Potter's Cay Dock, east of the Harbour. As per the International Ship and Port Security (ISPS) code and other security code requirements for the Nassau Cruise Port (NCP), the security command center will be maintained on site throughout the construction phase to continue regular patrols and further ensure the security of workers and the public during the construction phase. The security command center will function from a temporary structure during construction, but will move to a permanent location on site post-construction.

Small boat operators use the western harbor area near Woodes Rodgers Walk to transport guests between New Providence and Paradise Island, New Providence and Blue Lagoon Island, and fishing and snorkeling experiences (Figure 12). Dolphin Encounters at Blue Lagoon Island and other tour boat operators use the eastern area of the Harbor to transport cruise ship guests (Figure 13).

During the benthic survey two visitors were observed line fishing in the harbor from the bridge connection between Pier 2 and 3 (Figure 14). A fish trap was identified in the area of Pier 3, but it was unclear if the trap was intentionally set in the Harbour or was transported there by ocean currents as ghost fishing gear.

**Figure 12.** Arrow pointing to tour boats docked in the western Harbour area along Woodes Rodgers Walk.



**Figure 13.** Blue Lagoon Island ferry transporting passengers back to cruise ship terminal.



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**Figure 14.** Two men fishing in the Harbour off the connection between Piers 2 and 3.



Food, clothing, jewelry, cigars and general souvenir vendors are located within the boundary of the Port. These vendors were displaced from Festival Place during the renovation of the building and remain within the boundaries of the Port selling their wares (Figures 15 and 16). Hair braiders are also stationed at a structure between the Festival Place Welcome Center (Figure 17).

**Figure 15.** Festival Place vendors



**Figure 16.** Festival Place vendors continued



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**Figure 17.** Front and side view of the Licensed Hair Braider station within the boundary of the Port.



Stalls advertising all-terrain vehicles (ATV) and jet ski tours and rentals are located between the Festival Place building and the boundary fence (Figure 18).

**Figure 18.** ATV Scooter Rental stalls within the Port boundary.



There is a horse and carriage or surrey operator waiting area along the boundary fence of the Port (Figure 19). The drivers offer tours to cruise ship visitors throughout downtown Nassau and other historic sites.

**Figure 19.** Oblique view of horse and carriage waiting area.



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Taxi operators line up on the outside of Festival Place near Pier 1 when cruise ship passengers are disembarking to advertise their services. There is also a taxi waiting area between Festival Place and the Horse and Carriage waiting area. An individual was observed riding a bicycle along the pier during the sound and air quality surveys.

**Woodes Rodgers Walk** Several waterfront retail stores, restaurants, and bars are located along Woodes Rodgers Walk. The area is frequented by locals and visitors during the week and the weekend. Senior Frogs restaurant is located at the most western end of Woodes Rodgers Walk. The rear entrance to the Straw Market faces Woodes Rodgers Walk. There are a few vendors stationed near this entrance of the Straw Market. Other vendors along the Walk are marine shell and starfish vendors that offer passersby sales from their vessels docked at the western harbor area. The shells and starfish line the seawall along the Walk. There is a taxi only parking station along the seawall and a taxi line up area just outside the boundary of the Port Department along Woodes Rodgers Walk.

### 3.3.3. Meteorology and climatic conditions

On the Köppen-Geiger classification system the general climate in Nassau corresponds to classification Aw: Tropical wet and dry or savanna climate. There are two main seasons, a wet and dry season. While some rainfall is experienced year-round, there are more rainy days in the wet season, the period from May through October. The dry season is November through April. Average annual rainfall on New Providence is 48 inches (1.22 m) and the average air temperature is 76°F<sup>9</sup>. The average annual humidity is 78%<sup>10</sup>. April typically has the most hours of sunshine and February has the lowest. The average water temperature is shown in Figure 20.

**Figure 20.** Average water temperatures in Nassau, Bahamas from [www.weatherandclimate.com](http://www.weatherandclimate.com).

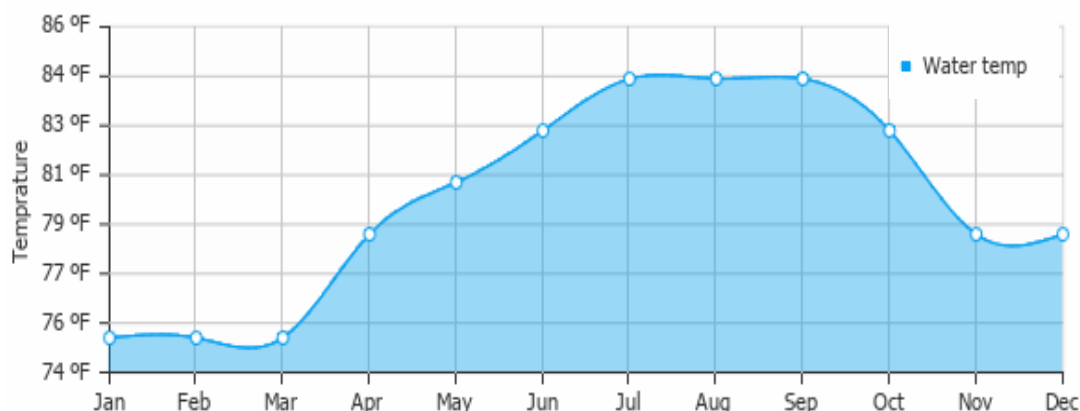


Table 4 which shows Climatological Means & Extreme Values for New Providence for the period of 1981 to 2010. New Providence Island is impacted by Hurricanes and storms periodically. Hurricanes typically impact The Bahamas during the six-month period of June 1 through November 30. Hurricanes are classified using the Saffir-Simpson Hurricane Scale, which classifies the storms from Category 1 to Category 5 based on wind speed. Table 5 shows the last five storms to impact the island of New Providence. As a result, construction material and design will consider the impacts of hurricanes such as wind speed and storm surge to help make the Nassau Cruise Port resilient.

<sup>9</sup> <https://en.climate-data.org/north-america/the-bahamas/nassau/nassau-1307/>

<sup>10</sup> <https://weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Nassau,Bahamas>



**Table 4.** Climatological Means & Extreme Values for New Providence 1981-2010<sup>11</sup>

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>Temp (°F) Highest Temp.</b>	88.3	89.2	91.4	91.4	95.5	97.7	96.8	96.6	95.4	95.4	92.1	89.1
<b>Mean of Daily Max Temp.</b>	78.2	79.0	80.4	82.6	85.8	88.5	90.3	90.4	89.4	86.4	82.2	79.6
<b>Mean of Daytime Temp.</b>	70.9	71.4	72.8	75.0	78.4	81.8	83.3	83.3	82.3	79.9	76.1	72.6
<b>Mean of Daily Min. Temp.</b>	63.4	64.3	65.4	67.6	70.9	74.4	76.0	76.0	75.4	73.4	69.6	66.0
<b>Lowest Temp. (°F)</b>	41.4	46.6	44.6	48.6	55.5	53.8	65.7	64.4	64.2	59.0	52.0	45.7
<b>Humidity Mean Relative Humidity (%)</b>	77	76	75	74	76	78	77	79	80	79	78	78
<b>Mean Dew Point (°F)</b>	62.8	62.9	63.8	65.7	70.0	74.4	75.5	75.8	75.4	72.4	68.2	65.2
<b>Wind Mean wind speed (knots)</b>	7.9	8.3	8.7	8.1	7.6	6.7	6.5	6.2	6.2	7.2	8.0	7.9
<b>Sunshine Mean Daily sunshine (hours)</b>	7.3	8.0	8.1	9.4	9.1	8.0	8.6	8.4	7.4	7.6	7.3	6.8
<b>Rainfall Total Monthly Rainfall (inches)</b>	1.92	1.95	2.55	2.46	4.54	8.77	5.89	8.54	7.18	5.41	3.11	2.03
<b>Max fall in a Day (inches)</b>	2.76	5.86	4.33	3.87	5.74	6.20	5.01	4.55	4.77	5.47	8.18	3.13
<b>Max rain days</b>	8	6	7	6	10	15	17	18	17	14	9	8

<sup>11</sup> Dupuch, E. (2018). Bahamas handbook. Nassau, The Bahamas: Etienne Dupuch Jr. Publications Ltd.  
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**Table 5.** The last 5 storms to impact New Providence.

Hurricane Name	Date of Impact	Observed Impacts <sup>12</sup>
Matthew	October 6, 2016	130 mph (209.21 km/h) winds; Storm surge up to 8 ft (2.44 m)
Noel	Nov 1, 2007 <sup>13</sup>	30 mph (48.28 km/h); 4.67 inches (11.86 cm) of rainfall [Tropical Storm]
Frances	Sept 4, 2004	115 mph (185.07 km/h) winds; “Frances also produced significant storm surge on several of the Bahama Islands, which the inundated the airports at Freeport, Grand Bahama, and Marsh Harbor, Abaco. However, exact surge values are not available. <sup>14</sup> ”
Michelle	Nov 5, 2001	85mph (136.79 km/h); 12.64 inches (32.11 cm) of rainfall <sup>15</sup>
Floyd	Sept 14, 1999	145 mph (233.35 km/h) winds; storm surge and rainfall data not available
Andrew	Aug 23, 1992	155 mph (249.45 km/h) winds; storm surge and rainfall data not available

#### 3.3.4. Existing drainage patterns

The topographic survey map from Atametrics Ltd. shows existing drains in the project area of impact (Appendix J). The drains on site are not operational according to NCP personnel which is evidenced by the standing water collected on site during periods of heavy rain. NCP commits to establishing a self-contained drainage system which will be described in the EMP. The drainage system will be maintained during construction and operation.

#### 3.3.5. Ground water resources

The main groundwater resource on New Providence is the freshwater aquifer, “saturated beds or formations which yield water in sufficient quantities to be economically useful” (US Army Corps of Engineers, 2004)<sup>16</sup>. The maximum depth of the historic freshwater lens thickness in the area of impact is 30 to 39 feet (11.89 m) (Figure 21). A 2004 study by the US Army Corps of Engineers revealed half of the fresh water supplies for New Providence was damaged as a result of storm surge or salt water intrusion as a result of over pumping.

The proposed redevelopment will not be connected to the fresh water lens for its water supply. It will rely on the Water and Sewerage Corporation for its potable water supply and will use the environmental guidelines in ISO 14001 as a guideline to ensure the water lens is not polluted or damaged by the development during construction or operation of NCP.

<sup>12</sup> <http://www.hurricanecity.com/city/nassau.htm>

<sup>13</sup> [https://www.nhc.noaa.gov/data/tcr/AL162007\\_Noel.pdf](https://www.nhc.noaa.gov/data/tcr/AL162007_Noel.pdf)

<sup>14</sup> [https://www.nhc.noaa.gov/data/tcr/AL062004\\_Frances.pdf](https://www.nhc.noaa.gov/data/tcr/AL062004_Frances.pdf)

<sup>15</sup> [https://www.nhc.noaa.gov/data/tcr/AL152001\\_Michelle.pdf](https://www.nhc.noaa.gov/data/tcr/AL152001_Michelle.pdf)

<sup>16</sup> US Army Corps of Engineers. (2004). Water resources assessment of The Bahamas.

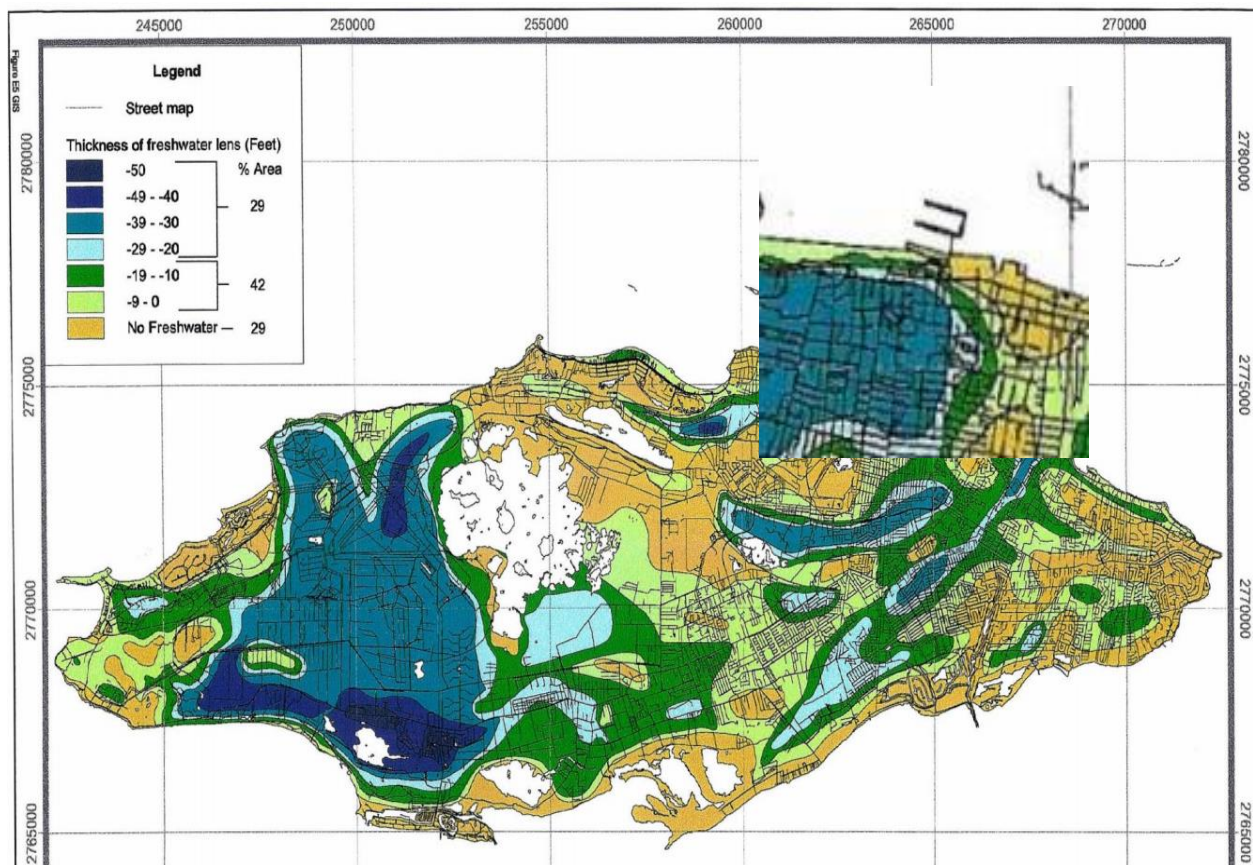
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**Figure 21.** Map of the freshwater lens on New Providence showing the lens thickness near Nassau Harbour. Figure taken from *The UNDP/Bahamas Government Groundwater studies in New Providence, 1976 – 1984*.<sup>17</sup>



### 3.3.6. Marine water resources

#### 3.3.6.1. Ambient water quality

NOAA defines water quality as “the condition of the water including the chemical, physical and biological characteristics usually with respect to its suitability for a particular purpose”<sup>18</sup>. The water quality in the Harbour should be suitable to maintain the marine species in the Harbour, and those surrounding the Harbour that may be exposed to the Harbour’s water quality during tidal flushing. A popular beach for tourists and locals, Junkanoo Beach, is adjacent to the Harbour. While the Harbour is not intended for swimming, in the event an NCP employee, cruise ship passenger, or crew falls overboard, the water quality should not be toxic to humans.

To establish a baseline for the water quality in the Harbour and determine if the water quality is suitable for marine life within and beyond the Harbour, several water quality parameters were measured at depth and at the surface of the marine environment within and around Nassau Harbour. Measurements were taken using a Horiba U52G water quality meter. Specifically, water quality measurements were recorded at the three (3) areas surveyed as a part of the Benthic Survey. The areas are as follows.

<sup>17</sup> [http://www.wsc.com.bs/The%20Water%20Resources%20of%20The%20Bahamas%20\(1\).pdf](http://www.wsc.com.bs/The%20Water%20Resources%20of%20The%20Bahamas%20(1).pdf)

<sup>18</sup> <https://floridakeys.noaa.gov/ocean/waterquality.html>

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1. Pier 3
2. Tour Boat Operation
3. Woodes Rodgers Walk

Parameters measured during sampling include temperature, pH, oxidation reduction potential, electrical conductivity, turbidity, dissolved oxygen, total dissolved solids, salinity, depth and GPS location. The general description of each parameter is below and Tables 6 through 8 show the readings for each parameter at the three benthic survey sites. Testing times were determined based on the berthing schedules and Port access.

*Water temperature* is a measure of the average amount of thermal energy available in a body of water, a result of kinetic energy of water molecules. Temperature is an important parameter impacting the ecology of a water body, as it influences other water quality parameters. Temperature changes have been known to influence the metabolism and behavior of marine fauna, as well as the photosynthetic and growth rate of marina flora. As temperature increases, the dissolved oxygen holding capacity of a water body decreases and the electrical conductivity increases.

*Electrical conductivity* is the ability of water to conduct electrical current. It is related to several other parameters, such as salinity, temperature and the concentration of ions from inorganic matter. Conductivity is directly proportional to the temperature and the salinity. As salinity increases, the conductivity will increase. Similarly, as the temperature increases, the conductivity will increase. "The anions from inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate and the cations sodium, magnesium, calcium, iron, and aluminum affects the conductivity. Organic compounds like oil, phenol, alcohol, and sugar do not conduct electrical current very well and therefore have a low conductivity when in water"<sup>19</sup>. As a result, a sudden increase or decrease in conductivity in a body of water can indicate pollution<sup>20</sup>.

*Total dissolved solids* (TDS) represent the total of dissolved material in a body of water. It is the combination of inorganic and organic substances that can pass through a 2 micron filter<sup>21</sup>.

*Salinity* is the measurement of the amount of dissolved salts in a body of water which equates the water's ability to conduct electricity. The average salinity of a marine habitat is measures at 35 parts per thousand (‰). These parameters act as an indicator of any possible changes in the water quality within an aquatic environment, which may indicate signs of contamination. Therefore, affecting the development of aquatic organisms.

*Turbidity* is a term used to describe the passage of light through a body of water. This parameter measures the presence of suspended particles in a body of water which include inorganic and organic matter. It's unit of measurement is Nephelometric Turbidity Units (NTU). The association with turbidity and water quality aids in identifying suitable conditions for aquatic organisms to thrive. For instance, clarity within the water column allows light to penetrate algae / primary producers which support complex food webs. High turbidity can inhibit fish from absorbing dissolved oxygen through their gills.

*pH* measurements provide an indication of the relative alkalinity or acidity of a sample of water. The device measures the potential difference of free Hydrogen ions (H<sup>+</sup>), and is expressed as a number between 1-14, 1-6 being acidic, 7 neutral and 8-14 alkaline. The pH is equal to  $-\log_{10}c$ , where c is the hydrogen ion concentration in moles per liter. The pH of a body of water has a direct impact on resident biology, impacting the ability for organisms to regulate life sustaining processes dependent on the exchange of ions with the

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<sup>19</sup> <https://archive.epa.gov/water/archive/web/html/vms59.html>

<sup>20</sup> <https://www.fondriest.com/environmental-measurements/parameters/water-quality/conductivity-salinity-tds/>

<sup>21</sup> <https://www.uwyo.edu/uwe/pubs/b1183/files/tds.pdf>

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water and respiration. The ideal pH range for aquatic organisms has been suggested as 6-9, although algae, fish and other extremophiles have been known to colonize extremely acidic and alkaline conditions where other life would not thrive. Ocean water has a pH range of 5-9, with the pH of 7 representing ideal conditions for marine life. Low pH levels can encourage the solubility of heavy metals and fish begin to die when the pH falls below 4<sup>22</sup>.

The *oxidation reduction potential (ORP)* is a measure of the state of equilibrium between the oxidants and reductants that coexist in a solution, which determines its ability to release or accept electrons during chemical reactions. ORP decreases as pH increases and it relates to the amount of dissolved oxygen in the water as when DO is low, ORP decreases<sup>23</sup>.

*Dissolved oxygen* represents the amount of atmospheric oxygen dissolved throughout a body of water. The EPA water quality criteria states that the dissolved oxygen should not fall below 4.0ml due to its negative affect on aquatic organisms and mortality rate (O'Brien, 2008)<sup>24</sup>. The *Dissolved Oxygen Percent (DO%)* is directly related to the total dissolved oxygen.

## Discussion

The body of water at Pier 3 consist of strong water currents that directed the flow of water west between Nassau Harbour and Paradise Island during observations. Water within the Tour Boat Operation area, flows through open channels beneath the concrete pavement between Pier 1 and Pier 2, which allows flushing and prevents stagnant water from developing within this area. Woodes Rodgers Walk is a semi-enclosed area with one exit area to the west. This exit opens to the north of Woodes Rodgers Walk. The Eastern boundary of this area is completely enclosed.

Strong water currents in the area of Pier 3 directed the flow of water west between Nassau Harbour and Paradise island. Water within the Tour Boat Operation area has the ability to flow through open channels beneath the concrete pavement between pier 1 and pier 2, which allows flushing and alleviates stagnant water within this area (Figure 22).

Woodes Rodgers Walk is a semi-enclosed area with one exit area to the west. This exit opens to the north of Woodes Rodgers Walk. The Eastern boundary of this area is completely enclosed. Overall, the water quality measurements reflect that flushing activities occur within the area.

Water quality measurements were summarized in Tables 6 through 8. Figures 23 through 25 show the location the measurements were taken. The measurements were compared to expected average measurements for each parameter in seawater. Table 9 summarizes expected levels for the measured parameters. Overall, the water quality measurements reflect there is sufficient water movement within the Harbour, the water quality is suitable to support marine life, and was not toxic to humans at the time of the measurements. The turbidity measurements will be used to compare the turbidity during the dredging and land reclamation phase. The EMP will describe turbidity monitoring methods to ensure NTU remains at the levels observed before the dredging and land reclamation.

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<sup>22</sup> <https://www.fondriest.com/environmental-measurements/parameters/water-quality/ph/>

<sup>23</sup> [https://www.enr.gov.nt.ca/sites/enr/files/oxidation-reduction\\_potential.pdf](https://www.enr.gov.nt.ca/sites/enr/files/oxidation-reduction_potential.pdf)

<sup>24</sup> O'Brien, P. (2008). Interpretation guidance for marine dissolved oxygen (DO) standard. Retrieved from <[http://www.dec.ny.gov/docs/water\\_pdf/togs116.pdf](http://www.dec.ny.gov/docs/water_pdf/togs116.pdf)>

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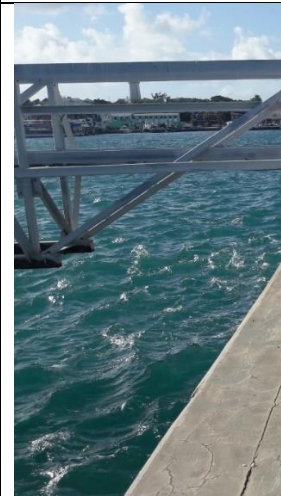
**Figure 22.** Channel opening to allow water movement at the Tour Boat Operation site.



**Table 6.** Water quality measurements near Pier 3 located along the last pier at Nassau Harbour, which is south of Paradise Island.

