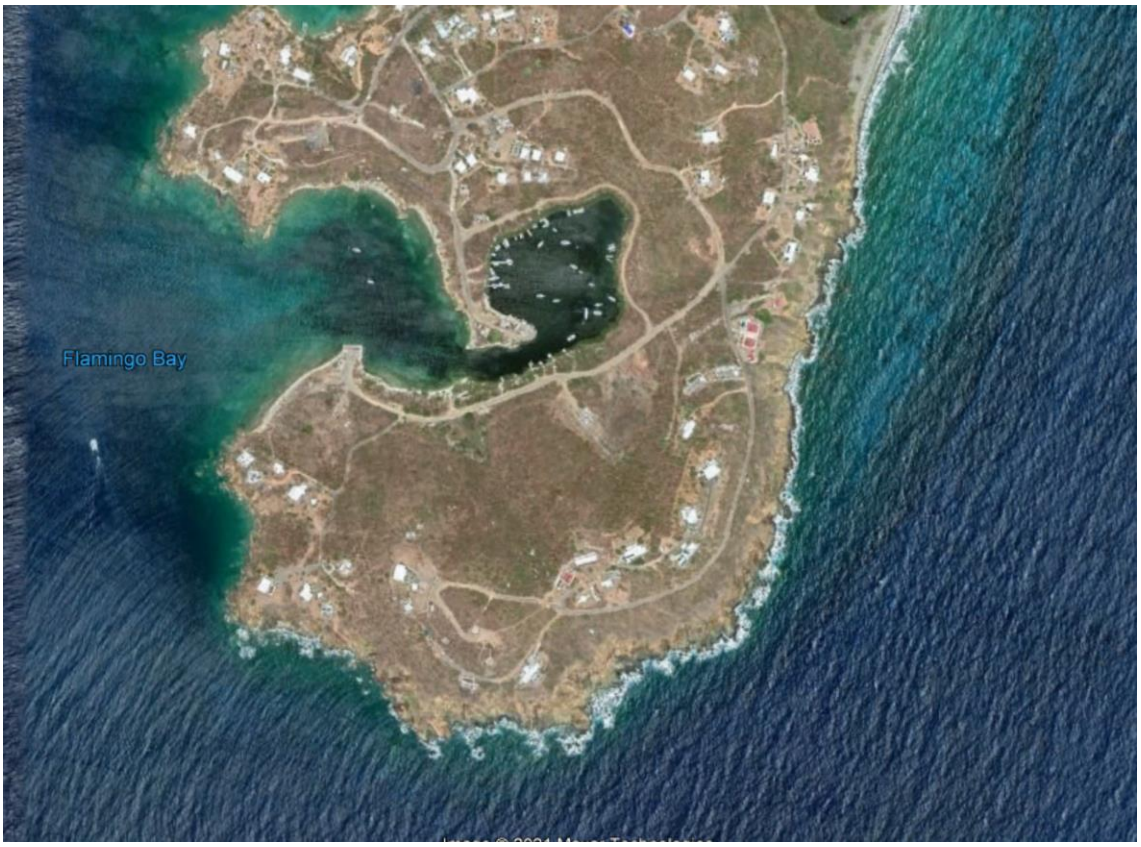
ENVIRONMENTAL ASSESSMENT REPORT
FLAMINGO BAY ECO RESORT
ST. THOMAS, U.S. VIRGIN ISLANDS



SUBMITTED TO

THE DIVISION OF COASTAL ZONE MANAGEMENT DEPARTMENT OF PLANNING AND NATURAL RESOURCES

PREPARED FOR

BBK DEVELOPMENT LLC

PREPARED BY
BIOIMPACT, INC.
P.O. BOX 132 KINGSHILL
ST. CROIX, U.S. VIRGIN ISLANDS 00851
bioimpact@islands.vi

SEPTEMBER 2021

ENVIRONMENTAL ASSESSMENT REPORT A MAJOR LAND PERMIT FLAMINGO BAY ECO RESORT

1.0 NAME AND ADDRESS OF APPLICANT

BBK Development, LLC
8168 Crown Bay Marina, Suite 505
St. Thomas, U.S. Virgin Islands 00802-5819

Mailing address:
c/o Nancy M. Anderson
7499 Estate St. Peter
St. Thomas, VI 00802-3426

2.00 LOCATION OF PROJECT

The project site is located on the southern end of Water Island south of Flamingo Bay Pond. Water Island is located off the south shore of St. Thomas, U.S. Virgin Islands. The proposed resort is located on Plot 19, Water Island, U.S. Virgin Island. The property is located at 18.310903°N Latitude and -64.953840°W Longitude. The property includes 4 military barracks building ruins.

The following location map and agency review map depicts the projects in reference to adjacent zoning and jurisdiction line of the Department of Planning and Natural Resources, Division of Coastal Zone Management. The vicinity map also follows showing the regional context and vicinity in the U.S. Virgin Islands.

Figure 2.00.1 Location and agency review map, the Coastal Zone Management jurisdiction is in color

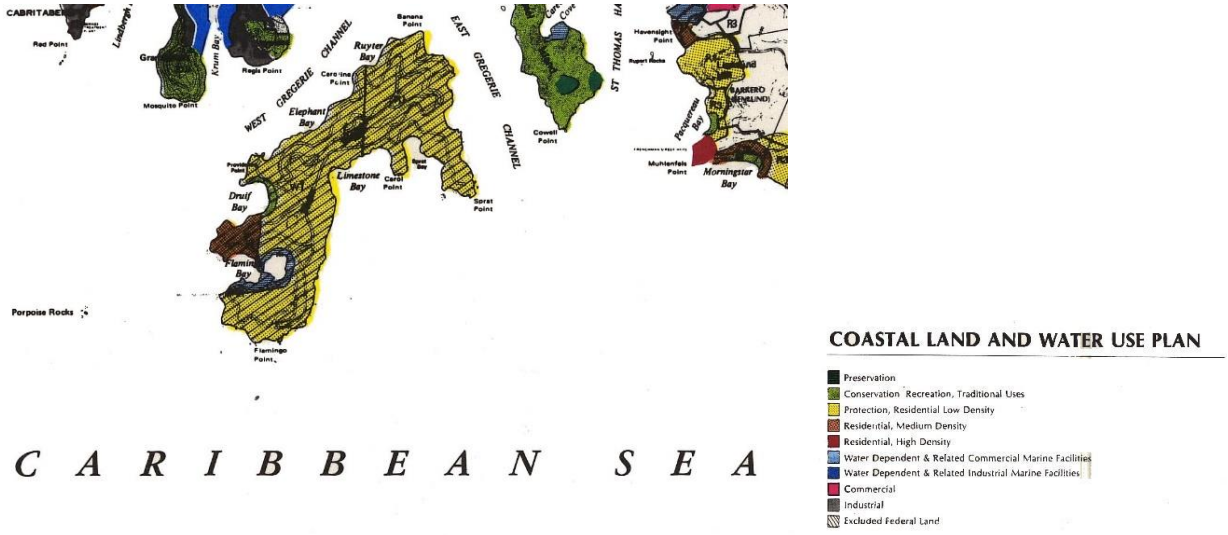
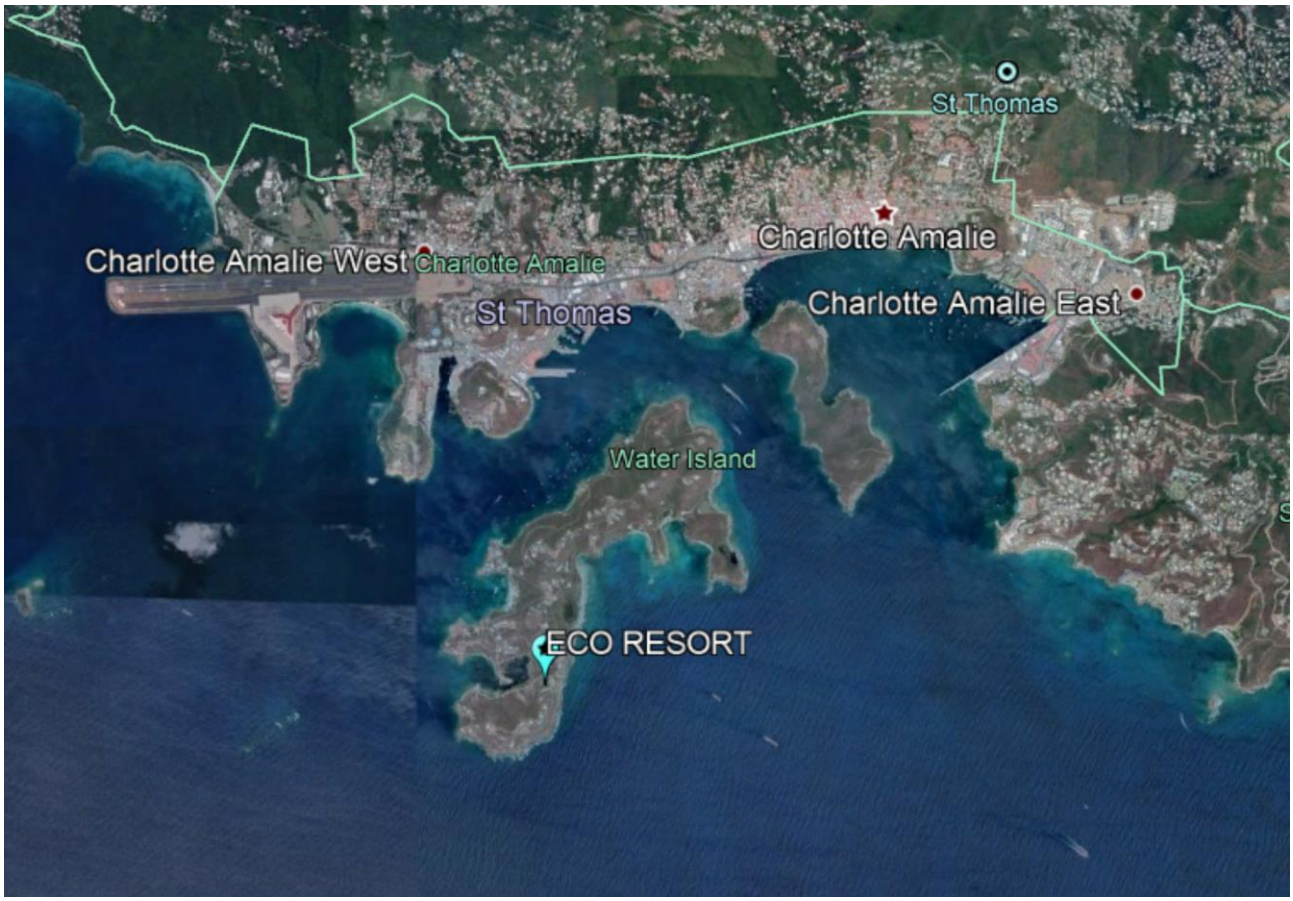


Figure 2.00.2 Vicinity map showing the project area in reference to other island features.



3.00 ABSTRACT

BBK Development LLC proposes to develop Plot 19 on Water Island to create a small Eco Resort. Within the 3.97-acre plot, 14 units – including eight (8) studio units, two (2) one-bedroom units, and four (4) two-bedroom units – will be constructed. The resort will also include a swimming pool, an open-air restaurant and bar and 30 parking spaces. Plot 19 contains what was once part of the Fort Segarra military complex and contains the remains of four buildings, including three barracks buildings and a mess hall. The ruins of these old buildings are being incorporated into the project. The project is incorporating solar energy to help meet its power requirements and will install a wastewater treatment plant and utilize the gray water for irrigation.

4.00 STATEMENT OF OBJECTIVES SOUGHT BY THE PROPOSED PROJECT

The objective of the application is to create a 14-unit eco-resort with a pool, an outdoor restaurant and bar and parking spaces on Plot 19 Water Island.

5.00 DESCRIPTION OF PROJECT

5.01 Summary of Proposed Activity

The proposed project will consist of constructing a 14-unit eco resort that includes 8 studio units, 2 one-bedroom units, and 4 two-bedroom units. All units will be single story, except for the two one-bedroom units which will be two story. The resort will also include a swimming pool, an open-air restaurant and bar and 30 parking spaces. The resort is repurposing the existing concrete slabs, that were once part of the Fort Segarra military complex, to be used for parking areas and is renovating two of the old barracks buildings for 11 en-suite studio rooms previously permitted by CZT-07-20L.

5.01a Purpose of Project

The purpose of the project is to create a 14-unit eco resort that includes 8 studio units, 2 one-bedroom units, and 4 two-bedroom units. The resort will also include a swimming pool, an open-air restaurant and bar, a reception building, a generator shed, and 30 parking spaces. The project will use a MicroFAST® 4.5 4500 gallons per day (GPD) wastewater treatment system and the effluent will be placed in a grey water cistern and be used for irrigation of landscaping.

5.01b Presence and Location of Critical Area

The property has been previously developed and much of the area was cleared at one time. The barracks have been periodically used for residences and other uses since they were abandoned. The buildings were badly damaged during the 2017 North Atlantic Hurricane Season. There are a number of large water mampoo trees (*Pisonia subcordata*) on site which will be preserved.

The property has adequate interdigitation, prey base for Virgin Islands tree boas (*Chilabothrus granti*); and one was seen on site in the eastern building in May of 2006. Since tree boas have been observed, the development of the site will follow the Virgin Islands (VI) Conservation Measures for the Tree Boa. The site will have to be hand cleared and BBK Development LLC will ask the Department of Fish and Wildlife (DFW) to conduct a tree boa training session for all individuals involved in hand clearing. This will include discussions on what to do if a tree boa is encountered, as well as tree boa identification. Photographs of the tree boa will be prominently displayed at the site. Clearing will be limited to construction footprints and those necessary for the installation of the infrastructure and amenities. All vegetation will be cut by hand and the site will be left undisturbed for 5 days prior to the use of heavy machinery. Any stone walls or rally occurring rock piles will be carefully dismantled by hand to allow any tree boas to vacate the site without injury. Per VI Tree Boa guidance, chainsaws are allowed to cut vegetation down to less than 36 inches off the ground. If a VI tree boa is found within any of the working or construction areas, activities in the area will stop and designated personnel will immediately contact DFW for safe capture and relocation, if necessary. A final site visit will be performed by DFW to confirm that hand clearing has been completed to DFW standards. Throughout the project DFW will be notified of any snakes observed.

5.01c Method of Land Clearing

Prior to the start of any clearing, BBK Development LLC will request DFW to conduct a tree boa training session for all individuals involved in hand clearing. Once the training has been conducted, the areas for necessary for development will be clearly marked and hand clearing will begin in accordance to the VI Conservation Measures for the Tree Boa. Sedimentation and erosion control will be installed prior to the commencement of any earth work.

5.01d Provisions Preserve Topsoil and to Limit Site Disturbance

Site disturbance will be limited to that which is required to construct the proposed eco resort. The resort plans to repurpose the existing buildings and to minimize impact on the site. The old concrete slab of the northern building will be used as a parking area, and the two more intact barracks buildings will be renovated for resort units.

Re-enforced silt fencing will be placed around perimeter of the site and all topsoil encountered in the improvements to the site will be stock piled, protected and reused in the landscaping and stabilization.

5.01e Erosion and Sedimentation Control Devices to be Implemented

Re-enforced silt fencing will be placed around the perimeter of the proposed development site. Silt fencing will be maintained until the area is stabilized. If topsoil is excavated it will be stockpiled to be re-used in landscaping. All stockpiled material will be stored so that it is not impacted by concentrated runoff and will be covered until use to prevent erosion.

5.01f Schedule for Earth Change Activities and Implementation of Erosion and Sediment Control Measures

No earth change will occur prior to the installation of silt fencing. The very first activity will be the hand clearing of the site following a DFW training on VI Tree Boa Conservation Measures. Hand clearing will be done prior to the installation of the silt fencing. Once the site has been cleared, site grading and foundation excavation will begin.

5.01g Maintenance of Erosion and Sediment Control Measures

All sedimentation and erosion measures shall be maintained in good working order throughout the project; if a repair is necessary, it shall be initiated within 24 hours. Built up sediment shall be removed from silt fence when it has reached one-quarter the height of the silt fence. Silt fences shall be inspected regularly for depths of sediment and tears/damage to check if the fabric is securely attached to the fence posts and to verify that fence posts are firmly embedded in the ground or attached to the ground in areas of concrete.

The measures will be inspected on a weekly basis and after every quarter inch of rainfall. A maintenance inspection report shall be made after each inspection by the contractor and shall be kept in active log readily available at the job site. The site superintendent or construction manager shall be responsible for inspection, maintenance, repair activities and completing the inspection and maintenance report.

5.01h Method of Stormwater Management

Stormwater will be allowed to follow existing drainage patterns. A swale will be installed to carry the eastern runoff to a sediment pond, which will be constructed in the northeastern corner of the site. The sediment pond will discharge stormwater into the existing drainage culvert under the road. The sediment pond (also referred to as catchment pond or stormwater catchment pond) will be 2,000 square feet and 24 inches deep.

5.01i Maintenance Schedule for Stormwater Facilities

The drainage swale and sediment pond will be inspected weekly and after every rainfall of a quarter inch or more. Debris and sediment will be removed as necessary to maintain adequate function of the catchment pond.

5.01j Method of Sewerage Disposal

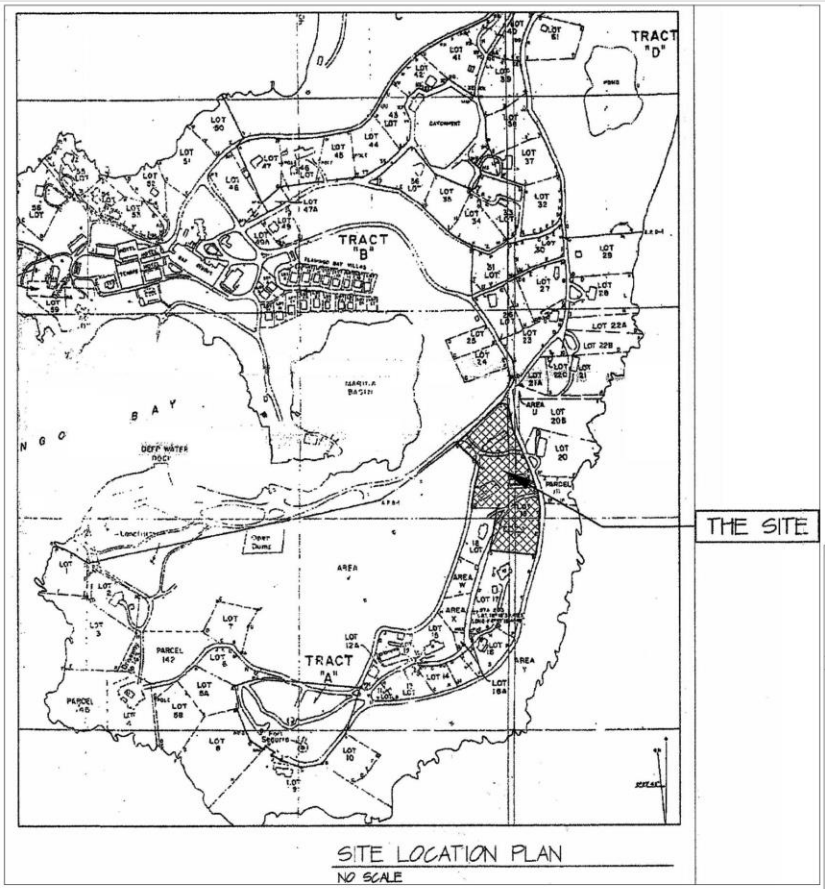
A MicroFAST® 4.5 4500 GPD unit will be installed on the property to service the 14 units, pool, restaurant and bar, and reception building. Gray water from the plants will be stored in an attached grey water cistern and utilized for irrigation.

5.02 Required Drawings and Plans

Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.



SITE LOCATION PLAN

NO SCALE

Flaming-Bay Eco-Resort

Resort Apartments with Open-Air Restaurant/Bar and Swim-Up Pool

Site: 3.97 acres, Lot 19, Water Island, Southside Quarter, US Virgin Islands, 00802.

SCOPE OF WORKS

1. Refurbishment of Existing Limestone Inn East & West Buildings to provide x11 en-suite studio rooms as per permit CZT-07-20L

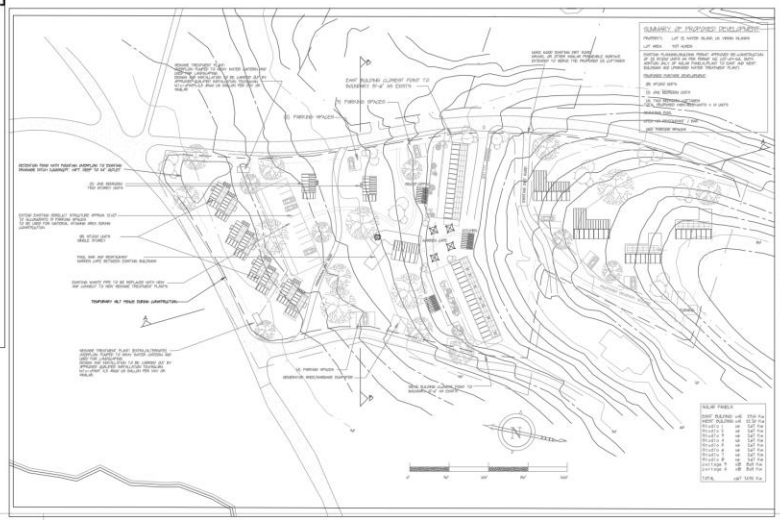
ADDITIONAL THIS PLANNING APPLICATION

2. New open-air restaurant/bar with swim-up pool
3. New x8 single story studio apartments
4. New x2 2-story 1-bed apartments
5. New x4 2-bed single story cottages
6. New Reception, Kitchen, and Toilet buildings

SUMMARY OF ACCOMODATION

x11 rooms, x8 studio apartments, x2 1-bed apartments, x4 2-bed apartments TOTAL x29 Bedrooms

- Detention Pond 2,000sq.ft >2ft depth
- x30 parking spaces
- self-sufficient solar power plant to 74Kw
- water treatment plant to 4,500 US Gallons/day



REVISIONS

DATE	ITEM
A	

CONSULTANTS

WALT BASNIGHT PE

BBK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF LOT 19 WATER ISLAND US VIRGIN ISLANDS

DESCRIPTION

COVER SHEET

SCALE Varies ON 24"x36" PAPER

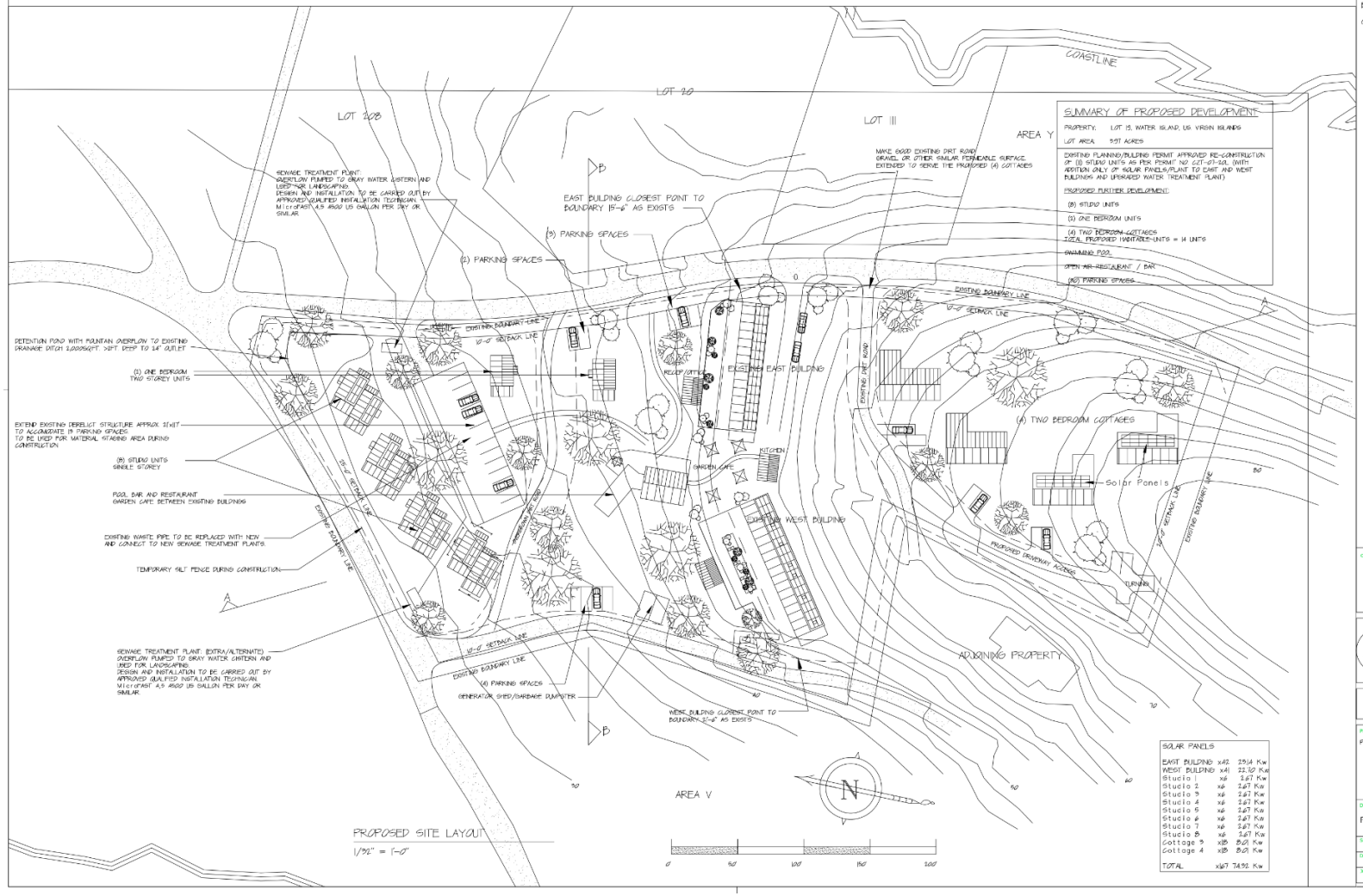
DRAWN BE/BD DATE 27 AUG 2021

JOB 1908 SHEET 000

Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.



REVISIONS

	DATE	ITEM
A	28-Aug	Silt Fence & Notes
B	01-Sep	Change Solar Panels
C	03-Sep	Water Treatment Plant 4500 USGallon/DAY Approx

CONSULTANTS

WALT BASNIGHT PE

BBK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF LOT 19 WATER ISLAND US VIRGIN ISLANDS

DESCRIPTION

PROPOSED SITE LAYOUT

SCALE 1/32"=1'-0" ON 24"x36" PAPER

DRAWN BE/BO DATE 27 AUG 2011

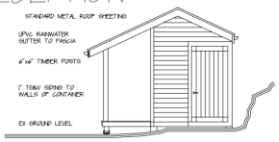
JOB 1508 SHEET 002

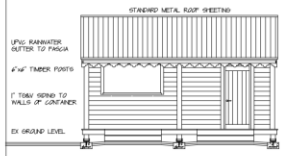
Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.