Site Name	Pier 3			
Location	25° 04' 55" N and 77° 20' 19" W			
Date	October 18, 2019		October 25, 2019	
	Surface	Substrate	Surface	Substrate
Time	16:58	16:55	10:03	10:07
Temp (°C)	29.16	29.09	28.67	28.7
pH	8.14	8.11	8.32	8.27
Cond (mS/cm)	54.8	56.4	55.3	56.6
Turbidity (NTU)	0	0	0	0
DO (mg/L)	7.09	6.1	6.4	6.46
DO%	111.9	96.7	100.4	101.9
TDS (g/L)	32.9	33.8	33.1	34
Salinity (ppt)	36.28	37.49	36.66	37.67
Depth (m)	0.2	2.95	0.25	2.85

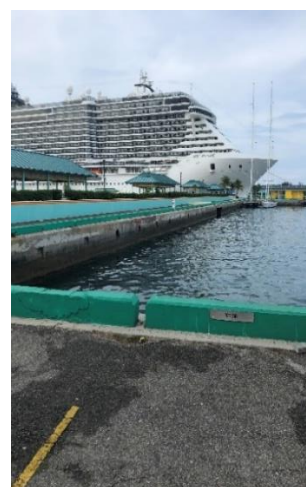
**Figure 23.** Pier 3 water quality measurement site.



**Table 7.** Water quality parameters measured at Tour Boat Operation located along the bridge connection between pier 1 and 2.

Site Name Location	Tour Boat Operation 25° 04' 55" N and 77° 20' 19" W			
Date	October 18, 2019		October 25, 2019	
	Surface	Substrate	Surface	Substrate
Time	17:13	17:16	10:55	10:57
Temp (°C)	28.97	29.1	28.9	28.93
pH	8.08	8.12	8.41	8.31
Cond (mS/cm)	54.9	55.8	55.1	56.2
Turbidity (NTU)	0	0	0	0
DO (mg/L)	6.72	5.56	6.14	5.96
DO%	105.7	88	96.6	94.2
TDS (g/L)	32.9	33.5	33.1	33.7
Salinity (ppt)	36.38	37.07	36.56	37.37
Depth (m)	0.45	3.5	0.55	3.05

**Figure 24.** Tour Boat Operation measurement site.



**Table 8.** Water quality measurements near Woodes Rodgers Walk along connecting concrete pavement near Nassau Harbour.

Site Name Location	Woodes Rodgers Walk 25° 04' 46" N and 77° 20' 23" W			
Date	October 18, 2019		October 25, 2019	
	Surface	Substrate	Surface	Substrate
Time	17:32	17:34	15:46	15:49
Temp (°C)	28.92	28.98	30.38	29.1
pH	8.26	8.18	10.76	10.05
Cond (mS/cm)	55.8	56.1	48.5	55.6
Turbidity (NTU)	0	0	14.3	0
DO (mg/L)	6.64	6.17	6.96	6.3
DO%	104.9	97.6	110.7	99.6
TDS (g/L)	33.5	33.6	28.8	33.4
Salinity (ppt)	37.03	37.26	32.14	36.92
Depth (m)	0.3	3.6	0.3	4.85

**Figure 25.** Woodes Rodgers Walk measurement site.



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**Table 9.** Expected values for Water Quality Parameters measured in the Harbour.

Parameter (unit)	Expected level
Temperature (°C)	Sea surface temperature fluctuates year round, but the average maximum for The Bahamas is 29.9°C and the average minimum is 26.9°C in October <sup>25</sup> . The average temperature for the Harbour was 29.1°C, which lies within the expected temperature range.
pH	Seawater usually has a pH around 8.2, though this can range between 7.5 to 8.5 <sup>26</sup> . While there were two pH values greater than the expected range indicated, the average pH in the Harbour was 8.6, which falls within the expected pH range. If the two higher values were removed, then the average pH would be 8.2.
Conductivity (mS/cm)	<p>Typical conductivity of seawater at 35 ppt is 5 S/m or 50mS/cm<sup>27</sup> and each body of water has a relatively constant conductivity<sup>28</sup>. Once the conductivity is established for a body of water, then fluctuations from the normal value in that body of water could indicate pollution. The average conductivity in the Harbour was 55.1 mS/cm, which is slightly above the typical conductivity of seawater. The high conductivity measurement could be the typical range for the Harbor, or it could mean there is a source of pollution nearby.</p> <p>Since salinity is directly related to conductivity, the average salinity for the Harbour [36.6 ppt] was converted to conductivity using the Salinity Conversion Calculator<sup>29</sup>. The expected conductivity at 36.6 ppt is 55.2 mS/cm. The average conductivity measured in the Harbour is 0.1 mS/cm less than the expected conductivity.</p>
Turbidity (NTU)	<p>Most measurements in the Harbour were 0 NTU, generally indicating clear water in the Harbour. The single measurement that was 14.3 NTU was taken in the Woodes Rodgers Walk sample location. NTU ranges from 1-10 NTU in water bodies with moderate plant and animal life, and 10-50 NTU in water bodies enriched with nutrients supporting large plumes of planktonic life.<sup>30</sup></p> <p>The higher NTU measurement was taken in the Woodes Rodgers Walk site near the surface. While the value was higher than the other turbidity readings, the measurement could be explained by run off from Woodes Rodgers Walk, a publicly accessible road.</p>
Dissolved Oxygen [DO] (mg/L)	<p>DO levels can fluctuate from 4-15 mg/L, though they usually remain around 5-8 mg/L, cycling between day photosynthesis production and night plant respiration.<sup>31</sup></p> <p>“If dissolved oxygen concentrations drop below a certain level, fish mortality rates will rise. In the ocean, coastal fish begin to avoid</p>

<sup>25</sup> <https://www.seatemperature.org/central-america/bahamas/nassau-october.htm>

<sup>26</sup> <https://www.fondriest.com/environmental-measurements/parameters/water-quality/ph/>

<sup>27</sup> <https://www.lenntech.com/applications/ultrapure/conductivity/water-conductivity.htm#ixzz6DriXVRuC>

<sup>28</sup> <https://www.epa.gov/national-aquatic-resource-surveys/indicators-conductivity>

<sup>29</sup> <https://www.hamzasreef.com/Contents/Calculators/SalinityConversion.php>

<sup>30</sup> [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/cwt/guidance/3150en.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/3150en.pdf)

<sup>31</sup> <https://www.fondriest.com/environmental-measurements/parameters/water-quality/dissolved-oxygen/>

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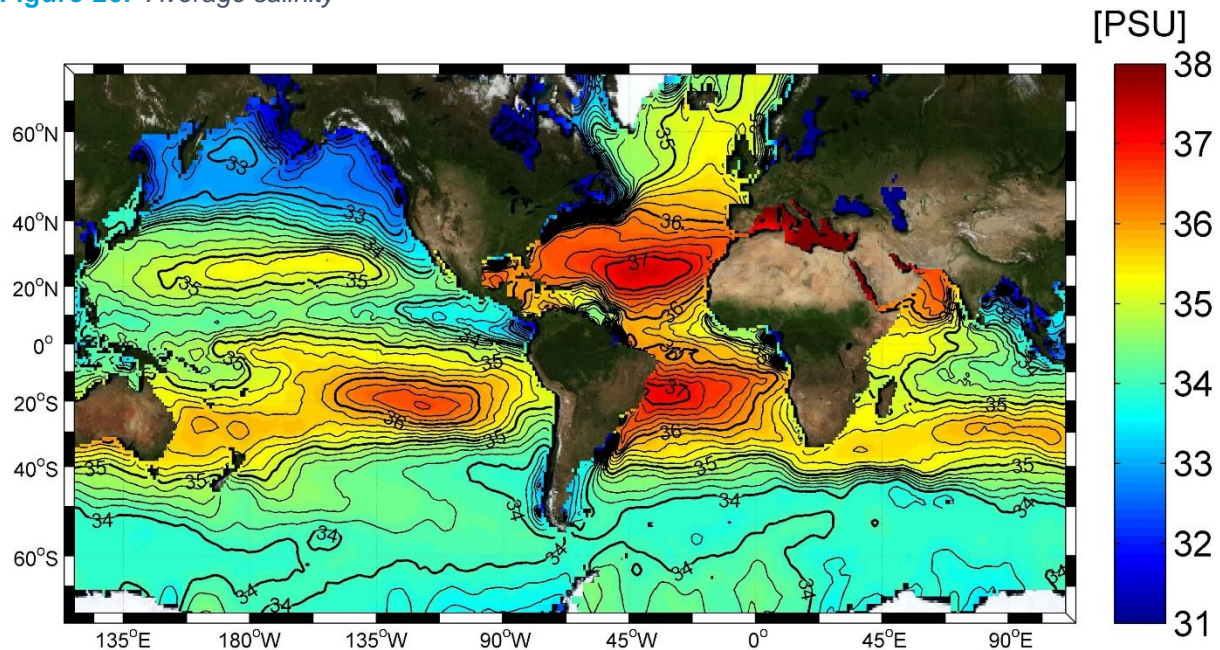
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	areas where DO is below 3.7 mg/L, with specific species abandoning an area completely when levels fall below 3.5 mg/L. Below 2.0 mg/L, invertebrates also leave and below 1 mg/L even benthic organisms show reduced growth and survival rates. <sup>32</sup> The average DO in the Harbour was 6.38mg/L which is above the level of concern.
Total Dissolved Solids (TDS) (g/L)	Total Dissolved Solids averaged 33.02 g/L in the Harbour.
Salinity (ppt)	The expected range for salinity is 36 – 37 ppt for the region. Figure 26 below shows the average salinity for seawater in PSU. The units psu, ppt and SA g/kg are nearly equivalent (and often interchanged) <sup>33</sup> . The average salinity in the Harbour was 36.6 ppt, which falls within the expected range for seawater.

Figure 26. Average salinity<sup>34</sup>



### 3.3.6.2. Seabed characteristics and bathymetry

A bathymetric study was conducted in 2019 by Cummins and Cederberg (Appendix F). The bathymetric report shows the area to be dredged near the most northern pier is 20 to 24 ft (7.32 m). The land reclamation area ranges from 10 to 26 ft (7.92 m). A Geotechnical Exploration Report was also conducted to ensure the proposed locations of the pier extensions and land reclamation area are suited for the current development. The Geotechnical Exploration Report is shown in Appendix I. Nine boreholes were assessed to determine the geotechnical properties of the sediment (Figure 27). The full geotechnical report shows the dredge material is suitable for use in land reclamation phase of the project.

<sup>32</sup> <https://www.fondriest.com/environmental-measurements/parameters/water-quality/dissolved-oxygen/>

<sup>33</sup> <https://www.fondriest.com/environmental-measurements/parameters/water-quality/conductivity-salinity-tds/>

<sup>34</sup> [http://www.salinityremotesensing.ifremer.fr/\\_rsrc/1286917514134/sea-surface-salinity/salinity-distribution-at-the-ocean-surface/annual\\_clim.jpg?height=1641&width=3015](http://www.salinityremotesensing.ifremer.fr/_rsrc/1286917514134/sea-surface-salinity/salinity-distribution-at-the-ocean-surface/annual_clim.jpg?height=1641&width=3015)

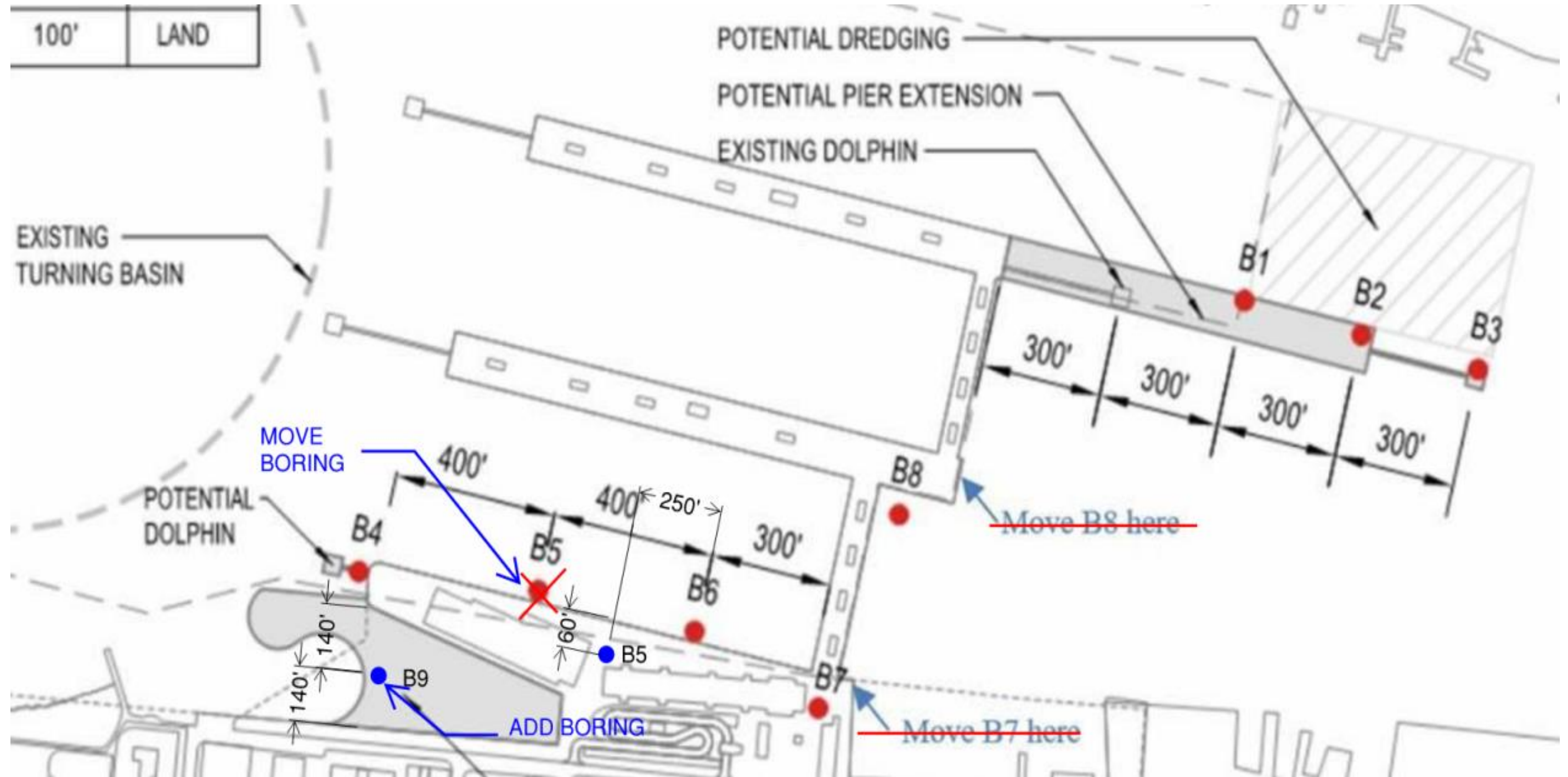
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Figure 27. Borehole locations in Nassau Harbour to assess geotechnical properties of the sediment.

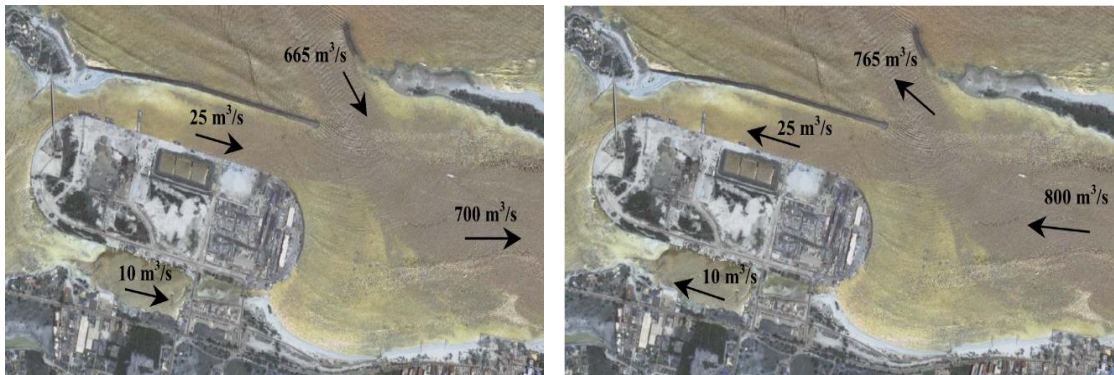


### 3.3.6.3. *Metoccean conditions*

Nassau Harbour is exposed to a semi diurnal tidal pattern. The waves and currents are driven by prevailing winds, the breakwater at the eastern entrance of the Harbour, and the bathymetry. When the bathymetry changed as described in the 2009 Baird & Associates Ltd. report titled, “Currents in Nassau Harbour” report, the currents and wave energy changed.

The “Currents in Nassau Harbour” report developed for the Nassau Harbour Port Improvement Project in 2009 by Baird & Associates Ltd. (refer to Appendix G) show current values near the land reclamation area of the project (see Figure 28 below). The report shows current entering the Harbour from the western entrance at 665 m<sup>3</sup>/s and leaving the same Harbour opening at 765 m<sup>3</sup>/s. As the Harbour narrows, the report shows the current entering the project site [Nassau Cruise Port] from the west increasing from 665 m<sup>3</sup>/s to 700 m<sup>3</sup>/s. This observed current speed is prior to widening and deepening of the turning basin of the Harbour. As the current leaves the project site, the current speed was 800 m<sup>3</sup>/s.

**Figure 28.** (Left) Generalized Ambient Flood Tide Measurements and (Right) Generalized Ambient Ebb Tide Measurements from the Baird & Associates Ltd. Currents in Nassau Harbour Report.



No potential impacts to Junkanoo Beach or any portion of the nearby coastline is expected as a result of the current proposed project. In section 1.3 of the “Wave Climate and Dredging Impacts Nassau Harbour Port Improvement Project” dated August 7, 2008 by Baird and Associates (refer to Appendix H), it is stated,

“Due to the existing width and depth of the navigation channel, the change in the cross sectional area of the harbour as a result of the proposed dredging will be very limited. Therefore, tidal currents should remain very similar pre and post dredging [...]”.

The dredging referenced was on a much greater scale than what is being proposed for the current improvement project. Figure 29 shows previous proposed dredging site according to Baird & Associates Ltd. The dredge site included the navigation channel, as well as areas directly offshore of Junkanoo Beach and Western Esplanade. The change in tidal currents as a result of the current proposed Nassau Cruise Port project is therefore considered as negligible as a result of the proposed dredging.

Again referencing the Baird 2008 report, waves enter the Harbour through the existing navigation channel. Junkanoo Beach is located between the navigation channel and the location of proposed dredging. As waves propagate from the navigation channel towards the east, the proposed seabed deepening cannot impact Junkanoo beach or adjacent beaches. Figure 5.5 in the report illustrates the wave conditions associated with the existing condition, and proposed condition, as well as the expected difference in wave height due to the proposed dredging at that time. The simulation shows that waves at the location of the proposed dredging in the current improvement project dissipate to 0.15 m-0.10 m in height. The energy of

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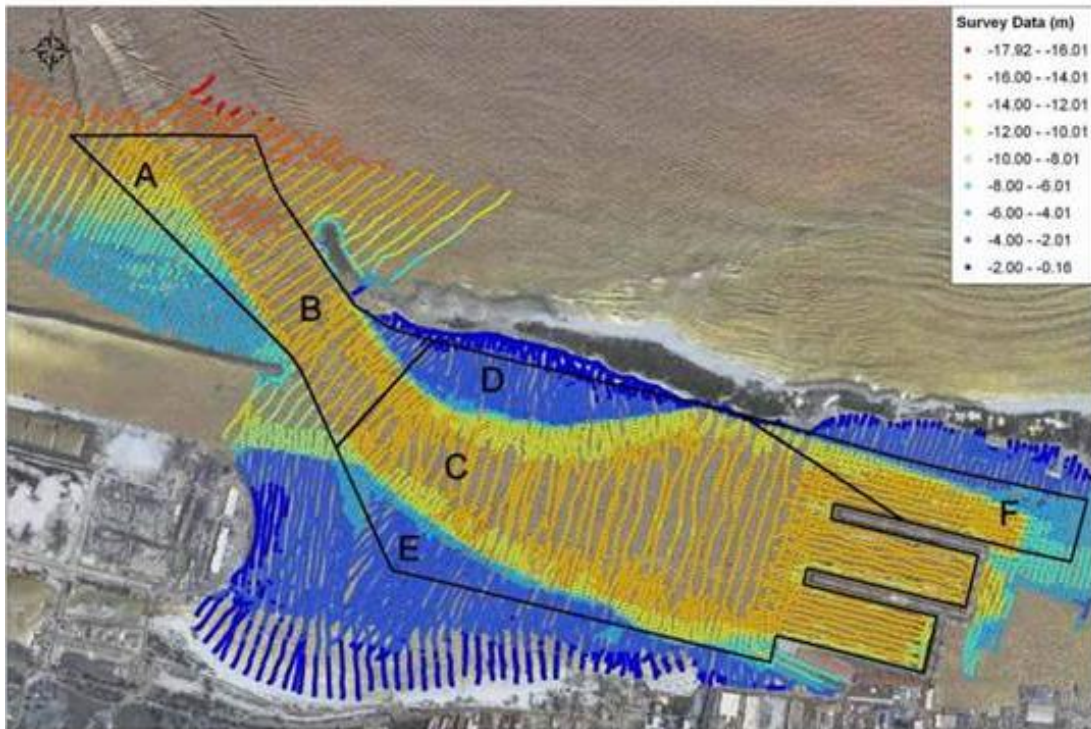
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waves of this magnitude are unable to interact with the seabed at the existing depth because it is too deep, and therefore cannot be affected by further deepening of the seabed.

Currents and waves are the driving factors in potential shoreline change. It is apparent that the proposed dredging will have negligible effects on either of these forces and therefore supports the theory that there will be no impact on surrounding shorelines.

**Figure 29.** Proposed Dredging Limits and Modifications from Baird & Associates Wave Climate and Dredging Impacts Nassau Harbour Port Improvement Project Report.



**Figure 5.1** Proposed Dredging Limits and Modifications

**Note:** While the Baird Report “Wave Climate and Dredging Impacts” was prepared as a part of a different project near the project site, the Report provided relevant information for the current project as it discusses the impacts of significant changes to the entrance channel and the turning basin which accounts for the majority of the area in the proposed project site. The Baird Report describes the conditions of the Harbour before the Nassau Harbour Port Improvement Project (NHPIP) and after the Harbour was altered significantly as a result of the NHPIP. The current proposed project does not alter the area and the current conditions in the Harbor should remain the same as those described in the Baird Report. Since the completion of the NHPIP, one development has been approved and constructed in the western harbour area since 2009. It is CCS’s experience with development within the western end of the Nassau Harbour, project approval is fundamentally based on the respective proposed developments not having substantial impact on the hydrodynamics nor operations of the harbour, especially the entrance channel and the cruise ship turning basin. Coastal modeling reports have been prepared and submitted to the respective agencies for projects within this area of high interest to validate that the designs satisfy this stipulation. As the project was approved, the conditions of the Harbour described in Appendix H did not change as a result of that development. Since the current proposed project will not alter the site near the marina entrance or turning basin, the condition described in Appendix H should remain the same.



Even if the proposed dredging were accepted to be substantial, the dredging location is well outside of the zone of influence on Junkanoo Beach. This supports the validity of the use of the 2009 Baird modeling results as representative of present day conditions.

The combined information in the Baird Report, the bathymetric surveys conducted as a part of the Nassau Cruise Port development, the present layout of the Harbour and the proposed new design of the Harbour revealed that a new study was not necessary. Based on a review of each of the aforementioned items, the following conclusions were made.