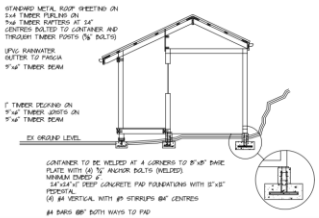
RECEPTION

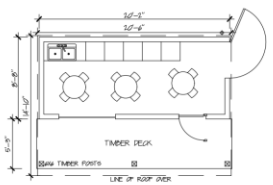


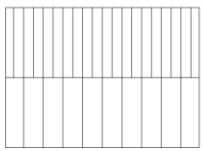


STANDARD SHIPPING CONTAINERS SET ON TIED AND WELDED TO STEEL PLATES ON CONCRETE FOUNDATIONS

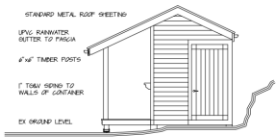
T. TIMBER BOARDING ON 3"x4" VERTICAL BATTENS AT 24" CENTRES BOLTED TO SIDES OF SHIPPING CONTAINER

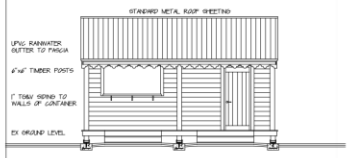






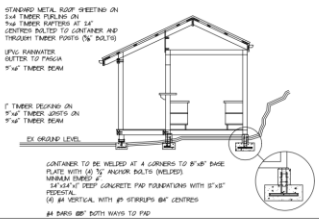
KITCHEN

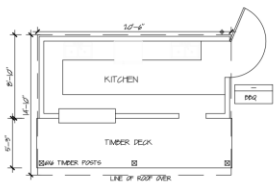




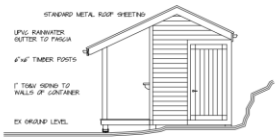
STANDARD SHIPPING CONTAINERS SET ON TIED AND WELDED TO STEEL PLATES ON CONCRETE FOUNDATIONS

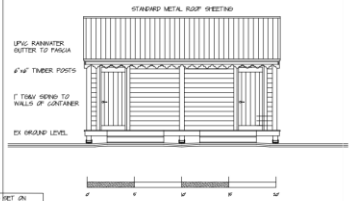
T. TIMBER BOARDING ON 3"x4" VERTICAL BATTENS AT 24" CENTRES BOLTED TO SIDES OF SHIPPING CONTAINER





RESTROOMS





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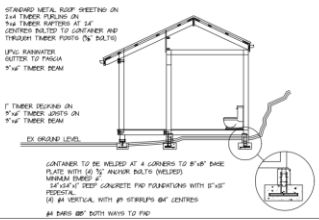
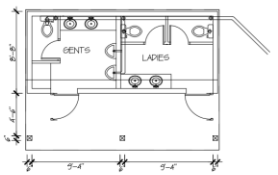




REVISIONS

	DATE	ITEM
A	28-Aug	Silt Fence & Notes

CONSULTANTS

WALT BASNIGHT PE

BBK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF LOT 19 WATER ISLAND US VIRGIN ISLANDS

DESCRIPTION

Reception, Kitchen & Toilets

SCALE 3/16"=1'-0" ON 24"x36" PAPER

DRAWN BE/BO

DATE 27 AUG 2021

JOB 1808

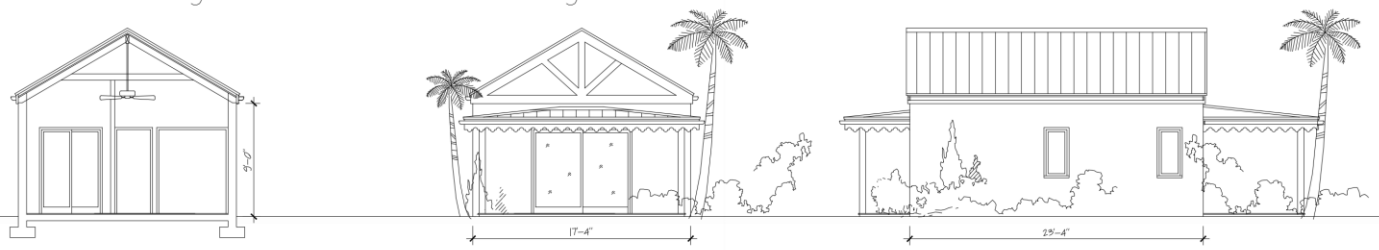
SHEET 003

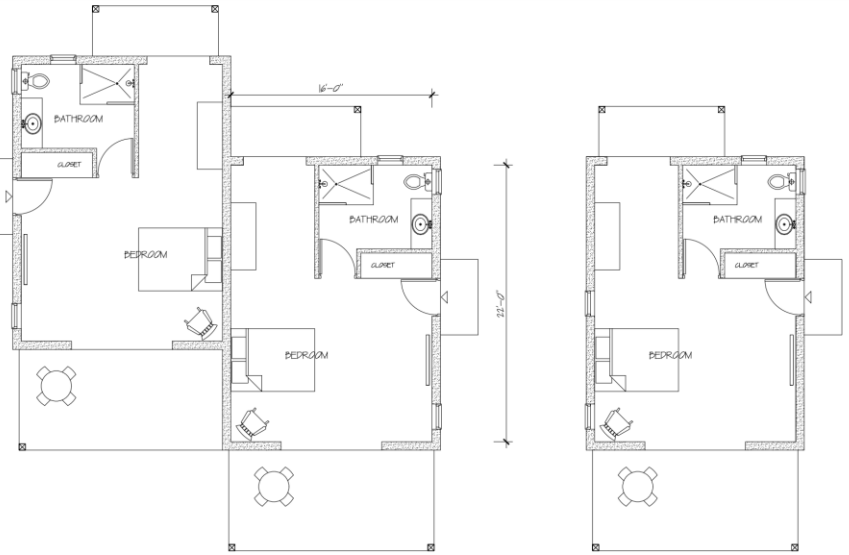
Flamingo Bay Eco Resort

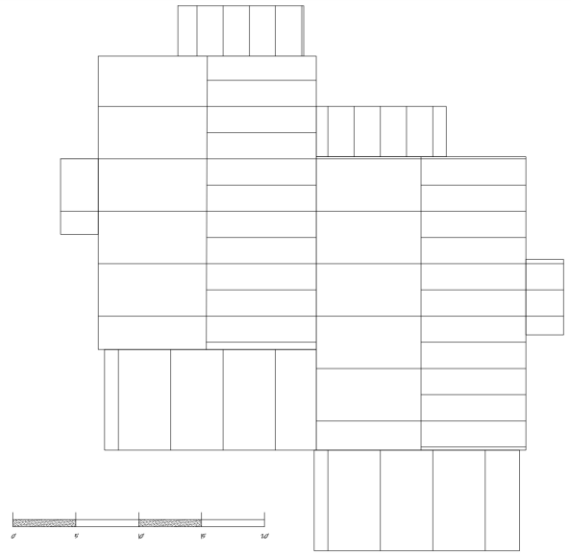
An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.

Double & Single Sudio Cottages







REVISIONS

	DATE	ITEM
A	28-Aug	Silt Fence & Notes

CONSULTANTS

WALT BARNIGHT PE

BBK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF LOT 19 WATER ISLAND US VIRGIN ISLANDS

DESCRIPTION

Double/Single Studio Unit

SCALE 1/4"=1'-0" ON 24"x36" PAPER

DRAWN BE/BO DATE 27 AUG 2021

JOB 1808 SHEET 002

Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.

EXISTING WALLS:
CHIP OFF PLASTER AND REPAIR WHERE NECESSARY. CHICKEN WIRE MESH REINFORCING NAILED TO EXISTING WALLS WITH ONE SCRATCH COAT OF FIBREGLASS REINFORCED PLASTER AND ONE SMOOTH COAT READY FOR PAINT FINISH.

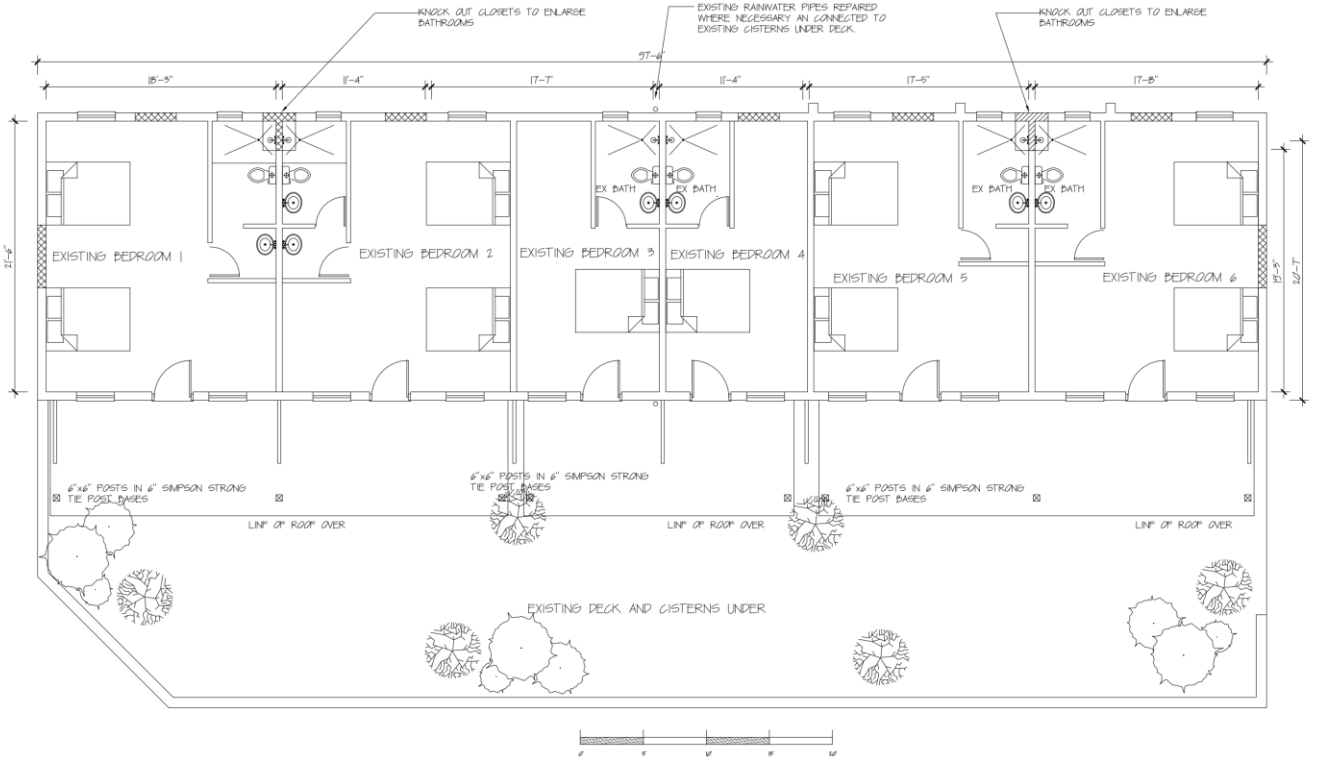
EXISTING BATHROOMS:
REPLACE EXISTING W.C'S WITH NEW SHORT FLUSH UNITS. REPLACE BASINS / SHOWERS / FAUCETS WITH NEW AMERICAN STANDARD UNITS, TO CLIENT'S CHOICE.

ALL PLUMBING NECESSARY TO BE CARRIED OUT BY A LICENSED, QUALIFIED PLUMBER.

ALL DIMENSIONS ARE EXISTING AND MUST BE DOUBLE CHECKED ON SITE PRIOR TO WORKS OR ORDERING MATERIALS.

ELECTRICS AS EXISTING. WHERE NECESSARY TO BE RE-WIRED BY LICENSED, QUALIFIED ELECTRICIAN.

REPLACE ALL WINDOWS AND DOORS WITH NEW IN EXISTING OPENINGS.



REVISIONS

	DATE	ITEM
A		

CONSULTANTS

WALT BASNIGHT PE
#6A4 PEDESCH PLAZA
ST THOMAS
USVI
(340) 514 9955

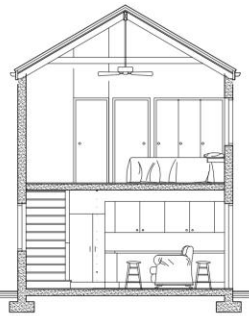
BBK Development LLC

PROJECT
PROPOSED RE-DEVELOPMENT OF
LOT 19
WATER ISLAND
US VIRGIN ISLANDS

DESCRIPTION
East Building
Floorplan as per
CZ-07-20.

SCALE	1/4"=1'-0" ON 24"x36" PAPER
DRAWN	DATE
BE/BO	27 AUG 2021
JOB	SHEET
1808	002

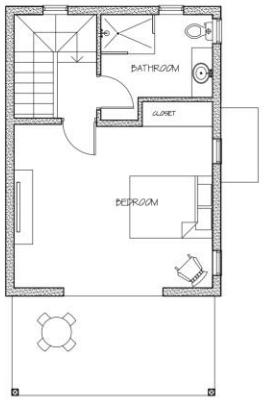
"THE FLAMINGO". A TWO STOREY, ONE BEDROOM UNIT, TOTAL FLOOR AREA, 1,070 SQ.FT.



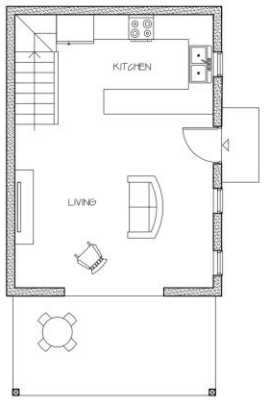
SECTION A–A
1/4" = 1'–0"

END ELEVATION
1/4" = 1'–0"

ENTRANCE ELEVATION
1/4" = 1'–0"



GROUND FLOOR PLAN
1/4" = 1'–0"



FIRST FLOOR PLAN
1/4" = 1'–0"

THE FLAMINO:

TWO STOREY ONE BEDROOM COTTAGE APPROX 1,070 SQ.FT.

REINFORCED CONCRETE CONSTRUCTION WITH TIMBER CONSTRUCTED DECK / PORCH.

ROOF: STANDING SEAM METAL ROOFING ON TIMBER TRUSSED ROOF.

WALL: PAINTED SMOOTH RENDER PLASTER FINISH.

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REVISIONS

	DATE	ITEM
A		

EAL
EDMUND ARCHITECTURAL LTD
ARCHITECTURE
PLANNING
PROJECT MANAGEMENT

BVI: +1 (284) 346 7000
BRIANEDMUNDEAL@GMAIL.COM

PROJECT
PROPOSED RE-DEVELOPMENT OF
LOT 17
WATER ISLAND
US VIRGIN ISLANDS
FOR
BBK DEVELOPMENTS LLC

DESCRIPTION
ONE BEDROOM
TWO STOREY COTTAGE

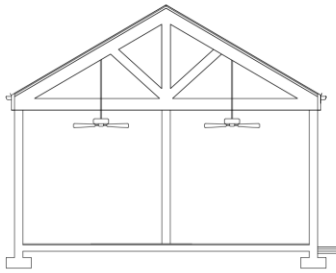
SCALE	1/4"=1'–0" ON 24"x36" PAPER		
DRAWN	BE	DATE	AUG 2010
JOB	1808	SHEET	1/10

Flamingo Bay Eco Resort

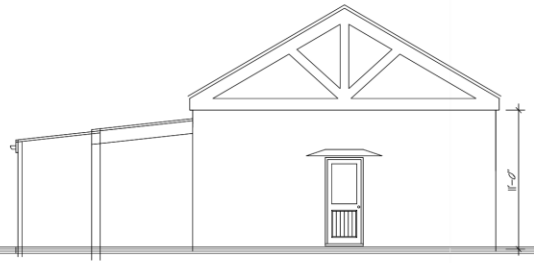
An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.

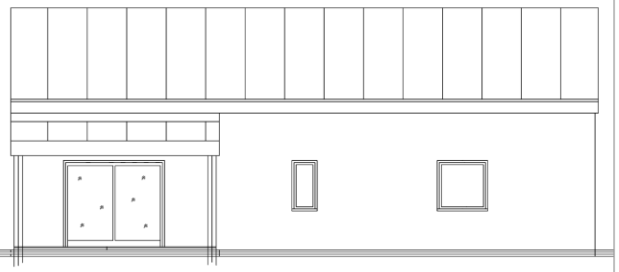
2-Bed Cottage Typical Section



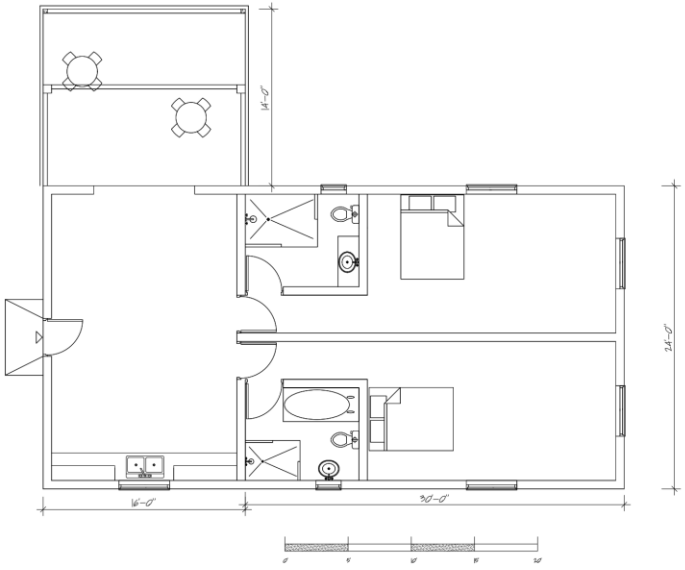
2-Bed Cottage Typical West Elevation



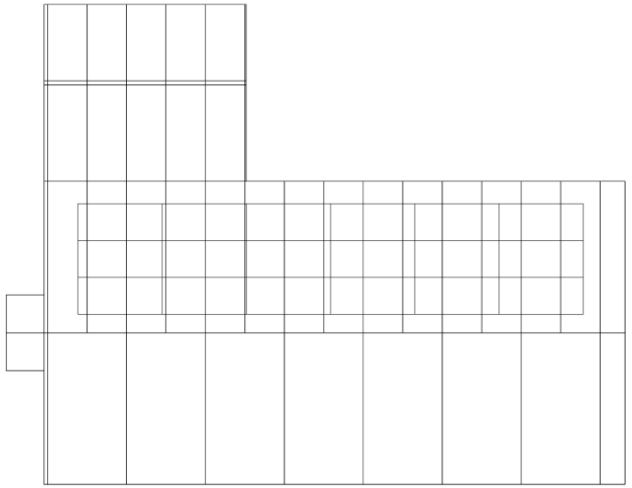
2-Bed Cottage Typical North Elevation



2-Bed Cottage Typical Floorplan



2-Bed Cottage Typical Roofplan



REVISIONS

	DATE	ITEM
A		

CONSULTANTS

WALT BARNIGHT PE

#401 PETTYSON PLAZA
ST THOMAS
USVI

(340) 340 6935

BDK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF

LOT 19
WATER ISLAND
US VIRGIN ISLANDS

DESCRIPTION

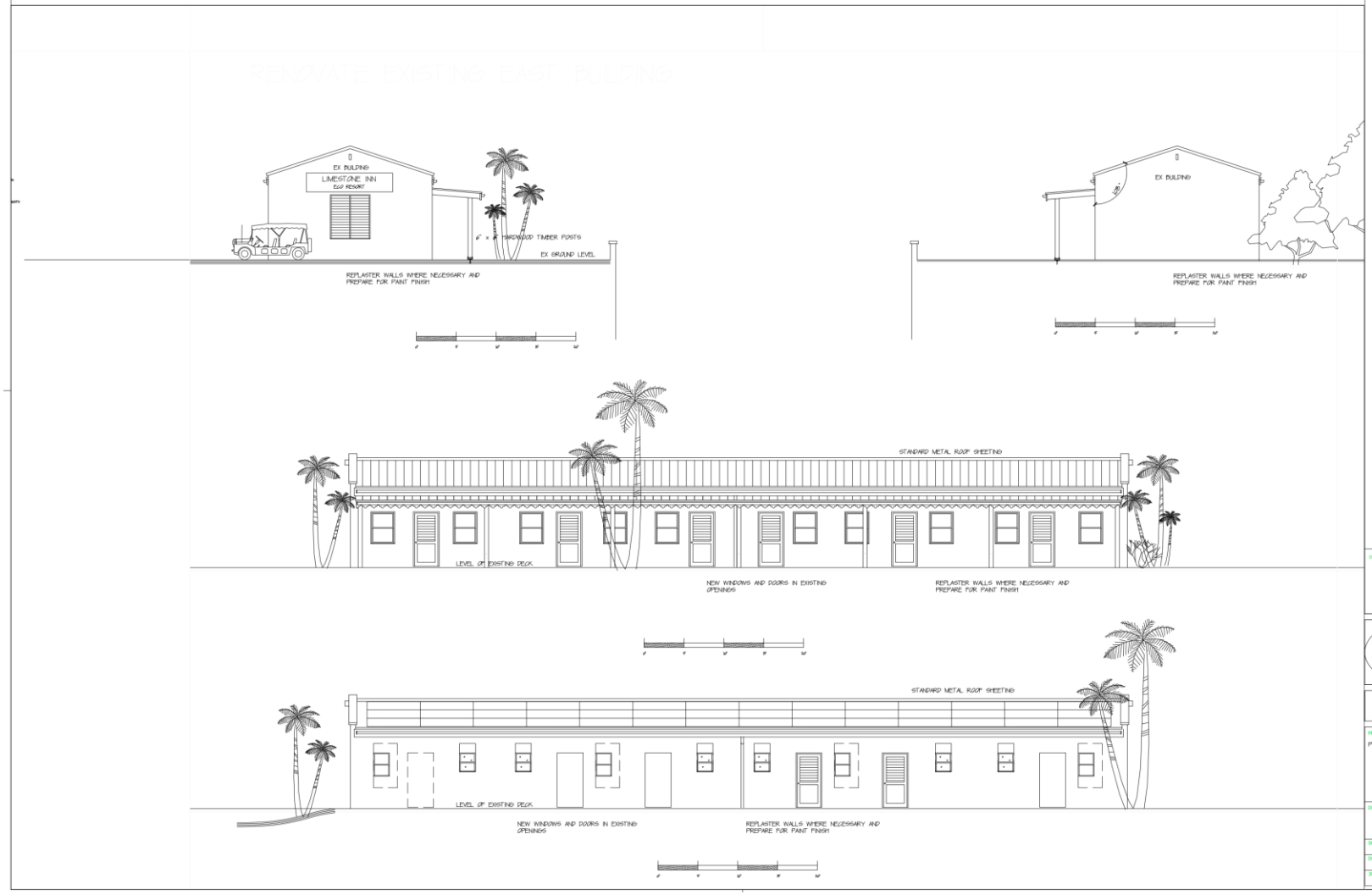
PROPOSED 2-Bed Typical Cottage

SCALE	1/4"=1'-0" ON 24"x36" PAPER
DRAWN	DATE
BE/BD	27 AUG 2021
JOB	SHEET
BDB	

Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.



REVISIONS

	DATE	ITEM
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CONSULTANTS

WALT BASNIGHT PE

BPK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF

LOT 19
WATER ISLAND
US VIRGIN ISLANDS

DESCRIPTION

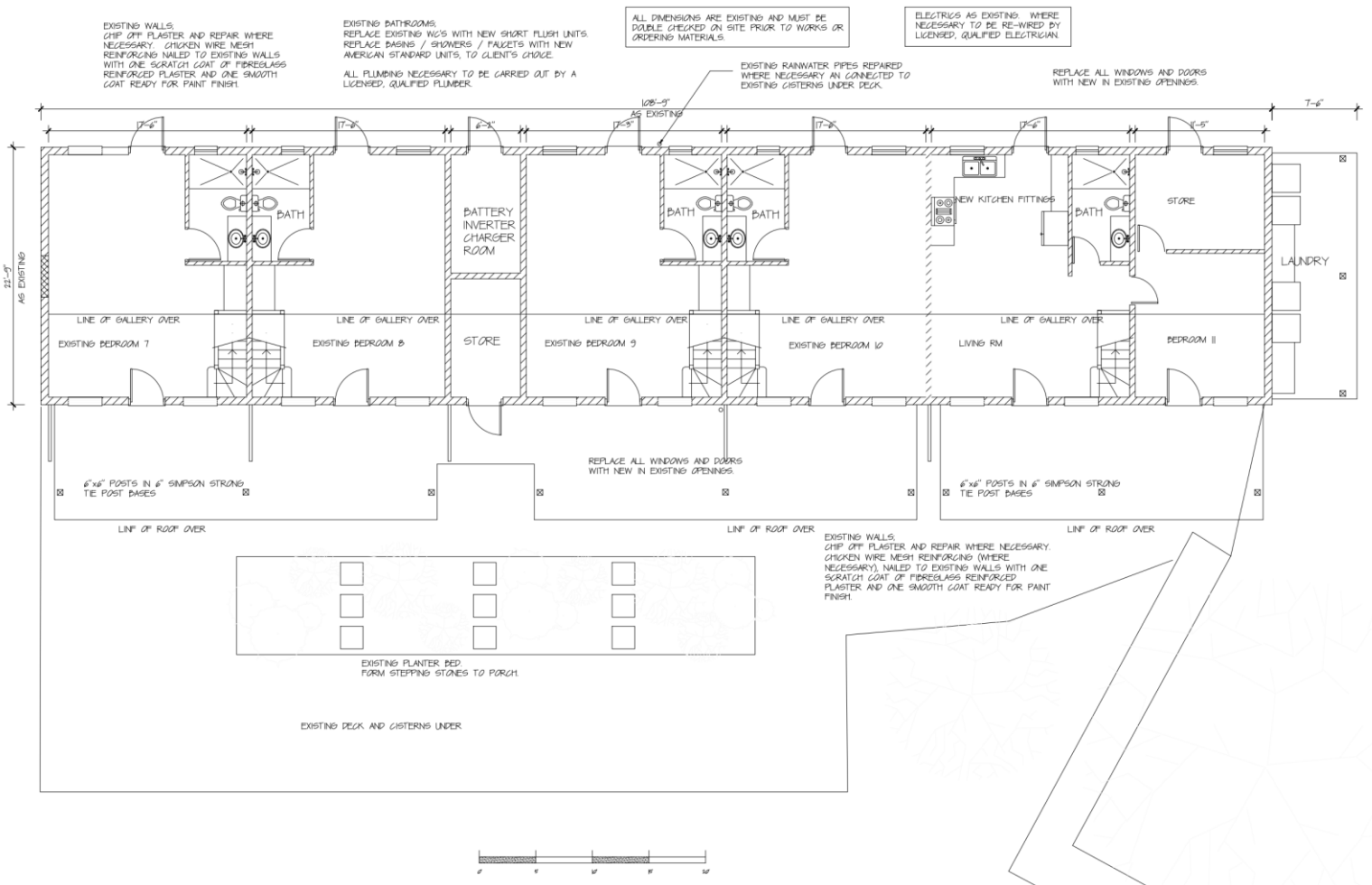
EAST BUILDING ELEVATIONS as per CZT-07-20L

SCALE	3/16"=1'-0" ON 24"x36" PAPER
DRAWN	DATE
BE/BO	27 AUG 2021
JOB	SHEET
1808	002

Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.



REVISIONS

DATE	ITEM
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CONSULTANTS

WALT BASNIGHT PE

BBK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF LOT 19 WATER ISLAND US VIRGIN ISLANDS

DESCRIPTION

WEST BUILDING LOWER FLOORPLAN as per GZT-07-20..