1. The proposed dredging is not expected to result in any significant changes to tidal or current flows, which might impact or create erosional events to areas of coastline in the vicinity of the project.
2. The proposed dredging is also not expected to create any rip currents or similar dangerous wave energy / activity to nearby beaches which may affect beach goers.
3. Changes to currents in the channel is not expected as a result of the intended dredging work.
4. Nor should the proposed dredging result in any changes to the wave energy or wave forces effect any of the beaches which border the project to the west or the east.

With the appropriate turbidity mitigation in place, as planned by Nassau Cruise Port, the project is not expected to have an impact on Junkanoo Beach.

There is no expected impact to private land north and north-east of the proposed dredge area. The proposed dredging is not expected to change the hydrodynamics of the Harbour, so current and wave interaction on the shoreline is expected to remain the same as present day conditions. Additionally, the southern shoreline of Paradise Island is predominantly rocky shoreline and is very resilient against erosion. Therefore, it is unlikely that mitigation will be necessary.

### 3.3.7. Ambient air quality

The purpose of the air quality screening is to determine a quantitative baseline for ambient air quality at the site. The first screening was conducted outdoors on November 7<sup>th</sup> 2019 at approximately 1700 hours. It was hypothesized prior to the data collection that the ambient air quality at the site was good, due to the well-ventilated open-air environment. The instrument used to quantitatively determine the ambient air quality was an Igeress Intelligent Air Quality Detector. The parameters and detection ranges of this instrument are provided in the Table 10.

**Table 10.** *Igeress Air Quality Detector Parameters and Detection Ranges*

Parameter	Detection Range (mg/m <sup>3</sup> )
Formaldehyde (HCHO)	0.000 – 1.999 mg/m <sup>3</sup>
Total Volatile Organic Compounds (TVOC)	0.000 – 9.999 mg/m <sup>3</sup>
Particulate Matter, 2.5/1.0/10µm (PM <sub>2.5/1.0/10</sub> )	0.000 – 0.999 ug/m <sup>3</sup>

Additionally, the hazard levels, air pollution levels, suggested actions, and levels of concern to be based on real time air quality data collected are provided in the Tables 11 and 12.

**Table 11.** Hazard Levels, Air Pollution Levels & Suggested Actions to be based on HCHO and PM<sub>2.5</sub> data

HCHO Range (mg/m <sup>3</sup> )	PM2.5 Range (ug/m <sup>3</sup> )	Hazard Level	Air Pollution Level	Suggested Actions
< 0.061	< 0.035	Safe	Fresh	Livable
< 0.100	< 0.075	Normal		Temporary stay
< 0.370	< 0.115	Light	Poor	Don't stay long
< 0.775	< 0.150	Medium	Harmful	Should not stay
< 1.181	< 0.250	Serious		Leave as soon as possible
≥ 1.181	≥ 0.250	Danger		Leave now

**Table 12.** Level of Concern to be based on TVOC Measurements (Source: <https://www.tecamgroup.com/acceptable-voc-levels/>)

TVOC (mg/m <sup>3</sup> )	Level of Concern
< 0.3	Low
< 0.5	Acceptable
< 1.0	Marginal
≥ 3.0	High

The instrument was calibrated in transit from the east entrance of the Port Authority building to the western extent of Pier 3, where data collection began. First, data was recorded from the western extent of Pier 3 to the eastern extent of Pier 3, then headed south to the western extent of Pier 2 to the eastern extent of Pier 2, then headed south again to the western extent of Pier 1 to the eastern extent of Pier 1 until arrival at the west entrance of the Port Authority building. Second, data was recorded from the eastern gate of the Port Authority building, headed east along Woodes Rogers Walk to Señor Frogs, and back. Screenshots of air quality data records are provided below in Figures 30 and 31. This data was recorded in real time and logged on the instrument for any future reference.

**Figure 30** Ambient Air Quality Screening Results – Metadata Record.



**Figure 31** Ambient Air Quality Screening – Data Record.



The results of the screening, in both the data records above and unrecorded real time data during calibration and standby periods, determined that none of the data points exceeded detection limits, hazard and air pollution levels are between normal (HCHO measured at 0.062 mg/m<sup>3</sup>) and safe (PM<sub>2.5</sub> measured at 1 ug/m<sup>3</sup>), and level of concern is low (TVOC measured at 0.268 mg/m<sup>3</sup>). This allows one to conclude that air quality at the site was good, and therefore, satisfactory for workers and the general public as they go about their activities. It is recommended that air quality screenings be continued throughout the life of the project to enhance the air quality data available for the site, as well as determine appropriate air quality control strategies during construction and operation phases of the redevelopment.

#### 3.3.8. Ambient noise levels

The purpose of sound level measurements is to determine a quantitative baseline for ambient noise levels at the site. The noise protection reported produced by Enka stated (Appendix J), “ambience noise during daytime must be measured and allowable noise level must be identified” while the marina wall is under construction. The survey was included to help identify the allowable noise level. The first noise level screening was conducted on November 7<sup>th</sup>, 2019 at approximately 1700 hours. It was hypothesized prior to data collection that the ambient noise at the site was normal, due to regular noise generation from conversations, loud music, public address (PA) system announcements, and the occasional ship horn. The instrument used to quantitatively determine noise levels was a BAFX Products Digital Sound Level Meter. The minimum and maximum detection range of this instrument is between 30dB and 130dB, respectively. Typical activities associated with noise in this range are provided in Table 13.

**Table 13.** *Noise level Chart.* <sup>35</sup>

dBA	Example	Home & Yard Appliances	Workshop & Construction
30	whisper		
40	babbling brook	computer	
50	light traffic	refrigerator	
60	conversational speech	air conditioner	
70	shower	dishwasher	
75	toilet flushing	vacuum cleaner	
80	alarm clock	garbage disposal	
85	passing diesel truck	snow blower	
90	squeeze toy	lawn mower	arc welder
95	inside subway car	food processor	belt sander
100	motorcycle (riding)		handheld drill
105	sporting event		table saw
110	rock band		jackhammer
115	emergency vehicle siren		riveter
120	thunderclap		oxygen torch
125	balloon popping		
130	peak stadium crowd noise		

According to the National Institute for Occupational Safety and Health (NIOSH) “exposures at and above [85 dBA] are considered hazardous.” (US Department of Health and Human Services, 1998).<sup>36</sup> As a result, recommended exposure limits (REL) for occupational noise should be controlled as noted in Figure 32.

Data collection began at the western extent of Pier 3. First, data was recorded from the western extent of Pier 3 to the eastern extent of Pier 3, then headed south to the western extent of Pier 2 to the eastern extent of Pier 2, then headed south again to the western extent of Pier 1 to the eastern extent of Pier 1 until arrival at the west entrance of the Port Authority building. Second, data was recorded from the eastern gate of the Port Authority building, headed east along Woodes Rogers Walk to Señor Frogs, and back. A graph of the sound level measurements recorded during the ambient noise level screening are provided in Figure 33.

<sup>35</sup> “Noise Level Chart”. Noise Help website, 2019. Accessed 8 November 2019. <https://www.noisehelp.com/noise-level-chart.html>. Accessed 8 November 2019.

<sup>36</sup> “Criteria for a Recommended Standard Occupational Noise Exposure Revised Criteria 1998”. US Department of Health and Human Services (National Institute for Occupational Safety and Health), 1998. Publication No. 98-126. Accessed 8 November 2019. <https://www.nonoise.org/hearing/criteria/criteria.htm>.



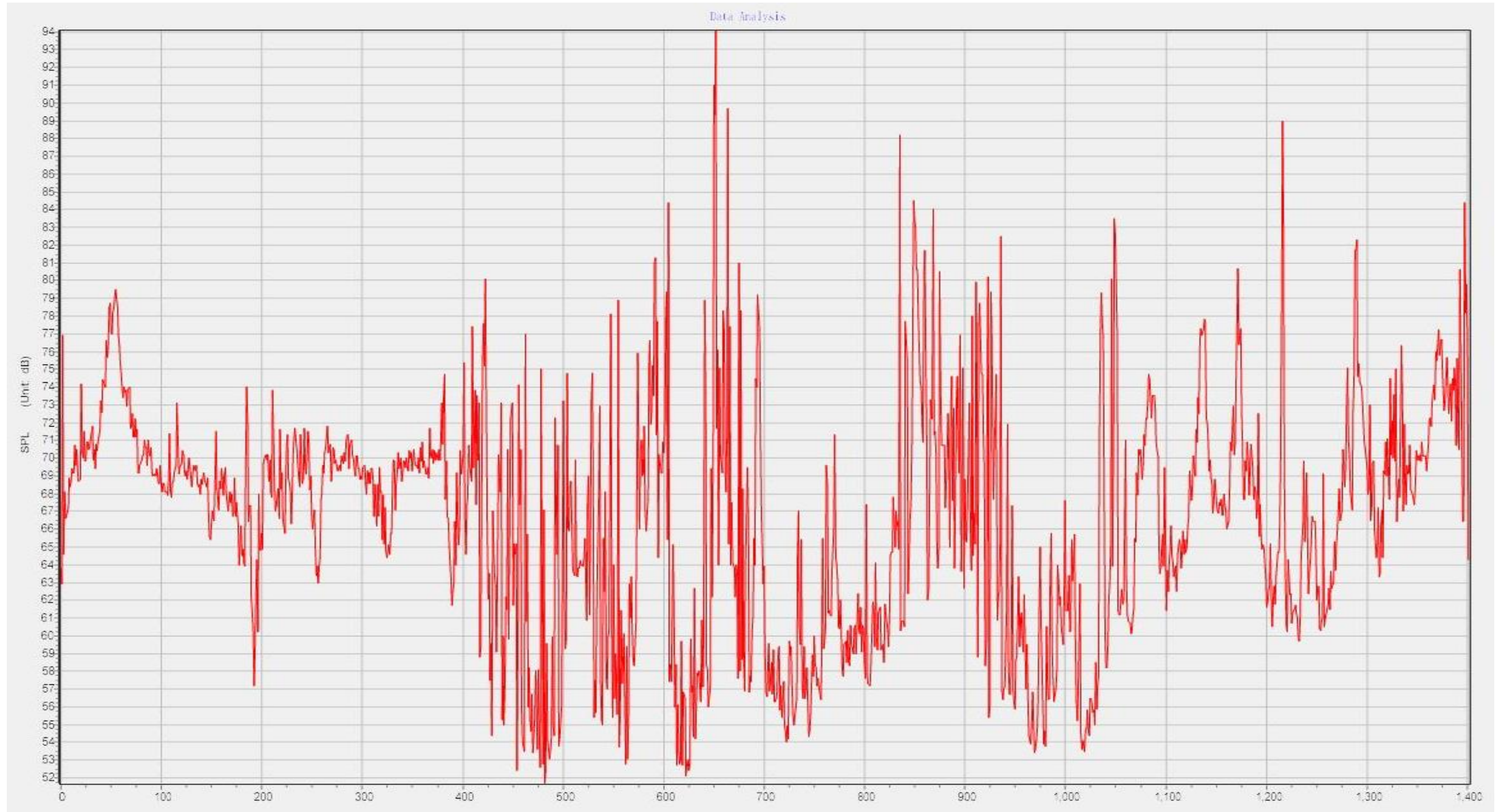
Figure 32. Recommended Exposure Limits for Occupational Noise<sup>37</sup>

Exposure level, <i>L</i> (dBA)	Duration, <i>T</i>			Exposure level, <i>L</i> (dBA)	Duration, <i>T</i>		
	Hours	Minutes	Seconds		Hours	Minutes	Seconds
80	25	24	—	106	—	3	45
81	20	10	—	107	—	2	59
82	16	—	—	108	—	2	22
83	12	42	—	109	—	1	53
84	10	5	—	110	—	1	29
85	8	—	—	111	—	1	11
86	6	21	—	112	—	—	56
87	5	2	—	113	—	—	45
88	4	—	—	114	—	—	35
89	3	10	—	115	—	—	28
90	2	31	—	116	—	—	22
91	2	—	—	117	—	—	18
92	1	35	—	118	—	—	14
93	1	16	—	119	—	—	11
94	1	—	—	120	—	—	9
95	—	47	37	121	—	—	7
96	—	37	48	122	—	—	6
97	—	30	—	123	—	—	4
98	—	23	49	124	—	—	3
99	—	18	59	125	—	—	3
100	—	15	—	126	—	—	2
101	—	11	54	127	—	—	1
102	—	9	27	128	—	—	1
103	—	7	30	129	—	—	1
104	—	5	57	130-140	—	—	<1
105	—	4	43	—	—	—	—

The results of the ambient noise level screening determined that none of the 1403 data points collected exceeded detection limits, or hazardous noise levels. The minimum, maximum, and average sound level measurements recorded were 51.70 dBA, 91.40 dBA and 66.47 dBA; respectively. Observations during the time of the screening confirmed that the maximum sound level recorded was generated by a heavy-duty truck in passing along Woodes Rogers Walk. This allows one to conclude that ambient noise levels at the site were normal and, therefore, acceptable for workers and the general public. It is recommended that noise level screenings be continued throughout the life of the project to enhance the baseline ambient noise level data available for the site, as well as determine appropriate noise quality control strategies during construction and operation phases of the redevelopment.

<sup>37</sup> “Criteria for a Recommended Standard Occupational Noise Exposure Revised Criteria 1998”. US Department of Health and Human Services (National Institute for Occupational Safety and Health), 1998. Publication No. 98-126. Accessed 8 November 2019. <https://www.nonoise.org/hearing/criteria/criteria.htm>.

Figure 33. Ambient Noise Level Screening Results, 7 November 2018.



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### 3.4. Biological resources characteristics of the project's area of influence

#### 3.4.1. Aquatic/marine biological resources

Marine biological resources were surveyed during the benthic survey conducted on October 31, 2019. Table 14 through 17 list the species observed during the survey.

**Pier 3 Survey** - Various marine species were observed throughout the Pier 3 survey area, including *Chaetodon capistratus*, *Pseudupeneus sp.*, *Acanthurus coeruleus*, *Aetobatus narinari*, *Gorgonia sp.*, *Diploria strigosa* and *Condylactis gigantea*. Large debris such as tires litter the seafloor. Small corals <10cm were observed growing on the benthos. Larger coral > 10cm were observed growing on the pier structures. A Coral Relocation Plan will be described in detail in the EMP. Strong currents at approximately 3-5 knots prohibited divers from venturing beyond the confines of the concrete structures at Pier 3. Slack tide conditions were considered however, diver safety regarding pier access/egress in a high vessel traffic area, were of the utmost concern. There was good visibility during the dive which permitted surveys of the area to continue from an angle. During the survey, despite the inability to swim directly over the site, visibility was sufficiently clear to observe a fish trap and sandy bottom in the area. The dive was planned and conducted with a Dive Safety Officer.

The benthic habitat consists of a considerable amount of coverage with green calcareous algae *Halimeda sp.*, located near the gangway/extension bridge at Pier 3. Course sand covers the benthos adjacent to the *Halimeda sp.* community. Numerous pieces of dead *Halimeda sp.* lie among the sand, adding to its coarse sand sediment.

Evidence of harbor dredged boundary exists within this survey area as dredge scars line the area directly beneath the gangway. Copious amounts of *Diadema sp.* line the dredge scars that extend eastward from Pier 3. The dredged area is approximately 42 ft (12.8 m) in depth.

**Tour Boat Operation** - The Tour Boat Operation survey area contains various forms of trash; such as lounge chairs, cans, cups, tires etc. Marine species in this survey area include *Serranus tabacarius*, *Acanthurus coeruleus*, *Lutjanus analis*, *Chaetodon capistratus*, *Lactophrys sp.*, *Pterois volitans*, *Syringodium filiforme* and *Holothuria mexicana*.

**Woodes Rodgers Walks** - The benthic survey near Woodes Rodgers Walk reveals the large amounts of solid waste pollution which lie beneath the clear surface waters. Marine species observed include *Panulirus argus*, *Octopus vulgaris*, *Urobatis jamaicensis*, *Bothus lunatus*, *Ancylomenes pedersoni*, *Aluterus scriptus*, *Acanthurus coeruleus*, *Acanthurus bahianus*, *Pterois volitans*, *Bartholomea annulate*, *Epinephelus striatus*, and *Epinephelus guttatus*. Few scattered empty lobster traps were observed within the survey area. Notable amounts of grey sand mounds were visible along the sandy bottom habitat, which indicate the presence of marine worms or crustaceans within the survey area.

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3.4.1.1. *Benthic macro-invertebrate*

**Table 14.** Marine invertebrates observed during benthic surveys.

Common Name	Scientific Name	Abundance	Habitat
Cliona	<i>Cliona tenuis</i>	Few	SB
Stinker Sponge	<i>Ircinia felix</i>	Few	SB
Black-Ball Sponge	<i>Ircinia strobilina</i>	Few	SB
Pederson Cleaner Shrimp	<i>Ancylomenes pedersoni</i>	Few	SB
Common Octopus (Figure 34)	<i>Octopus vulgaris</i>	Single	SB
Giant Anemone (Figure 35)	<i>Condylactis gigantea</i>	Few	SB
Corkscrew Anemone (Figure 36)	<i>Bartholomea annulata</i>	Few	SB
Furry Sea Cucumber	<i>Astichopus multifidus</i>	Single	SB
Donkey Dung Sea Cucumber	<i>Holothuria mexicana</i>	Single	SB
Caribbean Spiny Lobster (Adult and Juvenile)	<i>Panulirus argus</i>	Few	SB
Long-Spined Urchin	<i>Diadema antillarum</i>	Many	SB

**Figure 34.** Common Octopus hidden in debris.





**Figure 35.** *Giant Anemone*



**Figure 36.** *Corkscrew Anemone*



**Table 15.** *Coral species observed during benthic surveys.*

Common Name	Scientific Name	Habitat
Symmetrical Brain Coral (Figure 37)	<i>Diploria strigosa</i>	SB
Lesser Starlet Coral	<i>Siderastrea radians</i>	SB
Low Relief Lettuce Coral	<i>Agaricia humilis</i>	SB
Sea Fan	<i>Gorgonia sp.</i>	SB
Finger Coral	<i>Porites sp.</i>	SB
Mustard Hill Coral	<i>Porites astreoides</i>	SB

**Figure 37.** *Symmetrical Brain Coral attached to Woodes Rodgers Walk concrete structure.*



3.4.1.2. Fish and fisheries

**Table 16.** Marine vertebrates observed during benthic surveys. SB is Sandy Bottom.

Common Name	Scientific Name	Abundance	Habitat
Beaugregory Damselfish (Juvenile)	<i>Stegastes leucostictus</i>	Single	SB
Yellow Stingray (Figure 38)	<i>Urobatis jamaicensis</i>	Few	SB
French Angelfish (Juvenile) (Figure 39)	<i>Pomacanthus paru</i>	Single	SB
Slippery Dick	<i>Halichoeres bivittatus</i>	Few	SB
Tobacco fish	<i>Serranus tabacarius</i>	Single	SB
Lionfish	<i>Pterois volitans</i>	Many	SB
Peacock Flounder	<i>Bothus lunatus</i>	Single	SB
Scrawled Filefish	<i>Aluterus scriptus</i>	Few	SB
Yellowtail Snapper	<i>Ocyurus chrysurus</i>	Many	SB
Ocean Surgeon (Figure 40)	<i>Acanthurus bahianus</i>	Many	SB
Doctorfish	<i>Acanthurus chirurgus</i>	Many	SB
Foureye Butterflyfish	<i>Chaetodon capistratus</i>	Single	SB
Spotted Eagle Ray	<i>Aetobatus narinari</i>	Single	SB
Blue Tang	<i>Acanthurus coeruleus</i>	Many	SB
Goatfish	<i>Pseudupeneus sp.</i>	Few	SB
Nassau Grouper (Figure 41)	<i>Epinephelus striatus</i>	Few	SB
Saddled Blenny	<i>Malacoctenus triangulatus</i>	Single	SB
Red Hind Grouper	<i>Epinephelus guttatus</i>	Single	SB
Bar Jack	<i>Carangoides ruber</i>	Single	SB
Mutton Snapper	<i>Lutjanus analis</i>	Many	SB
Trunkfish (Juvenile)	<i>Lactophrys sp.</i>	Few	SB
Sergeant Major	<i>Abudefduf saxatilis</i>	Few	SB

**Figure 38.** Yellow Stingray.



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**Figure 39.** *Juvenile French Angelfish.*



**Figure 40.** *School of Surgeonfish.*





**Figure 41.** Juvenile Nassau Grouper.



3.4.1.3. Reptile, mammal, and bird wildlife

No marine reptiles, mammals, and marine birdlife was observed during the surveys.

3.4.1.4. Other Listed Species

**Table 17.** Marine algae observed during benthic surveys. SB is Sandy Bottom.

Common Name	Scientific Name	Habitat
Y-Branched	<i>Dictyota sp.</i>	SB
Shaving Brush	<i>Penicillus capitatus</i>	SB
Flat-Top Bristle Brush	<i>Penicillus pyriformis</i>	SB
Green Feather Algae	<i>Caulerpa sertularioides</i>	SB
Turtle Grass	<i>Thalassia testudinum</i>	SB
Leaf Hanging Vine (Figure 42)	<i>Halimeda sp.</i>	SB
Manatee Grass	<i>Syringodium filiforme</i>	SB

**Figure 42.** Leaf Hanging Vine Algae.





#### 3.4.1.5. Economically important species

The Nassau Grouper (*Epinephelus striatus*) and Caribbean Spiny Lobster (*Panulirus argus*) were observed within various benthic survey areas. These commercially important species are vital to the Bahamian economy due to their ability to generate a substantial amount of revenue. Additionally, both marine species play an important role in the Bahamian diet and culture. These marine species prove to be vital to the existing delicate marine ecology of The Bahamas.

The Nassau Grouper has a vital role in the marine ecology of The Bahamas. This fish helps to maintain balance within the coral reef habitat. This balance is achieved by consuming other fish that may overpopulate the reef. Groupers are an essential part of the coral reef ecosystem. Their role as predators is to stabilize the reef community by preventing overpopulation of certain marine species that may threaten the reef if left unregulated. If the coral reef system becomes overpopulated, it risks the health of the reef. Overconsumption of coral supporting algae and nutrient would deteriorate the health of the reef system overtime, eventually reducing biodiversity, impacting food webs and destroying this vital ecosystem. When the Nassau Grouper is at its juvenile phase, it consumes algae; this also helps to regulate the coral reef environment as well as the seagrass beds. As the juvenile Nassau Grouper consume the algae that cover these vital producers, it allows sunlight to penetrate these marine producers that would help them to grow. If the coral reef or the seagrass beds were covered in algae, this prohibits sunlight which is needed for food production development.

The Nassau Grouper is responsible for generating a considerable amount of revenue for The Bahamian economy. The Department of Marine Resources recorded that Nassau Grouper landings in 2008 consisted of 340,837lbs that generated B\$ 1,276,873 of commercial revenue (Department of Marine Resources, 2010)<sup>38</sup>. These statistics show that there is a high demand for the Nassau Grouper and with this demand it allows local fishermen and restaurants to generate substantial amounts of revenue that then is circulated throughout the Bahamian economy. The cultural significance of the Nassau Grouper to the Bahamian people is certain. "There is a strong local market for the Nassau Grouper. Traditional dishes such as Boiled fish and Grouper fingers, keep the Nassau Grouper in high demand" (Bahamas National Trust, 2008)<sup>39</sup>. Nassau Grouper is a part of Bahamian traditional dishes.