SCALE	1/4"=1'-0" ON 24"x36" PAPER
DRAWN	DATE
BE/BO	27 AUG 2021
JOB	SHEET
1808	

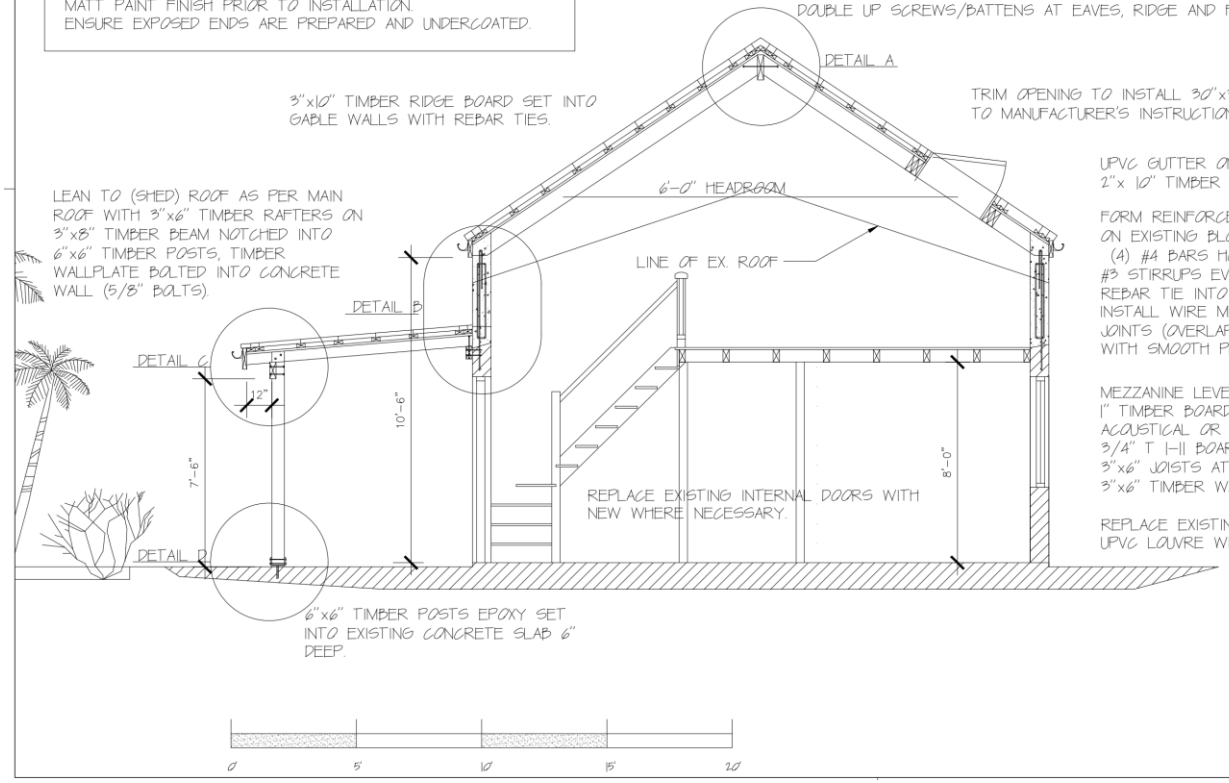
Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.

T1-11 PLY ROOF SHEETING TO BE GREY STAIN/PICKLE FINISH PRIOR TO INSTALLATION.
ROOF RAFTERS TO BE PREPARED AND FIRST COAT WHITE MATT PAINT FINISH PRIOR TO INSTALLATION.
ENSURE EXPOSED ENDS ARE PREPARED AND UNDERCOATED.

STANDARD METAL ROOF SHEETING SCREWED EVERY 6" HORIZONTALLY, 20" VERTICALLY ON
2"x4" TIMBER BATTENS AT 20" CENTRES SCREWED THROUGH TO RAFTERS WITH
3/8"x5" LAG BOLTS ON
HEAVY DUTY WEATHERSHIELD ON
3/4" T1-11 TIMBER PLYWOOD ON
3"x8" TIMBER RAFTERS AT 24" CENTRES SET INTO CONCRETE RING BEAM WITH REBAR HOOK TIES.
DOUBLE UP SCREWS/BATTENS AT EAVES, RIDGE AND FLASHINGS.



TRIM OPENING TO INSTALL 30"x30" VELUX ROOF LIGHT TO MANUFACTURER'S INSTRUCTIONS.

LEAN TO (SHED) ROOF AS PER MAIN ROOF WITH 3"x6" TIMBER RAFTERS ON
3"x8" TIMBER BEAM NOTCHED INTO
6"x6" TIMBER POSTS, TIMBER WALLPLATE BOLTED INTO CONCRETE WALL (5/8" BOLTS).

UPVC GUTTER ON BRACKETS ON
2"x 10" TIMBER FASCIA SPIKED TO ENDS OF JOISTS

FORM REINFORCED CONCRETE RING BEAM (HEIGHT VARIES), ON EXISTING BLOCK/CONCRETE WALL.
(4) #4 BARS HORIZONTALLY
#3 STIRRUPS EVERY 10"
REBAR TIE INTO EXISTING CONCRETE WALL EVERY 8"
INSTALL WIRE MESH REINFORCING SHEET OVER COLD JOINTS (OVERLAP MINIMUM 14"), SCRATCH COAT OF PLASTER WITH SMOOTH PLASTER COAT READY FOR PAINT FINISH.

MEZZANINE LEVEL;
1" TIMBER BOARDING ON
ACOUSTICAL OR SIMILAR SOUND INSULATION ON
3/4" T 1-11 BOARDING ON
3"x6" JOISTS AT 18" CENTRES ON
3"x6" TIMBER WALLPLATES/BEAMS

REPLACE EXISTING INTERNAL DOORS WITH NEW WHERE NECESSARY.

REPLACE EXISTING WINDOWS AND EXTERNAL DOORS WITH NEW UPVC LOUVRE WINDOWS.

0 5' 10' 15' 20'

REVISIONS

	DATE	ITEM
A		

CONSULTANTS

WALT BASNIGHT PE

BBK Development LLC

PROJECT
PROPOSED RE-DEVELOPMENT OF
LOT 19
WATER ISLAND
US VIRGIN ISLANDS

DESCRIPTION
WEST BUILDING SECTION as per CZT-07-20L

SCALE 1/2"=1'-0" ON 24"x36" PAPER

DRAWN BE/BO DATE 27 AUG 2021

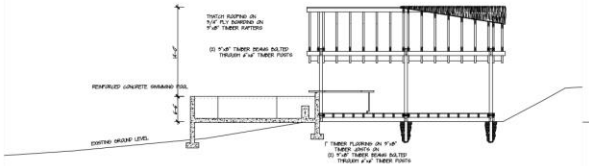
JOB No. 1808 SHEET 002

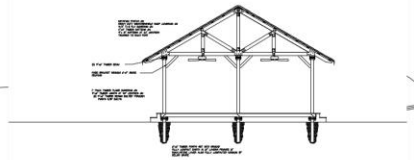
Flamingo Bay Eco Resort

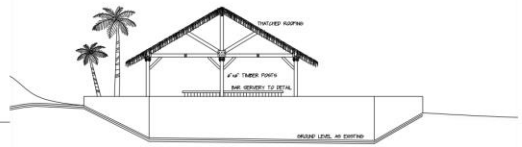
An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.

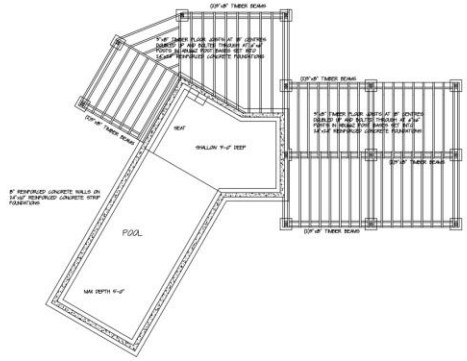
BAR / RESTAURANT / POOL



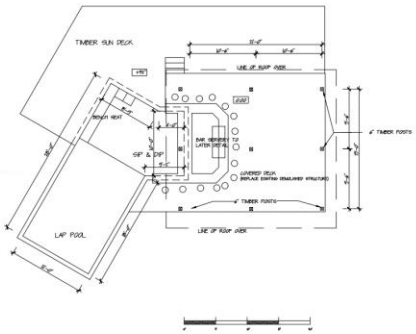


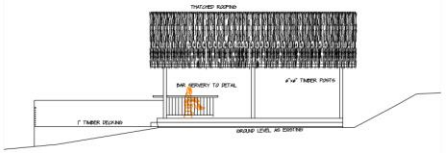


BAR POOL FOUNDATIONS



BAR POOL FLOOR PLAN





REVISIONS		
DATE:		ITEM:
A	28-Aug	Silt Fence & Notes

CONSULTANTS

WALT BAGNIGHT PE

BBK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF LOT 19 WATER ISLAND US VIRGIN ISLANDS

DESCRIPTION

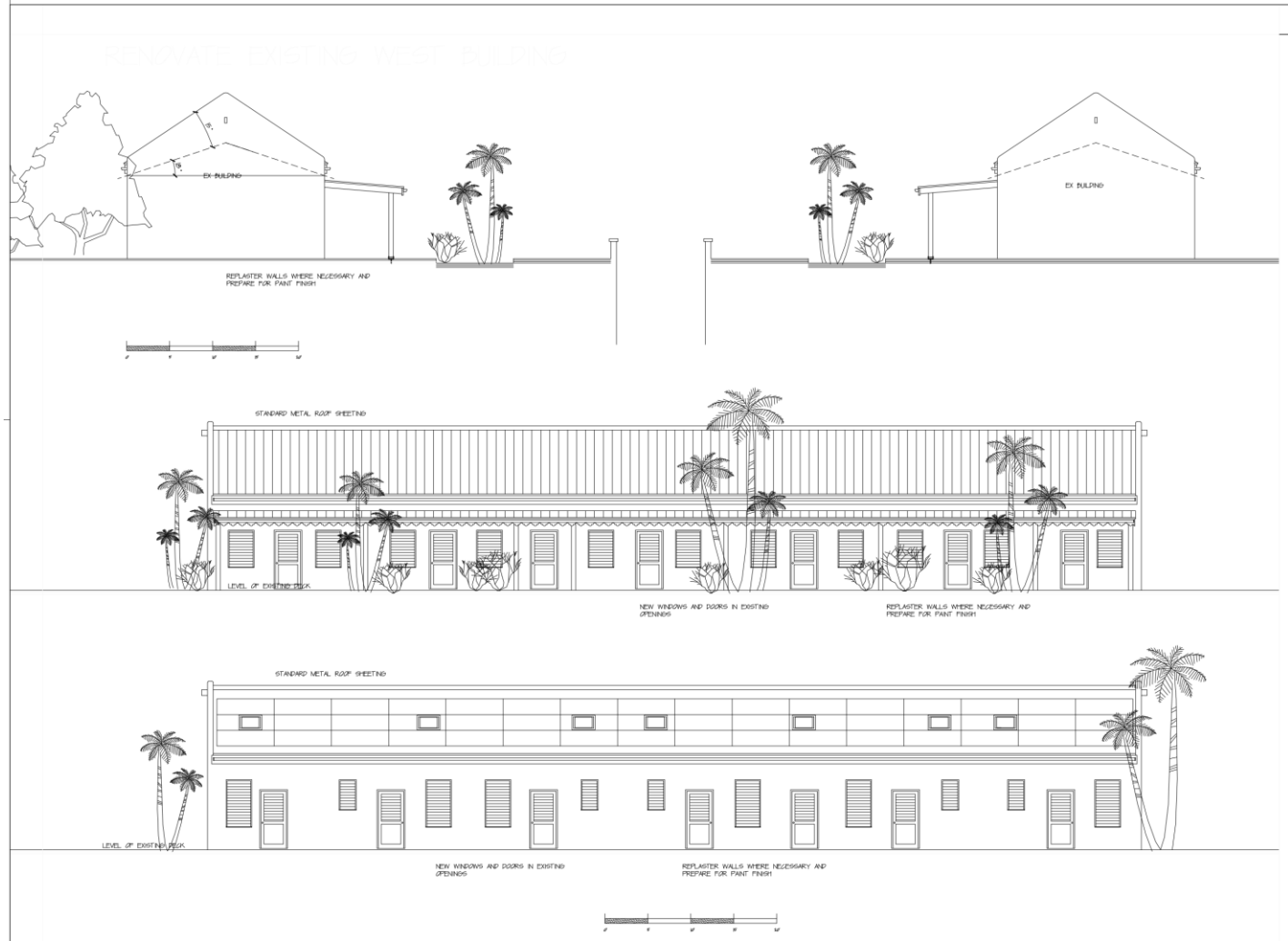
Bar/Restaurant/Pool

SCALE	1/8"=1'-0" ON 24"x36" PAPER
DRAWN	DATE
BE/BO	27 AUG 2021
JOB	SHEET
1908	

Flamingo Bay Eco Resort

An Island Paradise

Proposed Re-Development of Lot 19, Water Island, US Virgin Islands.



REVISIONS

	DATE	ITEM
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CONSULTANTS

WALT EMBAINGHT PE

BBK Development LLC

PROJECT

PROPOSED RE-DEVELOPMENT OF

LOT 19
WATER ISLAND
US VIRGIN ISLANDS

DESCRIPTION

WEST BUILDING ELEVATIONS
as per CZT-07-50L

SCALE 3/16"=1'-0" ON 24"x36" PAPER

DRAWN BE/BO

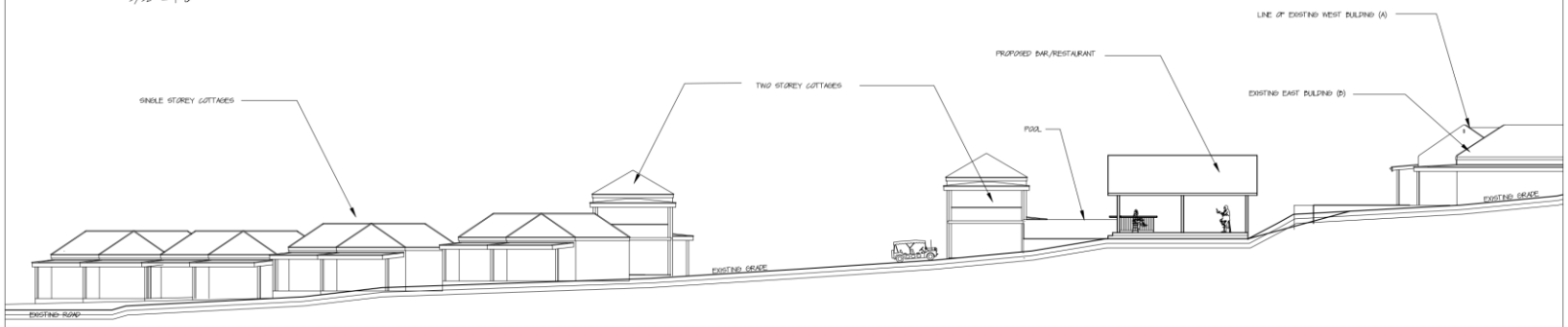
DATE 17 AUG 2011

JOB 1508

SHEET

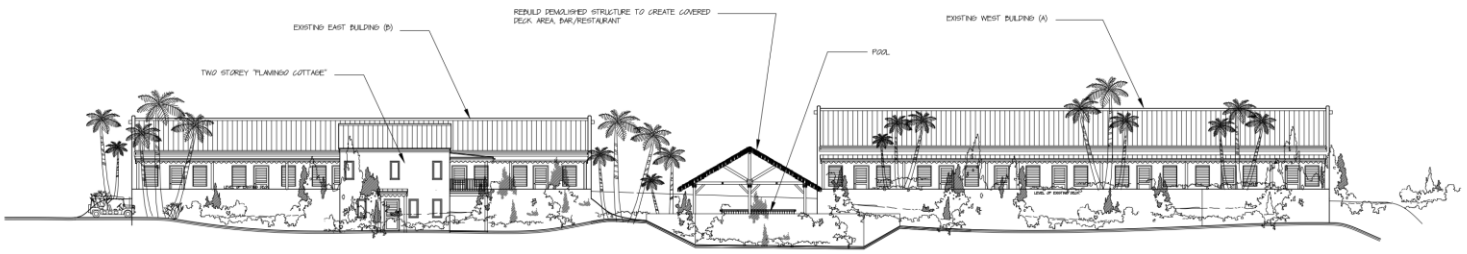
SITE ELEVATION FROM THE WEST

3/32" = 1'-0"



EAST / WEST SECTION THROUGH SITE

3/32" = 1'-0"



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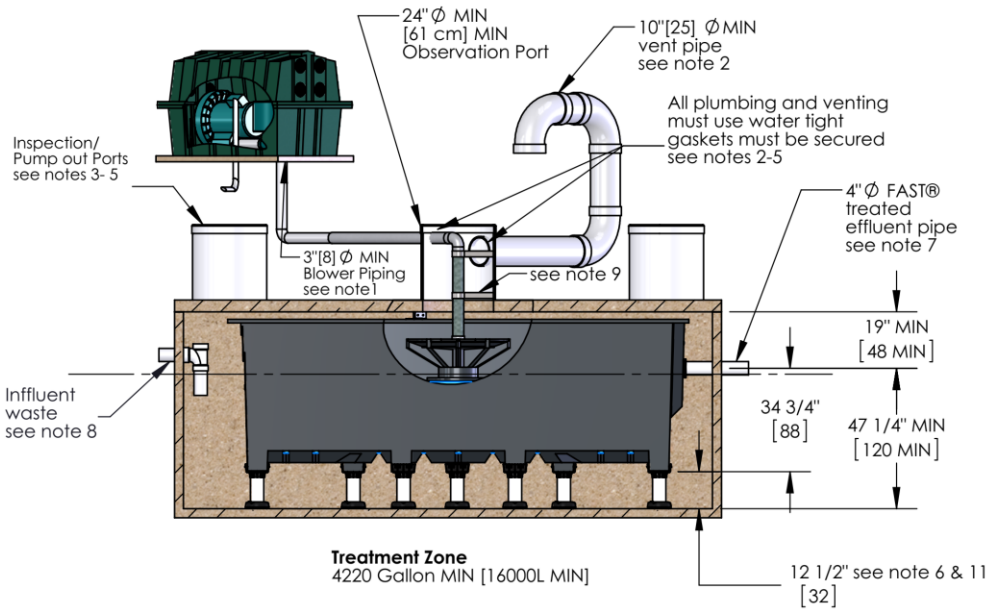
EAL
EDMUND ARCHITECTURAL LTD
ARCHITECTURE
PLANNING
PROJECT MANAGEMENT

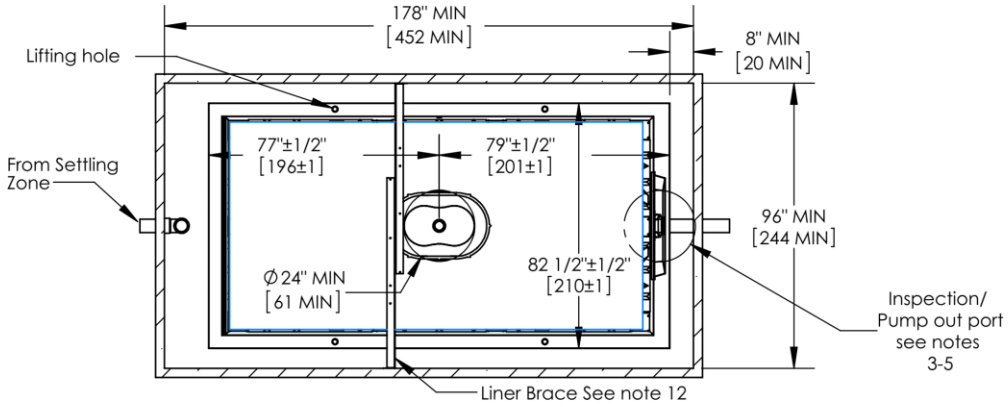
BVI: +1 (284) 346 7000
BRIANEDMUNDEAL@GMAIL.COM

PROJECT
PROPOSED RE-DEVELOPMENT OF
LOT 13
WATER ISLAND
US VIRGIN ISLANDS
FOR
BBK DEVELOPMENTS LLC

DESCRIPTION
PROPOSED SITE LAYOUT

SCALE	1/32"=1'-0" ON 24"x36" PAPER
DRAWN	BE
DATE	AUG 2010
JOB	1008
SHEET	002





NOTES

1. Airline piping to FAST® may not exceed 100 FT [30m] total length and have a maximum of 4 elbows in the piping system. For distances greater than 100 FT [30m] consult factory. Blower must be located above flood levels on a concrete base 57" X 36" X 2.5" [150 X 90 X 7cm] minimum.
2. Vent to desired location and cover opening with a vent grate with at least 20 sq in.[125 sq. cm] open surface area. Secure with stainless steel screws. Vent piping must not allow condensate build up or create back pressure. Vent must be above finished grade or higher (see sheet 3 of 3).
3. All appurtenances to FAST® (e.g. tanks, access ports, electrical, etc.) must conform to all applicable country, state, province, and local plumbing and electrical codes. Pump out access shall be adequate to thoroughly clean out both zones.
4. All inspection, viewing and pump out ports must be secured to prevent accidental or unauthorized access.
5. Tank, piping, conduit, etc. are provided by others. Blower control system by Bio-Microbics, Inc. See Installation Manual.
6. If less than the specified minimums are considered necessary, consult factory for guidance.
7. All piping and ancillary equipment installed after FAST must not impede or restrict free flow of effluent.
8. The tank(s) shall be designed to prevent air passage between the settling zone/tank and the treatment zone and preventing an air lock. Examples include a baffle wall sealed to the lid or treatment zone inlet line with a pipe cap. Consult factory for guidance.
9. The air supply line into the FAST® unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2' min [60 cm]. See alternate air supply option on sheet 3 of 3.
10. Specialized treatment levels may require specific features to be incorporated into the design. Consult factory for guidance.
11. Refer to sheet 3 of 3 for leg extensions requirements.
12. Secure provided support braces to prevent movement.

DO NOT SCALE

UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS] TOLERANCES ± 0.02 IN/IN [± 0.05 CM/CM]

BIO MICROBICS
BETTER WATER. BETTER WORLD.

MicroFAST 4.5 FAST Unit

WEIGHT	lb	SIZE	DRAWING NUMBER	SHEET
NAME	DATE	A	MicroFAST 4.5 with feet	1 OF 3
DRAWN CTC	5/10/2006			
CHECKED PF	12/18/2014	REVISED 12/18/2014	REV. INI-07-W	

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BIO-MICROBICS © 2015

Specifications for MicroFAST 4.5 Wastewater Treatment System

1. GENERAL
The contractor shall furnish and install (1) MicroFAST 4.5 treatment system as manufactured by Bio-Microbics, Inc. The treatment system shall be complete with all needed equipment as shown on the drawings and specified herein.
The principal items of equipment shall include FAST System insert, leg extensions, blower assembly, blower controls and alarms. The MicroFAST 4.5 unit shall be situated within a 4,220 Gallon (16,000 L) minimum tank, as shown on the plans. Suggested maximum settling tank(s) equaling ½ to 1 x daily flow must be used prior to FAST. Tank must provide adequate pump out access and conform to local, state, and all other applicable codes. The contractor shall provide coordination between the FAST system and tank supplier with regard to fabrication of the tank, installation of the FAST unit and delivery to the job site.

2. OPERATING CONDITIONS
The MicroFAST 4.5 treatment system shall be capable of treating the wastewater produced by typical family activities (bath, laundry, kitchen, etc.) ranging from (18) eighteen to (63) sixty-three persons and not to exceed 4,500 US Gallons per day (17,000 LPD) provided the waste contains nothing that will interfere with biological treatment. The FAST system is a biological treatment system not meant for non-biodegradable or industrial wastewater.

3. MEDIA
The FAST media shall be manufactured of rigid PVC, polyethylene, or polypropylene and it shall be supported by the polyethylene insert. The media shall be fixed in position and contain no moving or wearing parts and shall not corrode. The media shall be designed and installed to ensure that sloughed solids descend through the media to the bottom of the septic tank.

4. BLOWER
The MicroFAST 4.5 unit shall come equipped with a regenerative type blower capable of delivering 90-140 CFM [185-238m3/hr]. The blower assembly shall include an inlet filter with metal filter element. Blower piping to the tank shall use non-corrosive material (Galvanized, or Stainless Steel). Do not run galvanized pipe inside the treatment tank. Refer to Installation Manual for further details.

5. REMOTE MOUNTED BLOWER
The blower elevation must be higher than the normal flood level. A two-piece, rectangular housing shall be provided with tamper-proof screws. The discharge air line from the blower to the MicroFAST shall be provided and installed by the contractor.

6. ELECTRICAL
The electrical source should be within 150 feet [45 meters] of the blower. Consult local codes for longer wiring distances. All wiring must conform to code. Input power on 60Hz electrical systems 220/460VAC, 3Ø, 6.4/3.3 FLA, on 50 Hz electrical systems 230/380VAC, 3Ø, 6.1/3.5 FLA. Other voltages and phase are also available. Actual power consumption varies with site conditions. All conduit and wiring shall be supplied by contractor.

7. ALARMS
The alarm system shall consist of a visual and audible alarm to indicate loss of power to the blower. A manual silence switch is included.

8. INSTALLATION AND OPERATING INSTRUCTIONS
All work must be done in accordance with local codes and regulations. Installation of the MicroFAST 4.50 shall be done in accordance with the written instructions provided by the manufacturer.
An operation and maintenance manual shall be furnished, which will include a description of system installation, operation, and maintenance procedures.

Treatement unit weighs approximately 1600 pounds [726kg]. Four holes for lifting the FAST liner are supplied. Spreader bars are to be used in lifting the unit. Place spreader bars between lifting holes.

9. FLOW & PIPE SIZING
Each FAST module is provided with a standard (4) four inch effluent pipe hole and gasket. An optional (6) six inch hole and gasket can be utilized consult factory for guidance.

FAST systems have been successfully designed, tested and certified receiving gravity, demand-based influent flow. When influent flow is controlled by pump or other means to help with highly variable flow conditions, then multiple dosing events should be used to maximize performance. The flow rate shall not exceed 15 gpm (57 Lpm) with a maximum hourly flow not to exceed 10% of the design daily flow (450 gph (1700 LPH)).

10. WARRANTY
Bio-Microbics, Inc. warrants all new residential FAST® models (MicroFAST® 3.0, 4.5, and 9.0) against defects in materials and workmanship for a period of one year after installation or eighteen (18 months) from the date of shipment which ever occurs first. All other FAST® system models are warranted for a period of one year after installation or eighteen months from date of shipment, whichever occurs first. All are subject to the following terms and conditions below:

During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions, and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by Bio-Microbics, Inc., Bio-Microbics, Inc. will repair or replace at its discretion such defective parts free of charge. Defective parts must be returned by owner to Bio-Microbics, Inc.'s factory postage paid, if so requested. The cost of labor and all other expenses resulting from replacement of the defective parts and from installation of parts furnished under this warranty and regular maintenance items such as filters or bulbs shall be borne by the owner. This warranty does not cover general system misuse, aerator components which have been damaged by flooding or any components that have been disassembled by unauthorized persons, improperly installed or damaged due to altered or improper wiring or overload protection. This warranty applies only to the treatment plant and does not include any of the structure wiring, plumbing, drainage, septic tank or disposal system. Bio-Microbics, Inc. reserves the right to revise, change or modify the construction and/or design of the FAST system, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in present equipment. Bio-Microbics, Inc. is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defect in design, material, or workmanship, or delays in delivery, replacements or repairs.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. BIO-MICROBICS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

NO REPRESENTATIVE OR PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR BIO-MICROBICS, INC., ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. Contact your local distributor for parts and service.

DO NOT SCALE

UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS]
TOLERANCES
± 0.02 IN/IN
[± 0.05 CM/CM]

BIO MICROBICS
BETTER WATER. BETTER WORLD.

MicroFAST 4.5 FAST Unit

WEIGHT	lb	SIZE	DRAWING NUMBER		SHEET
NAME	DATE	A	MicroFAST 4.5 Specifications		2 OF 3
DRAWN	5/10/2006				
CHECKED PF	12/18/2014		REVISED 12/18/2014	REV.	

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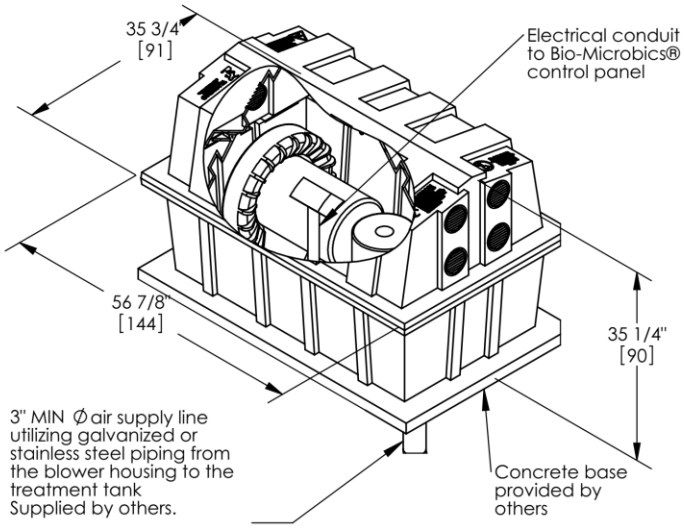
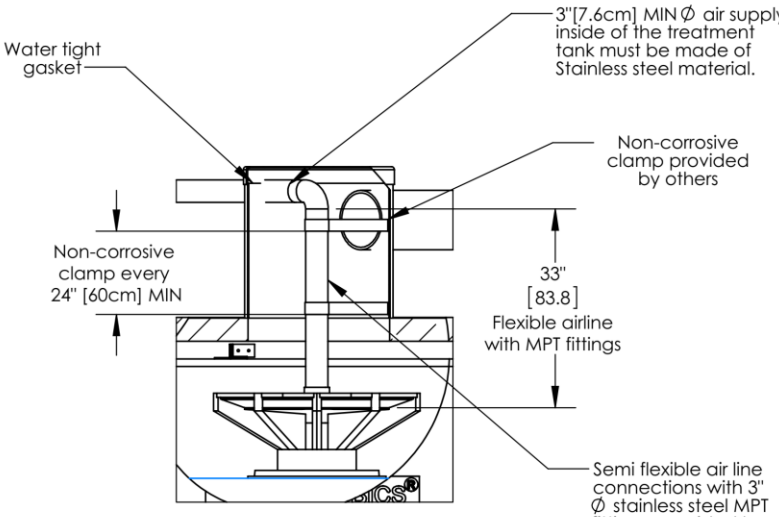
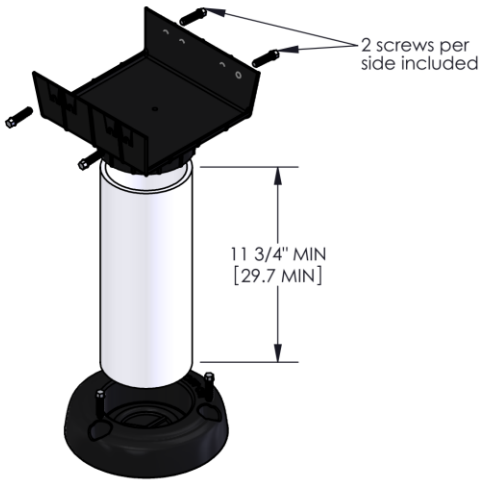




DETAIL
SCALE 2 : 55

Minimum leg extension assembly see notes 1-4



Notes

1. Secure leg extension to the FAST® unit by placing two screws on each side of the leg extension (4 screws per foot are included).
2. Cut 4" schd. 40 PVC pipe (not included) to obtain the desired height. Minimum pipe length of 11 3/4" [29.7cm]. For heights greater than 18" [45.7cm] use schd. 80 PVC pipe (not included). Consult factory for extending leg beyond 36"[90 cm].
3. Anchor the leg extensions to the tank with non-corrosive hardware (not included) at the provided mounting points.
4. If less than the specified minimums are considered necessary, consult factory for guidance.
5. The air supply line into the FAST® unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2ft [0.6m] minimum. The unit is supplied with 3" Ø semi-flexible airline connections with stainless steel MPT fittings and sample U-shape pipe clamps.
6. Tank, anchors, liner brace, piping conduit, blower, housing pad and vents are provided by others.

DO NOT SCALE

UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS]
TOLERANCES
± 0.02 IN/IN
[± 0.05 CM/CM]

BIO MICROBICS
BETTER WATER. BETTER WORLD.

MicroFAST 4.5 FAST Unit

WEIGHT	lb	SIZE	DRAWING NUMBER		SHEET
NAME	DATE	A	MicroFAST 4.5 Details		3 OF 3
DRAWN CTC	5/10/2006				
CHECKED PF	12/18/2014	REVISED 12/18/2014		REV. INI-07-W	

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5.03 Project Workplan and Schedule

The development of the site will proceed as follows:

1. DFW will be contacted regarding clearing of the site and conducting a training on VI Tree Boa Conservation Measure protocols.
2. DFW will conduct a tree boa training for all individuals involved in hand clearing.
3. Areas for clearing will be clearly marked.
4. Hand clearing will commence.
5. DFW will be asked to review site upon completion of hand clearing.
6. Site will sit undisturbed for 5 days.
7. Machine clearing will commence after 5 days.
8. Silt fencing will be installed.
9. Construction of units will commence.

6.00 ENVIRONMENTAL SETTING AND PROBABLE PROJECT IMPACTS

6.01 Climate and Weather

Prevailing Winds

The Virgin Islands lie in the "Easterlies" or "Trade Winds" which traverse the southern part of the "Bermuda High" pressure area, thus the predominant winds are usually from the east-northeast and east (IRF, 1977). These trade winds vary seasonally and are broadly divided into four seasonal modes: 1) December to February; 2) March to May; 3) June to August; and 4) September to November. Below are the characteristics of these modes as taken from Marine Environments of the Virgin Islands Technical Supplement No. 1 (IRF, 1977).

December to February

During the winter, the trade winds reach a maximum and blow with great regularity from the east-northeast. Wind speeds range from eleven to twenty-one knots about sixty percent of the time in January. This is a period when the Bermuda High is intensified with only nominal compensation pressure changes in the Equatorial Trough. The trade winds during this period are interrupted by "Northerners" or "Christmas Winds" which blow more than twenty knots from a northerly direction in gusts from one to three days. Such outbreaks average about thirty each year. They are created by strengthening of high-pressure cells over the North American continent, which, in turn, allow weak cold fronts to move southeastward over the entire Caribbean region. These storms are accompanied by intermittent rains, clouds, and low visibility.

March to May

During the spring, the trade winds are reduced in speed and blow mainly from the east. Winds exceed twenty knots only thirteen percent of the time in April. The change in speed and direction is the result of a decrease of the Equatorial Trough.

June to August

Trade winds reach a secondary maximum during this period and blow predominantly from the east to east-southeast. Speeds exceed twenty knots, twenty-three percent of the time during July. The trend for increasing winds results from the strengthening of the Bermuda High and a concurrent lowering of the pressure in the Equatorial Trough. Trade winds during this period are interrupted by occasional hurricanes.

September to November

During the fall, winds blow mainly from the east or southeast and speeds reach an annual minimum. Only seven percent of the winds exceed twenty knots in October. The low wind speeds result from a decrease in the Equatorial Trough. During this period, especially during late August through mid- October, the normal trade wind regime is often broken down by easterly waves, tropical storms, and hurricanes.

Figure 6.01.1 Wind roses from the U.S. Army Corps of Engineers (USACE) showing the predominant easterly trade winds from the two closest buoys

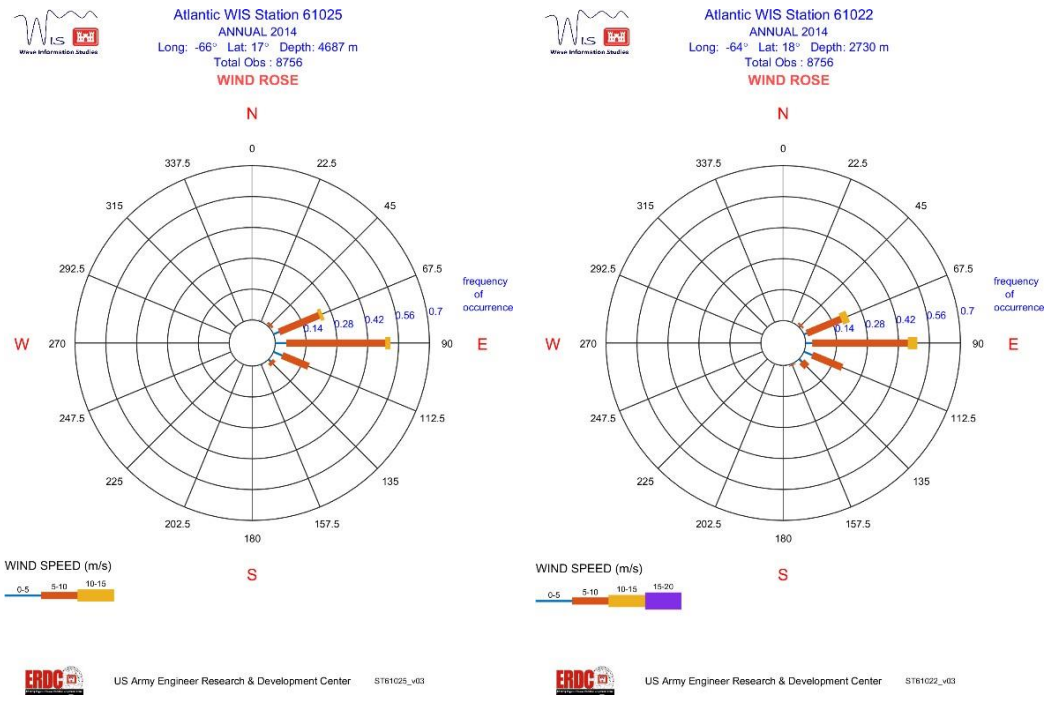


Figure 6.01.2 Wind averages from Weatherspark
Accessible: https://weatherspark.com/y/28234/Average-Weather-inCharlotte-Amalie- U.S.-Virgin-Islands

The percentage of hours in which the mean wind direction is from each of the four cardinal wind directions (north, east, south, and west), excluding hours in which the mean wind speed is less than 1 mph. The lightly tinted areas at the boundaries are the percentage of hours spent in the implied intermediate directions (northeast, southeast, southwest, and northwest).

Storm and Hurricanes

There are numerous disturbances during the year, especially squalls and thunderstorms. These occur most frequently during the summer, lasting only a few hours and causing no pronounced change in the trade winds.

A tropical cyclone whose winds exceed 74 miles per hour is termed a hurricane in the northern hemisphere, and significantly affects the area. These hurricanes occur most frequently between August and mid-October with their peak activity occurring in September. The annual probability of a cyclone used to be one in sixteen years (Bowden, 1974). However, the Virgin Islands were hit with two Category Five hurricanes within a two-week period in 2017 and a Category One hurricane in 2019.

Table 6.01.3 Return frequency of storms

Return Period, years	Wind Speed, kt			Hurricane Category
	Best-fit	95% non-exc.	5% non-exc.	Saffir-Simpson
5	95.68	101.27	90.09	3
10	117.20	124.22	110.19	4
25	135.41	144.88	125.94	5
50	146.30	157.49	135.12	5
100	155.81	168.57	143.05	5

Figure 6.01.4 Tropical cyclone frequencies in the Atlantic
Source: NOAA via the National Weather Service

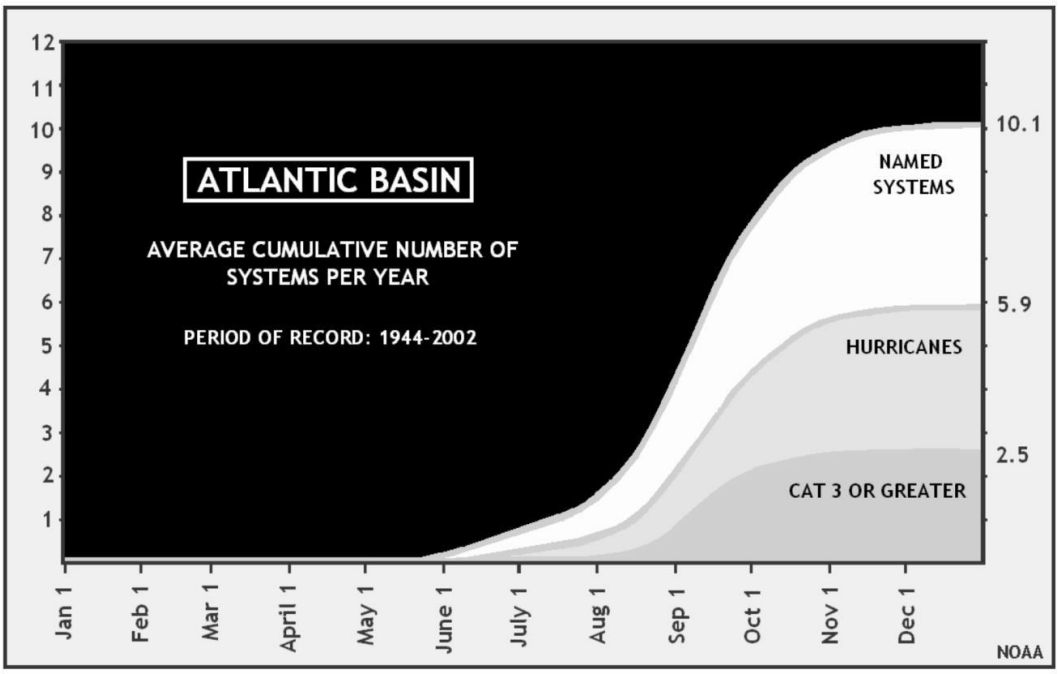
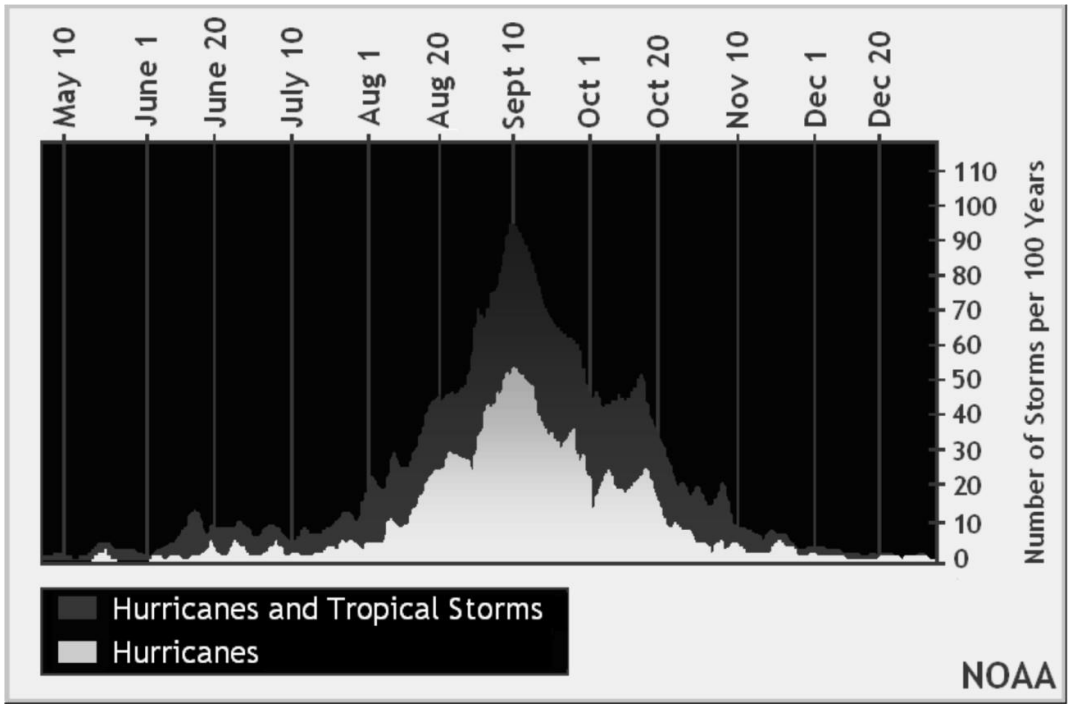


Figure 6.01.5 Tropical storm and hurricane occurrences in the Atlantic
Source: National Weather Service



Climate

The average annual rainfall on St. Thomas is approximately 45 inches, ranging from 35 inches toward the eastern end of the island to more than 55 inches at the higher elevation to the west. Rainfall usually occurs in brief, intense showers of less than a few tenths of an inch and major rainfall events are associated with weather systems (USGS, 1998). The Virgin Islands have no sharply defined wet season. The wettest period generally is from September to November, and the driest period is from January to June (USGS, 1998). The project area receives between 39 inches of rainfall annually. The average rainfall received in Charlotte Amalie which is located approximately 1.35 miles to the north between 1972 and 2012 is found in the following table.

Table 6.01.6 Monthly climate summary
Source: Southeast Regional Climate Center, sercc@climate.ncsu.edu

CHARLOTTE AMALIE HARBOR, VIRGIN ISLANDS (678905)

Period of Record Monthly Climate Summary

Period of Record : 1/12/1972 to 4/30/2012

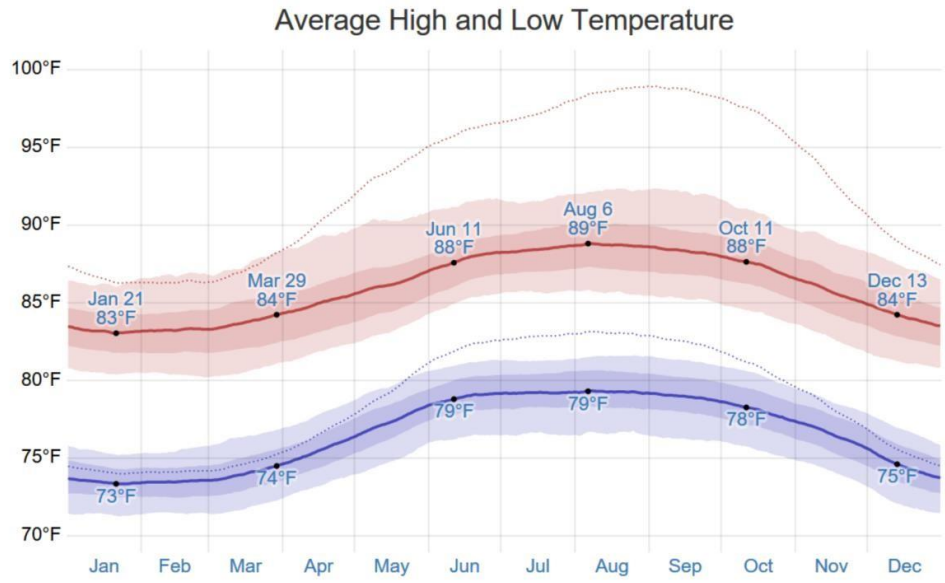
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	84.7	85.0	85.5	86.4	87.4	89.1	89.9	90.1	89.5	88.6	87.0	85.5	87.4
Average Min. Temperature (F)	72.3	72.2	72.7	74.2	76.3	77.7	78.0	78.1	77.6	76.6	75.1	73.3	75.3
Average Total Precipitation (in.)	2.03	1.45	1.46	2.74	3.35	2.75	2.66	3.83	5.42	5.94	5.54	2.84	40.01
Average Total Snowfall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 84% Min. Temp.: 83.6% Precipitation: 80.9% Snowfall: 80.1% Snow Depth: 76%
Check Station Metadata or Metadata graphics for more detail about data completeness.

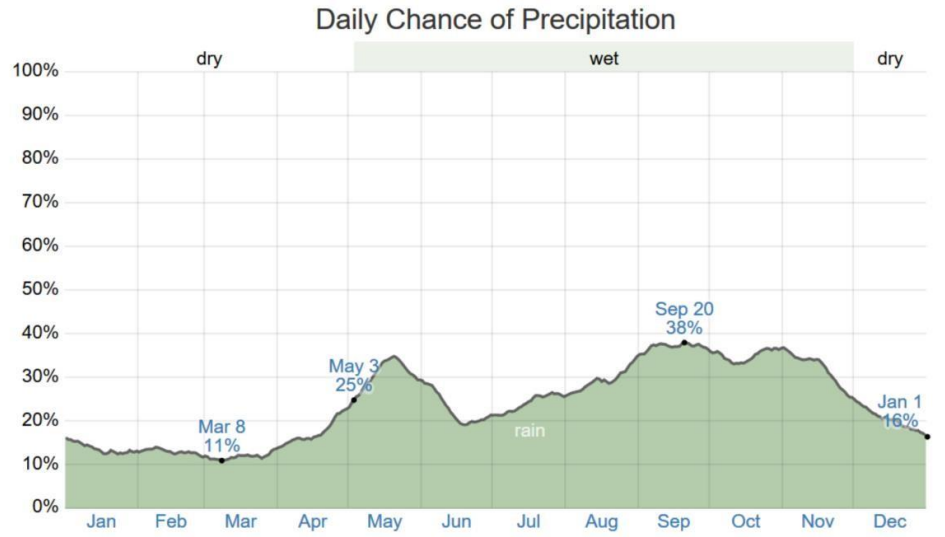
The National Oceanic and Atmospheric Administration's (NOAA) estimated frequency point precipitation table from Estate Fort Mylner is provided below. Estate Fort Mylner is the closest station. The table indicates that more than 1 inch of rain can fall in 15 minutes in a 10-year recurring storm.

The difference between the mean temperatures of the coolest and warmest month is only 5 to 7°F. The highest temperatures are in August or September and the lowest are in January or February. The highest average daytime temperature in the warmest months is about 88°F, and in the coolest months is in the low 80's. Nighttime lows are usually in the mid 70's during the warmer months and in the high 60's during the cooler months (USGS 1998). In general, air temperature in the Virgin Islands ranges between 77 degrees and 85 degrees.

Figure 6.01.7 Climate averages, temperature and precipitation
Source: https://weatherspark.com/y/28234/Average-Weather-inCharlotte- Amalie-U.S.-Virgin-Islands

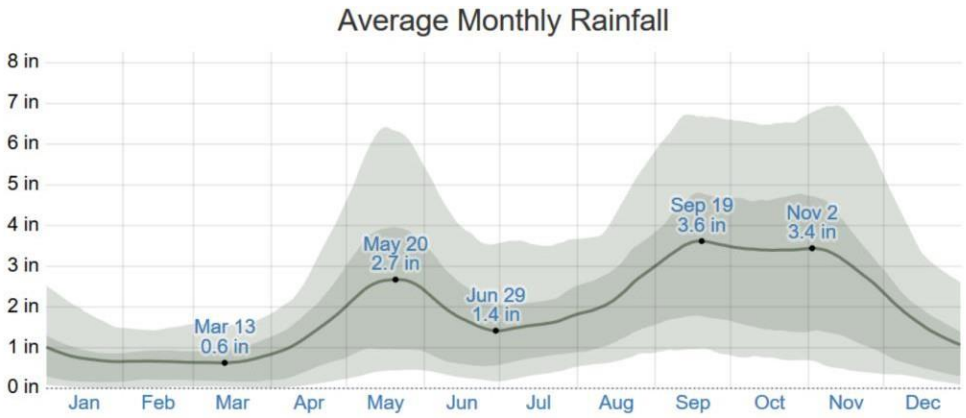


The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

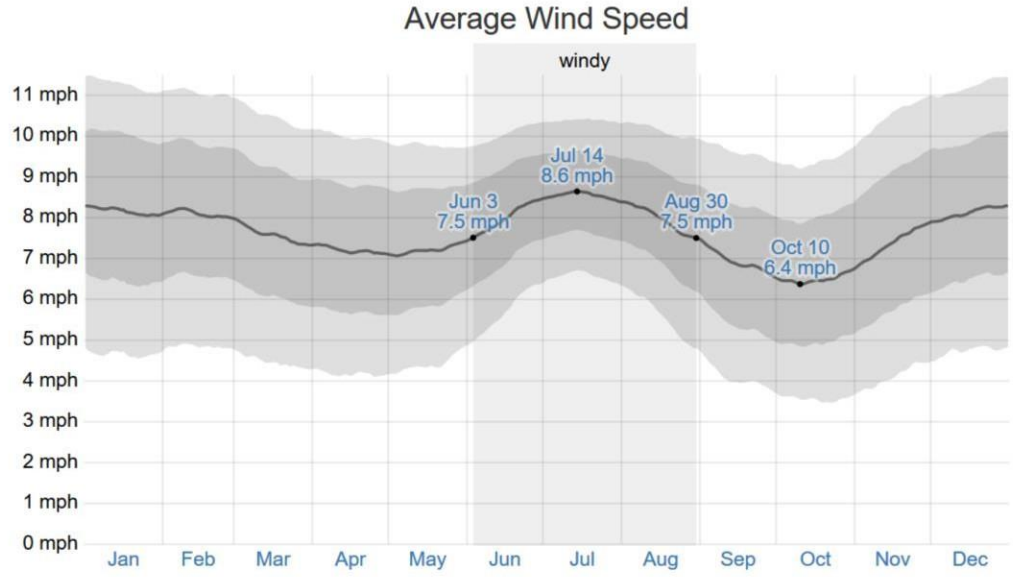


The percentage of days in which various types of precipitation are observed, excluding trace quantities: rain alone, snow alone, and mixed (both rain and snow fell in the same day).

Figure 6.01.8 Climate averages, temperature and precipitation
Source: https://weatherspark.com/y/28234/Average-Weather-inCharlotte- Amalie-U.S.-Virgin-Islands



The average rainfall (solid line) accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands. The thin dotted line is the corresponding average liquid-equivalent snowfall.



The average of mean hourly wind speeds (dark gray line), with 25th to 75th and 10th to 90th percentile bands.

6.02 Landforms, Geology, Soils and Historic Land Use

Geology of the Virgin Islands

The Virgin Islands are near the northeastern corner of the present Caribbean Plate, a relatively small trapezoidal-shaped plate that is moving eastward relative to the North and South American continents carried on the American plate. The arc of the Lesser Antilles is an active volcanic arc above a subduction zone in which the Atlantic oceanic crust of the American Plate is carried downward under the Caribbean Plate. The closest volcano to the Virgin Islands that is still active is on Saba Island, about 160 kilometers

to the east.