The ecological role of the Spiny Lobster serves to control the population of bottom feeders such as sea urchin, crustaceans, etc. If the Spiny Lobster is removed from the ecosystem, then this allows these bottom feeders to reproduce in large numbers. Therefore, over populating the area and consuming all the producer plant species almost to extinction. The Spiny Lobster generates a considerable amount of revenue for The Bahamas, both commercial and export value. The Department of Marine Resources reported that in 2008 the commercial value of the Spiny Lobster (inclusive of meat, tails, whole and head) totaled B\$ 60,157,722. The export value in 2008 generated B\$ 77,525,063 (Department of Marine Resources, 2010). The Spiny Lobster in The Bahamas is of great cultural significance in reference to Bahamian food as it is considered a Bahamian delicacy that is consumed sparingly.

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<sup>38</sup> The Government of The Bahamas, The Ministry of Agriculture and Fisheries: Department of Marine Resources. (2010). Final five-year sector strategic plan 2010-2014. Retrieved from < [https://www.bahamas.gov.bs/wps/wcm/connect/b159bfee-7eeb-4742-9153-91e67373dca1/Department+of+Marine+Resources+5+Year+Strategic+Plan.pdf?MOD=AJPERES&CONVERT\\_TO=url&CACHEID=b159bfee-7eeb-4742-9153-91e67373dca1](https://www.bahamas.gov.bs/wps/wcm/connect/b159bfee-7eeb-4742-9153-91e67373dca1/Department+of+Marine+Resources+5+Year+Strategic+Plan.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=b159bfee-7eeb-4742-9153-91e67373dca1) >

<sup>39</sup> The Bahamas National Trust. (2008). Nassau grouper. Retrieved from < <http://bnt.bs/wp-content/uploads/2016/03/nassaugrouper.pdf> >

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According to the International Union for Conservation of Nature (IUCN), the Nassau Grouper is considered critically endangered due to threats of invasive species, poor fishing practices and climate influences<sup>40</sup>. The IUCN lists the Spiny Lobster as data deficient due to gaps in the data relating to fishing effort. For the major producers of this species, both Cuban and Florida fisheries are thought to be relatively stable, however Nicaraguan, the Bahamas and Brazilian fisheries are uncertain<sup>41</sup>. Due to anthropogenic threats, The Government of The Bahamas has implemented closed seasons and fishing regulations for the Nassau Grouper and Spiny Lobster to encourage the development of these vital species.

**Invasive Species** - Lionfish (*Pterois volitans*) were observed at two of three benthic survey areas, which includes Tour Boat Operation and Woodes Rodgers Walk. Figure 43 shows lionfish hovering over marine debris. GPH intends to remove marine debris prior to the commencement of construction activities. Their presence is cause for concern due to their diet, lack of predators and rapid reproduction rate. The abundance of this species negatively affects the population of commercially important marine species such as the Spiny Lobster, Nassau Grouper, etc. Furthermore, impacting the vital marine ecosystems and their biodiversity. For instance, the Nassau Grouper is known to eat reef fish which aids in reef management within complexed food webs. As part of the overall land reclamation, the first activity is removal of debris. The seabed will be cleared of debris as required in preparation for dredging activities.

**Figure 43.** *Lionfish above solid waste debris.*



### 3.4.2. Terrestrial biological resources

Flora observed during the terrestrial assessment are a direct result of landscaping. The primary vegetation was removed for the construction of the current standing structures more than three decades ago. There appears to have been a concerted effort to incorporate native vegetation or culturally significant species in the current landscaped environment. Nassau Cruise Port aims to continue this trend in landscaping of the redeveloped areas. Two invasive species were identified the Hawaiian Sea Lettuce (*Scaevola taccada*) and Common Rat (*Rattus sp.*). Table 18 shows the list of species identified on site. Figure 44 through 62 show photos of observed species.

<sup>40</sup> Sadovy, Y., Aguilar-Perera, A. & Sosa-Cordero, E. 2018. *Epinephelus striatus*. The IUCN Red List of Threatened Species 2018: e.T7862A46909843. <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T7862A46909843.en> .

<sup>41</sup> Butler, M., Cockcroft, A., MacDiarmid, A. & Wahle, R. 2011. *Panulirus argus*. The IUCN Red List of Threatened Species 2011: e.T169976A6697254. <http://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T169976A6697254.en> .

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**Table 18.** Flora and fauna species identified within the boundaries of Festival Place (FP) and Prince George Wharf (PGW) and Rawson Square (RS). \* indicates invasive species.

Common Name	Scientific Name	Area
<i>Flora</i>		
Buttonwood	<i>Conocarpus erectus</i>	PGW
Hawaiian Sea Lettuce*	<i>Scaevola taccada</i>	PGW
Coconut Tree	<i>Cocos nucifera</i>	PGW, FP
Sea Grape	<i>Coccoloba uvifera</i>	PGW
Mahogany	<i>Swietenia mahagoni</i>	FP
Red Bottlebrush Tree	<i>Callistemon viminalis</i>	FP
Sabal Palm	<i>Sabal palmetto</i>	RS
Bismarkia Palm	<i>Bismarkia nobilis</i>	RS
Dwarf Autograph Tree	<i>Clusia sp.</i>	RS
Large Ficus Tree	<i>Ficus sp.</i>	RS
Macho Fern	<i>Nephrolepsis exaltata</i>	RS
Crinum lily	<i>Crinum asiaticum</i>	RS
Crinum lily (red variety)	<i>Crinum sp.</i>	FP
Tabebuia	<i>Tabebuia sp.</i>	RS
Juju Tree	<i>Ziziphus sp.</i>	FP
Cork Tree	<i>Thespesia populnea</i>	FP
Agave	<i>Agave americana</i>	FP
Asparagus fern	<i>Asparagus sp.</i>	FP
Yucca	<i>Yucca aloifolia</i>	FP
Bromeliad	<i>Aechmea sp.</i>	FP
Papaya	<i>Carica papaya</i>	FP
Moses in the Basket	<i>Tradescantia spathacea</i>	FP
Dwarf Elephant Ears	<i>Colocasia sp.</i>	FP
Hibiscus	<i>Hibiscus sp.</i>	FP
Aloe	<i>Aloe vera</i>	FP
Opuntia	<i>Opuntia sp.</i>	FP
Variegated Agave	<i>Agave americana</i>	FP
Euphorbia	<i>Euphorbia sp.</i>	FP
Liriope	<i>Liriope sp.</i>	FP
Yellow Elder	<i>Tecoma stans</i>	FP
Dwarf Variegated Schefflera	<i>Schefflera sp.</i>	FP
Green Island Ficus	<i>Ficus microcarpa var. crassifolia</i>	RS
Christmas Palm	<i>Adonidia merrillii</i>	RS
Bougainvillea	<i>Bougainvillea sp.</i>	RS
Crab Grass	<i>Digitaria sp.</i>	FP
<i>Fauna</i>		
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	RS
Laughing gull	<i>Leucophaeus atricilla</i>	PGW, RS
House sparrow	<i>Passer domesticus</i>	RS
Rat*	<i>Rattus sp.</i>	FP,RS,PGW



**Figure 44.** *Buttonwood and Hawaiian Sea Lettuce*



**Figure 45.** *Coconut Trees and Sea Grape trees*



**Figure 46.** *Coconut trees & ornamental plants*



**Figure 47.** *Mahogany*





**Figure 48.** *Red Bottle Brush Tree*



**Figure 49.** *Sabal Palm*



**Figure 50.** *Bismarkia Palm*



**Figure 51.** *Dwarf autograph tree*



**Figure 52.** *Large Ficus Tree*



**Figure 53.** *Macho Fern*



**Figure 54.** *Crinum lily*



**Figure 55.** *Crinum lily (Red Variety)*



**Figure 56.** *Tabebuia*





**Figure 57.** *Hawaiian Sea Lettuce, Juju Tree, & Cork Tree*



**Figure 58.** *Agave Plant, Yucca, Asparagus fern & Bromeliad*



**Figure 59.** *Landscape planter outside western boundary of Port Building including Papaya, Dwarf Elephant Ears, Moses in the Basket & Hibiscus*



**Figure 60.** *Landscape planter on eastern side of Festival Place including Aloe, Opuntia, Variegated Agave, Euphorbia sp., Liriope*





**Figure 61.** Landscape planter on eastern boundary of Rawson Square including, Yellow Elder, Dwarf Variegated Schefflera, Green Island Ficus



**Figure 62.** Landscaped planter on south west corner of Rawson Square including Bougainvillea and Green Island Ficus



### 3.5. Socio-economic & cultural characteristics of the project's area of influence

#### 3.5.1. Demographic patterns and occupations

The total population of The Bahamas is 351,461, seventy percent (70%) of which resides in the country's capital, Nassau (2010 Census Report<sup>42</sup>). Nassau is located on New Providence. The latitude and longitude at a central location on the island is 25° 3'32.39"N and 77° 21'1.72"W.

Key findings from the 2011 Occupation and Wages Report by the Department of Statistics summarizes occupational wages for the island of New Providence (Table 19 and Figure 63). The industry mentioned in Figure 63 relevant to the Nassau Cruise Port construction phases is Construction [average hourly wage for Bahamians is \$BSD 17]. Industries mentioned relevant to the operation of NCP are Accommodation and Food Service Activities [average hourly wage for Bahamians is \$BSD 9], Transportation and Storage

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<sup>42</sup> <http://www.bahamas.gov.bs/wps/wcm/connect/a6761484-9fa0-421d-a745-34c706049a88/Microsoft+Word+-+2010+CENSUS+FIRST+RELEASE+REPORT.pdf?MOD=AJPERES>

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[average hourly wage for Bahamians is \$BSD 15] and Arts, Entertainment, Recreation and Other Service Activities [Average hourly wage for Bahamians is \$BSD 13].

**Table 19.** Key Findings of the 2011 New Providence occupational wage survey<sup>43</sup>.

Sex	Average Normal Hours Worked Per Week	Average Hourly Wage	Average Weekly Wage	Median Weekly Wage	Average Annual Wage	Median Annual Wage
<b>Total</b>	40	\$12	\$483	\$345	\$25,141	\$17,940
<b>Male</b>	40	\$13	\$505	\$350	\$26,276	\$18,200
<b>Female</b>	39	\$12	\$463	\$343	\$24,081	\$17,836

For the specific site of Festival Place, there are 11 vendors permitted to occupy the Woodes Rodgers Walk area. The names can be made available upon request. Items permitted for sale are listed below. An additional 10 persons have been previously issued permits to occupy the area but they have not renewed their permits.

- Paintings
- Hot Dogs
- Handmade Jewelry
- Conch Shells
- Coffee
- Water
- Cooked Food
- Cooked Food
- Sea Shell
- Ice Cream
- Conch Shells

There are multiple storefronts along Woodes Rodgers Walk, a retail promenade, that provide full time and part time employment year round. A few of the businesses are listed below.

- Via Caffe
- Lukka Kairi Restaurant and Bar
- Tropicana
- Fat Tuesdays
- Sharkeez Tiki Bar
- Harley-Davidson Motor Cycles
- Bambu
- Duty Free Golden Karat
- Pirate Republic Brewing Co.
- 700 Wines and Spirits
- Señor Frogs
- Never Say Never Again Bar & Grill

<sup>43</sup> <https://www.bahamas.gov.bs/wps/wcm/connect/f5085e4d-c532-47e4-a9f4-84dc7b689773/Occupations+%26+Wages+Report+2011.pdf?MOD=AJPERES>

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**Figure 63.** Data from the 2011 Occupations & Wage Report.<sup>44</sup>

**EMPLOYEES BY INDUSTRIAL GROUP, NATIONALITY, AVERAGE NORMAL HOURS WORKED PER WEEK, AVERAGE AND MEDIAN, HOURLY, WEEKLY AND ANNUAL WAGE: NEW PROVIDENCE, 2011**

INDUSTRY	AVERAGE NORMAL HOURS WORKED PER WEEK			AVERAGE HOURLY WAGE			AVERAGE WEEKLY WAGE		
	Total	Bahamian	Non Bahamian	Total	Bahamian	Non Bahamian	Total	Bahamian	Non Bahamian
<b>TOTAL</b>	<b>40</b>	<b>40</b>	<b>38</b>	<b>\$12</b>	<b>\$14</b>	<b>\$12</b>	<b>\$483</b>	<b>\$484</b>	<b>\$522</b>
Mining, Quarrying and Manufacturing	39	39	40	\$11	\$11	\$7	\$405	\$416	\$282
Electricity, Gas, Air Conditioning and Water	38	38	40	\$23	\$23	\$7	\$842	\$843	\$260
Construction	41	41	41	\$18	\$17	\$28	\$743	\$670	\$1,116
Wholesale and Retail Trade	40	40	39	\$10	\$10	\$9	\$411	\$417	\$341
Transportation and Storage	43	41	41	\$15	\$15	\$12	\$597	\$612	\$505
Accommodation and Food Service Activities	40	39	37	\$10	\$9	\$9	\$366	\$368	\$342
Information and Communication	41	40	59	\$15	\$16	\$3	\$594	\$624	\$147
Financial and Insurance Activities	39	39	39	\$25	\$23	\$41	\$949	\$907	\$1,618
Real Estate Activities	39	39	37	\$17	\$17	\$14	\$549	\$555	\$501
Business Services (Professional, Technical and Administrative) Activities	41	41	41	\$14	\$14	\$12	\$592	\$595	\$510
Education	38	38	37	\$13	\$11	\$18	\$488	\$420	\$696
Human Health and Social Work Activities	39	40	35	\$19	\$19	\$20	\$750	\$749	\$770
Arts, Entertainment, Recreation and Other Service Activities	39	39	34	\$13	\$13	\$8	\$414	\$430	\$305

<sup>44</sup> <https://www.bahamas.gov.bs/wps/wcm/connect/f5085e4d-c532-47e4-a9f4-84dc7b689773/Occupations+%26+Wages+Report+2011.pdf?MOD=AJPERES>

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### 3.5.2. Economic activities and employment

#### 3.5.2.1. Permanent and part time employment

The 2019 Preliminary Results Labour Force Survey<sup>45</sup> prepared by the Department of Statistics summarizes the employment trends for The Bahamas with some island specific data for New Providence. The national unemployment rate decreased from 10.7% in November 2018 to 9.5% at the time of the survey in 2019. This could be mainly contributed to the 1.8% increase in private sector employment. The number of discouraged workers decreased by 1% in New Providence and the unemployment rate for the island was 9.4% at the time of the survey.

“Discouraged workers, according to the standard definition of the International Labour Organization (ILO), “are persons without work and available for work, yet were not actively seeking work because they are not hopeful about their prospects of finding work.” ”

The Report stated women were more likely to be unemployed than men, young women were more likely to be unemployed than young men and the hotel and restaurant sector had the greatest employment increase at 24% since November 2018. Table 20 shows the comparison of these labour force components.

**Table 20.** Comparison of Labour Force Components<sup>46</sup>.

	Components of Labour Force	May 2017	November 2018 <sup>47</sup>
<b>Women</b>	Total Labour Force	76,655	79,110
	Employed Labour Force	67,730	69,840
	Unemployed Labour Force	8,925	9,270
	Unemployment Rate	11.6%	11.7%
<b>Men</b>	Total Labour Force	80,465	84,515
	Employed Labour Force	73,010	75,850
	Unemployed Labour Force	7,455	8,665
	Unemployment Rate	9.3%	10.3%

Stalls located on Festival Place are owned by individuals who may work in the stalls themselves or who may hire workers as either part time or full time employees. A list of Festival Place Tenants is available upon request.

#### 3.5.2.2. Local and export markets

Local markets for the Nassau Cruise Port include but are not necessarily limited to charters and tour operations. While data on local markets is limited, it is believed that most of these charters and tours operate around New Providence, Paradise Island, Blue Lagoon Island (Salt Cay), Rose Island, Pearl Island and Athol Island. Export markets for the Nassau Cruise Port include all the cruise lines that utilize the Port. Stopover Visitors are defined as “visitors that stay 24 hours or more in the destination and can come by air or sea”<sup>48</sup>. The Bahamas Ministry of Tourism sources data on Stopover Visitors by region of residence and

<sup>45</sup> <http://www.bahamas.gov.bs/wps/wcm/connect/bf831aa4-30f6-4669-9a1a-f3e1ec3b95b4/PRESS+RELEASE+-+Labour+Force+Survey+MAY+2019.pdf?MOD=AJPERES>

<sup>46</sup> [http://www.bahamas.gov.bs/wps/wcm/connect/8c4c944a-a289-4d39-bbb1-7d3a81a044bd/Labour+Force+Report+May\\_2017.pdf?MOD=AJPERES](http://www.bahamas.gov.bs/wps/wcm/connect/8c4c944a-a289-4d39-bbb1-7d3a81a044bd/Labour+Force+Report+May_2017.pdf?MOD=AJPERES)

<sup>47</sup> <http://www.bahamas.gov.bs/wps/wcm/connect/d67f546d-5311-4566-ac0a-0bfd09a14efc/Preliminary+Results+Labour+Force+Survey+November+2018.pdf?MOD=AJPERES>

<sup>48</sup> [http://www.tourismtoday.com/sites/default/files/summary\\_foreign\\_air\\_and\\_sea\\_arrivals\\_january\\_to\\_december\\_2018\\_with\\_stopovers\\_1.pdf](http://www.tourismtoday.com/sites/default/files/summary_foreign_air_and_sea_arrivals_january_to_december_2018_with_stopovers_1.pdf)

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month of arrival from the Department of Immigration, Port Authority, Customs Department as well as their own Research & Statistics Department. However, this data is limited for cruise arrivals. This data, which has records from 1977 to present, consistently shows the majority of Stopover Visitors reside in the USA (approximately 80%), Canada (approximately 10%), Europe (approximately 5%), and Latin America<sup>49</sup>. The top 10 states, provinces, and countries in each aforementioned region for stopover visitors between 2017 and 2018 are shown in the table below<sup>50</sup>.

**Table 21.** Top 10 States, Provinces and Countries for Stopover Visitors to The Bahamas between 2017 and 2018

US STATES	Full Year			CANADA PROVINCES	Full Year		
	2018	2017	% Chg		2018	2017	% Chg
Florida	286,340	276,196	3.7%	Ontario	80,643	67,902	18.8%
New York	133,748	114,689	16.6%	Quebec	18,353	17,897	2.5%
Texas	80,708	62,023	30.1%	Alberta	7,545	6,492	16.2%
California	63,892	56,420	13.2%	British Columbia	7,445	6,302	18.1%
New Jersey	62,113	54,314	14.4%	Nova Scotia	1,777	1,704	4.3%
Pennsylvania	49,081	41,837	17.3%	Manitoba	1,490	2,320	-35.8%
Georgia	47,483	39,703	19.6%	Saskatchewan	1,174	1,116	5.2%
Massachusetts	41,940	36,081	16.2%	New Brunswick	900	919	-2.1%
Virginia	36,721	31,878	15.2%	Newfoundland and Labrador	501	498	0.6%
Illinois	34,885	29,637	17.7%	Prince Edward Island	217	172	26.2%
Other	467,725	395,612	18.2%	Other	6,800	5,757	18.1%
<b>TOTAL</b>	<b>1,304,636</b>	<b>1,138,390</b>	<b>14.6%</b>	<b>TOTAL</b>	<b>126,845</b>	<b>111,079</b>	<b>14.2%</b>

EUROPEAN COUNTRIES	Full Year			LATIN AMERICA	Full Year		
	2018	2017	% Chg		2018	2017	% Chg
UK	36,389	33,582	8.4%	BRAZIL	8,270	8,701	-5.0%
FRANCE	17,562	16,785	4.6%	ARGENTINA	6,615	7,401	-10.6%
ITALY	13,576	13,077	3.8%	MEXICO	5,560	5,829	-4.6%
GERMANY	13,019	11,943	9.0%	COLOMBIA	2,551	2,233	14.2%
SWITZERLAND	6,118	6,257	-2.2%	CHILE	1,964	1,685	16.6%
SPAIN	4,286	4,332	-1.1%	PANAMA	1,746	1,506	15.9%
POLAND	3,453	3,137	10.1%	PERU	1,735	1,470	18.0%
NETHERLANDS	2,675	2,909	-8.0%	VENEZUELA	1,273	1,298	-1.9%
ROMANIA	2,417	1,643	47.1%	ECUADOR	892	859	3.8%
SWEDEN	2,237	2,203	1.5%	URUGUAY	746	832	-10.3%
OTHER	20,467	19,052	7.4%	OTHER	2,716	2,874	-5.5%
<b>TOTAL</b>	<b>122,199</b>	<b>114,920</b>	<b>6.3%</b>	<b>TOTAL</b>	<b>34,068</b>	<b>34,688</b>	<b>-1.8%</b>

Source: Dept. of Immigration and The Research and Statistics Dept, The Bahamas Ministry of Tourism. All numbers subject to revision

Data relating to Stopover Visitors who arrive by cruise is not provided, however, the majority of Foreign Air & Sea Arrivals to New Providence are by cruise. In 2018, Cruise Arrivals to Nassau/Paradise Island at the

<sup>49</sup> [http://www.tourismtoday.com/sites/default/files/1\\_stopover\\_visitors\\_by\\_country\\_of\\_residence\\_1977-2016.pdf](http://www.tourismtoday.com/sites/default/files/1_stopover_visitors_by_country_of_residence_1977-2016.pdf)

<sup>50</sup> [http://www.tourismtoday.com/sites/default/files/summary\\_foreign\\_air\\_and\\_sea\\_arrivals\\_january\\_to\\_december\\_2018\\_with\\_stopovers\\_1.pdf](http://www.tourismtoday.com/sites/default/files/summary_foreign_air_and_sea_arrivals_january_to_december_2018_with_stopovers_1.pdf)

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First Ports of Entry was 68% of the total Foreign Air & Sea Arrivals (ASA) to Nassau/Paradise Island. The data for these statistics is provided in the Table 22.

**Table 22.** 2018 Foreign Air & Sea Arrivals at First Ports of Entry

Foreign Air & Sea Arrivals	TOTAL (%ASA) (%BHS)	Cruise Arrivals Only	TOTAL (%ASA) (%BHS)
Bahamas	6,622,015 (100%) (100%)	Bahamas	4,877,596 (74%) (100%)
Nassau/Paradise Island	3,777,664 (57%) (57%)	Nassau/Paradise Island	2,596,687 (68%) (53%)

### 3.5.2.3. Regional industrial development

The United Nations Industrial Development Organisation (UNIDO) has an aim of achieving inclusive and sustainable industrial development<sup>51</sup>. This aim “reflects Sustainable Development Goal (SDG) No. 9, [which is] to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.” The latest Industrial Development Report (IDR) by UNIDO highlights ‘inclusive and sustainable industrial development’ as “the role of long-term (or sustained) industrialization as a driver for development and includes three different aspects: creating shared prosperity (offering equal opportunities and an equitable distribution of benefits to all), advancing economic competitiveness and safeguarding the environment (addressing the need to decouple generated prosperity of industrial activities from excessive natural use and negative environmental impacts)”.

In this 2018 report, The Bahamas is categorized as a high income, other developing economy in the Latin America (& Caribbean) region. In 2015, The Bahamas ranked 117 overall out of 148 countries on the Competitive Industrial Performance (CIP) Index at 0.009. This ranking was just one above Zambia, which has the lowest ranking in the lower middle quintile. Its group ranking for industrial competitiveness and selected indicators for other developing economies and world ranking comparison between 2010 and 2015, was 40 of 52.