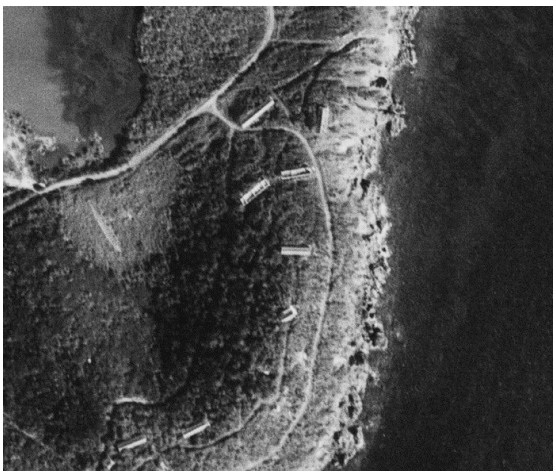
St. Thomas is composed of stratified volcanic and volcaniclastic rocks with minor limestone of the Early Cretaceous (Albian) to possibly the late Cretaceous Age (Donnelly 1966). These rocks are granitic composition, some of which may be as young as Tertiary (Kesler and Sutter, 1979). The oldest rocks of St. John are submarine lavas (keratophyre and spilite), beds of volcanic debris and chert. Associated intrusive rocks of the Water Island Formation is overlain by andesitic volcanic and volcaniclastic rocks of the Louisenhoj Formation which underlies the island of St. Thomas to the east and much of the northwestern portion of St. John. Donnelly (1966) suggested that the Louisenhoj Formation was deposited unconformably on the Water Island Formation after a period of emergence, tilting and erosion, on the slopes and environs of a subaerial volcanic island located roughly between St. Thomas and St. John, an area now occupied by Pillsbury Sound. The youngest layered deposits on St. Thomas are volcaniclastic rocks of the Tutu Formation. Fossils contained in the Tutu Formation suggest that those deposits are of the Early Cretaceous (Albian) Age (Donnelly et. Al. 1971). It appears that all the volcaniclastic rocks of St. Thomas were deposited in a relatively short period of time spanning 10 to 15 million years approximately 100 million years ago (D. Rankin 1988).

Water Island is characterized by an irregular coastline, numerous bays, steep, slopes, and small drainage areas. There are numerous salt ponds along the coastline of the island and there is a salt pond immediately to the northwest of the project site.

Historic Use

The proposed project site was previously used by the U.S. Navy for barracks in relationship with the Segarra Military Reservation. The ruins of the barracks remain on site.

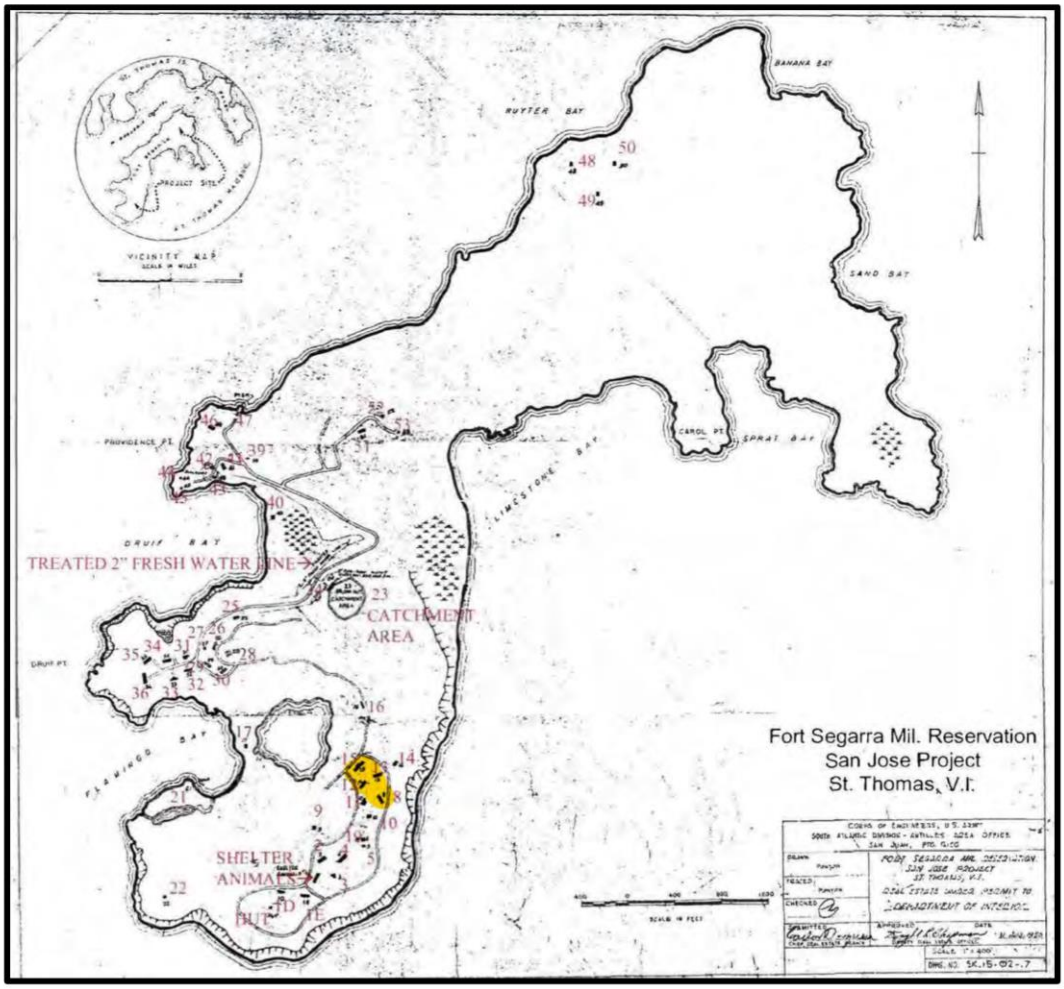
Figure 6.02.1 The proposed project site on Water Island in 1954 and 2019



1954

2019

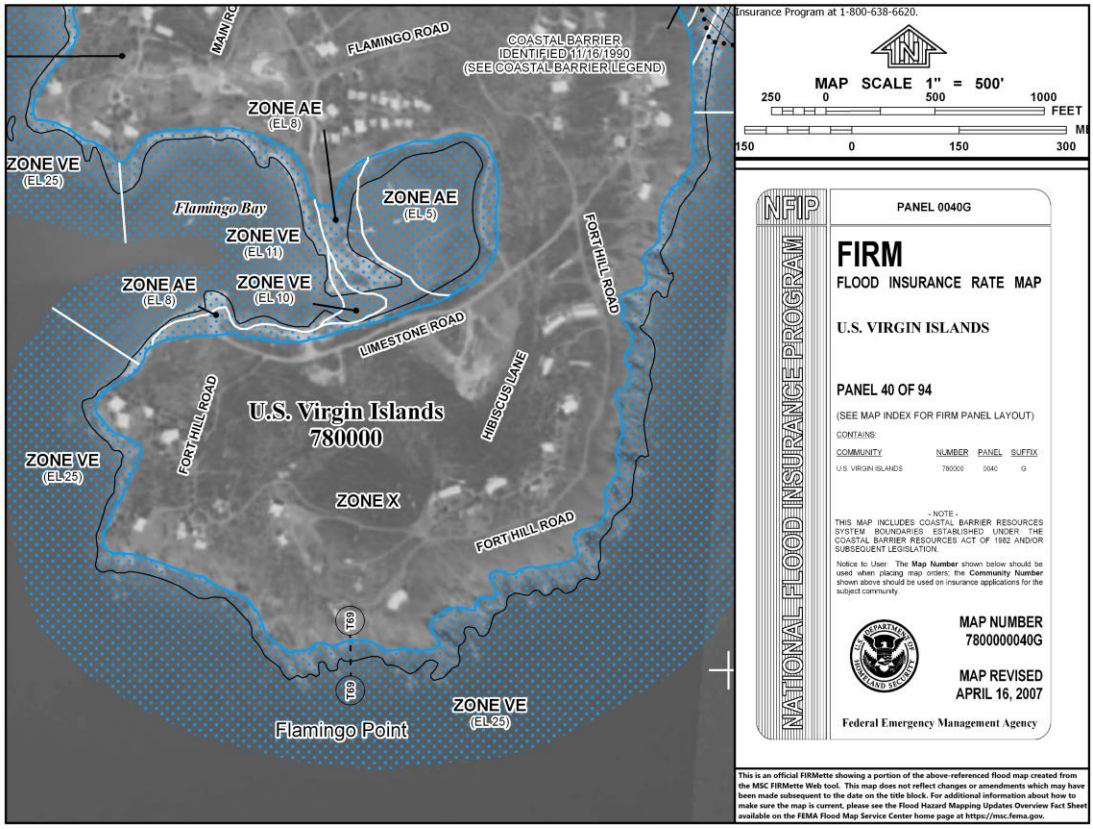
Figure 6.02.2 Map of structures associated with the proposed project
Source: CocoSol Archeological Report Appendix IIIV



Adverse Site Conditions

The typical wind and wave patterns will not impact the proposed project site as it is located entirely inland. The proposed project site is in a Federal Emergency Management Agency (FEMA) designated Zone X, where 100-year coastal flooding is not expected (Flood Insurance Rate Map, FEMA Panel 40 of 94, revised April 16, 2007).

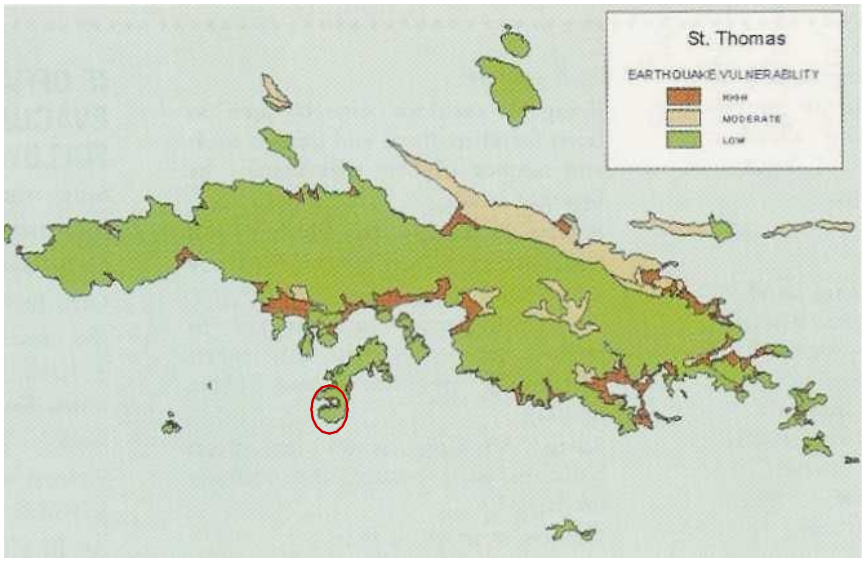
Figure 6.02.3 FEMA FIRM map, panel 40 of 94, dated April 16, 2007



The U.S. Virgin Islands lie in one of the most earthquake prone areas of the world, and are susceptible to ground shaking, earthquake-induced ground failures, surface fault ruptures and tsunamis (tidal waves) (Hays, 1984). The activity is mostly associated with large-scale tectonic activity or faulting, originating in the Anegada Trough to the northeast of the islands. The trough, and its related scarp, were apparently thrown up by block faulting during the late Pliocene or early Pleistocene. It is oriented generally northeast to southwest, separating St. Croix from Puerto Rico and the other Virgin Islands. Based on shallow focus earthquakes, the Anegada Fault Trough is estimated to be more than 400 miles in length. There are indications that strike slip movement is occurring, with St. Croix shifting northeast relative to Puerto Rico (Puerto Rico Water Authority 1970).

The year 2020 marks the 153rd anniversary of the last major earthquake in the islands. This quake, which occurred on November 18, 1867, had an identified intensity of VIII on the Modified Mercalli Scale. Earthquakes of this magnitude have generally been associated with epicentral ground accelerations of between 0.05 and 0.35 gravities. Since the 1868 quake, there has been continuous low intensity activity, all below 6.0 Richter. Thousands of tiny earthquakes occur yearly on the island.

Figure 6.02.4 Earthquake probability map.



Soils

Th soil types at the proposed project site were identified in the U.S. Geological Survey (USGS) Custom Soil Survey report. Solitude gravelly fine sandy loam, 0 to 2 percent slopes, frequently flooded is located immediately along the north road and is associated with the salt pond. No development is occurring within this area but the 2,000 square foot catchment pond. To the south is Annaberg-Maho Bay complex, 12 to 20 percent slopes, extremely stony. This soil is rocky and well-drained soil, additionally bedrock is usually found between 10 and 20 inches below the surface. Farther to the south, and along the eastern side of the proposed site, is a small area of Southgate-Rock outcrop complex, 20 to 40 percent slopes. The remainder of the site is Southgate-Rock outcrop complex, 40 to 60 percent slopes. Both soils are also well drained and have lithic bedrock between 10 and 20 inches below the surface. The surface of the proposed site is covered with loose rocks.

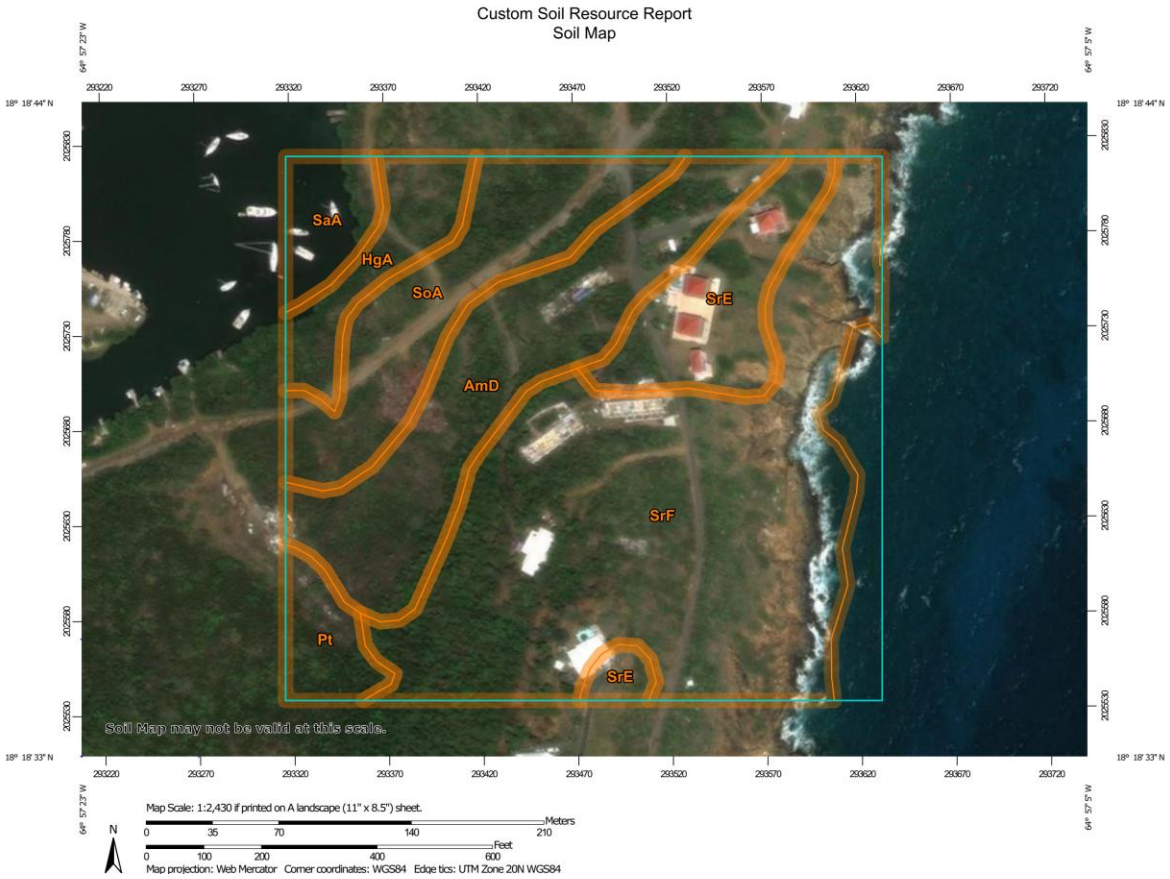


Figure 6.02.6 Photos of the proposed project site

Figure 6.02.3 Soil Survey Map

There are exposed boulders and rocks on the surface throughout the property.

Impact of Proposed Project

The project plans to respect the existing topography and no cutting nor filling of the property is proposed. Thus, the proposed project will have no impact on the geology of the site.

Impact of the Geology on the Project

The site is underlain with shallow bedrock and this will impact excavation on the site.

6.03 Drainage, Flooding and Erosion Control

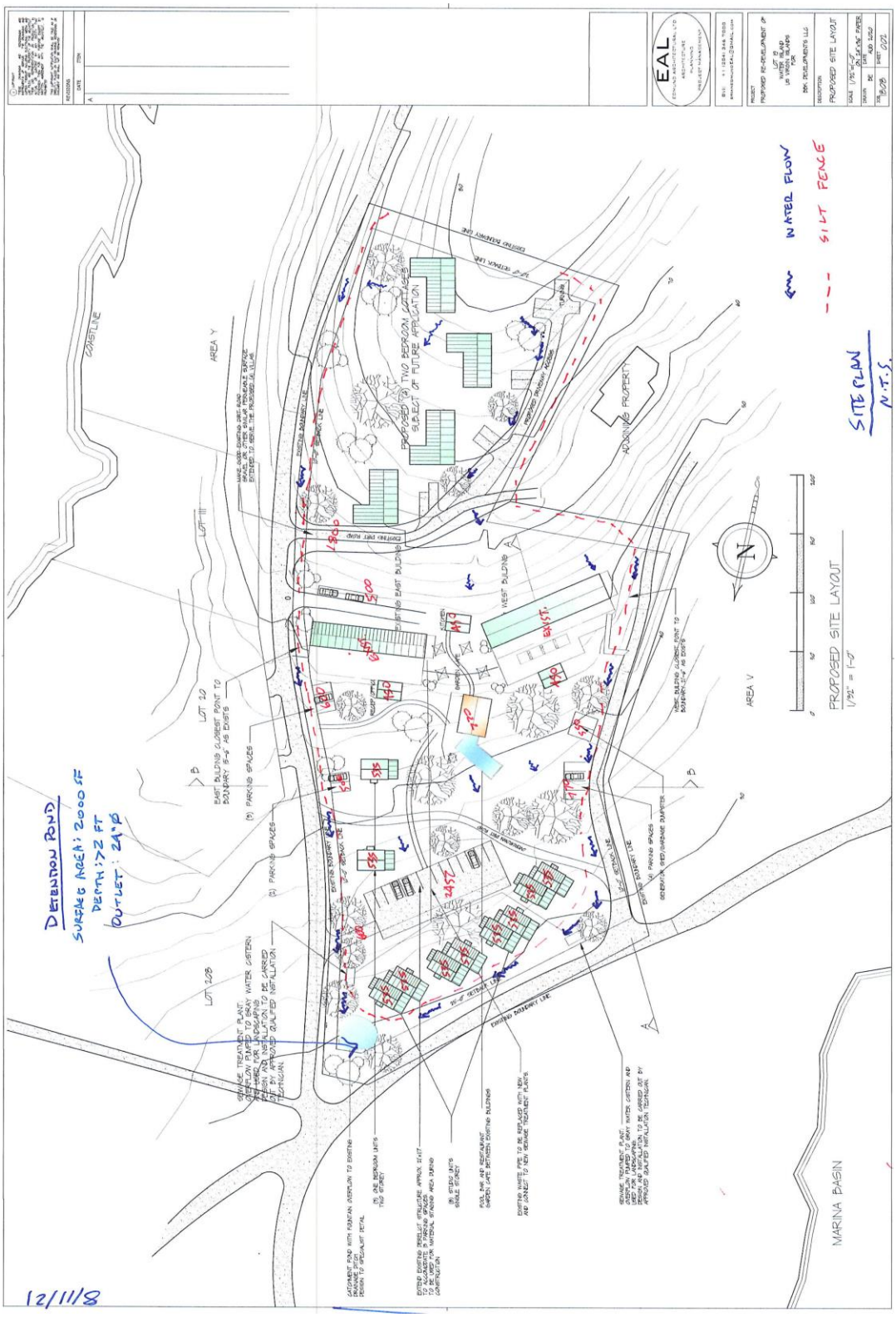
6.03a Existing Drainage Patterns

Rainwater runoff currently flows in a sheet-like formation across the property to the surrounding roadways to the east, west and north. Water flows onto the property through the culvert under the paved roadway and then sheet flows across the unpaved dirt roadway to the barge landing.

6.03b Alterations to Existing Drainage Patterns

The only drainage change will be the creation of a 2,000 square foot stormwater catchment pond that will be 24 inches deep. Water will continue to flow along the existing drainage patterns.

Figure 6.03.1 Design of catchment pond



6.03c Relationship of the Project to the Coastal Floodplain

The typical wind and wave patterns will not impact the proposed project site as it located entirely inland. The project site is in FEMA-designated Zone X, where 100-year coastal flooding is not expected. (FEMA Panel 40 of 94, revised April 16, 2007, Figure 6.02.1).

6.03d Peak Flow Calculations

The peak flow calculations are provided in Appendix III. The pre-development peak flow for the 25-year return period storm is 32.81 cubic feet per second (cfs). The post-development peak flow for the 25-year return period storm is 34.42 cfs, an increase of 1.61 cfs. To handle the discharge, the pipe must be sized to 24 inches.

6.03e Existing Storm Water Disposal Structures

There is an existing culvert under the roadway which moves stormwater through the site under the road. The water then sheet flows across the dirt roadway.

Figure 6.03.2 Existing culvert on proposed project site

6.03f Proposed Storm Water Facilities

A 2,000 square foot catchment, or retention, pond that is 24 inches deep is proposed along with a 24 inch discharge culvert.

6.03g Maintenance of Storm Water Control Facilities

The eco-resort will check and clean the stormwater catchment pond after all storm events and any heavy rainfalls exceeding one inch to ensure that the pond does not become blocked or full during rainfall. The pond will be cleaned out when sediment reaches one-quarter full (6 inches of stormwater depth).

6.03h Method of Land Clearing

Only the areas necessary for development will be cleared; these areas will be clearly marked and no clearing will occur beyond these areas. Prior to the start of clearing these areas, a training will be conducted by DFW on how to hand clear the site in accordance with VI Tree Boa Conservation Measures. These measures will be followed through the clearing process. Sedimentation and erosion control will be installed prior to any earth work begins.

6.03i Provisions Preserve Topsoil and to Limit Site Disturbance

Site disturbance will be limited to that required to construct the proposed eco resort. The resort plans to repurpose the existing buildings to minimize impact on the site. The old concrete slab of the northern building will be used as a parking area and the two more intact barracks buildings will be renovated for resort units. Re-enforced silt fencing will be placed around perimeter of the site.

6.03j Presence and Location of Critical Areas

The property has been previously developed and much of the area was cleared at one time. The former military barracks have been periodically used for residences and other activities since they were abandoned. The buildings were badly damaged during the 2017 North Atlantic Hurricane Season. There are a number of large water mampoo trees (*Pisonia subcordata*) on the site and that will be preserved.

The property has adequate interdigitation, prey base for VI tree boas and one was seen on site in the eastern building in May of 2006. Since tree boas have been observed, the development of the site will follow the VI Conservation Measures for the Tree Boa. The site will have to be hand cleared and BBK Development LLC will request DFW to conduct a tree boa training session for all individuals involved in hand clearing. This will include discussions on what to do if a tree boa is encountered, as well as tree boa identification. Photographs of the tree boa will be prominently displayed at the site. Clearing will be limited to construction footprints and those necessary for the installation of the infrastructure and amenities. All vegetation will be cut by hand and the site will be left undisturbed for 5 days prior to the use of heavy machinery. Any stone walls or rally occurring rock piles will be carefully dismantled by hand to allow any tree boas to vacate the site without injury. Per VI Tree Boa guidance, chainsaws are allowed to cut vegetation down to less than 36 inches off the ground. If a VI tree boa is found within any of the working or construction areas, activities in the area will stop and designated personnel will immediately contact DFW for safe capture and relocation, if necessary. A final site visit will be performed by DFW to confirm that hand clearing has been completed to DFW standards. Throughout the project DFW will be notified of any snakes observed.

6.03k Erosion and Sedimentation Control Devices to be Implemented

Re-enforced silt fencing will be placed around the perimeter of the proposed development site. Silt

fencing will be maintained until the area is stabilized. If topsoil is excavated, it will be stockpiled to be re-used in landscaping. All stockpiled material will be stored so that it is not impacted by concentrated runoff and will be covered until use to prevent erosion.

6.03l Maintenance of Erosion and Sediment Control Measures

All sedimentation and erosion measures shall be maintained in good working order throughout the project; if a repair is necessary, it shall be initiated within 24 hours. Built up sediment shall be removed from silt fence when it has reached one-quarter the height of the silt fence. Silt fences shall be inspected regularly for depths of sediment and tears/damage to check if the fabric is securely attached to the fence posts and to verify that fence posts are firmly embedded in the ground or attached to the ground in areas of concrete.

The sedimentation and erosion measures will be inspected on a weekly basis and after every one-quarter inch of rain. A maintenance inspection report shall be made after each inspection by the contractor and shall be kept in active log readily available at the job site. The site superintendent or construction manager shall be responsible for inspection, maintenance, repair activities and completing the inspection and maintenance report.

6.03m Impacts of Terrestrial and Shoreline Erosion

The proposed project site was previously developed by the United States Navy, and, at that time, it impacted the natural state of the property. Runoff currently sheet flows across the site and there is some erosion along the roadsides. The proposed site is located inland and is not located along the shoreline. The closest water body is the Flamingo Bay Marina Basin. Thus, the proposed development of the site should have a negligible impact on terrestrial erosion and no impact on shoreline erosion.

6.04 Fresh Water Resources

There are sources of fresh water on the proposed project site. The project will meet its fresh water needs by roof catchment and cisterns.

6.05 Oceanography

6.05a Seabed Alteration

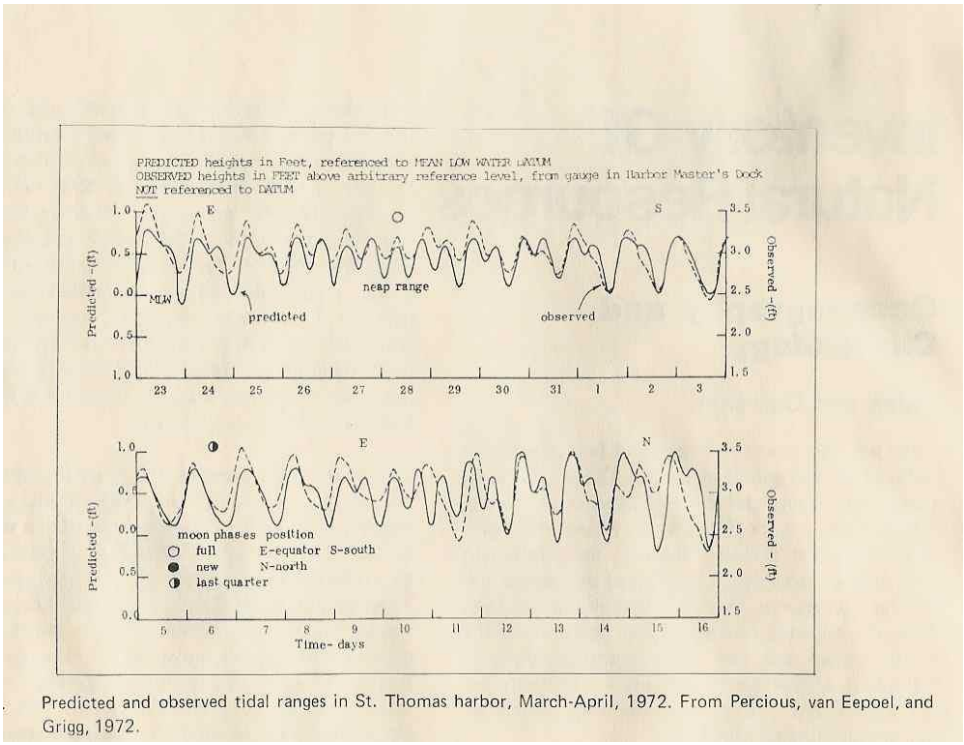
The property is not located on the shoreline and proposes no seabed alterations.

6.05b Tides and Currents

The Virgin Islands coastal areas are not subject to significant tidal ranges or tidal currents. Due to the small size of the island, the sea flows around the island causing an average tidal height of only a few inches and maximum change of only a little over a foot. Only very narrow intertidal zones are found because of this lack of tidal amplitude and the steepness of the island rising out of the sea. The tides around within Flamingo Bay Pond are primarily semi-diurnal in nature, with two cycles of high and two of low water every 24 hours. The mean tides range from 0.8 feet (ft) to 1.0 ft and the spring tidal ranges

reach up to 1.3 ft (IRF, 1977). There are locally driven tidal currents due to the lack of confinement of the pond. NOAA has a tide gauge in Charlotte Amalie and has recorded water levels since 1975. The high tide recorded on September 18, 1989, during Hurricane Hugo, was 3.35 ft and, during Hurricane Marilyn in 1995, the highest tide height 3.98 ft above the mean low water level. The lowest tide recorded was on February 6, 1985, and was -1.44 ft.

Figure 6.05.1 Tides recorded in St. Thomas Harbor, IRF 1975. The tidal ranges of the station are as follows:



Predicted and observed tidal ranges in St. Thomas harbor, March-April, 1972. From Percious, van Eepoel, and Grigg, 1972.

Mean Higher High Water	1.09’
Mean High Water	0.94’
Mean Tide Level	0.54’
Mean Sea Level	0.52’
Mean Low Water	0.13’
Mean Lower Low Water	0.0’

The following figures shows the extreme water levels at the Charlotte Amalie station that were evaluated using the USACE calculator (version 5/17/2017) based on local tide gauge data – 32 years of record.

Figure 6.05.2 Tidal Datums and extreme water levels Station relative to VIVD09 - Station 9751639

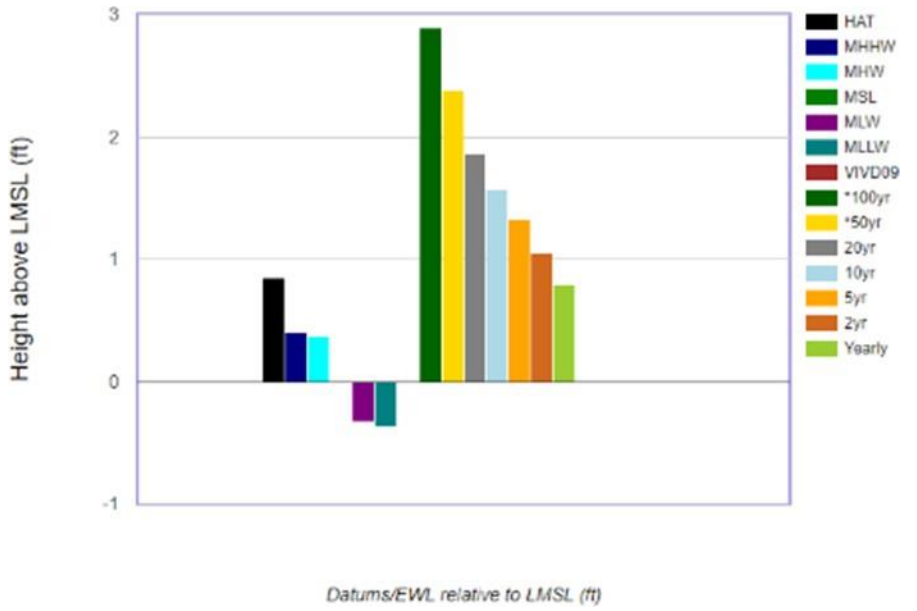


Figure 6.05.3 Extreme water levels Station relative to VIVD09 - Station 9751639

Extreme Water Level		MSL (ft)
	Yearly	0.79
	2 years	1.05
	5 years	1.32
	10 years	1.57
	20 years	1.87
	50 years*	2.38
	100 years*	2.89

[* Period of record is less than return period]

The surface currents throughout the Caribbean are driven by the North Equatorial Current that runs through the islands west-northwest and then joins the Gulf Stream (Figure 6.05.4). These currents change very little from season to season with the currents coming more from the south during the summer months. Because of the shallowness of the Caribbean basin, which is less than 1,000 meters, mainly surface water from the Atlantic flows through the islands. The westerly drift of the Caribbean current sweeps into Pillsbury Sound from the Southeast, seeking a way North through the barrier set up by the Cays to discharge along the North Shore of St. Thomas and out into the Atlantic. The current flows along the south side of St. Thomas in a westerly direction. Water flows past the opening of Flamingo Bay in a southwesterly direction. The currents within the pond are only influenced by tidal changes.

Figure 6.05.4 Prevailing currents in the Caribbean (IRF, 1975)

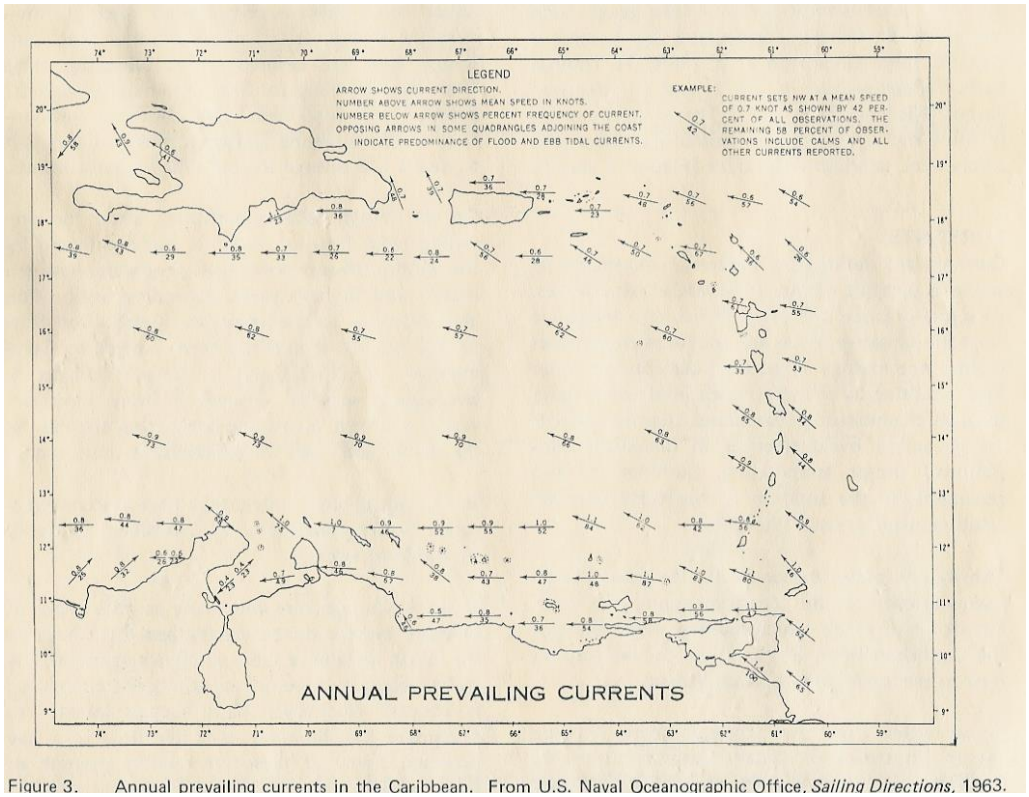
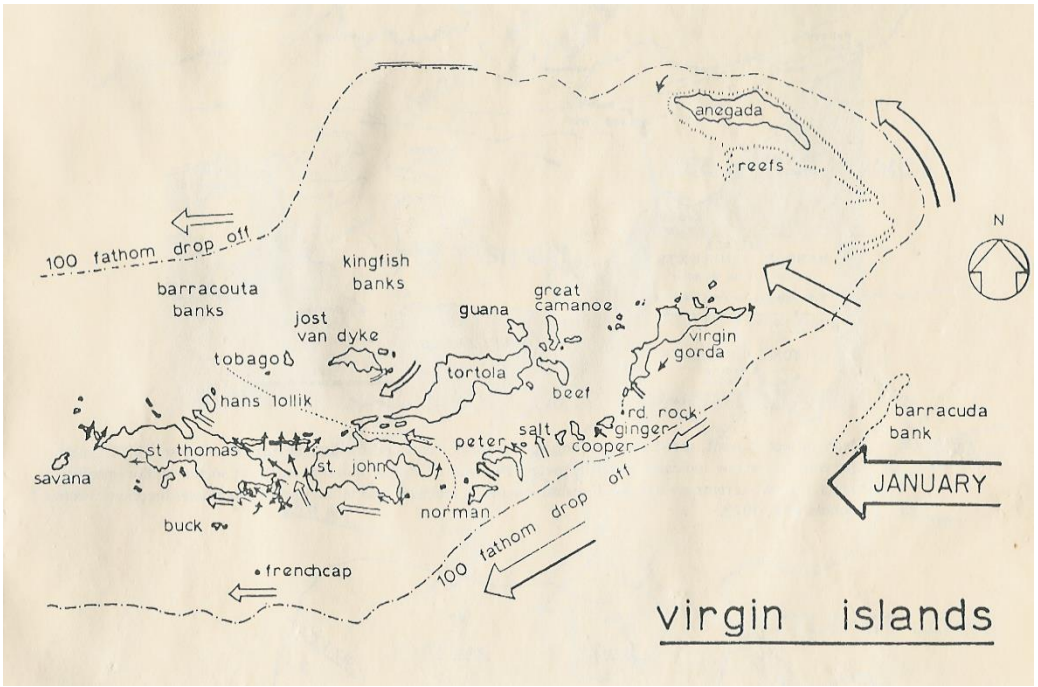


Figure 3. Annual prevailing currents in the Caribbean. From U.S. Naval Oceanographic Office, *Sailing Directions*, 1963.

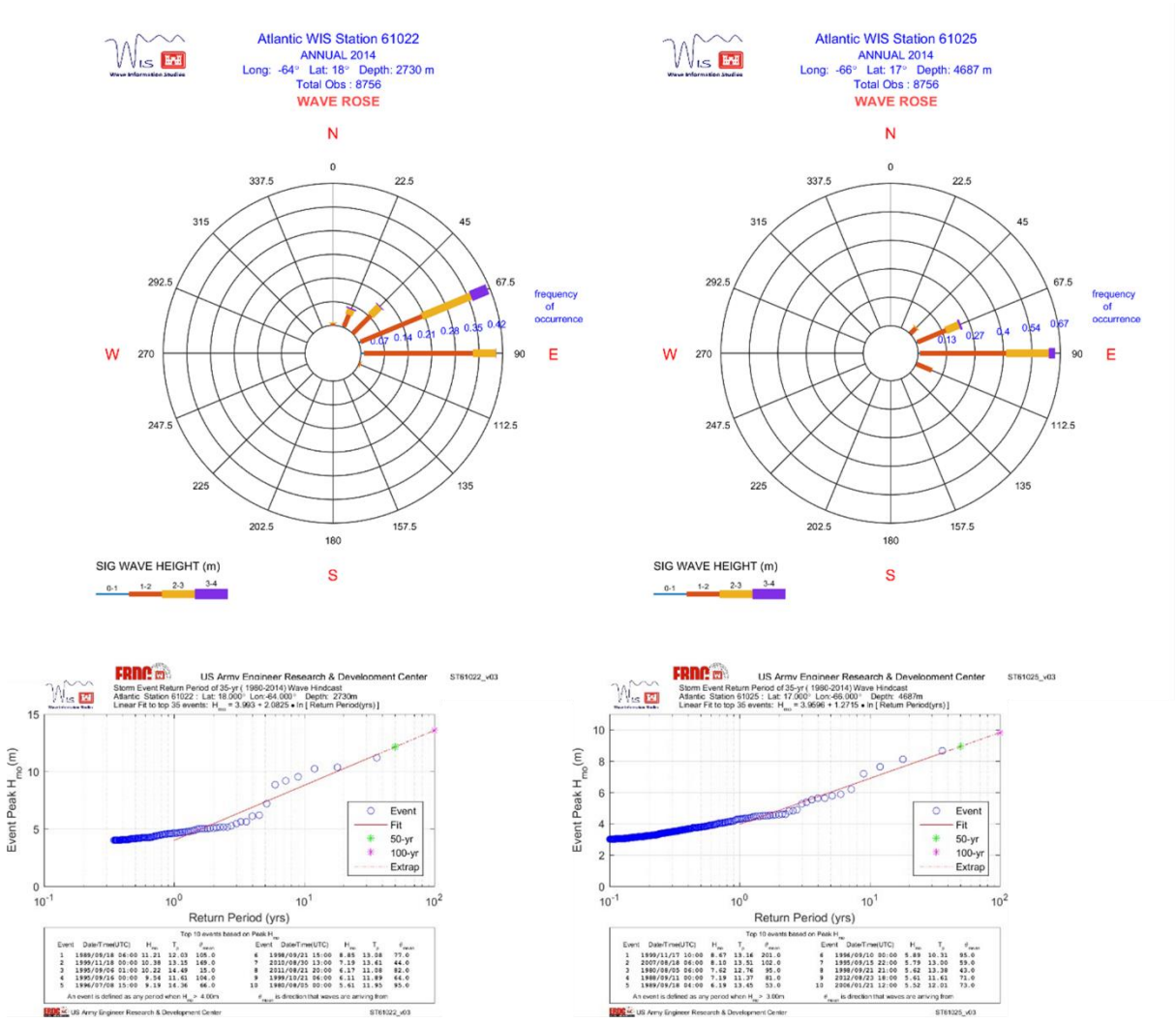
Figure 6.05.5 Prevailing current in Thomas, IRF 1975.



6.05c Waves

The deep-water waves off St. Thomas are primarily driven by the northeast trade winds that blow most of the year (Figure 6.05.6). Waves average from one to three feet from the east, 42% of the time throughout the year (IRF, 1977). For 0.6% of the time, easterly waves reach 12 ft. in height. The southeasterly swell with waves one to twelve feet high become significant in late summer and fall when the trade winds blow from the east or when tropical storms and hurricanes pass the islands at a distance to the south. During the winter months, long length, long period northern swells develop to a height of one to 5 feet. Waves have negligible impact on the Flamingo Bay Pond.

Figure 6.05.6 Wave Information for Station 61022 and 61025
Source: http://wis.usace.army.mil/hindcasts.html?dmn=atlantic



6.05d Marine Water Quality

Flamingo Bay Pond has poor water quality and visibility is often less than one foot. Dissolved oxygen is often low and when the opening to the bay was blocked after the 2017 North Atlantic Hurricane Season, a fish kill occurred during sunken vessel removal when the circulation was impaired.

The open water of Flamingo Bay is classified as Class B and the best usage of the water is listed as the propagation of desirable species of marine life and for primary contact recreation (swimming, water skiing, etc.). The quality criteria include dissolved oxygen not less than 5.5mg/l from other than natural conditions. The pH must not vary by more than 0.1 pH unit from ambient; at no time shall the pH be less than 7.0 or greater than 8.3. Bacteria (fecal coliform) cannot exceed 70 per ml, and turbidity should not exceed a maximum nephelometric turbidity unit (NTU) of three (3) NTU. It is doubtful the water within the pond meets this criterion.

6.05e Sea Level Rise

Sea levels are projected to rise in coming decades as a result of increased global temperatures associated with climate change (IPCC, 2013). When reviewing sea level rise (SLR) projections, it is important to distinguish the differences between global and local SLR rates. In 2007 The US Global Change Research Program assessed the Global Mean Sea Level projections and adjusted them to account for key factors important at regional scales, including: 1) shifts in oceanographic factors; 2) changes in the Earth's gravitational field and rotation; and 3) vertical land movement. The estimated relative sea level rise changes scenarios at Charlotte Amalie Station location are presented in Figure 6.05.7. The proposed project site is at high enough elevation it will not be impacted by the extreme change of the year 2100.

Figure 6.05.7 Wave Information for Station 61022 and 61025

	VLM	Low	Int-Low	Intermediate	Int-High	High	Extreme
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2010	0.00	0.10	0.13	0.16	0.23	0.26	0.30
2020	0.00	0.20	0.26	0.36	0.49	0.56	0.62
2030	0.00	0.36	0.43	0.59	0.79	0.98	1.15
2050	0.00	0.59	0.79	1.21	1.74	2.40	2.79
2080	0.00	0.98	1.31	2.49	3.94	5.54	6.69
2100	0.00	1.15	1.61	3.58	5.94	8.30	10.24

6.06 Marine Resources and Habitat Assessment

The proposed project site is located inland on Water Island. The closest water body is the Flamingo Bay Pond which is open to Flamingo Bay Pond. The pond is surrounded with a monoculture of white mangroves (*Lagunucularia racemose)*. The fringe is only one to three mangroves in width. There are scattered buttonwood mangroves (*Conocarpus erectus)* and seaside maho (*Thespesia populnea*) in the

fringing forest between the pond and the public road. The proposed eco-resort is, at its closest, 240 ft from Flamingo Bay Pond.

There are boulders scattered along southeastern shore of the pond amid the mangroves and the pond is extremely shallow throughout the eastern side. The pond is colonized by the invasive seavine *Halophila stipulacea* and *Caulerpa sertularioides* algae. Filamentous green algae and blue green algal mats are also common.


Caulerpa sertularioides


Halophila stipulacea


Uncolonized/Macro-Algae

6.07 Terrestrial Resources

The proposed project site has been previously developed; a roadway once bisected the site but is now overgrown. There are dirt roadways along the northern and western boundaries of the property; a road also cuts across the property, on the northernmost section, to provide access to a single-family residence to the southwest. The property's lowest elevation is approximately 24ft along the northern roadway and the property rises onto a knoll at its southern boundary to 160ft.

The property was developed by the U.S. Navy in the late 1940's and four structures were built on the proposed eco resort property. These buildings – listed as A, B, C and D – were listed as barracks (A, B and C) and a mess hall (D). It is likely that much of the property may have been cleared in the 1940s. There are scattered mature trees throughout the property and there are numerous landscape species near the building ruins. There is a lot of debris scattered in various locations across the site.

Methods

Walk through transects were conducted throughout the entirety of the proposed project site and around all the buildings. Due to a tree boa sighting in one the building ruins in 2006, evening and night surveys were also conducted to search for tree boas.

Findings

The site has scattered large water mampoos (*Pisonia subcordata*) within its interior. Many of these trees show damage from the 2017 hurricanes. The canopy is composed of scattered turpentine trees (*Bursera simaruba*), kasha (*Acacia tortuosa),* three species of capers (i.e., *Capparis flexuosa*, *Capparis indica*, and *Capparis cynophallophora*), black mampoo (*Guapira fragrans*), milk trees (*Plumeria alba*), pipe organ cactus (*Pilosocereus royenii*), and pink cedar (*Tabebuia heterophylla*). Marble trees (*Cassine xylocarpa*) are spread across the property but are most abundant along the eastern roadway and on the north end of the property. Most of the trees are not very large probably due to the dry nature of the property. Within the understory are *Agave missionum*, *Aloe vera,* beggars tick (*Bidens frondose*), multiple species of *Croton (i.e., Croton variegate* and *Croton astroites*), donkey cactus, night blooming cereus (*Hylocereus trigonatus*), leaf of life (*Kalanchoe delagoensis*), wild sage (*Lantana involucrata*), tan tan (*Leucaena*

leucocephala), fiddlewood (*Citharexylum fruticosum*), Turk's cap cactus (*Melocactus intortus*), Guinea grass (*Megathyrsus maximus*), *Opuntia pubescens*, brisslet (*Erythroxylum brevipes*), black torch (*Erithalis fruticosum*), *Randia aculeata*, *Rivina humilis*, snake plant (*Sansevieria trifasciata*), Ginger Thomas (*Tecoma stans*), *Tillandsia lineatispica* and Spanish bayonet (*Yucca aloifolia*). The vine, Mexican creeper (*Antigonon leptopus*), is also scattered across the site.

There are landscape plants remaining around the buildings including Desert rose (*Adenium spp.*), christmas palm (*Adonidia merrillii*), Bougainvillea, pencil cactus (*Euphorbia tirucalli)*, *Hesperaloe parviflora*, *Hibiscus spp*., West Indian Jasmin (*Ixora spp.*) monkey puzzle, spider lilies (*Hymenocallis caribaea*) and frangipani (*Plumeria rubra).*

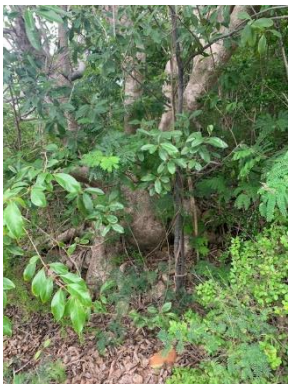
The site has a large number of lizards, including the crested anole (*Anolis cristatellus*), barred anole (*Anolis stratulus*) the grass anole (*Anolis pulchellus*), and the ground lizard (*Ameiva exsul*). Numerous *Sphaerodactylus macrolepis* were seen on other Water Island sites so leaf litter was searched on the proposed project site but no *Sphaerodactylus spp.* were found within the property. Wood slaves (*Hemidactylus mabouia*) and geckos (*Thecadactylus spp.)* were found in the debris within the damaged buildings. Red-footed tortoise (*Geochelone carbonaria*) have been seen along the adjacent paved roadway to the east but were not seen during the survey. The tortoise is not a native species. The Puerto Rican racer (*Borikenophis portoricensis*) has also been seen on an adjacent property. A flock of smooth billed ani (Crotophaga ani) during site surveys.

A tree boa was observed in one of the rooms in the eastern building in 2006. Terrestrial surveys were made of the site over three nights in July between 8pm and11pm, and between 3 and 5am. No tree boas were observed during the surveys, but this does not mean that tree boas do not reside on, or traverse, the proposed project site.

Figure 6.07.1 Photographs from the terrestrial survey of the proposed project site

The vegetation of the proposed project site is a dry forest with scattered cactus, turpentine trees, crotons, marble trees and capers.





Marble trees line the paved roadway and there are large areas of shorter herbaceous plants in areas that were previously disturbed. There are also large water mampoos scattered across the site.




The northern building ruins are being taken over by vegetation. The east and west barracks have been converted into an inn at one time and then residential rental units.



There is debris and refuse from dumping around the old structures.



Landscape plants still thrive around the old structures.

A smooth billed ani and the red-footed tortoise were seen during surveys in 2021

Impact of Proposed Development

The proposed project will avoid the large water mampoos and other large trees. Most of the areas which will be cleared are overgrown with secondary growth vegetation. Prior to the start of any clearing, BBK Development LLC will request DFW to conduct a tree boa training session for all individuals involved in hand clearing. Once the training has been conducted, the areas for necessary for development will be clearly marked and hand clearing will begin in accordance with the VI Conservation Measures for the Tree Boa. Tree and vegetation corridors will remain on the site where tree boas can travel across the property off the ground.

6.08 Wetlands

The USACE defines wetlands as "those areas that are periodically inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, marshes and similar areas." (USACE, 1986). There are no terrestrial wetlands within Plot 19 Water Island – i.e., the proposed project site.

6.09 Rare and Endangered Species

The proposed project site is habitat for the VI tree boa (*Chilabothrus granti).* The property has adequate interdigitation, prey base for VI tree boas and one was seen on site in the eastern building in May of 2006. Since tree boas have been observed, the development of the site will follow the VI Conservation Measures for the Tree Boa. The site will have to be hand cleared and BBK Development LLC will request DFW to conduct a tree boa training session for all individuals involved in hand clearing. This will include discussions on what to do if a tree boa is encountered, as well as tree boa identification. Photographs of the tree boa will be prominently displayed at the site. Clearing will be limited to construction footprints and those necessary for the installation of the infrastructure and amenities. All vegetation will be cut by hand and the site will be left undisturbed for 5 days prior to the use of heavy machinery. Any stone walls or rally occurring rock piles will be carefully dismantled by hand to allow any tree boas to vacate the site without injury. Per VI Tree Boa guidance, chainsaws are allowed to cut vegetation down to less than 36 inches off the ground. If a VI tree boa is found within any of the working or construction areas, activities in the area will stop and designated personnel will immediately contact DFW for safe capture and relocation, if necessary. A final site visit will be performed by DFW to confirm that hand clearing has been completed to DFW standards. Throughout the project DFW will be

notified of any snakes observed.

DFW lists four endangered plants in the Virgin Islands, three occur in St. Croix (i.e., *Agave eggersiana, Catesbaea melanocarpa* and *Buxus vahlii)* and one occurs on St. Thomas (i.e., *Zanthoxylum thomasianum,* known as the St. Thomas prickly-ash). In addition, *Malpighia woodburyana* is considered endangered by the Virgin Islands Fish and Wildlife service.

No plants, nor birds, listed under the Endangered Species Act (ESA) were noted within the proposed project site. There are numerous ESA-listed marine species offshore of Water Island, but these should not be impacted by the development of the eco resort.

Impact of Project

If the DFW VI Conservation Measures for the Tree Bo are carefully followed, then the proposed project should not impact the tree boas and adequate habitat and prey base for the tree boa should remain on site.

6.10 Air Quality

All of St. Thomas and Water Island are designated Class II by the Environmental Protection Agency in compliance with National Ambient Air Quality Standards. In Class II air quality regions, the following air pollutants are regulated: open burning, visible air contaminants, particulate matter emissions, volatile petroleum products, sulfur compounds, and internal combustion engine exhaust (Virgin Islands Code Rules and Regulations).

Impact of Project

In the long-term, the proposed project will have no impact on air quality. During construction, the project will impact air quality through the use of heavy equipment. Combustion exhaust will increase during construction. Once complete the air quality will return to ambient. Additionally, earth work may create some dust, however such dust will be controlled in the form of wetting if the dust becomes a problem.

7.00 IMPACTS ON THE HUMAN ENVIRONMENT

7.01 Land and Water Use Plans

Plot 19 Water Island is zoned by the USVI Department of Planning and Natural Resources as "W-1" Waterfront Pleasure; and the proposed project is an allowable use in the W-1 Zone. Uses permitted are subject to the conditions set forth in sections 231 and 232 of Chapter 3 Virgin Islands Code Title Twenty-nine Public Planning and Development. Apartment houses, hotels and guesthouses are permitted in the W-1 Zone District, subject to the following conditions:

A. There shall be a minimum zoning lot area of three (3) acres. The proposed project meets this condition as the parcel is 3.97 acres.
B. The maximum number of persons per acre for residential structures shall not exceed forty (40) persons at the time of construction. The proposed project meets this condition. The eco resort will have a total of 29 bedrooms; based on two persons per bedroom there will be a maximum of fifty-eight (58) persons across 3.97 acres.
C. No residential structure shall exceed a height of three (3) stories. The proposed project meets this condition as the tallest structure will be two stories in height.

D. Off-street parking shall be provided in accordance with the provisions of section 230 of this subchapter. The proposed project meets this condition as a total of 30 parking spaces will be provided on site.

7.02 Visual Impact

The proposed project site is currently undeveloped and has scattered building ruins. There is a dilapidated trailer on one of the old concrete slabs and junk vehicles and debris in other areas. The development and cleanup of the site will greatly improve the appearance of the area. The architectural design will keep with character of the area.

7.03 Impact on Public Services

7.03a Potable Water

Potable water will be supplied by rainwater roof catchment and cisterns. Two large cisterns are located under the old east and west barracks buildings which will supply the east and west building units, the bar, restaurant, kitchen, reception, toilets and pool. Each new apartment building will have its own cistern.