Detailed information was unavailable to determine the potential contribution of the Nassau Cruise Harbour at that time. Though industrialization at The Nassau Cruise Port is limited in terms of its proposed operations, it shares similar aims of building resilient infrastructure and fostering innovation as notable contributions to a prosperous economy and environment that are inclusive and sustainable.

### 3.5.3. Characterization of tourism activities

Nassau Cruise Port is a tourist hub due to the nature of the Port and its strategic location to popular tourist destinations and hotels. Cruise ships dock at Prince George Wharf daily and local vendors take advantage of the opportunity by offering several services once tourists disembark from their various vessels. Nassau Cruise Port is the only port that permits cruise ships to dock on New Providence.

The Bahamas Ministry of Tourism classifies tourists that arrive by sea as Sea arrivals<sup>52</sup>. Sea arrivals are further defined as a Cruise visitor, a Cruise stopover visitor, or a boater/yachter. “Cruise stopover visitors

<sup>51</sup> United Nations Industrial Development Organization, 2017. Industrial Development Report 2018. Demand for Manufacturing: Driving Inclusive and Sustainable Industrial Development. Vienna.

[https://sustainabledevelopment.un.org/content/documents/2537IDR2018\\_FULL\\_REPORT\\_1.pdf](https://sustainabledevelopment.un.org/content/documents/2537IDR2018_FULL_REPORT_1.pdf)

<sup>52</sup> <http://www.tourismtoday.com/sites/default/files/docs/studentcorner/TypesofVisitors.doc>

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come to The Bahamas on a cruise ship but stay in land-based accommodations and stay 24 hours or more. Cruise visitors are persons visiting The Bahamas by cruise ship and uses the cruise ship for accommodation.”

In 2018, 2.5 million cruise visitors arrived in Nassau as their first port of entry and over 1 million as their second port of entry. Up to July 2019, over 1.7 million cruise visitors arrived in Nassau as their first port of entry and over 557,000 as their second port of entry<sup>53</sup>. The total expenditure in 2015 and 2016 for cruise visitors arriving in Nassau was \$235,086,922 BSD and \$242,457,065 BSD respectively. Table 23 summarizes data from The Bahamas Ministry of Tourism for the last 5 years for Cruise visitors arriving in Nassau.

Reviewing the available cruise expenditure survey reports from the Ministry of Tourism showed cruise ship visitors spent money in order of priority on shopping, tours and excursions, meals. and drinks off the ship. Expenses related to transportation, casino and nightlife alternated in priority depending on the year of the survey.

**Table 23.** Summary of cruise visitor arrivals in Nassau as first and second port of entry. \* Cruise stop over visitors were added to these years.

Year	# Cruise visitors (1 <sup>st</sup> port of entry)	#Cruise visitors (2 <sup>nd</sup> port of entry)	Expenditure Bahamian currency <sup>54</sup>
2015*	2,248,632 + 5,303 <sup>55</sup>	1,060,068	\$242,457,065
2016*	2,557,973 + 4,570	957,854	\$235,086,922
2017	2,637,243	946,906	\$258,200,000 <sup>56</sup>
2018	2,596,687	1,004,382	unavailable
2019 (up to July)	1,737,224	557,387	unavailable
<b>Total</b>	<b>11,787,632</b>	<b>4,526,597</b>	<b>\$735,743,987</b>

Tourism activities available for cruise visitors are shopping within the boundaries of the Port and beyond the Port boundary along Woodes Rodgers Walk and Downtown Nassau. Festival Place vendors offer a variety of products and services including but not limited to 1) food and drink, 2) clothing, 3) general souvenirs, 4) hair braiding, and 5) booking snorkeling, sightseeing excursions and historic tours. Along Woodes Rodgers Walk and in Downtown Nassau visitors have similar options and the additional option to shop in the historic straw market and visit Parliament Square which is located opposite Rawson Square. Portraits of persons who have contributed to The Bahamas’ development are often on display in the square. Parliament Square is also the home of the Central Government of The Bahamas. The buildings were constructed in 1815 and a nod to the colonial architecture that can be observed throughout Downtown Nassau.

Woodes Rodgers Walk and Downtown Nassau are available to the stopover visitor as well as the cruise visitor as a result of their proximity to hotels like the British Colonial Hilton and the Towne Hotel. A series of small colorful huts lining the coast along the northern boundary of Woodes Rodgers Walk offering a variety of goods and services to visitors. Goods available for sale vary from cigars to soft drinks. On the southern boundary of Woodes Rodgers Walk there is a variety of storefronts that range from restaurants

<sup>53</sup> <http://www.tourismtoday.com/services/statisticse/cruise-lines>

<sup>54</sup> <http://www.tourismtoday.com/services/statistics/expenditure>

<sup>55</sup> <http://www.tourismtoday.com/services/statistics/stopoversfrequently-requested-statisticstrends>

<sup>56</sup> [http://www.tourismtoday.com/sites/default/files/cruise\\_expenditure\\_brochure\\_nassau\\_paradise\\_island\\_2017.pdf](http://www.tourismtoday.com/sites/default/files/cruise_expenditure_brochure_nassau_paradise_island_2017.pdf)

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and bars, general souvenir shops, to the straw market. At the most western end of Woodes Rodgers Walk is Pompey Square and Señor Frogs, both population sites for locals and visitors throughout the year.

#### 3.5.4. Regional infrastructure

##### 3.5.4.1. Land and marine transportation

**Land transportation** – Transportation in the project area include the public bus system, taxi operators, general vehicular and pedestrian traffic. A traffic impact assessment was conducted by the Caribbean Civil Group Ltd. (Appendix A).

##### **Marine transportation**

*Docking in the Harbour* – Cruise ships, Blue Lagoon Island ferry boats, and general small boat operators currently dock in different berths within the Harbour. The cruise ship berthing schedule is usually updated weekly by the Operations Manager. Cruise ships will be accommodated during the dredging and land reclamation activities through strategic scheduling. They will dock at the remaining berths not impacted by the respective project activity underway at the time of their scheduled arrival. A schedule was not available for the small boat operators docking in the western portion of the Harbour near Woodes Rodgers Walk at the time of this assessment. Anecdotal evidence collected during the water quality measurements revealed the western harbor area is the high traffic time for this area is in the morning. NCP is currently in negotiations with management of the Kelly Dock and adjacent properties to facilitate temporary relocation of the remaining ferry boat operators. NCP does not anticipate these operators will be displaced for a long period of time during the construction based on the ongoing negotiations with adjacent properties. Once the operational, cruises will be scheduled to berth at the renovated Piers and tour boat operators will be permitted to berth at the new tour boat operator station, bridge connection between Piers 1 and 2.

Some ferry boat operators will continue along the Kelly Dock area and negotiations with adjacent properties are ongoing to facilitate temporary relocation of the remaining ferry boat operators.

*Passing through the Harbour* – The channel along the northern boundary of the Harbor, near Pier 3, permits passage of other marine vessels. The marine police, defense force patrol, jet skis operators, fishing charter vessels, and tour boat operators pass through the Harbour daily. Mailboats navigate the channel en route to and from Potter's Cay Dock. Several docks were observed on the southwestern coastline of Paradise Island, which is near the dredge site (Figure 64). These stakeholders were consulted in May 2020. This indicates marine vessels may be navigating the channel to berth at these docks.

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**Figure 64.** Docks near the project dredge site on the southwestern coastline of Paradise Island (Google Earth, 2019). The arrow shows the dredge location and the rectangle identifies the docks.



#### 3.5.4.2. Electricity

The current standing structures in the project area are connected to the Bahamas Power and Light (BPL) system. Lamp pole locations, underground and above ground utilities in Rawson Square, Woodes Rodgers Walk, and within the Port boundary were identified during the Topographic survey conducted by Atametrus Ltd (Appendix J). On the southwest corner of Rawson Square there is a storage facility for Bahamas Power and Light (Figure 65).

#### 3.5.4.3. Water and sewerage facilities

The current standing structures in the project area are connected to the Water and Sewerage Corporation supply and disposal system. Appendix D shows the location of underground and aboveground utilities. A WSC station is located on the southeast corner of Rawson Square (Figure 65). A lift station is located at western boundary of the Festival Place building between the Port Warehouse. This lift station is located between two demolition sites (Figure 66). The Port Warehouse will be demolished first. A demolition EMP inclusive of schedule will be submitted to BEST once the demolition of Festival Place is scheduled. There are additional Water and Sewerage related features located within the Port boundary that should be considered during demolition of Festival Place and construction. Between Festival Place and the boundary fence there are potable water stations for horses working in the Surrey tours and drains near the taxi waiting area (Figure 67). The final design encompasses amenities for surrey operators.

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**Figure 65.** (Left) Water and Sewerage Corporation station located at the northeastern corner of Rawson Square near Churchill Building. (Right) Bahamas Power and Light station located at the southwestern corner of Rawson Square.



**Figure 66.** Lift Station located between Festival Place and the Port Warehouse on Prince George Wharf.





**Figure 67.** (Left) Potable water connected to horse troughs (Center and Right) Drains within the boundary of the Port.



#### 3.5.4.4. Waste collection and disposal

Solid waste from the offices and vendors within the boundary of the Port is collected on site at several locations on property and disposed of daily at the main trash collection station. Cruise ships may request to offload while docked by submitted a garbage discharge request form prior to arrival. If approved, a garbage truck with a garbage container is placed near the vessel. Solid waste is transferred directly to the container and the truck leaves the facility. Hazardous waste is disposed of in the same way.

The main collection site features five (5) 22' long x 07' wide x 5'2" high bins and one (1) 20' long x 07' wide x 6" high bin. At least one of these bins are emptied daily by the trash collection services.

#### 3.5.5. Sites of historical and cultural significance

##### **Historical Overview of Nassau Harbour**

Nassau Harbour is located along the north northeastern coastline of New Providence Island and south of Paradise Island. It functioned as a pirate sanctuary in 1697 partially due to its depths that permitted shallow-draught vessels with experienced captains' passage<sup>57</sup>. In the 1930's the shallow harbor could no longer support the developing cargo and passenger ship industries. The first of a series of modification projects began in 1965 to 1966 with dredging the Harbour to 36 feet (10.97 m) to allow large vessels to anchor in the Harbour. Figure 68<sup>58, 59</sup> shows a timeline of development for the Nassau Harbour cruise terminal area.

<sup>57</sup> "The Story of The Bahamas" by Paul Albury, 1975

<sup>58</sup> <https://bahamianology.com/kelly-island-renamed-arawak-cay-nassau-1969/>

<sup>59</sup> <https://www.nassaucontainerport.com/history.cfm>

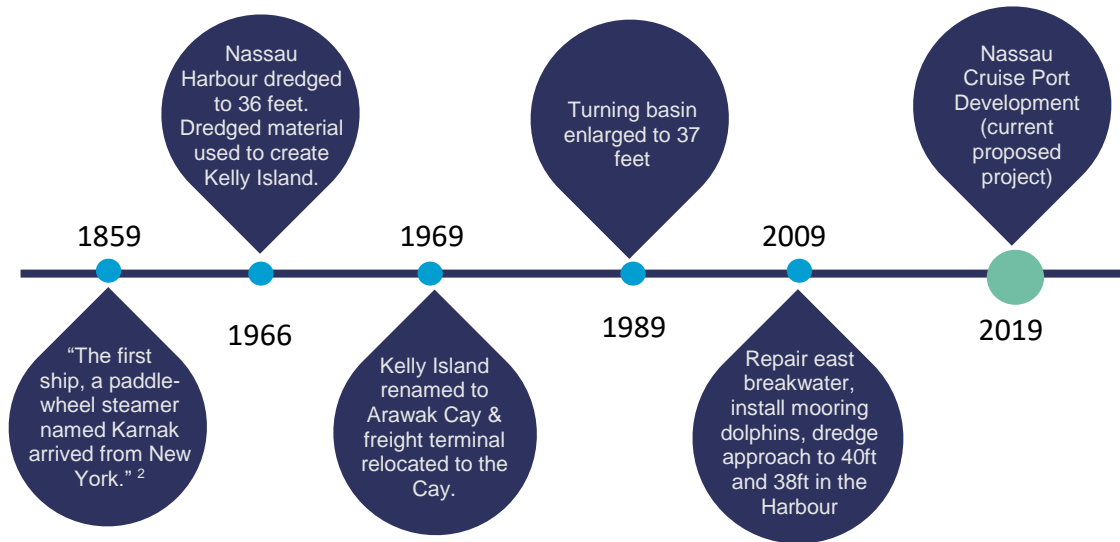
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**Figure 68.** Nassau Harbour Development Timeline. Information from the 2008 Draft Environmental Impact Assessment for the Nassau Harbour Port Improvement Project, Nassau Bahamas and other sources.



After consulting with the Bahamas Historical Society & Museum, it was determined there were no known historical buildings in the project area of impact. Important historical sites within the project area include the Woodes Rodgers Walk, named after the first Royal Governor of The Bahamas, Rawson Square, named after Sir Rawson W. Rawson Governor of The Bahamas in the late 1960s, and the buildings surrounding Parliament Square, constructed in 1815 by the Loyalists (Figure 69) and the Churchill Building (Figure 70.)

**Figure 69.** Parliament Square buildings.

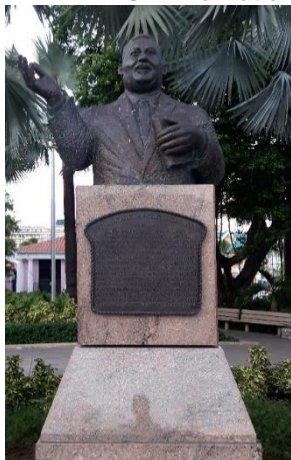


**Figure 70.** Plaques on the Churchill Building.



Other points of interest are pictured below.

**Figure 71.** Bronze Bust of Sir Milo Butler



**Figure 72.** Bahamas Quincentennial Celebrations Monument



**Figure 73.** Monument to Bahamian Woman



**Figure 74.** Sir Stafford Sands Water Fountain.



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## 4. Proposed Project Facilities, Infrastructure, & Operations

### 4.1. Description of facilities, infrastructure, and operations

#### 4.1.1. Port and harbor facilities layout

The proposed project facilities include three distinct components described below.

**Marine and Pier Works** – Figure 75 through 79 shows the Marine Site Plan.

**a. Cruise ship berths** - The work consists of rehabilitation of the existing piers and new construction to increase the berthing capacity, while at the same time fixing the issues with the existing berths. Currently the improvements will consist of:

- i. Pier 1 – rebuild and repair to increase berth length to 1,200' via a combination of bulkhead and dolphin and at least 36' of clear depth at pier side
- ii. Pier 2 – Repairs and improvements to surface area
- iii. Pier 3 – East extension of the pier to create two 1,200' long berths along the north side and 36' of clear depth at pier side

**b. Tour boat area** - Expansion of the main north south connection trestle to create a new area for passengers to take water tours and an adjacent tour boat docking area.

**c. Mega Yacht berths** - Development of a limited number of mega-yacht docks along the north face of the waterfront park.

**d. Recreational Marina** - A small marina located adjacent to the town to locate water taxis, tour boats and private recreational vessels.

**Upland waterfront development park** –The final details will be subject to the final Master Plan. The main elements of the Plan are shown in Figure 80 and will include:

**a. Waterfront park** – A new waterfront park intended to be open to public while at the same time responding to the proper security and immigration protocols and processes. Fences will be strategically located to allow the dual public use while at the same time creating a restricted port area. The park will provide the canvas for locating a series of venues as described below. The park will include pathways that have both shade and shelter from rain and sun while maintaining the open space needed to create the world-class waterfront. Landscaping will be featured to add character, bridging the port with downtown and support an inviting upscale community park feeling.

**b. Terminal / administration building** – The building will be an architectural landmark, an iconic building constructed to welcome guests and direct them to their destinations. The new Terminal Building would replace the existing port department building, changing the current predominately administrative function and will serve as an iconic arrival gateway. The facility would house functions for passenger ID checking, customs and immigration, offices for the Port Department and for Port operations, visitor services, a medical aid centre, restrooms, and security functions. It would be designed as a gateway to distribute guests into the open space and Downtown Nassau. The terminal building will have the capacity to serve 32,000 daily cruise passengers.

**c. Amphitheatre** - The park will include a major amphitheater suitable of holding large and intimate concerts. The facility will be suitable for night time concerts and if possible, include high-tech video feed to hold high resolution shows from all over the world. This venue will feature events catering to cruise and

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hotel visitors and residents alike with the objective of bringing vitality to the downtown area at night and providing a venue supporting family gatherings, cultural celebrations, and artistic creativity. The facility will provide for a fixed stage and roof area and a small back-of-house area to support functions, the facility will be designed for viewing using seating in a green space.

d. **Junkanoo museum** – Influenced by legendary, Percy “Vola” Francis, a boutique Junkanoo museum will be built featuring the costumes, artefacts and history reflecting the soul of the traditional Bahamian culture. On display in the Junkanoo Museum will be the dazzling and vibrant Junkanoo costumes, including “Best Costume” winners from previous parades. There will also be demonstrations on the many stages of Junkanoo costume design and construction; rush outs and historical stories of Junkanoo and its origin; and Junkanoo artefacts and craft items will be on sale. Also, on display will be paintings by Bahamian artists (visual and fine artists) and photographs depicting the Junkanoo cultural experience. There will also be exhibited, videos of past parades.

e. **Theatre** - An “impact” theatre will be built to feature films suitable for all audiences, providing impactful summaries on the Bahamian environment, culture, geography, history, and more. The experience will turn the cruise passenger into a return visitor and likely increase the visitor arrivals throughout the Bahamas. The impact theatre is an intimate venue using high-resolution video and sound to leave a marked impression on those guests attending. High definition imagery specific to the region is delivered in both an exhilarating and educational format, weaving biodiversity of the area with cultural heritage, sporting activities, and excitement of the natural and historical surrounding. Our design utilizes sound and visual technology with minimum 18 seats that deliver video content in a life-like format. Impact Theatre Experiences are designed to showcase the diverse and fruitful aspects of the Bahamas into a 15-minute immersive visual and auditory experience.

f. **Vendors** – the current vendors that operate in the port will be relocated to maximize their potential sales and revenues while at the same time, using their authentic offerings to create an original and Bahamian arrivals experience removing the negative and exhausting arrival encounter currently experienced by the guests. Vendors will benefit from a Nassau Cruise Port and downtown Nassau branding campaign, while being located along the paths heavily traversed by passengers. Passengers will benefit from the strategic layout, coming in contact with Bahamian art, culture, crafts, goods, foods and so much more.

g. **Transportation area** – A new transportation and tour area will be created with sufficient capacity to improve both the guest and taxi/tour operator experience and provide the necessary curbside capacity to meet the needs of visitor demand. The area will be designed to create organization that is clear to the guests and to the tour and taxi industry. All transportation areas will be covered to provide shade and shelter.

h. **Inner harbour** - At the east end of the park, the new inner harbour will be the place to house a fun waterfront food and beverage area surrounding the recreational marina. Dredging is not anticipated for the east end of the park. The project design team reviewed the bathymetric survey of the harbour. The team then realized the current bathymetry of the proposed location of the east end park meets the requirements of the design plan. As a result, dredging in the area is not required. The marina will be used by the existing water taxis linking the cruise port to numerous waterfront venues stretching from the Fish Fry to Paradise Island and possibly even Baha Bar. This modern marina will also support tour boats, fishing boats and others. The restaurants and food and beverage venues will uniquely compliment the historic cityscape, attracting more customers, providing more life and activity, and becoming a welcome addition by the existing establishments. The inner harbour will be able to handle the largest mega yachts, helping to support the Bahamas yachting industry and may include a small arrival building for the mega-yachts. Dredging is not anticipated for the east end of the park.

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**Off-site improvements** – The final details will be subject to the final Master Plan. The main elements of the Plan will include budgets to invest in the downtown area and connecting streets to integrate the new waterfront facility to Bay Street in collaboration with the Downtown Nassau Partnership. The objective is to feature Bay Street as the anchor to the new waterfront, and to use the waterfront park to distribute guests throughout downtown. Although this part of the plan requires significant stakeholder input, it is anticipated that the investment will be made in the following areas:

a. **Sidewalk improvements** – New sidewalks, or repairs to the existing sidewalks will be needed. The design will include elements of greenspace which softens the downtown hardscape. These improvements will be done strategically as the entire downtown cannot be done.

b. **Street improvements** – Improvements to facilitate street crossing, or curb sides are anticipated.

c. **Signage improvements** – better signage will be included from the foot of the pier to Bay Street.

**Lighting** – strategic LED lighting may be needed to augment night time operations of the park.

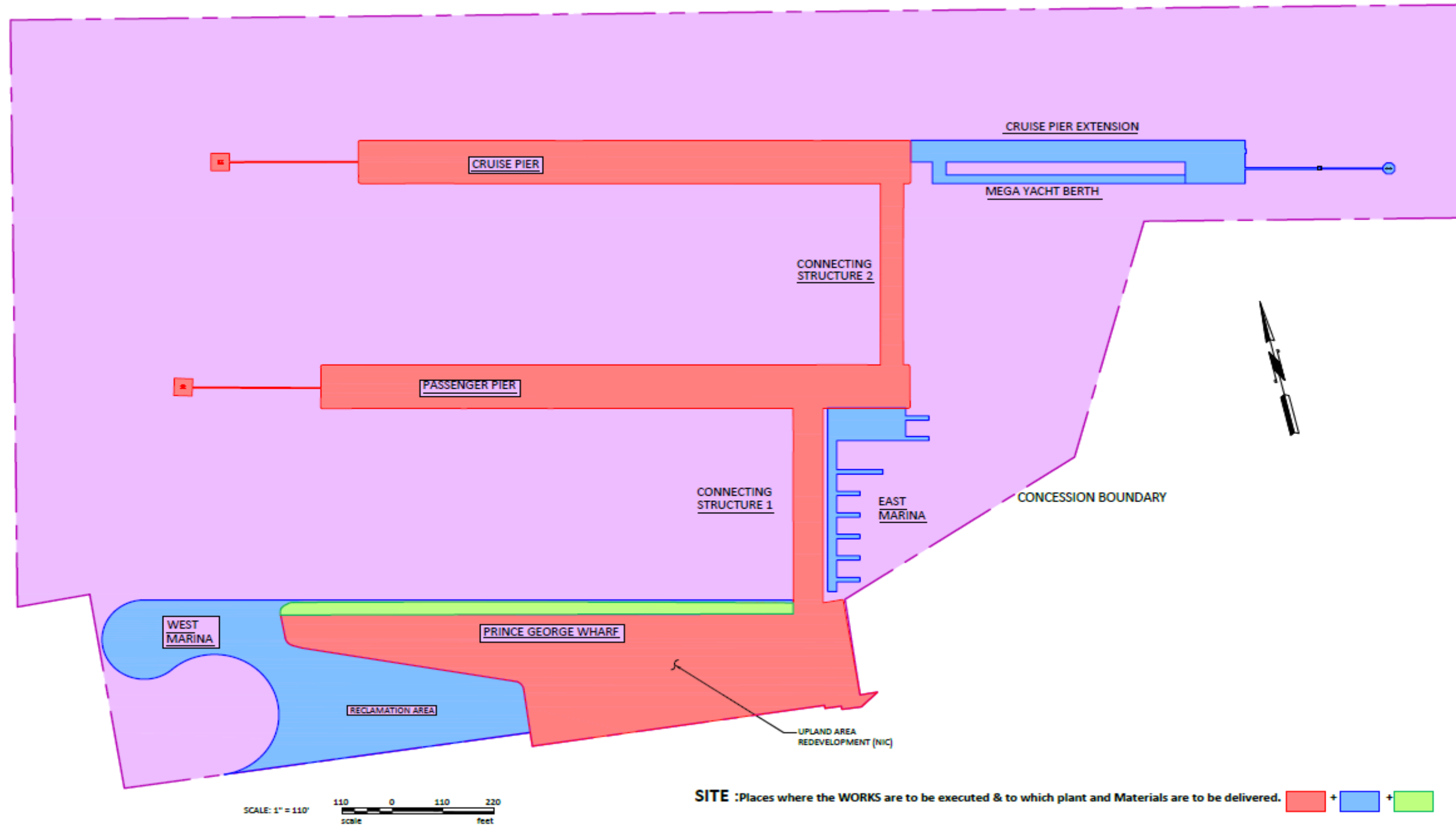
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Figure 75. Marine Works Plan



**SITE** : Places where the WORKS are to be executed & to which plant and Materials are to be delivered. ■ + ■ + ■

<b>PORT : EXISTING FACILITIES</b>	<span style="color: red;">■</span>
<b>EXTENSION : NEW CONSTRUCTION AREAS</b>	<span style="color: blue;">■</span>
<b>PGW Rehabilitation : NEW BULKHEAD CONSTRUCTION IN FRONT OF EXISTING BULKHEAD</b>	<span style="color: green;">■</span>

**EXHIBIT 1**



**NASSAU CRUISE PORT  
MARINE WORKS**

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Figure 76. Marine Site Plan (Plan - Surface Features East Marina)

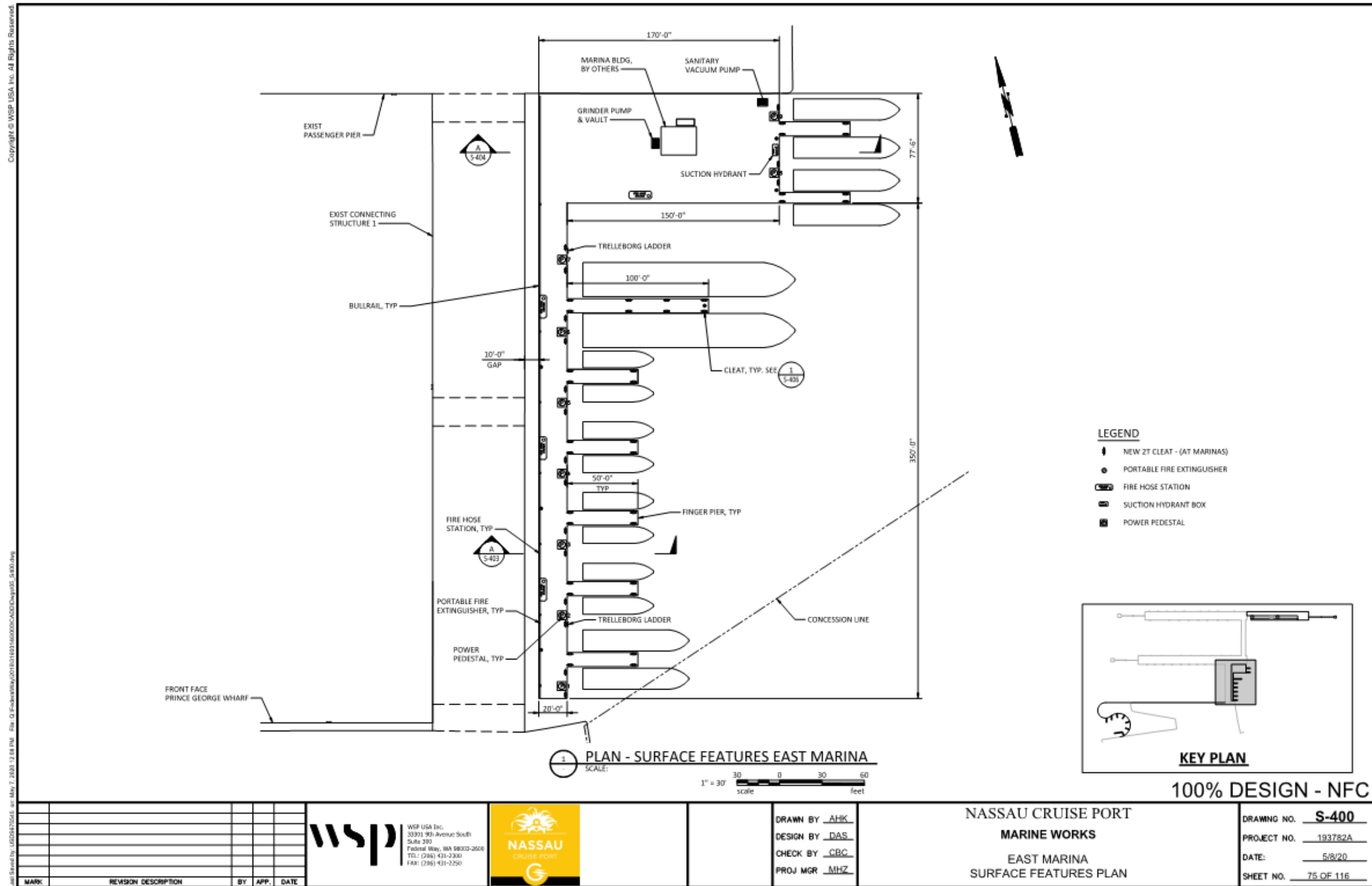
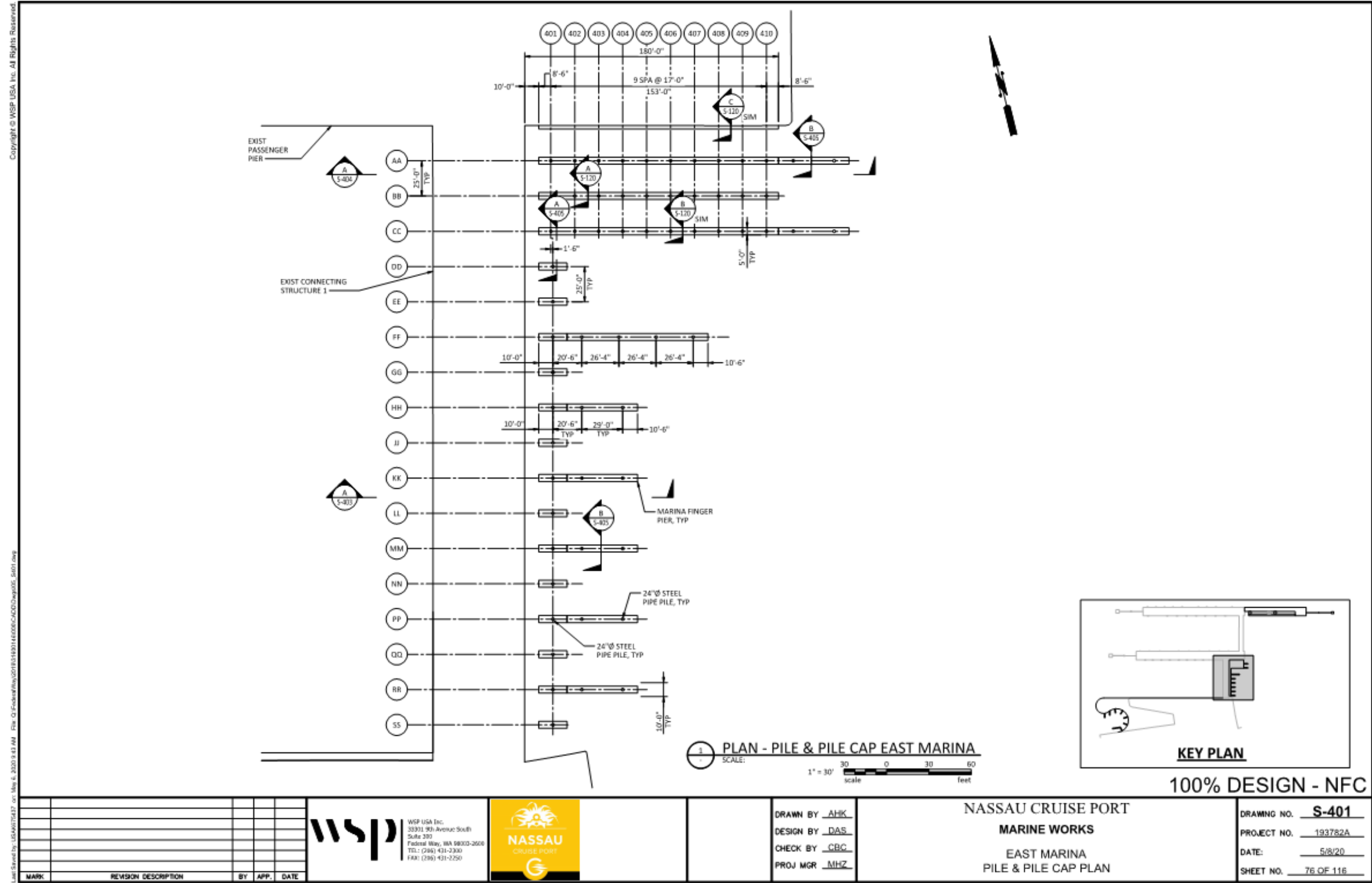


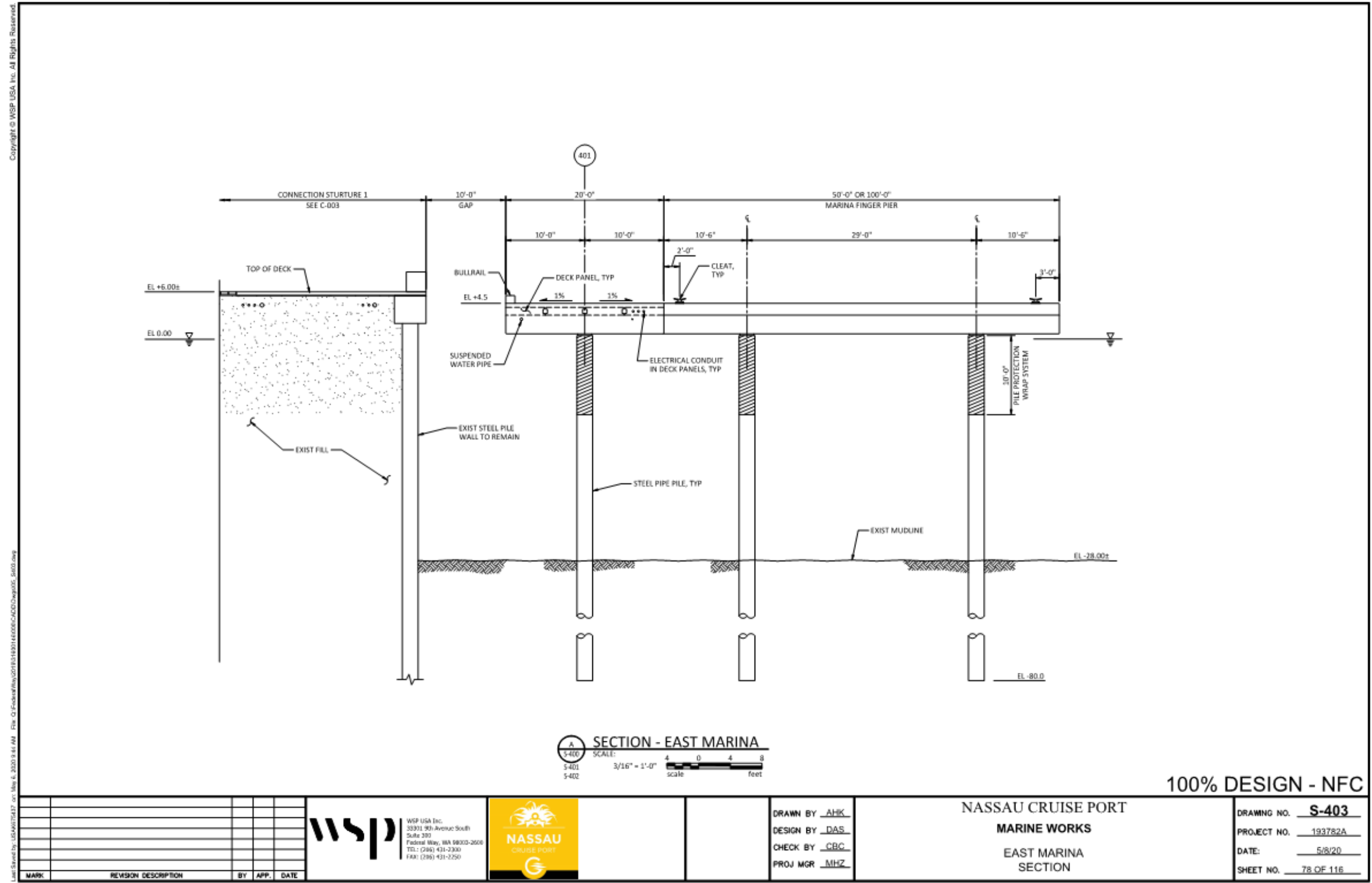


Figure 77. Marine Site Plan (Plan - Pile & Pile Cap East Marina)



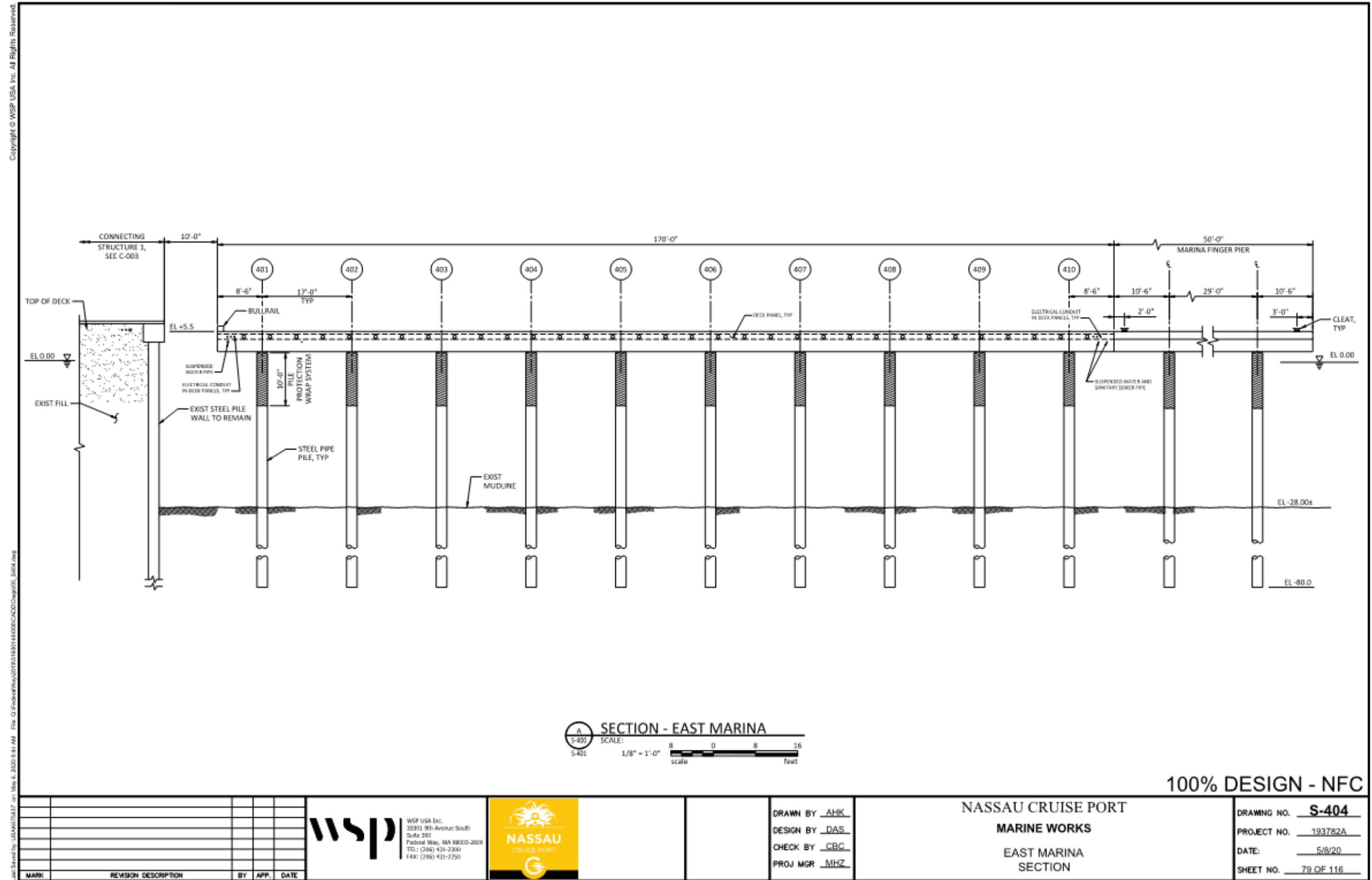
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Figure 78. Marine Site Plan (Section - East Marina\_1)



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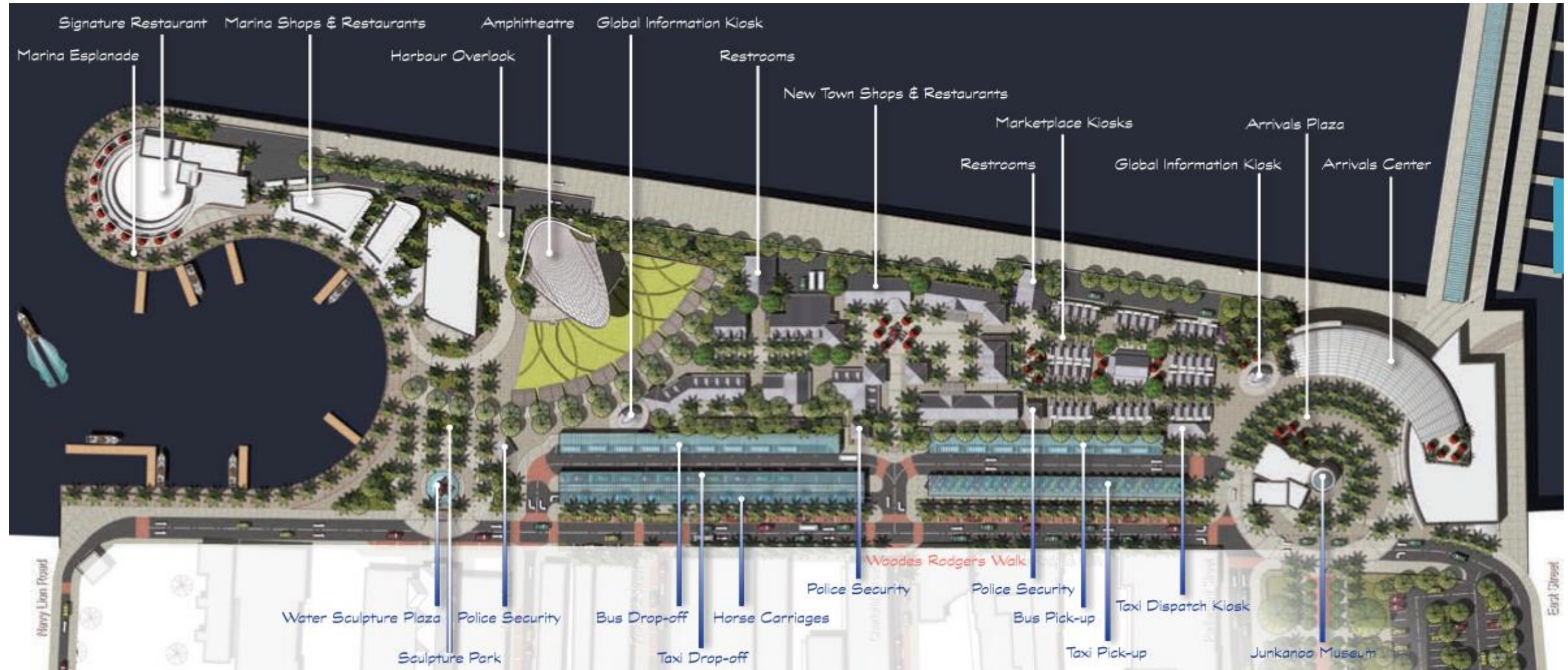
Figure 79. Marine Site Plan (Section - East Marina\_2)



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Figure 80. Terrestrial Site Plan.



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#### 4.1.2. Materials mass balance

NCP Ltd. has approval to use the dredge material generated by dredging the harbour in the land reclamation project activity in the western part of the Harbor. Cutter suction dredge methodology will be used. As the material is dredged, it will be piped to the land reclamation area. Figure 81 shows the dredge and land reclamation plan for the site and the total dredge material. The purple line identifies the layout of the pipe from the dredge site to the land reclamation site. This configuration will reduce the impact to boaters using berths in the eastern area of the Harbour. The pipes will be routed along the piers to avoid impacting marine traffic. The total dredge material is 148,010 CY and the total overdredge is 24,389. The total fill area is 187,305 CY.

#### 4.1.3. Water and wastewater mass balance

Grey water is not currently used at the harbor and NCP does not anticipate using grey water in the future unless a third part contract could be identified.

#### 4.1.4. Land clearing methodologies

The project's area of impact is currently developed, and native forest was previously cleared during the development of the current standing structures. Protected plants identified in the area of impact were included in the landscape design for the current structures. These will be removed and included in the landscaping plan for the proposed project where possible. The Forestry Unit will be consulted and transplanting will be guided by the Environmental Management Plan. Main land clearing will focus on demolition of the Port Warehouse. A six-week schedule is being allotted for the Warehouse demolition. A demolition methods statement and EMP will be submitted to the Department of Environmental Planning and Protection once the demolition schedule is confirmed for the remaining buildings. The Demolition EMP was developed by Bahamas Marine Construction Co. Ltd. for the demolition of the Port Warehouse (Appendix C).

#### 4.1.5. Dredging plans, construction phase and operational phase

The redevelopment of Nassau Harbour will be guided by the schedule described in Section 1.7 Project Schedule. Marine Works for the project include the dredging and land reclamation activities. Figure 81 shows the Dredge and Land Reclamation Plan. As the area near Pier 3 is dredged, it will be piped to the land reclamation area near Woodes Rodgers Walk.