7.03b Sewage Treatment and Disposal

A 4500 GPD MicroFAST® Unit will be installed, grey water from the plants will be stored in a grey water cistern and utilized for irrigation. Details of the MicroFAST® units are found in Appendix III.

7.03c Solid Waste Disposal

Debris associated with the project will be disposed of following the VI Waste Management Agency (VIWMA) regulations. The materials will be collected and sent over in a private dumpster by private hauler. The dumpster will have to be transported to and from Water Island by barge.

7.03d Roads, Traffic and Parking

Construction will result in an increase of vehicles and materials brought to Water Island by ferry. The vehicles and supplies will be carried to the proposed project site which is approximately 0.3 miles down a compacted dirt roadway from the barge landing. The roadway is in poor condition and has minimal traffic.

Figure 7.03.1 Photographs of the roadways

Once the project is complete, most guests to the eco resort will arrive on Water Island by the ferry barge which comes in at the public ferry landing. Most people visiting Water Island rent golf carts and the addition of the additional carts on the roads will not have negative impact on traffic. The same is true of the 12 full- and part-time employees at the eco resort. It is probable that most employees will be St. Thomas residents and will travel to Water Island via the public ferry and would then be shuttled to the resort by golf cart or would take a golf cart to the resort. The increase in golf carts on the roadway will not have a negative impact on island traffic.

7.03e Electricity

The eco resort plans to install solar panels on the roofs of the buildings. A total of 167 panels will be installed which should be able to produce a total of 74.31 kilowatts of electricity. The resort will also purchase 275wH batteries and, thus, should normally be self-sufficient. Additional or emergency power requirements will be met by interconnection to the VI Water and Power Authority which has service lines along the roadways.

7.03f Schools

The proposed Eco Resort will hire 12- full and part-time employees drawn from the local labor pool and, therefore, will not put an additional demand on public or private schools.

7.03g Fire and Police Protection

Water Island has its own volunteer fire and rescue (i.e., Water Island Search and Rescue [WISAR]) which would be the first responders in the even of an emergency. The VI police also maintain a presence on Water Island and have a police car which is kept on the island.

7.03h Public Health

The proposed eco resort will have a minor impact on the public health system, in the event that a resort guest becomes ill or injured and seeks emergency treatment at the public emergency room or at a private

emergency office. For more serious or long-term treatment visitors would return home for treatment.

The proposed eco resort will hire 12 full- and part-time employees drawn from the local labor pool; thus, they will not put an additional demand on the public health system.

7.04 Social Impacts

The proposed eco resort will have a positive social impact by providing jobs while repurposing previously developed land which is currently in ruins. The redevelopment of brownfield sites is the best use of previously disturbed areas.

7.05 Economic Impact

The proposed eco resort will have a positive economic impact by providing jobs while repurposing previously developed land which is currently in ruins and is not producing income. The construction of the eco resort will introduce money into the economy through the purchase of materials and the hiring of local contractors. Once in operation the resort will pay hotel taxes and other operational taxes.

7.06 Impacts on Historical and Archeological Resources

A Phase 1A and 1B Cultural Resource Survey was conducted of Plot 19 Water Island by CocoSol International in 2020. The report concluded that "The Phase I Cultural Resources Survey performed for Plot 19, Water Island, St. Thomas, U.S. Virgin Islands resulted in the identification of the remains of four Fort Segarra buildings (A-D). Two of the buildings (B and C) were extensively modified in the past to create a hotel venue. The other two buildings are in ruinous conditions, but their basic plan and wall elevations remain partially preserved.

The U.S. Department of Interior, National Park Service recently commissioned the documentation of World War II era cultural resources on St. Thomas, including Water Island. We note that multiple officer, non-commissioned officer and enlisted barracks on St. Thomas are considered to represent contributing elements to the US Military Resources, St. Thomas, USVI and specifically to the World War II, U.S. Military Installations and Facilities on St. Thomas (U.S. Navy, Marines, and Army) (Longiaru: 2019:1 DRAFT).

The WWII barracks and other Army buildings built on Water Island are differentially preserved, some have been adaptively reused as residences (Patton Mulford, personal communication to Carlos Solís). In the case of Buildings B and C on the subject property, the open bays were subdivided and converted to hotel rooms. Both of these buildings have experienced extensive damage by hurricanes and were noted to be undergoing rehabilitation for future use within the current plan to develop an eco-resort on the subject property.

Buildings A and D appear to have also been damaged during multiple hurricanes. We note that further damage may have been caused by the "re-cycling" of cement blocks. The property records cited above indicate that Building A was a barracks and Building D a mess hall. Our observations are in line with the property records. Building A contains a wholly open bay while Building D contains a large open bay, and a bar or long countertop as shown in Figure 20. Additionally, the attached spaces on the west side of the building likely represent a kitchen and a storeroom. Although both buildings are poorly preserved, they retain sufficient features to contribute to a better understanding of the types of living quarters and mess

halls built on the Fort Segarra post.

We consider the remains Buildings A and D to be contributing elements to the WWII US Army's complex of military buildings and fortifications on Water Island, in this case a barracks and a mess hall, both critical to the military mission on Water Island or any garrisoned force. Buildings B and C have been modified to such an extent that they are not considered to retain sufficient integrity to contribute significant information to architectural and engineering record of the WWII military post on Water Island."

The report recommends that, "the [Virgin Islands State Historic Preservation Office] VISHPO issue a conditioned finding of no objection to the proposed development of the eco-resort, the existing conditions of Buildings A and D should be documented through measured drawings and scale photographs of their plan, elevations and features. These should be submitted to the VISHPO prior to the demolition of Buildings A and D. No further cultural resources management is considered warranted for Buildings B and C or the rest of the subject property, except as mentioned above for Buildings A and D." The developer is in the process of having the buildings documented as recommended. The archeological report is found in Appendix III.

7.07 Recreational Use

Plot 19 – i.e., the proposed project site, is not currently inuse and its redevelopment will have no impact on recreational uses of the site. Guest of the resort will likely visit the military archeological sites on the island and Honeymoon Beach. These are popular Water Island tourist attractions and the addition of up to 58 guests from the eco resort should not create an overuse or overcrowding situation.

7.08 Waste Disposal

Debris associated with the cleanup and demolition of the site will be disposed of following VIWMA regulations. The materials will be collected and sent over in a private dumpster by private hauler. The dumpster will have to be transported to and from Water Island by barge. None of the work associated with this permit will result in the production of any hazardous waste.

7.09 Accidental Spills

The property will have a small back up generator located on the western side of the property near the dumpster. The generator will have an internal fuel storage and will be placed on concrete with redundant containment. A small fuel spill kit will be kept on hand at the generator.

7.10 Potential Adverse Effects Which Cannot Be Avoided

The property has been previously developed and much of it has been cleared. The development will result in the clearing of vegetation most of which is secondary growth. The large water mampoos and scattered larger trees are being preserved wherever possible. The reuse of the existing structures minimizes impact to undeveloped areas.

8.00 MITIGATION PLANS

The proposed project site is habitat for the VI tree boa (*Chilabothrus granti).* The property has adequate interdigitation, prey base for VI tree boas and one was seen on site in the eastern building in May of 2006. Since tree boas have been observed, the development of the site will follow the VI Conservation Measures for the Tree Boa. The site will have to be hand cleared and BBK Development LLC will request DFW to conduct a tree boa training session for all individuals involved in hand clearing. This will include discussions on what to do if a tree boa is encountered, as well as tree boa identification. Photographs of the tree boa will be prominently displayed at the site. Clearing will be limited to construction footprints and those necessary for the installation of the infrastructure and amenities. All vegetation will be cut by hand and the site will be left undisturbed for 5 days prior to the use of heavy machinery. Any stone walls or rally occurring rock piles will be carefully dismantled by hand to allow any tree boas to vacate the site without injury. Per VI Tree Boa guidance, chainsaws are allowed to cut vegetation down to less than 36 inches off the ground. If a VI tree boa is found within any of the working or construction areas, activities in the area will stop and designated personnel will immediately contact DFW for safe capture and relocation, if necessary. A final site visit will be performed by DFW to confirm that hand clearing has been completed to DFW standards. Throughout the project DFW will be notified of any snakes observed.

9.00 ALTERNATIVES TO PROPOSED ACTION

The proposed project could have opted not to utilize the existing structures on site, demolishing all the existing buildings and building new structures. This would have resulted in greater earthwork and potentially more impact to the vegetation on the site.

The proposed project could be more extensively developed resulting in more site disturbance more tree loss and loss of tree boa habitat.

Another undeveloped property could also have been chosen for the eco resort, which could have resulted in more terrestrial impact. Utilizing a previously developed site minimizes overall impact of the proposed project.

10.00 RELATIONSHIP BETWEEN SHORT TERM AND LONG TERM USES OF MAIN'S ENVIRONMENT

The proposed project will repurpose a previously developed site, which is best for both short-term and long-term use of the environment. The re-development of brownfield sites verse greenfield sites preserves the natural environment, and in this case of this project will result in the clean up of a site which currently has ruins and debris.

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APPENDIX I

BIOIMPACT, INC.
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Company Profile

Bioimpact, Inc. is a Virgin Islands Corporation in good standing licensed to do business in the Virgin Islands Since 1986.

Bioimpact, Inc. is qualified to conduct and prepare both terrestrial and marine Environmental Assessment Report required by the Department of Planning and Natural Resources, Division of Coastal Zone Management, and the U.S. Army Corps of Engineers.

Amy Claire Dempsey, principal of Bioimpact, Inc. is certified in wetland delineation by the National Wetland Science Training Cooperative to establish wetland jurisdictional limits for the U.S. Army Corps of Engineers.

Bioimpact, Inc. is experienced in the creation and implementation of wetland, coral, and seagrass mitigation programs.

Bioimpact, Inc. is experienced in preparing Environmental Assessments for federal permitting and the issuance of Findings of No Significant Impact.

Bioimpact, Inc. is experienced in the preparations of Phase I Environmental Site Assessments as set forth in the ASTM Standard Practice Designation E 1527-13 and All Appropriate Inquires and Phase II Environmental Site Assessments as set for in ASTM E1903 – 11.

Biompact Inc. was founded on September 2, 1986 and has been in business for 35 years.

List of Services Bioimpact, Inc. Provides: Terrestrial and Marine Environmental Assessments
Water Quality Assessments
Wetland Delineations
Phase I Environmental Assessments
Sampling of Hazardous Materials
Environmental Reporting
Environmental Monitoring
Coral, Wetland and Seagrass Mitigation

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Ocean Systems Laboratory, Inc.

Education:
M.A. Biology, 1984 (University of Texas)
B.A. Biology, 1979 (University of Texas)

Professional Registrations, Certifications
E.P.A. Certified Laboratory Analyst/Supervisor/Quality Assurance Officer
E.P.A. Certified Water Sampler
National Wetland Science Training Cooperative Certified
Wetland Delineator
P.A.D.I. Dive Instructor

Fields of Specialization

Amy Claire Dempsey has been president and owner of **BIOIMPACT, INC.** a Virgin Islands Corporation, licensed to do business in the Virgin Islands since 1986. She is qualified to conduct and prepare both terrestrial and marine environmental assessment reports as required by the Department of Planning and Natural Resources, Division of Coastal Zone Management, and U.S. Army Corps of Engineers. She is experienced in the establishment of wetland jurisdictional limits for the U.S. Corps of Engineers and is experienced in the creation and implementation of wetland mitigation programs. Ms. Dempsey is experienced in the development and implementation of water quality monitoring programs, and long-term photographic monitoring of the benthic community. Ms. Dempsey is highly experienced in underwater video and inspection. Ms. Dempsey Ms. Dempsey is experienced in the preparation and implementation of coral and seagrass transplanting programs. Ms. Dempsey is experienced in identifying Endangered Species Act listed species in both the terrestrial and marine environments in the U.S. Virgin Islands. Ms. Dempsey is experienced in preparing Biological Assessments and assisting NMFS in the preparation of Biological Opinions and has received take permits for various species and is experienced including the relocation of ESA listed species. Ms. Dempsey is experienced in establishing undersea cable and pipeline routes and monitoring cable installation. Ms. Dempsey is a certified laboratory analyst and has served as the laboratory director of Ocean Systems Laboratory, Inc. an E.P.A. Certified Laboratory. Ms. Dempsey is experience in designing and implementing sampling programs for Recognized Environmental Concerns (RECs), including pesticides, herbicides, metals, asbestos, mold, fungus and bacterial contamination. Ms. Dempsey is experienced in developing and implementing sampling plans following EPA, NMFS and COE guidelines and preparing and implementing Quality Assurance Program Plans (QAPP) following EPA guidelines.

Professional Experience

Large Scale Water Quality and Benthic Monitoring Studies

Development and Implementation of the Water Quality Monitoring and Compensatory Mitigation Plans for the Installation of a SPM at the Limetree Bay Terminal on St. Croix.

Development and Implementation of the Water Quality Monitoring and Compensatory Mitigation Plan for the Construction of Veterans Drive, St. Thomas for Virgin Islands Department of Public Works.

Development and implementation of the Water Quality Monitoring and Coral Transplant Monitoring for Improvements to the Frederiksted Pier, Crown Bay Marine Terminal, Crown Bay Marina, Enighed Pond and Molasses Dock for the Virgin Islands Port Authority.

Development and implementation of the Water Quality Monitoring and Seagrass Transplanting for the Dredging of the Charlotte Amalie Harbor for the Virgin Islands Port Authority.

Development and implementation of the Water Quality Monitoring Program for the construction of the GCL and ATT Cable Landing Facilities, and Placement of Submarine Cables Mitigation Programs

Implementation of the Coral Transplanting for the installation of the Mangrove Lagoon Sewage Outfall for LTI, contracted to the Virgin Islands Department of Public Works.

Development and implementation of a plan for the creation of 2.8 acres of wetland for the Virgin Islands Port Authority at Enighed Pond, St. John

Development and implementation of a plans for the creation of wetlands and enhancement of wetlands for the Puerto Rico Highway and Transit Authority for PR 20, PR 5, PR 22 and Tren Urbano.

Environmental Assessment Reports

Since 1986, Ms. Dempsey has worked on over 170 Environmental Assessment Reports in the U.S. Virgin Islands, as well as, Puerto Rico, Florida, and the British Virgin Islands. The scope of projects ranges from major industrial activities, submarine cables, hotels, and marine facilities to mariculture farms and artificial reef creation.

Phase I Environmental Assessments/Hazardous Materials Sampling/Bacteria/Mold/Fungus

Ms. Dempsey has served as principal field investigator and sampler with Bioimpact, Inc. and Ocean Systems Laboratory, Inc., for the sampling of lead, copper, asbestos, pesticides, hydrocarbons, PCB's, other hazardous materials, bacterial contamination, mold, and fungus.

Diver Surveys

Ms. Dempsey has conducted diver surveys for cable landings, harbor obstructions, piling and bulkhead inspections, and vessel damage.

Primary Area of Expertise

Ms. Dempsey has served as principal field investigator for the last 33 years with Bioimpact, Inc. Her responsibilities include field surveys, identification of fauna and flora, both terrestrial and marine, underwater photography, inspection and video, wetland delineations, and the development and implementation of mitigation, sampling and monitoring programs. She has worked diligently with clients to help develop environmental sensitive projects, which in turn helps facilitate permitting.

Teaching Experience

Ms. Dempsey has taught Oceanography, as well as labs in Estuarine Ecology and Marine Microbial Ecology at the University of Texas.

Research Experience

Ms. Dempsey has conducted research on bacterial communities within the gut of shrimp, distribution of molds and yeast in estuarine communities in Laguna Madre and distribution of contaminants in cisterns in the USVI.

APPENDIX II

VI Tree Boa: Site Clearance Protocol

Tracts of wooded habitat and associated understory outside the footprint and setback of the building and not required for infrastructure should be retained as tree boa habitat. Connections with habitat on adjacent property should be left intact.

All personnel will be instructed in identifying this harmless snake and photographs of the VI Tree Boa are to be prominently displayed on this notice at the site.

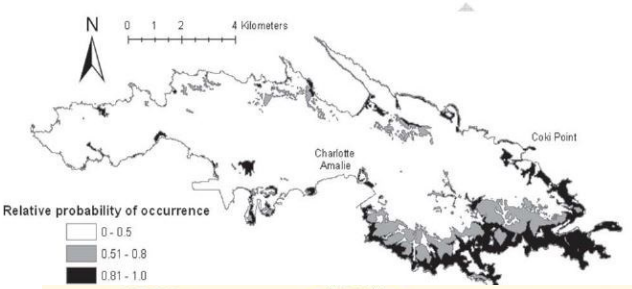
At least 10 days prior (if under 1 acre) to the use of heavy machinery on the site, the site is to be flagged and vegetation cut by hand, saving trees where possible. Any stone walls or naturally occurring rock piles must be carefully dismantled by hand as these are refuges for the snake. This will allow any boas present to vacate the site without injury. If the area to be cleared exceeds 1 acre then the resting period is 14 days.

Any trees with trunks greater than 7 cm diameter that are felled should be placed in a undisturbed location to allow snakes hiding in tree holes to vacate.

The Division of Fish and Wildlife (DFW) or an on-site agent should be notified of any snakes observed or captured. If a snake is in imminent danger, the snake can be moved to undisturbed habitat outside the construction area that has been pre-approved by DFW. If no undisturbed habitat exists near the site, the landowner or agent shall identify a suitable release site in collaboration with DFW prior to any vegetation clearance. A permit from DFW under section 2(b) of the Cooperative Agreement will be required for all personnel involved in any snake handling or relocation activities.

Once these measures have been completed and the hand-cleared site has been inspected for the presence of any boas, heavy machinery may be used to clear the remainder of the site.

All personnel involved in site preparation and construction must be verbally instructed on the importance of snake protection and preservation and all procedures developed for that purpose. Personnel will be informed of the penalties for injury to any snake encountered.



The Division of Fish and Wildlife may be called during any of the above steps to assist with snake removal or to verify compliance with this protocol. Please note that any boas killed or injured at the site will constitute a violation under the federal Endangered Species Act, which can be avoided by carefully following the preceding steps. For further information, please contact the Division of Fish and Wildlife at (340) 775-6762.

Step By Step guide for clearing in VI Tree-Boa habitat

Division of Fish and Wildlife (DFW)

(340)775-6762

1. Contact DFW for free consultation.
2. DFW will come out for an onsite discussion. We will need a copy of your building plans or at least a narrative of your intended project.
3. DFW will coordinate via email so that all developers, owners, contractors, and other agencies, can follow along and provide input.
4. DFW will conduct a short VI Tree-Boa training session for all individuals conducting hand clearing. This will involve discussions on what to do if a boa is encountered as well as boa identification. This can be done any time prior to hand clearing but is often preformed the first day on site. DFW staff will come to you!
5. Hand clearing is to be performed. This usually allows for chainsaws to cut vegetation down to less than 36 inches off the ground.
6. Vegetation ideally can be removed by hand to reinforce sediment fencing/ brush berms.
7. Another site visit will be preformed by DFW to confirm that hand clearing has been completed to our standards. Clock starts after inspection.
8. The site is to sit undisturbed for 10-14 days prior to the use of heavy machinery. However hand work may be performed during this time and any vegetation may be moved by hand.
9. Heavy machinery is only permitted on the agreed upon date.

U.S. Fish & Wildlife Service

USVI boa conservation measures

Virgin Islands Tree Boa

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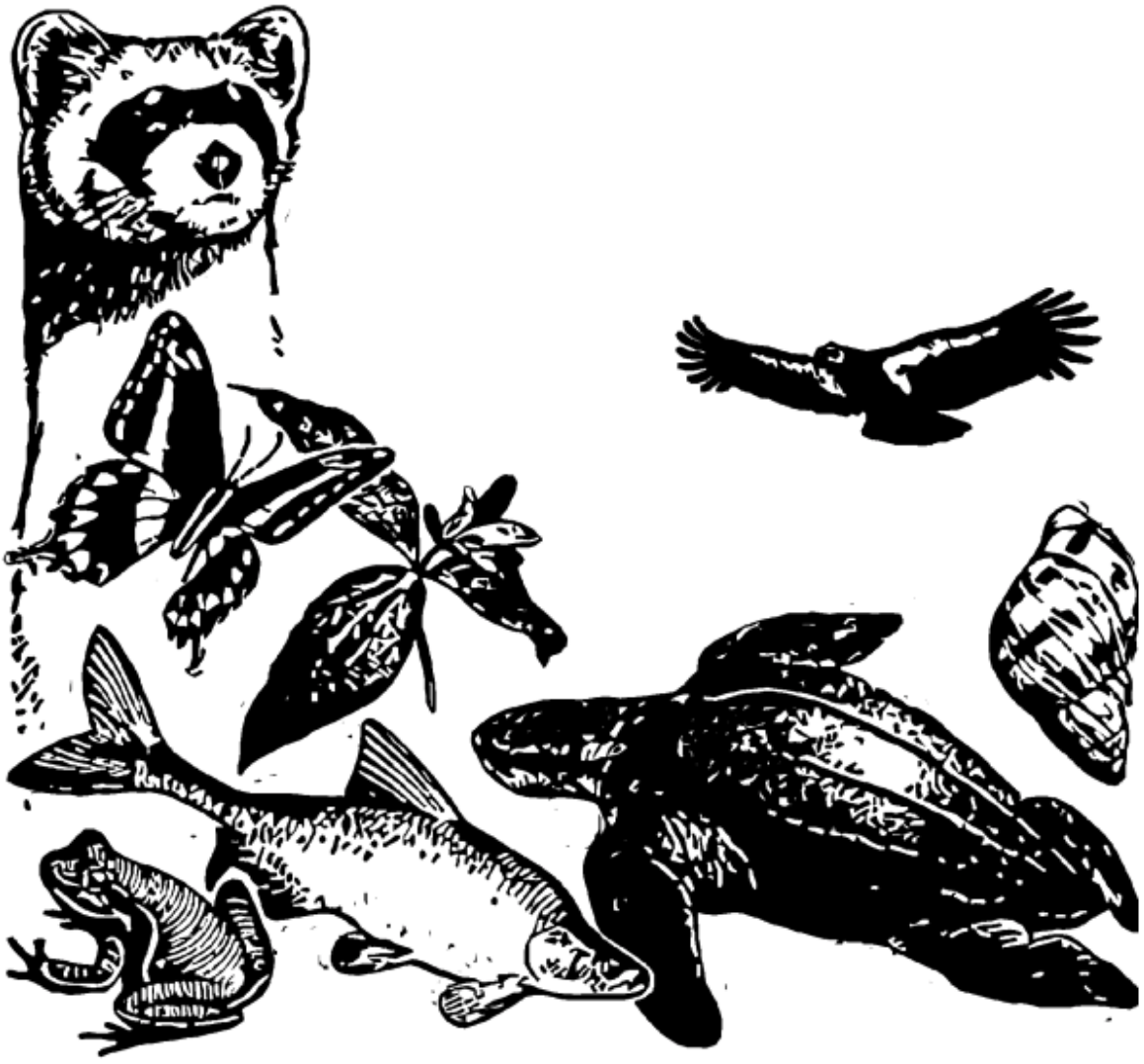

IPaC - Information for Planning and Consultation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish and Wildlife Service environmental review process.

U.S. FISH AND WILDLIFE SERVICE
CARIBBEAN ECOLOGICAL SERVICES FIELD OFFICE

Conservation Measures for the Virgin Islands tree boa (*Chilabothrus granti*)

The endangered Virgin Islands (VI) tree boa (*Chilabothrus granti*, formerly *Epicrates monensis granti*) is a small, slender, nocturnal, arboreal non-venomous snake. The VI boa does not pose any life threating danger to human beings. Although considered docile, some individuals might try to bite if disturbed or during capture and handling. Newborn and juveniles are a light grey with brown to black blotches along their bodies, and darken as they mature into adults. Adults may reach between 3 to 4 feet in length.

Within U.S. jurisdiction, VI boas are found on the northeast side of Puerto Rico, Culebra Island, east end of St. Thomas, and on a few offshore cays. They are also found in some islands in the British Virgin Islands. VI boas generally live in xeric (dry) habitat, which is characterized by poor rocky soils, in scrub woodland or subtropical dry forest with high density of interdigitating branches and vines connecting adjacent tree canopies. The VI boa is difficult to detect in the wild and can be found moving among branches, vines, and crawling on the ground at night. During the day, they are mostly sheltered and out of sight. Some individuals have been found in or close to houses, especially if near their habitat.

All construction projects should avoid affecting the VI boa and its habitat. Thus, the U.S. Fish and Wildlife Service (Service) has developed the following conservation measures with the purpose of assisting others to avoid and minimize adverse impacts to the species and its habitat.

Last Revised: November 2020

These recommendations may be incorporated into development projects. Depending on the project, additional conservation measures can be implemented besides the ones presented in this document.

Conservation Measures for Puerto Rico:

1. Inform all project personnel about the potential presence of the VI boa in areas where the proposed work will be conducted. A pre-construction meeting should be conducted to inform all project personnel about the need to avoid harming this species as well as penalties for harassing or harming boas. An educational poster or sign with photo or illustration should be displayed at the project site.

2. Prior to any construction activity, including removal of vegetation and earth movements, the boundaries of the project area and areas to be excluded and protected should be clearly marked in the project plan and in the field in order to avoid further habitat degradation into forested and conservation areas.

3. Once areas are clearly marked and prior to any construction activity, including removal of vegetation and earth movements, a biologist or experienced personnel should survey the areas to be cleared to ensure that no boas are present within the work area.

4. The VI boa is considered more active at night. Thus, in order to maximize VI boa detection, the species can be searched for the night(s) prior to any vegetation clearing starts according to the construction plan.

5. Once the area has been searched for VI boas, vegetation should first be cleared by hand to the maximum extent possible. Vegetation should first be cut about one meter above the ground, prior to the use of heavy machinery for land clearing. Once land is cleared by hand, this will allow boas present on site to potentially move away on their own to adjacent available habitat.

6. For all boa sightings (dead or alive), record the time and date of the sighting and the specific location where it was found. VI boa data should also include a photo of the animal (dead or alive), relocation site GPS coordinates, the time and date, and comments on how the boa was detected, and its behavior.

7. If a VI boa is found within any of the working or construction areas, activities should stop at the area where the VI boa is found and information recorded accordingly (see #6). **Do not capture the boa.** If boas need to be moved out of harm's way, , designated personnel shall immediately contact Puerto Rico Department of Natural and Environmental Resources (PRDNER) Rangers for safe capture and relocation of the animal (PRDNER phone #s: 787-724-5700, 787-230-5550, 787-771-1124). If immediate relocation is not an option, project-related activities at this area must stop until the boa moves out of harm's way on its own. If a VI boa is captured by the PRDNER , record the name of the PRDNER staff and information on where the VI boa will be taken. This information should be reported to the Service.

Last Revised: November 2020

8. Measures should be taken to avoid and minimize VI boa casualties by heavy machinery or motor vehicles being used on site. Any heavy machinery left on site (in staging areas) or near potential VI boa habitat (within 50 meters of potential boa habitat), needs to be thoroughly inspected each morning before work starts to ensure that no boas have sheltered within engine compartments or other areas of the equipment. If VI boas are found within vehicles or equipment, do not capture the animal and let it move on its own or call PRDNER Rangers for safe capture and relocation of the animal (see #7).

9. VI boas may also enter or occur within debris piles. Measures should be taken to avoid and minimize boa casualties associated with sheltering in debris piles as a result of project activities. Debris piles should be placed in areas farthest away from forested areas. Prior to moving, disposing or shredding, debris piles should be carefully inspected for the presence of boas. If debris piles will be left on site, we recommend they be placed in an undisturbed area.