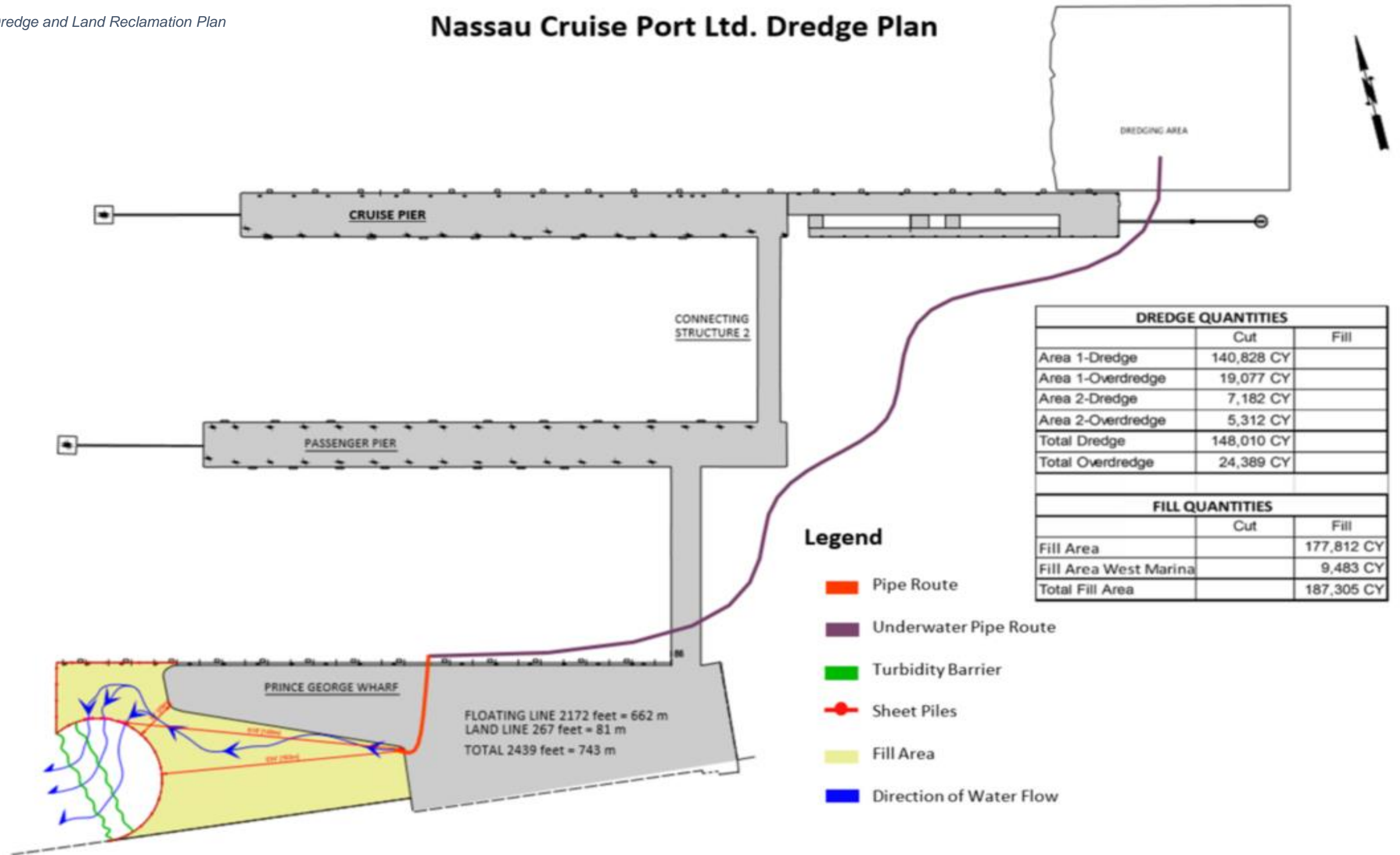
The first step in the construction of the new Cruise Terminal is the demolition of the Port Warehouse. An Environmental Management Plan was developed for the demolition of the Port Warehouse (Appendix C). The site of the former Port Warehouse will be used as the site compound area. All heavy equipment will be stored at this location and spill prevention, containment and response measures will be clearly detailed in the EMP. Festival Place will also be demolished as a part of the construction of the new Cruise Terminal. The anticipated schedule for this activity is August 2021 - November 2021.

Prior to commissioning, the Nassau Cruise Port Maintenance Plan will be implemented. An outline of a typical maintenance plan created by GPH is provided in Appendix M in the revised EIA. The complete plan will be developed by NCP and will be included in the Environment Management Plan. NCP is committed to appropriate and timely maintenance to ensure longevity of the Port infrastructure and protection of the environment.

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Figure 81. Dredge and Land Reclamation Plan



#### 4.1.6. Seasonality of operations

Construction will be continuous to help expedite project completion. Once construction is complete, the Port will remain in operation 24 hours 7 days a week. During the Junkanoo seasons construction will cease.

#### 4.1.7. Support shops and services

During construction support services will include providing housing for 162 expatriate workers and transportation from the housing location to the construction site. During operation support shops will include vendors in good standing with the government offering authentically Bahamian products.

#### 4.1.8. Fueling facilities and fuels management

Fueling will not be permitted on site during operation. During construction refueling heavy equipment on site will be guided by the Environmental Management Plan. Spill kits will be available on site to clean up fuel spills that may result during fuel transfer during construction.

#### 4.1.9. Air pollution prevention and control systems and procedures

Air pollution will be guided by the Environmental Management Plan, which will be influenced by the ISO 14001. All the cruise lines were made aware that The Bahamas has ratified MARPOL Annex VI and incineration while in port is prohibited. NCP will adopt many of the guidelines of the convention and incorporate these guidelines in the EMP.

#### 4.1.10. Odor control

Once an odor is detected, sulphur dioxide gas detectors will measure the emissions in conjunction with the respective ship's Environmental Officer of the vessel in question. If sulphur levels are above the allowable limits, a report will be drafted and sent to the flag state and the Port State Control officer. NCP Environmental Fees would be levied to the cruise ship. The full response will be guided by the Environmental Management Plan.

#### 4.1.11. Noise control

Enka produced a "Noise protection report" for construction in the areas of the Pier Extensions, Prince George Wharf, and the Marina Wall (Appendix K). The EMP will provide further details of noise protection during construction and operation.

#### 4.1.12. Waste oil and solvent management facilities and operations

Waste oil is currently received from the vessels via waste trucks (see section [3.5.4.4 Waste collection and disposal](#)). NCP will continue to receive waste oil from vessels and will improve upon this process by requiring detailed information about the waste oil discharged from the vessel. Information such as the type of waste oil, quantity of waste oil to be disposed, and recommended disposal information based on the type of waste oil. A reporting form for this procedure will be detailed in the EMP. To prevent spills during the transfer of the waste oil, a spill kit will be made available at the expense of the vessel requesting disposal. The spill kit will be prepared once the request for disposal is submitted and approved prior to the vessel's arrival in Port.

#### 4.1.13. Wash water containment, collection, treatment, disposal facilities and operations

Grey water disposal is not permitted in the Harbour. NCP is willing to make use of grey water in the operation of the Port once a third-party company could be identified that is qualified and could provide proof of such. Additional information required from the third-party company would include:

- Method of receiving grey water
- Proof of the ability to receive
- Quantity receiving

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- Treatment methodology
- Disposal information

#### 4.1.14. Solid waste management

During construction and operation, solid waste will be disposed of daily. During construction portable toilets will be installed by a DEHS approved contractor. These will be emptied daily by the contractor. There are no composting or waste-to-energy systems identified for the proposed redevelopment during construction or operation.

#### 4.1.15. Hazardous materials, including biocides and hazardous waste management plan

Every effort will be made to foster a safe environment for all users at Nassau Cruise Port. This includes both tourists and local working in the Port. Hazardous waste will not be accepted at the Port from cruise vessels and any other vessels utilizing the Port. The use of hazardous materials, inclusive of biocides, will be restricted. In the unlikely event of an emergency leading to a vessel requiring hazardous waste removal in the Port, NCP will communicate with BEST, DEHS and the Department of Environmental Planning and Protection to determine the best course of action.

#### 4.1.16. Coordination with Bahamas Government entities, such as law enforcement

During Construction the Project Manager will remain in contact with the relevant Ministries throughout construction to ensure local regulations are followed. GPH Project Manager and Operations Manager will liaise with the Royal Bahamas Police Force (RBPF) to avoid traffic congestion in the downtown Nassau Area. The Project Director will continue to work with the Royal Bahamas Defense Force (RBDF) to gradually transition the security at the Port from full RBDF detail in the Port Restricted Area to Strike Force Detail. The Environmental Monitor will provide updates at regularly scheduled intervals to the relevant regulatory body.

During operation, the Project Director and Operations Manager will remain in contact with the RBPF to help maintain a physical presence in the port areas accessible by the general public and in the adjoining areas.

#### 4.1.17. Port, facilities, and vessel security management plans

NCP currently follows and will continue to follow the International Ship and Port Facility Security (ISPS) codes as discussed in section [2.2 Internationally recognized regulations and industry codes](#). The Global Ports Holding Port and Terminal Facility Security Code (GPH-PTFS CODE) will also be used to guide the security at the Harbour. The Table of Contents for the Plan is shown in Appendix E. The Port Department is a member of the NCP Committee. All site plans and security measures are discussed with the Port representatives on the committee regularly. The Port will follow the ISPS code during construction and operation.

### 4.2. Complete set of preliminary engineering and architectural plans.

As NCP continues to review the capacity of existing bollards, as well as the structural condition of the existing fenders and their connections, NCP will establish more accurate tidal datum in the vicinity of the project site in collaboration with the government agencies to confirm the tidal predictions used in this report are adequate for intents and purposes. The Basis of Design Report is provided in Appendix N.

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### 4.3. Utilities and basic infrastructure

#### 4.3.1. Potable water system

Infrastructure throughout the proposed project facilities will be connected to the Water and Sewerage Corporation (WSC) network. Potable water will be provided through this network and the sewerage collection and disposal will follow standard set by WSC and the Department of Environmental Health Services (DEHS). The system will be laid out in a loop configuration with backflow prevention controls.

#### 4.3.2. Process water system

Nassau Cruise Port does not plan to use grey water but is open to including it in the operation phase if a certified third party contractor is available and capable of supporting this activity.

#### 4.3.3. Sewerage collection, treatment, and disposal system

Sewerage waste collection and containment will follow a similar method as it is presently collected disposed. It will follow the standards provided by DEHS and will be guided by the Environmental Management Plan.

#### 4.3.4. Liquid waste collection, containment, treatment, and disposal system

Liquid waste collection and containment will follow the standards provided by DEHS and will be guided by the Environmental Management Plan.

#### 4.3.5. Storm water management

Drainage will be collected and disposed of in drainage wells. Run-on and run-off controls with map showing preliminary design drainage patterns will be included in the Environmental Management Plan (EMP). The EMP will also address run-on and run-off controls in fueling and machinery/equipment repair facilities.

#### 4.3.6. Solid waste collection, containment, treatment, and disposal system

Solid waste collection and containment will follow standards provided by DEHS will be guided by the Environmental Management Plan. Solid waste will be removed daily from the site by an DEHS approved waste removal service provider. The waste removal service provider must provide proof of disposal/treatment/recycling processes from the Department of Environmental Health Services.

#### 4.3.7. Electrical system

GPH is committed to a sustainable design and will include solar power generation and battery storage as a part of the development. All feasible and available roof areas will include photovoltaic cells. The Port will rely on Bahamas Power and Light (BPL) during construction and it will rely on BPL for electrical supply during operation. ([See 4.4 Sustainability section](#))

#### 4.3.8. Transportation

A Traffic Impact Assessment will be conducted by the Caribbean Civil Group (CCG) and will be used to guide the Environmental Management Plan. The report discusses the complex intersection of the horse and carriage drivers, the taxi operators, daily vehicular traffic and pedestrian traffic. The traffic study is shown in Appendix A.

#### 4.3.9. Security

Security during construction and operation of the Port will be maintained and shall comply with the [International Ship and Port Facility Security \(ISPS\) Code](#). Additionally, the “Global Ports Holding Port and Terminal Facilities Security Code (GPH-PTFS Code)” Manual will be adapted for use at Nassau Harbour. The Table of Contents for the manual is shown in Appendix E.

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#### 4.3.10. Housing

During construction 378 Bahamians and 162 expatriate workers will be employed. Housing for the 162 workers will be off-site at a base camp at John Alfred Wharf (Figure 82). Transportation will be provided between the housing location and project sites by ENKA, project contractor.

**Figure 82.** Basecamp location of ENKA housing location for expatriate workers.



Prefabricated units suitable for worker accommodation, recreation areas, a mess hall, a clinic and other required facilities will be constructed at the basecamp. All facilities will follow the Department of Environmental Health standards. Should the number of required personnel living at the basecamp exceed the amount of available units, apartments will be rented for the personnel overflow. Transportation will also be provided between the apartment and the construction site ENKA shuttles.

#### 4.3.11. Buildings and other support structures designed in accordance with criteria that ensure their structural integrity

The final design and construction will follow The Bahamas' building code and will consider hurricane force winds and storm surge. The Basis of Design document is shown in Appendix N.

### 4.4. Sustainability

Much of the sustainability section will be detailed in the Environmental Management Plan.

#### 4.4.1. Consideration of the carrying capacity of the site in the financial feasibility analysis

Dredged material from the Harbour will be used in the land reclamation portion of the project. This will directly reduce the cost during the project's construction phase by offsetting the cost to purchase sand and limestone material for the land reclamation portion of the project. Using the dredge material at the

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construction site will reduce the solid waste disposal costs in the project, because there is no expense to ship dredged material to a disposal site. Dredged material will be piped directly to the land reclamation site.

The current land capacity will not support the proposed expansion of the Port facilities. As a result, Nassau Cruise Port also includes the redevelopment of Woodes Rodgers Walk. Additional features included in the redevelopment project are an amphitheater increased parking and trash disposal facilities.

#### 4.4.2. Project competition with other demands, existing and planned

There is no known competition between the current proposed project and the existing or planned projects at the time of this assessment. There will be increased demand on the utility infrastructure during construction and operation. The electrical demand will decrease between construction and operation because the Nassau Cruise Port aims to include a solar power system.

#### 4.4.3. Potable and process water conservation considerations

NCP will pursue the ISO 9001 & 14001 standards during operation.

#### 4.4.4. Strategy to monitor and prevent impacts on biological resources

An Environmental Officer will monitor the construction site to ensure the Environmental Management Plan is followed.

#### 4.4.5. Process pollution prevention strategies, waste reuse and recycling considerations

Pollution prevention strategies include clearly identifying solid waste disposal locations using signage visible during construction and operation. Operations staff will patrol the site at regular intervals during construction to remove debris on site. NCP staff will empty garbage bins in at regular intervals from offices locations. Bins will also be made available in the parking lot. Additional more detailed pollution prevention strategies will be identified in the EMP.

#### 4.4.6. Potable conservation considerations

Infrastructure will be maintained to reduce the occurrence of leaks from developing in the potable water infrastructure. Routine maintenance will also help to identify leaks early and reduce the amount of potable water loss.

#### 4.4.7. Energy efficiency considerations (fuels and electricity)

“To the maximum extent possible, the Company will endeavor to design and implement the Project by using environmentally friendly and energy efficient components and materials in order to reduce its carbon impact.”

#### 4.4.8. Vulnerability assessment for port and industrial operations; consider natural, human, and technological threats

Areas likely to flood from cloudbursts were identified by Atometrics Ltd and shown in Figure 3. The map was consulted prior to final design of the conceptual plan for the project area to reduce the impact of flooding related to heavy rainfall. Additionally, areas currently susceptible to flooding will be regraded and elevated prior to construction. The Security Manual will guide NCP response to human and technological threats. The Table of Contents for the Security Manual is shown in Appendix E. The full security manual is not included to help maintain national security at this Port of Entry for the country.

#### 4.4.9. Worker health & safety program particularly and waste management operations.

The Health and Safety Manual for Nassau Cruise Port will follow the template for the Global Ports Holding Health & Safety and Environment Management Manual. Some sections relevant to Nassau Cruise Port

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are shown below. The draft Health & Safety and Environment Management Manual for Nassau Cruise Port is shown in Appendix O.

- I. INTRODUCTION  
General overview of GPH and the reasons of publishing this manual and the scope of implementation is explained.
- II. NORMATIVE REFERENCES  
The Management System Standards which guide this manual are explained.
- III. LIST OF ABBREVIATIONS AND ACRONYMS  
The important abbreviations and definitions are explained in this section.
- IV. CONTEXT OF THE ORGANIZATION  
This section is prepared to include the scope of the individual GPH port(s). The context section also includes the strong and weak points and the opportunities and the threats of the ports.
- V. POLICY  
The integrated management system policy of GPH is added to the manual. There may be other policies to be documented for different legal and other requirements of different ports. (i.e. information security policy, security system policy etc.) We have the sample policy documents to help document them.
- VI. ORGANIZATION  
This part is for the hierarchical organization and the job definitions of the staff of the port in question. We have added the sample documents for the possible port organizations.
- VII. PORT INFRASTRUCTURE, PLANT AND EQUIPMENT  
Infrastructure of the port facilities are listed here with some explanations. All the possible infrastructure is named in this section. The final definitions of the infrastructure of the ports will be prepared for each port in the final document.
- VIII. OPERATIONS  
All possible port operations are documented from different sources. These are the processes of the ports. Same names may appear in “infrastructure”, “risk evaluation” or in “Operations” Operations section documents the processes. Each port’s processes will be evaluated in detail.
- IX. H&S ISSUES  
Health and safety headlines are documented in this section. The section has mainly 3 parts;
  - Planning the H&S system
  - Explaining all the possible hazards of the sector
  - The risk issues for the possible hazards

To submit a wider selection of possibilities to the ports the hazards and related risks are widely drafted.
- X. APPLICABLE LEGAL AND OTHER REQUIREMENTS  
The applicable legal and other requirements.
- XI. MANAGING HEALTH AND SAFETY & ENVIRONMENT IN PORTS

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Management plans for H&S and Environmental headlines are made based upon the previously done risk analysis and impact analysis of the ports.

- XII. **EMERGENCY ARRANGEMENTS (PREPAREDNESS AND RESPONSE)**  
Despite all the precautions and management plans there is still the possibility of emergency cases. The main idea is to respond any emergency case on time and with fewer losses. There are emergency response drills.
- XIII. **INVESTIGATION AND REPORTING OF INCIDENTS AND ACCIDENTS**  
If there is an incident (with no harm) or an accident (with harm) the report of the incident or accident should be reported properly to be able to investigate and improve the system.
- XIV. **TRAINING**  
Training is an important part in all management systems. Main guidelines are given in the manual
- XV. **CONSULTATION AND COMMUNICATION**  
Consultation and communication guidelines are given.
- XVI. **DOCUMENTED INFORMATION**  
The document preparation, publishing, revising and re-publishing processes will be defined.
- XVII. **PERFORMANCE EVALUATION**  
Based on the management plans, the monitoring topics are documented.
- XVIII. **CORRECTIVE ACTIONS, AUDITS AND MANAGEMENT REVIEW**  
The internal audits, and system review meetings are described.

## 5. Identification and Assessment of Potential Environmental Impacts

### 5.1. Screening/scoping process to identify & assess potential environmental impacts.

The initial step in the screening for environmental impacts process involved the identification of the habitats in the project's immediate area of impact by consulting the conceptual plan and conducting site visits. Marine and terrestrial surveys were conducted in the area of impact. Desktop research was conducted to supplement the information collected during the site visits. Information was collected during meetings with the BEST Commission and other stakeholders. The 2008 draft Environmental Impact Assessment for the Nassau Harbour Port Improvement Project prepared by Blue Engineering Ltd. and its supplementary studies were also reviewed during the scoping and screening process.

### 5.2. Impact identification and assessment methodology

Impacts were identified and assessed based on their significance. Significance is a function of the impact's magnitude and its likelihood. The magnitude was determined by the combination of the project activity's Extent, Duration, Intensity and Likelihood (Table 24). A summary of impacts will be provided in the EMP.

*Extent* refers to the area and distance influenced by the project activity. Restricted on site to the immediate project area (O), locally within a 10-mile radius (L), regionally to include the island of New Providence (R), and Nationally to include the extent of the Bahamian Archipelago (N).

*Duration* reflects the timeframe the project activity will be influencing the project area. The duration of the impact relates to the temporal scale which is required for changes in the host environment to return to

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baseline conditions or undetectable levels. Temporary (T) impacts persist for a short duration and occur occasionally and/or intermittently. Short Term (ST) impacts are expected to persist for the duration of the project activities related to the construction phase of the Project. Long Term (LT) impacts extend beyond the duration of the construction period and exist throughout the life of the Project. Permanent (P) impacts persist far beyond the life of the Project and are irreversible changes to the host environment due to project related activities.

*Intensity* The intensity of an impact can be considered as Negligible (N), Low (L), Medium (M) or High (H). A Negligible impact is one which has no detectable change on the host environment. A low intensity impact does not affect the host environment in such a manner to alter natural flows and processes. Medium intensity impacts alter the natural flows and process of the host environment while allowing the flows and process to retain their natural functions. High intensity impacts alter natural flows and processes to the extent where natural functions are totally inhibited for a temporary or permanent period of time.

*Likelihood* The likelihood of an impact evaluates the likely potential for an impact to occur, with typical rating categories being Unlikely to occur (U), Likely to occur under most conditions (L), and definitely will occur (D).

**Table 24.** *Magnitude classification system used to identify and assess impacts.*

SIGNIFICANCE			
MAGNITUDE			LIKELIHOOD
Extent	Duration	Intensity	
On Site (O)	Temporary (T)	Negligible (N)	Unlikely (U)
Local (L)	Short-Term (ST)	Low (LW)	Likely (LK)
Regional (R)	Long-Term (LT)	Medium (M)	Definite (D)
National (N)	Permanent (P)	High (H)	

### 5.2.1. Assessment of potential environmental impacts

Potential environmental impacts were assessed according to the project component and its related activities. Related activities listed in Table 1 and Table 2 with no environmental impact are not discussed below.

#### **Impact Significance Discussion**

**Phase 1 Demolition** - Festival Place and the Port Warehouse will be demolished to facilitate the development of the new cruise terminal. Both buildings are located on Prince George Wharf, near Woodes Rodgers Walk and downtown Nassau. The Port Warehouse is scheduled to be demolished first. A Demolition EMP was prepared by the demolition contractor, Bahamas Marine Construction Co. Ltd. and is shown in Appendix C. Impacts pertaining to the Warehouse demolition are described in section six (6) on page ten (10) in the Appendix. Once planning for the Festival Place demolition commences, a demolition EMP will be prepared and submitted to the Department of Environmental Planning and Protection for review and approval. Perceived potential impacts from the demolition of the both buildings could be debris and silt from the demolition falling in the Harbour, which will impact marine resources in the immediate vicinity or flush beyond the harbor boundary impacting marine resources found there. Silt may also impact the air quality in the surrounding marine and terrestrial areas during this demolition. The noise associated with the demolition process and the heavy machinery required for demolition may impact surrounding businesses and the horses used in surrey tours. Transporting heavy equipment may impact the traffic flow in the area. A traffic impact assessment was conducted by CCG. Businesses displaced during the demolition such as

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the Festival Place vendors, vendors along Woodes Rodgers Walk, tour boat operators using the western and eastern berths in the NCP boundary will be temporarily negatively impacted. In summary, the following parameters may be impacted. A more detailed impact analysis for the demolition of the Warehouse demolition is found section seven (7) in Appendix C.

- Air Quality
- Water Quality
- Noise
- Traffic
- Socioeconomics

**Phase 2 Sheet Piling and Dredging** - Land reclamation is included in this discussion because the dredge material will be piped to the land reclamation site as it is dredged. A cutter suction dredger will be used to dredge the project site. Dredging and land reclamation will remove the benthic habitat from the areas identified in the habitat map. The species that cannot move out of the dredged area and the land reclamation area will be negatively impacted. The proposed dredging is not expected to change the hydrodynamics of the harbour. As a result, the current and wave interaction on the shoreline is expected to remain the same as that of present day conditions. Sediment does not currently shift around notably within the harbour under the existing conditions, i.e. formation/movement of sandbars etc. Therefore, it is not expected that sediment will shift notably under the proposed post-dredge conditions. The existing basin is demarcated by a sheer vertical cut face, which implies that the basin was dredged into sound rock substrate. It is expected that the cut face from the proposed dredging will be very similar, which means that the walls of the dredged area will not be vulnerable to erosion or collapse and that sediment from the surrounding shallower seabed will not slide or collapse into the proposed basin due to wall collapse, and so there is no change in bathymetry to surrounding areas expected. The location of the dredger during mobilization and dredging may negatively influence marine traffic in the navigation channel along the northern boundary of the Port. The pipe used to transfer dredge material to the land reclamation site may become a hindrance to smaller tour boat operators using the eastern and western portion of the Harbour since the Port will remain in operation during this process. The route of the dredge pipe was relocated to reduce the impact to marine traffic. See Figure 81 showing the proposed route of the pipe. The noise associated with the demolition process and the heavy machinery required for dredging and land reclamation may impact surrounding businesses and cruise ship visitors. Should any silt or sedimentation flush beyond the Harbour during the construction, the visibility and turbidity on adjacent beaches by the Pointe development and Junkanoo Beach may be negatively impacted. With appropriate turbidity mitigation in place, the project is not expected to have an impact on Junkanoo Beach. In summary, the intended dredging is not expected to change the currents in the Harbour, or create rip currents or similar dangerous wave energy or activity to nearby beaches which may affect beach goers. The proposed dredging is also not expected to impact the tidal or current flows in any significant way to create erosional events to the area of coastline in the vicinity of the project. Nor should the proposed dredging result in any changes to the wave energy or wave forces effect any of the beaches which border the project to the west or the east. The following parameters may be impacted.

- Marine Benthic Habitat - [O / P / M / LK]
- Marine Traffic – [O / ST / LW / LK]
- Air Quality - [L / T / LW /LK]
- Water Quality - [L / T / LW / U] - Increased turbidity is typically expected once dredging begins. Sediment will be dredged from one area of the harbor and transferred to another area in the harbor via pipe underwater (see Figure 81). This will eliminate the need to load dredge material on a barge for transport, which could increase the likelihood of dredge material falling in the ocean during transport. Additionally, prior to dredging the reclamation area will be closed with tiles to prevent increased turbidity along Junkanoo beach. An open reclamation area would allow material to settle at its own angle of repose which could mean increased turbidity in adjacent areas. Since the land reclamation area will be closed during dredging and land reclamation, increased turbidity

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is unlikely on Junkanoo Beach. Once the sediment has settled, the tiles will be removed. Turbidity monitoring during dredging and land reclamation will be described in detail in the EMP.

- Noise – [L / T / LW / LK] - The noise report produced by Enka lists the steps that will be taken to reduce noise and limit impact onsite (immediate area). The full report is included as Appendix K.
- Traffic – [L / ST / LW / U]
- Socioeconomics - [L / T / LW / LK]

**Phase 3 Land Side Works** – The vehicular traffic will be slightly negatively influenced by heavy equipment travelling to and from the construction site. During landscaping traffic may be negatively impacted. There should be limited noise impact and during the landscaping activities in the land side works. Construction of the new cruise terminal will lead to increase noise but this will be a temporary nuisance to surrounding business communities. Businesses displaced during the land side works such as the Festival Place vendors and the vendors along the northern boundary of Woodes Rodgers Walk may be temporarily negatively impacted because they will be displaced for a short period. In summary, the following parameters may be impacted.

- Air Quality - [L / T / LW / LK]
- Water Quality - [O / T / LW / U]
- Noise – [O / T / M / LK]
- Traffic – [L / ST / LW / LK]
- Socioeconomics – [O / ST / LW / LK]

### 5.3. Public/community participation activities conducted

Blue Orchid Advertising agency conducted public stakeholder meetings for the Nassau Cruise Port project in 2019. Videos are available on the Nassau Cruise Port website and meeting notes will be made available upon request. In May 2020 NCP conducted stakeholder meetings with Paradise Island stakeholders.

### 5.4. Potential environmental impact matrices for various phases of the project

#### 5.4.1. Early development activities

Early development activities included preliminary studies to inform the development of the current EIA. There were little to no impacts in the early development activities including but not limited to the Environmental Site Assessments, Marine Benthic Surveys, Terrestrial Site Assessments, Geotechnical Exploration, Traffic Impact Study, Topographic Survey and Flushing Study (Appendix P).

#### 5.4.2. Development/construction activities

See Tables 25 and 26.

#### 5.4.3. Operation/maintenance activities

See Tables 25 and 26.

**Table 25.** Impact significance matrix key.

Impact Significance	Color Code
Negligible/No Impact	
Minor Impact	Yellow
Moderate Impact	Orange
Severe Impact	Red
Beneficial Impact	Green

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Table 26. Nassau Cruise Port - Impact Significance Matrix during construction and operation.

Project Component	Impacting Factor	Physical		Coastal Processes			Biological					Socio-Econ & Cultural				
		Hydrology & Hydrogeology	Air Quality	Noise	Erosion & Sedimentation	Beach	Terrestrial Habitats	Marine Habitats	Birds	Terrestrial Flora	Marine Mammals	Marine Resources	Neighboring Communities	Relocation	Traffic	Economic
<b>Marina</b>	Land Reclamation	Yellow		Yellow	Yellow	Yellow		Orange	Green	Green	Yellow	Orange	Orange		Orange	Green
	Dredging	Orange	Orange	Orange	Orange	Yellow		Red			Yellow	Orange	Orange	Orange	Yellow	Green
	Tour boat expansion	Yellow			Yellow			Yellow			Yellow	Orange	Orange			Green
	Repair Pier 1	Yellow			Yellow		Green	Yellow	Green	Green	Yellow					Green
	Pier 3 extensions	Yellow			Yellow			Red			Yellow	Orange	Orange	Red		Green
	Spoil Stockpiling	Yellow			Yellow			Orange			Orange					Green
	Dock Piles Installation	Yellow		Orange	Yellow			Yellow			Yellow	Orange	Orange			Green
<b>Upland Construction</b>	Land Clearing & Demolition				Orange		Orange	Yellow	Yellow			Orange	Red	Orange		Green
	Infrastructure Installation		Yellow	Yellow	Yellow		Yellow		Green			Orange	Red	Red		Green
	Boat Traffic										Orange	Red	Red			Green
	<b>Accidental</b>															
	Fuel / Oil Spills	Orange	Orange			Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	Sewage Discharge	Yellow	Yellow													
	Surface Runoff	Orange			Orange		Yellow	Yellow		Yellow	Yellow					
<b>Operations</b>	Amphitheatre			Orange					Orange				Red		Yellow	
	Emissions		Orange				Yellow		Yellow				Yellow			
	Retail, Resort, Restaurants			Yellow					Orange				Green		Orange	Green

## 5.5. Description of positive potential environmental impacts of the proposed project.

Terrestrial invasive species will be removed during the construction and operational phase of the project.

- Through continued monitoring and maintenance by the NCP's landscaping team, the return of invasive Hawaiian Sea Lettuce will be prevented. Native plants will replace the invasive Hawaiian Sea Lettuce in the landscaping. A benefit of using native species in landscaping is it will reduce irrigation demand during operation and reduce the consumption of potable water. Native species are adapted to growing in dry arid conditions in The Bahamas. Since NCP will be connected to the Water and Sewerage Corporation, this will reduce demand on the Corporation. Another benefit of using native flora is that native flora typically attracts native fauna, which should be aesthetically pleasing for both locals and tourists using the area.
- Invasive *Rattus sp.* were abundant in the Woodes Rodgers Walk, Rawson Square, and Festival Place areas. These are highly visible areas for locals and cruise ship visitors. Through consistent landscaping and waste removal, the population of Rats is expected to reduce. Rats will not have large amount of debris to hide under or a significant food source to attract them. Another measure to reduce the amount of rats in the area is to strategically position rat traps and remove them regularly as a part of the NCP maintenance program. This is beneficial because Rats can potentially impact public health as they can transmit diseases<sup>60</sup>.

Marine debris observed in the NCP project site will be removed prior to dredging and land reclamation.

- Transport of the debris beyond the Harbor limits will likely be avoided because the debris will be removed prior to dredging and the land reclamation process. Plastic debris is generally not biodegradable and can be mistaken for prey by marine life or lead to entanglements. Plastic debris also breaks down into microplastics, small pieces of plastic less than 5 mm long, is dangerous to the marine life as well because it can be mistaken for food<sup>61</sup>. Many tires were observed in the NCP site during the marine benthic survey. Tires are also not biodegradable and can destroy coral reefs when currents or storm surge moves them onto coral reefs<sup>62</sup>.

Regrading of the Festival Place site and the Woodes Rodgers Walk, and improving drainage on site will reduce flooding in both areas.

- This will eliminate standing water which can act as a vector for mosquitoes and is an eye sore for both tourists and locals. An example of the standing water observed on the project site is shown in Figure 83.

Modifying the watering station for the horses working in the horse and carriage tours will also reduce the amount of available standing water that may harbor mosquitoes. The existing watering station is a small container of open standing water.

- Relocating the horse and carriage area and separating it from the retail space will help improve the shopping experience for both locals and visitors because the nuisance odors will not occur in the same space.

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<sup>60</sup> [https://www.who.int/water\\_sanitation\\_health/hygiene/ships/gssanitation8.pdf](https://www.who.int/water_sanitation_health/hygiene/ships/gssanitation8.pdf)

<sup>61</sup> <https://oceanservice.noaa.gov/facts/microplastics.html>

<sup>62</sup> <https://ecogreenequipment.com/how-do-old-discarded-tires-affect-the-environment/>

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**Figure 83.** Standing water at the Festival Place site.



## 5.6. Description of negative potential environmental impacts

### 5.6.1. Land clearing or reclamation:

#### 5.6.1.1. *Loss of the natural resources due to land reclaimed*

Mangroves and other native forests were not observed in the project area of impact during the surveys. These habitats were also not identified in the environmental impact assessment report in 2008 for the NHPIP. As a result, there will be no negative impact in this regard. During the land reclamation activity, the benthic habitat will be negatively impacted. However, this impact will be temporary and not significant.

#### 5.6.1.2. *Displacement of other existing land uses*

The cruise terminal will remain in operation during construction which will not permanently displace vendors and tour operators. Vendors will be temporarily displaced during the Festival Place demolition, the schedule for the demolition of this building will be provided to the Department of Environmental Planning and Protection. This impact will be temporary and insignificant (see [Impact Significance Discussion in section 5.2](#)). Once in operation, vendors and other tour operators will be relocated to the designated retail, taxi and surrey location. There will be little to no long term impact to these operators. The intended storage location for heavy equipment will be determined by the contract and will be submitted in the EMP.

#### 5.6.1.3. *Soil erosion and siltation*

There is potential for significant impact related to soil erosion and siltation due to the location of the demolition sites, and the dredging and land reclamation sites. The potential impact is related to soil erosion entering the NCP marine environment because the demolition sites are in proximity to the Harbour (see [Impact Significance Discussion in section 5.2](#)).

#### 5.6.1.4. *Land availability for planned facilities*

The land reclamation component of the project will create the necessary space for the new recreational marine located in the western harbor.

### 5.6.2. Potential impact on physical resources

#### 5.6.2.1. *Deterioration of water quality due to flushing capacity*

Preliminary water quality analysis suggests the NCP site has flushing capacity. The flushing analysis results indicate that the main cruise berths will all still flush effectively and in accordance with BEST's requirements of 90% in 24 hrs., after the port expansion has been completed. The two areas of concern identified by the flushing analysis are the East and West Marinas. The flushing of these areas did not meet BEST's requirements of 90% in 24 hrs. However, the report recommended the incorporation of culverts (connecting the East Marina to the berth to the west and connecting the West Marina to the

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berth to the north) into the final design of these areas will ensure that flushing will occur in accordance with BEST's requirements. The flushing study report is provided in Appendix P. The East Marina design has been updated to an open pile structure which, like connecting structure 2, will have no impact on water circulation. Additionally, connecting structure 1 will remain as is dimensionally/geometrically, but the existing structures will be replaced with new structures where needed, based on the as-built survey. The new structure will function exactly as the existing structure does presently. The figures below show the existing location of the openings that will be maintained during the marine construction. Culverts similar to those at connecting structure 1 will be implemented for the west marina to improve flushing times.

**Figure 84** The existing location of the openings that will be maintained during the marine construction to assist NCP flushing.



#### 5.6.2.2 *Deterioration of water and soil quality associated with oil spills & hazardous materials*

Ship repair facilities are not a component of the proposed project. A strategy to address oil spills from onshore and offshore operations will be discussed in the EMP. A hazardous waste management plan will be established per procedure only as NCP does not anticipate receiving any hazardous materials at the Port.

#### 5.6.2.3. *Flooding, surface water flow patterns*

Referring to Figure 3, it is evident that flooding will impact the project site. However, due to regrading the surface early in the construction phase surface water should not settle on the project site.

#### 5.6.3. *Potential impacts on socio-economic and cultural resources*

##### **Short Term Impacts**

The Surrey drivers and marina operators that will be relocated may face business interruption, a negative socioeconomic impact. Business interruption refers to the loss of income due to the suspension of the business operation<sup>63</sup>. NCP is working with these stakeholders to ensure a smooth transition of operations from their current location to their permanent location within the site plan. Through continued stakeholder consultations, NCP aims to understand the business needs of these stakeholders to help identify the best way forward to appropriately mitigate the loss of income associate with business interruption.

The cultural resources identified in Rawson Square will not be impacted by the redevelopment of the Nassau Harbour. A portion of the Woodes Rodgers Walk will be transformed into a waterfront Park that will attract both locals and visitors to the area.

<sup>63</sup> <https://www.marsh.com/us/insights/research/business-insurance.html>



## Long Term Impacts

According to the NCP Ltd., the Project will generate wide-spread economic growth and a more competitive tourism sector through the transformation of the port and the downtown area. The Project would transform the Nassau Cruise Port into a world-class facility in a cost effective manner, while creating jobs and driving increased economic opportunity into the community. The Project structure is tailored to accommodate Bahamian interests and create an opportunity for thousands of Bahamians to be vested in the Project through BIF, an investment fund designed for Bahamians. The YES Foundation would support essential social programs including educational events and sports designed to assist deserving youth. According to KPMG analysis, the Project would have a cumulative impact of US \$15.7B from 2019 to 2049 on the Bahamian economy.

The Company agreed with the Government of The Bahamas (“GOB”) that the employment of Bahamians in the Project, and in the operation of the Property as a cruise port and an entertainment facility for cruise ship passengers and other guests, is of importance to GOB. While it is acknowledged that, having regard to the complexity of some construction works (such as the marine works) and the need to ensure the highest levels of technical compliance with international standards, it may be necessary to hire greater numbers of skilled non-Bahamians than hereafter provided; the Parties agree over the life of such construction phase to aim for an overall ratio of 80% Bahamian workers to 20% non-Bahamian workers, subject as herein before acknowledged and subject always to qualified Bahamian candidates being available to allow the Company to meet such ratio.

The Company estimates that approximately 70 permanent jobs will be created for Bahamians post-construction. The Company will offer employment positions to Bahamians that encompass a breadth of disciplines, including horticulture, transportation, security, maintenance, custodial, food and beverage, recreation, as well as management positions and opportunities for advancement. The Company will also work closely with GOB and local communities to develop training and professional development programs for Bahamians desiring to work during the operation of the project.

Ancillary Contributions by the Company:

The Company will make the following ancillary contributions for the ultimate benefit of Bahamians:

- a. Three million US dollars (USD 3,000,000) to the YES Foundation to be used in furtherance of its objects and purposes;
- b. allocate to the YES Foundation issued shares corresponding to 2% of the share capital of the Company;
- c. provide to the Small Business Development Centre a one-time one million US dollar (USD 1,000,000) grant to fund its operations and a Two million US dollar (USD 2,000,000) interest free loans for the micro loans issued by the Small Business Development Centre to be given to eligible deserving recipients;
- d. provide to the Bahamas Agricultural & Industrial Corporation (BAIC) Two million US dollars (USD 2,000,000) for its support of qualified local artisans and farmers;
- e. provide to BIF a loan of Ten million US dollars (USD 10,000,000) for its interest free funding of loans to qualifying Bahamians for their investment in the Project through BIF; and
- f. allocate eight million US dollars (USD 8,000,000), for purposes of the Company’s contribution to a green management plan and a redevelopment initiative for downtown Nassau in conjunction with the Downtown Nassau Partnership.

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GPH Americas Headquarters:

GPH established its “Americas Headquarters” in The Bahamas for GPH’s North, Central and South Americas’ portfolio. By locating its “Americas Headquarters” in the Bahamas, GPH will be well positioned to offer its knowledge and technical expertise in operating cruise ports for the development and engagement of all stakeholders in North, Central and South Americas. In The Bahamas, GPH will prioritize developing local knowledge and involvement in the cruise industry by, among others, organising annual conventions, association meetings, workshops and other industry events in the Caribbean.

Retail space:

Upon completion of the reconstruction of the Retail Space, the Company will, in accordance with relevant Laws, give priority to retaining existing Bahamian small business owners and entrepreneur tenants within the Port in respect of renting the newly reconstructed Retail Space at the current rent rates for a period of 12 Months starting from the completion of the reconstruction of the Retail Space.”

## 6. Impact Mitigation Measures

### 6.1. Description of mitigation measures

All project activities will not have the same environmental and socioeconomic impact. The impacts for the major activities are summarized and classified according to their impact in Table 26, the Impact Significance Matrix. While the EMP will describe in detail the project’s mitigation measures, the activities with impacts identified as having a Severe Impact, coded in red in Table 26, during construction and operation are listed below according to environmental or socioeconomic impact. The proposed mitigation measures associated is also discussed below.

#### 6.1.1. Measures developed in response to the potential environmental impacts

During the marina development the dredging and Pier 3 extension activity are expected to have severe impacts on the environment. The following mitigation measures will reduce the impact on the environment during marina development and upland construction.

- Installation of dust control measures to prevent negative impacts on water and air quality. Water may be applied as needed to the site to prevent wind transport of dust from the site into the harbor and the surrounding environment.
- Landscaping will commence as soon as possible to help prevent soil eroding and washing in the harbor during rains.
- To help reduce the impact of noise, several “noisy” operations will be scheduled at the same time to reduce the duration the surrounding community will be exposed to noise higher than the usual ambient noise level in the area.
- Noisy operations will not be scheduled during main business hours and peak traffic times
- Landscaping operations will not be scheduled during peak traffic times
- Corals will be relocated from the project site prior to land reclamation and dredging activities. Corals >10 cm in diameter will be carefully dislodged from the seafloor or manmade structures in the designated area and transported in seawater to a nearby relocation site. The final selection of the relocation site will be made in consultation with government. Corals will be attached to the substrate using underwater cement and/or epoxy. The Coral Relocation Plan will be described in detail in the EMP.
- Several turbidity controls during dredging and land reclamation will be implemented as increased turbidity is typically expected once dredging begins. Sediment will be dredged from one area of the harbor and transferred to another area in the harbor via pipe underwater. This will eliminate the

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need to load dredge material on a barge for transport, which could increase the likelihood of dredge material falling in the ocean during transport. Additionally, prior to dredging the reclamation area will be closed with tiles to prevent increased turbidity along Junkanoo Beach. An open reclamation area would allow material to settle at its own angle of repose which could mean increased turbidity in adjacent areas. Since the land reclamation area will be closed during dredging and land reclamation, increased turbidity is unlikely on Junkanoo Beach. Once the sediment has settled, the tiles will be removed. Turbidity monitoring during dredging and land reclamation will be described in detail in the EMP.

#### 6.1.2. Measures developed in response to the potential socioeconomic impacts

During the marina development the Pier 3 extension activity is expected to have a temporary negative impact on the socioeconomics because it will lead to displacing some tour boat operators and vendors using the western harbour to sell seashells and starfish from their boats in the Harbour.

Proposed mitigation for the vendors include arranging another location with the Kelly Dock for the vendors and operators to set up. Negotiations through continued stakeholder consultations, as mentioned in [section 3](#), and with the Kelly Dock will refine the mitigation for this activity and will be presented in the EMP.

During upland construction the infrastructure installation activity is expected to impact the socioeconomics by reducing the traffic flow and relocating vendors. The boat traffic of neighboring communities is expected to be impacted during the upland construction as well as the dredge location is along the northern boundary of the Harbour, South of Paradise Island. The neighboring community on Paradise Island use this area to access their docks. These stakeholders were consulted in May 2020. Surrey operators will also be relocated during the construction.

Proposed mitigation to reduce the impact on traffic and the neighboring boating communities will involve redirecting traffic. The vehicular traffic will be redirected as shown in the Traffic Impact Study in Appendix A. The neighboring boating community will be given advanced notice prior to the commencement of dredging in order to prevent user conflicts. Surrey operators will be accommodated in the redeveloped area and continued communications through stakeholder meetings will refine the site plan for the Surrey Operators.

During operations the neighboring communities may be impacted by the sound from the amphitheater during events.

Proposed mitigation to reduce the sound impact is to include soundproofing in the construction design of the building and providing advance notice of any events that may lead to elevated sounds.

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## 7. Conclusion

The Nassau Cruise Port redevelopment of the historic Nassau Harbour is expected to generate great economic opportunities for the growth of the Bahamian economy through several avenues. The first is to increase the capacity of Nassau Harbour to welcome large vessels. Secondly by improving visitor experience by updating the arrival terminal and providing authentically Bahamian goods and services. Nassau Cruise Port also aims to provide opportunities for locals to interact with guests further enhancing the visitor experience through the development of the upland waterfront development park. Thirdly, the necessary renovations and modernization of the site will assist in propelling The Bahamas forward to compete in global tourism markets.

The project site is significantly impacted by previous dredging and construction. Most impacts associated with this project, which is a redevelopment project, are expected to have minimal negative effects on the immediate and surrounding environment. Positive environmental impacts associated with the project include marine debris removal and replacing invasive terrestrial species with native species. Through compliance with the best environmental practices and mitigation efforts, Nassau Cruise Port aims to complete construction with minimal negative impacts that will be maintained throughout operation.

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## Appendix A: Nassau Cruise Port Traffic Impact Assessment

## Appendix B: Demolition Hazards Assessment

## Appendix C: Port Warehouse Demolition Environmental Management Plan

## Appendix D: Utilities Maps



## Appendix E: GPH Port and Terminal Facilities Security Code - Table of Contents

## Appendix F: Bathymetric Survey

## Appendix G: Currents in Nassau Harbour Report

## Appendix H: Wave Climate and Dredging Impacts Report



## Appendix I: Geotechnical Exploration Report

## Appendix J: Topographic Survey

The Topographic Survey was conducted by Atametrics Ltd. The map shows the ground surface contours for the project site and surrounding area. Additional features such as bollards and fenders, trees, signs, roads, underground and above ground utilities were also included in the map. Piers 1 through 3 and the bridge connectors were generally 6 ft (1.83 m) and the planters were 7 ft (2.13 m). The elevation decreased to 5 ft (1.52 m) in the area between Festival Place and the Surrey Operator waiting area and the area east of the Port building. The elevation along Woodes Rodgers Walk near the western harbor was 4 ft (1.22 m). This decrease in elevation was expected because a step was constructed to ease guest access to ferry and tour boats. The highest elevation in Rawson Square was 9ft (2.74 m), which was in the center of the Square. The ground contours in Parliament Square range from 10 ft (3.05 m) – 13 ft (3.96 m). This is the highest elevation in the area. The layout of the topography of the area provides an idea of those areas that would likely be inundated during heavy rainfall events by observing the undulations that indicate where the elevation decreases.

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## Appendix K: Noise Protection Report

## Appendix L: Stakeholder Meeting Schedule



## Appendix M: Nassau Cruise Port Maintenance Plan Outline

## Appendix N: Basis of Design Report

## Appendix O: Nassau Cruise Port Health & Safety and Environmental Manual

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## Appendix P: Flushing Study