10. If the event a dead VI boa is found, immediately cease all work in that area and record the information accordingly (see #6). If the VI boa was accidentally ?killed as part of the project actions, please include information on what conservation measures had been implemented and recommendations on what will be done to avoid further killing more individuals. A dead VI boa report should be sent by email (see contacts below) to the Service within 48 hours of the event. If possible, place the dead VI boa in a container or bag and frozen for later collection by the Service (José Cruz-Burgos, Endangered Species Coordinator, mobile 787-510-5206, email: jose_cruz-burgos@fws.gov) or other partner.

11. Projects must comply with all state laws. Please contact the PRDNER for further guidance.

Conservation Measures for the USVI:

1. Contact Government of the Virgin Islands, Department of Planning and Natural Resources, Division of Fish and Wildlife (DFW) at (340) 775-6762, for consultation.

2. DFW will come out for an on-site discussion. They will need a copy of your building plans or a narrative of your intended project. DFW will coordinate via email so that all developers, owners, contractors, and other agencies, can follow along and provide input.

3. DFW will conduct a short VI boa training session for all individuals conducting hand clearing. This will involve discussions on what to do if a boa is encountered as well as boa identification. This can be done any time prior to hand clearing but is often preformed the first day on site. Photographs of the VI boa are to be prominently displayed at the site.

Last Revised: November 2020

4. At least 5 days prior to the use of heavy equipment on the site, the site vegetation may be cut by hand. Any stone walls or naturally occurring rock piles must be carefully dismantled by hand as these are refuges for the snake. This will allow any boas present to vacate the site without injury.

5. Only hand clearing of vegetation is to be performed. This allows the use of chainsaws cutting vegetation down to less than 36 inches off the ground.

6. If a VI boa is found within any of the working or construction areas, activities should stop at the area where the VI boa is found. If boas need to be captured immediately to continue work and avoid harming the boa during the project activities, designated personnel shall immediately contact the DFW for safe capture and relocation

7. DFW should be notified of any snakes observed.

8. Another site visit will be performed by DFW to confirm that hand clearing has been completed to our standards. The waiting period clock starts after inspection.

9. The site is to be left undisturbed for 5 days prior to the use of heavy machinery. However manual work may continue to be performed during this time and any vegetation may be moved by hand.

10. Use of heavy equipment is only permitted to start after the agreed upon date.

If you have any questions regarding the comments above, please contact the USFWS Monday to Friday 8am-4:30pm:

- Marelisa Rivera, Deputy Field Supervisor
    - Email: marelisa_rivera@fws.gov
    - Office phone 787-851-7297 ext. 206 or mobile 787-510-5219
- José Cruz-Burgos, Endangered Species Coordinator
    - Email: jose_cruz-burgos@fws.gov
    - Office phone 787-851-7297 ext. 218 or mobile 787-510-5206

Last Revised: November 2020

Walt Basnight, PE
Structural Engineer

6501 Red Hook Plaza Suite 201
St. Thomas, VI 00802
waltbasnight@gmail.com
(252) 241-5392

August 11, 2021

Barry Osborne
BBK Development, LLC

Via email: barry@flatout.uk.net

RE: Stormwater Analysis
Water Island Development
Lot 19
Water Island, USVI

Dear Barry:

As requested, a stormwater analysis of the subject property was performed, analyzing both pre-development and post-development conditions to determine conditions for a 25-year rain event. Based on the findings, a detention pond and outlet were sized for the development to retain water until an outflow rate less than the predevelopment rate could be realized.

Please let me know if you have any questions.

Sincerely,

Walt Basnight, PE

Attachments: Site Plan
TR-55 Software Output

LOT-19
BBK DEVELOPMENT
8/11/21

Sk-01

DETENTION POND
SURFACE AREA: 2000 SF
DEPTH: >2 FT
OUTLET: 24"Ø

COASTLINE

LOT 20B

LOT 20

LOT 111

AREA Y

LOT 20B

EAST BUILDING CLOSEST POINT TO BOUNDARY 15'-6" AS EXISTS

(3) PARKING SPACES

(2) PARKING SPACES

SEWAGE TREATMENT PLANT:
OVERFLOW PUMPED TO GRAY WATER CISTERN AND USED FOR LANDSCAPING.
DESIGN AND INSTALLATION TO BE CARRIED OUT BY APPROVED QUALIFIED INSTALLATION TECHNICIAN.

MAKE GOOD EXISTING DIRT ROAD GRAVEL OR OTHER SIMILAR PERMEABLE SURFACE EXTENDED TO SERVE THE PROPOSED (4) VILLAS.

CATCHMENT POND WITH FOUNTAIN OVERFLOW TO EXISTING DRAINAGE DITCH.
DESIGN TO SPECIALIST DETAIL

(3) ONE BEDROOM UNITS
TWO STOREY

EXTEND EXISTING DERELICT STRUCTURE APPROX. 21'x117' TO ACCOMODATE 15 PARKING SPACES.
TO BE USED FOR MATERIAL STAGING AREA DURING CONSTRUCTION

(8) STUDIO UNITS
SINGLE STOREY

POOL BAR AND RESTAURANT
GARDEN CAFE BETWEEN EXISTING BUILDINGS

EXISTING WASTE PIPE TO BE REPLACED WITH NEW AND CONNECT TO NEW SEWAGE TREATMENT PLANTS.

SEWAGE TREATMENT PLANT:
OVERFLOW PUMPED TO GRAY WATER CISTERN AND USED FOR LANDSCAPING.
DESIGN AND INSTALLATION TO BE CARRIED OUT BY APPROVED QUALIFIED INSTALLATION TECHNICIAN.

EXISTING BOUNDARY LINE
10'-0" SETBACK LINE
EXISTING DIRT ROAD
RECEP/OFFICE
EXIST.
EXISTING EAST BUILDING
KITCHEN
GARDEN CAFE
WEST BUILDING
PROPOSED (4) TWO BEDROOM COTTAGES
SUBJECT OF FUTURE APPLICATION
PROPOSED DRIVEWAY ACCESS
TURNING
ADJOINING PROPERTY
35'-0" SETBACK LINE
EXISTING BOUNDARY LINE
(4) PARKING SPACES
GENERATOR SHED/GARBAGE DUMPSTER
WEST BUILDING CLOSEST POINT TO BOUNDARY 21'-6" AS EXISTS
AREA V
MARINA BASIN

WATER FLOW
SILT FENCE

PROPOSED SITE LAYOUT
1/32" = 1'-0"

SITE PLAN
N.T.S.

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REVISIONS

	DATE	ITEM
A		

EAL
EDMUND ARCHITECTURAL LTD
ARCHITECTURE
PLANNING
PROJECT MANAGEMENT

BVI: +1 (284) 346 7000
BRIANEDMUNDEAL@GMAIL.COM

PROJECT
PROPOSED RE-DEVELOPMENT OF
LOT 19
WATER ISLAND
US VIRGIN ISLANDS
FOR
BBK DEVELOPMENTS LLC

DESCRIPTION
PROPOSED SITE LAYOUT

SCALE 1/32"=1'-0" ON 24"x36" PAPER
DRAWN BE
DATE AUG 2020
JOB 1808
SHEET 001

WB

Lot 19 - Water Island
Existing Condition
St. Thomas-Sw County, Virgin Islands

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 25-Yr (cfs) (hr)
SUBAREAS	
Lot 19	32.81 11.93
REACHES	
OUTLET	32.81

1/6

WB

Lot 19 - Water Island
Developed Condition
St. Thomas-Sw County, Virgin Islands

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 25-Yr (cfs) (hr)
SUBAREAS	
Lot 19	34.42 11.93
REACHES	
OUTLET	34.42

216

WB

Lot 19 - Water Island
Developed Condition
St. Thomas-Sw County, Virgin Islands

Hydrograph Peak/Peak Time Table (Trial #1)

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 25-Yr (cfs) (hr)
SUBAREAS	
Lot 19	34.42
	11.93
REACHES	
Basin	34.42
	11.93
Down	18.62
	12.06
OUTLET	18.62

3/6

WB

Lot 19 - Water Island
Developed Condition
St. Thomas-Sw County, Virgin Islands

Hydrograph Peak/Peak Time Table (Trial #2)

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 25-Yr (cfs) (hr)
SUBAREAS	
Lot 19	34.42
	11.93
REACHES	
Basin	34.42
	11.93
Down	23.09
	12.04
OUTLET	23.09

WB

Lot 19 - Water Island
Developed Condition
St. Thomas-Sw County, Virgin Islands

Hydrograph Peak/Peak Time Table (Trial #3)

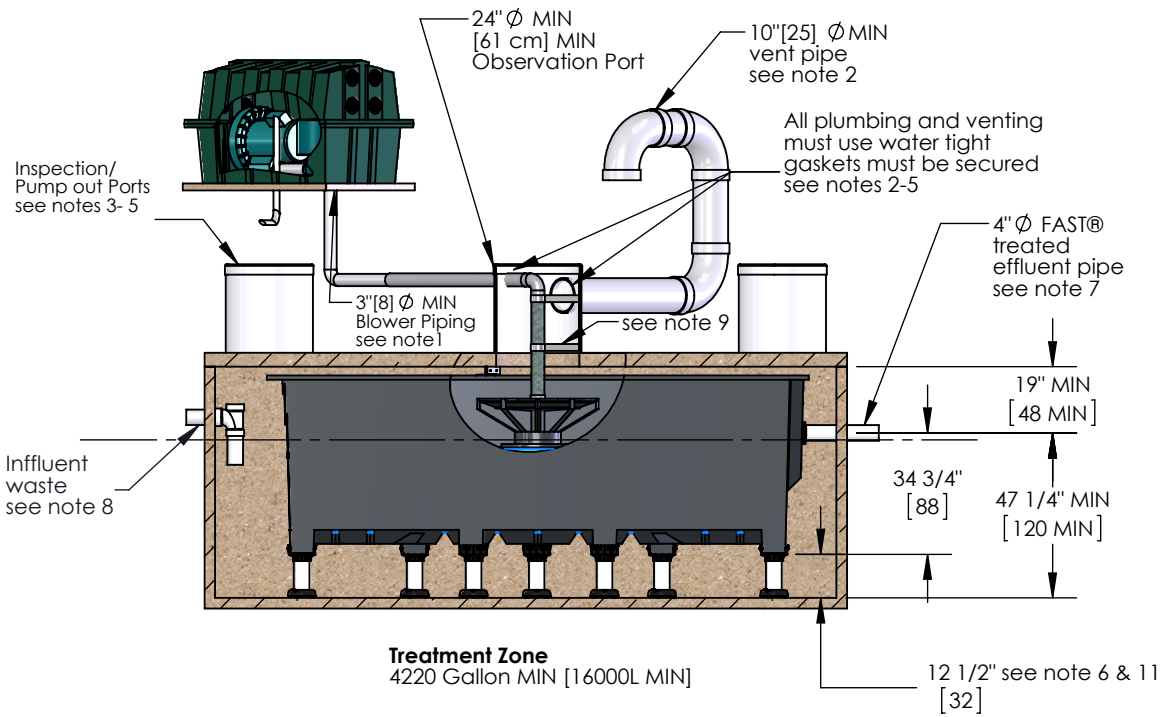
Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 25-Yr (cfs) (hr)
SUBAREAS	
Lot 19	34.42
	11.93
REACHES	
Basin	34.42
	11.93
Down	30.59
	11.97
OUTLET	30.59

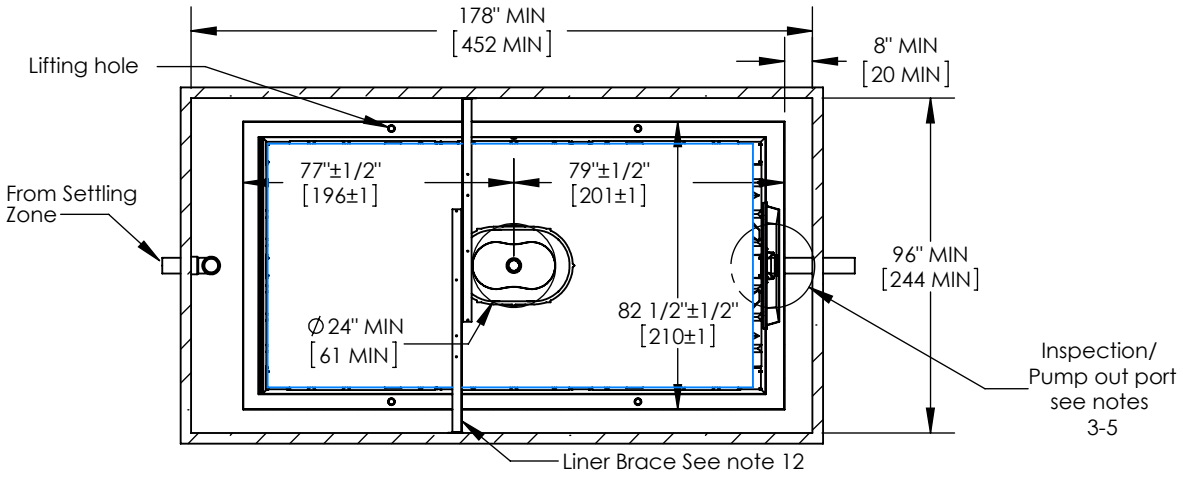
5/16

Lot 19 - Water Island
Developed Condition
St. Thomas-Sw County, Virgin Islands

Structure Output Table

Reach Identifier / Structure Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period 25-Yr
Reach: Basin	
Pipe : Basin	
15(in)	
PF (cfs)	18.62
SV (ac ft)	.30
STG (ft)	6.67
18(in)	
PF (cfs)	23.09
SV (ac ft)	.19
STG (ft)	4.28
24(in)	
PF (cfs)	30.59
SV (ac ft)	.05
STG (ft)	1.12





NOTES

1. Airline piping to FAST® may not exceed 100 FT [30m] total length and have a maximum of 4 elbows in the piping system. For distances greater than 100 FT [30m] consult factory. Blower must be located above flood levels on a concrete base 57" X 36" X 2.5" [150 X 90 X 7cm] minimum.
2. Vent to desired location and cover opening with a vent grate with at least 20 sq in.[125 sq. cm] open surface area. Secure with stainless steel screws. Vent piping must not allow condensate build up or create back pressure. Vent must be above finished grade or higher (see sheet 3 of 3).
3. All appurtenances to FAST® (e.g. tanks, access ports, electrical, etc.) must conform to all applicable country, state, province, and local plumbing and electrical codes. Pump out access shall be adequate to thoroughly clean out both zones.
4. All inspection, viewing and pump out ports must be secured to prevent accidental or unauthorized access.
5. Tank, piping, conduit, etc. are provided by others. Blower control system by Bio-Microbics, Inc. See Installation Manual.
6. If less than the specified minimums are considered necessary, consult factory for guidance.
7. All piping and ancillary equipment installed after FAST must not impede or restrict free flow of effluent.
8. The tank(s) shall be designed to prevent air passage between the settling zone/tank and the treatment zone and preventing an air lock. Examples include a baffle wall sealed to the lid or treatment zone inlet line with a pipe cap. Consult factory for guidance.
9. The air supply line into the FAST® unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2' min [60 cm]. See alternate air supply option on sheet 3 of 3.
10. Specialized treatment levels may require specific features to be incorporated into the design. Consult factory for guidance.
11. Refer to sheet 3 of 3 for leg extensions requirements.
12. Secure provided support braces to prevent movement.

APPENDIX IV

DO NOT SCALE

UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS]
TOLERANCES
± 0.02 IN/IN
[± 0.05 CM/CM]

BIO MICROBICS
BETTER WATER. BETTER WORLD.

MicroFAST 4.5 FAST Unit

WEIGHT	lb	SIZE	DRAWING NUMBER		SHEET
NAME	DATE	A	MicroFAST 4.5 with feet		1 OF 3
DRAWN CTC	5/10/2006				
CHECKED PF	12/18/2014	REVISED 12/18/2014		REV. INI-07-W	

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BIO-MICROBICS © 2015

Specifications for MicroFAST 4.5 Wastewater Treatment System

1. GENERAL

The contractor shall furnish and install (1) MicroFAST 4.5 treatment system as manufactured by Bio-Microbics, Inc. The treatment system shall be complete with all needed equipment as shown on the drawings and specified herein.
The principal items of equipment shall include FAST System insert, leg extensions, blower assembly, blower controls and alarms. The MicroFAST 4.5 unit shall be situated within a 4,220 Gallon (16,000 L) minimum tank, as shown on the plans. Suggested maximum settling tank(s) equaling ½ to 1 x daily flow must be used prior to FAST. Tank must provide adequate pump out access and conform to local, state, and all other applicable codes. The contractor shall provide coordination between the FAST system and tank supplier with regard to fabrication of the tank, installation of the FAST unit and delivery to the job site.

2. OPERATING CONDITIONS

The MicroFAST 4.5 treatment system shall be capable of treating the wastewater produced by typical family activities (bath, laundry, kitchen, etc.) ranging from (18) eighteen to (63) sixty-three persons and not to exceed 4,500 US Gallons per day (17,000 LPD) provided the waste contains nothing that will interfere with biological treatment. The FAST system is a biological treatment system not meant for non-biodegradable or industrial wastewater.

3. MEDIA

The FAST media shall be manufactured of rigid PVC, polyethylene, or polypropylene and it shall be supported by the polyethylene insert. The media shall be fixed in position and contain no moving or wearing parts and shall not corrode. The media shall be designed and installed to ensure that sloughed solids descend through the media to the bottom of the septic tank.

4. BLOWER

The MicroFAST 4.5 unit shall come equipped with a regenerative type blower capable of delivering 90-140 CFM [185-238m3/hr]. The blower assembly shall include an inlet filter with metal filter element. Blower piping to the tank shall use non-corrosive material (Galvanized, or Stainless Steel). Do not run galvanized pipe inside the treatment tank. Refer to Installation Manual for further details.

5. REMOTE MOUNTED BLOWER

The blower elevation must be higher than the normal flood level. A two-piece, rectangular housing shall be provided with tamper-proof screws. The discharge air line from the blower to the MicroFAST shall be provided and installed by the contractor.

6. ELECTRICAL

The electrical source should be within 150 feet [45 meters] of the blower. Consult local codes for longer wiring distances. All wiring must conform to code. Input power on 60Hz electrical systems 220/460VAC, 3Ø, 6.4/3.3 FLA, on 50 Hz electrical systems 230/380VAC, 3Ø, 6.1/3.5 FLA. Other voltages and phase are also available. Actual power consumption varies with site conditions. All conduit and wiring shall be supplied by contractor.

7. ALARMS

The alarm system shall consist of a visual and audible alarm to indicate loss of power to the blower. A manual silence switch is included.

8. INSTALLATION AND OPERATING INSTRUCTIONS

All work must be done in accordance with local codes and regulations. Installation of the MicroFAST 4.50 shall be done in accordance with the written instructions provided by the manufacturer.
An operation and maintenance manual shall be furnished, which will include a description of system installation, operation, and maintenance procedures.

Treatement unit weighs approximately 1600 pounds [726kg]. Four holes for lifting the FAST liner are supplied. Spreader bars are to be used in lifting the unit. Place spreader bars between lifting holes.

9. FLOW & PIPE SIZING

Each FAST module is provided with a standard (4) four inch effluent pipe hole and gasket. An optional (6) six inch hole and gasket can be utilized consult factory for guidance.

FAST systems have been successfully designed, tested and certified receiving gravity, demand-based influent flow. When influent flow is controlled by pump or other means to help with highly variable flow conditions, then multiple dosing events should be used to maximize performance. The flow rate shall not exceed 15 gpm (57 Lpm) with a maximum hourly flow not to exceed 10% of the design daily flow (450 gph (1700 LPH)).

10. WARRANTY

Bio-Microbics, Inc. warrants all new residential FAST® models (MicroFAST® 3.0, 4.5, and 9.0) against defects in materials and workmanship for a period of one year after installation or eighteen (18 months) from the date of shipment which ever occurs first. All other FAST® system models are warranted for a period of one year after installation or eighteen months from date of shipment, whichever occurs first. All are subject to the following terms and conditions below:

During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions, and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by Bio-Microbics, Inc., Bio-Microbics, Inc. will repair or replace at its discretion such defective parts free of charge. Defective parts must be returned by owner to Bio-Microbics, Inc.'s factory postage paid, if so requested. The cost of labor and all other expenses resulting from replacement of the defective parts and from installation of parts furnished under this warranty and regular maintenance items such as filters or bulbs shall be borne by the owner. This warranty does not cover general system misuse, aerator components which have been damaged by flooding or any components that have been disassembled by unauthorized persons, improperly installed or damaged due to altered or improper wiring or overload protection. This warranty applies only to the treatment plant and does not include any of the structure wiring, plumbing, drainage, septic tank or disposal system. Bio-Microbics, Inc. reserves the right to revise, change or modify the construction and/or design of the FAST system, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in present equipment. Bio-Microbics, Inc. is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defect in design, material, or workmanship, or delays in delivery, replacements or repairs.

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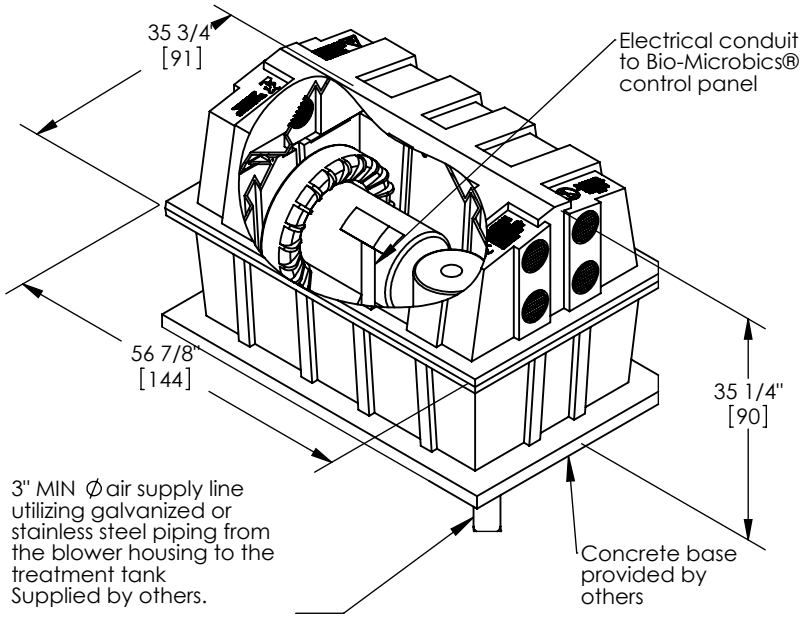
DO NOT SCALE

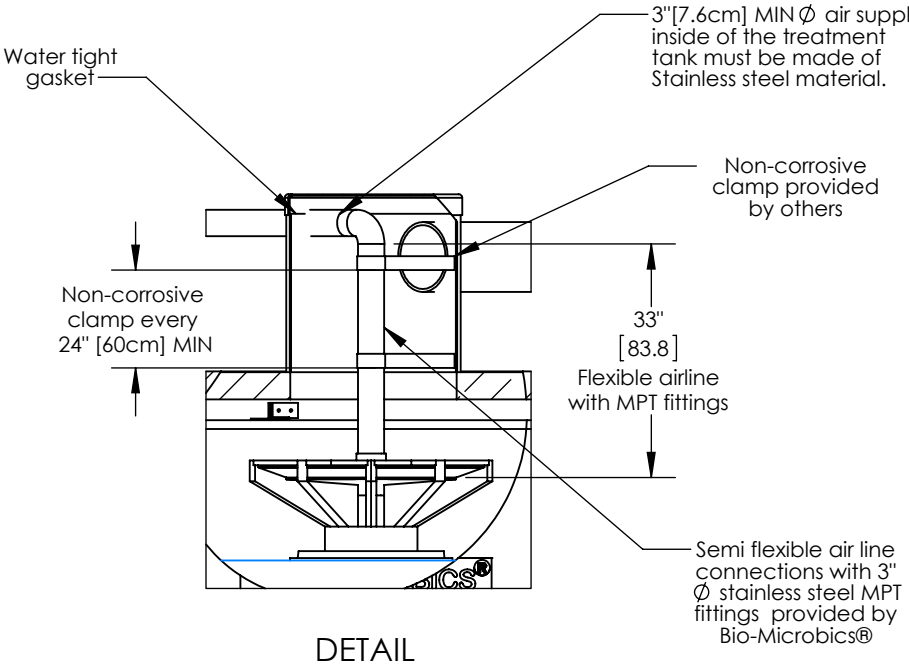
UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS]
TOLERANCES
± 0.02 IN/IN
[± 0.05 CM/CM]

BIO MICROBICS
BETTER WATER. BETTER WORLD.

MicroFAST 4.5 FAST Unit

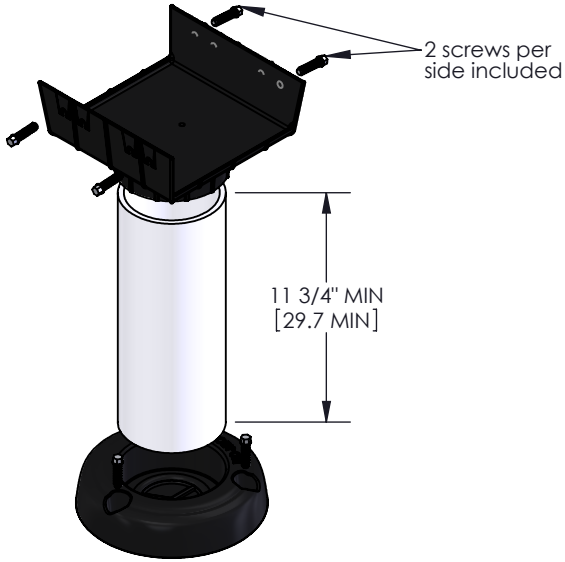
WEIGHT lb		SIZE	DRAWING NUMBER		SHEET
NAME	DATE	A	MicroFAST 4.5 Specifications		2 OF 3
DRAWN	5/10/2006				
CHECKED PF	12/18/2014	REVISED 12/18/2014		REV.	





DETAIL
SCALE 2 : 55

Minimum leg extension assembly see notes 1-4



Notes

1. Secure leg extension to the FAST® unit by placing two screws on each side of the leg extension (4 screws per foot are included).
2. Cut 4" schd. 40 PVC pipe (not included) to obtain the desired height. Minimum pipe length of 11 3/4" [29.7cm]. For heights greater than 18" [45.7cm] use schd. 80 PVC pipe (not included). Consult factory for extending leg beyond 36"[90 cm].
3. Anchor the leg extensions to the tank with non-corrosive hardware (not included) at the provided mounting points.
4. If less than the specified minimums are considered necessary, consult factory for guidance.
5. The air supply line into the FAST® unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2ft [0.6m] minimum. The unit is supplied with 3" ∅ semi-flexible airline connections with stainless steel MPT fittings and sample U-shape pipe clamps.
6. Tank, anchors, liner brace, piping conduit, blower, housing pad and vents are provided by others.

DO NOT SCALE

UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS]
TOLERANCES
± 0.02 IN/IN
[± 0.05 CM/CM]

BIO MICROBICS
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MicroFAST 4.5 FAST Unit

WEIGHT	lb	SIZE	DRAWING NUMBER	SHEET
NAME	DATE	A	MicroFAST 4.5 Details	3 OF 3
DRAWN CTC	5/10/2006			
CHECKED PF	12/18/2014	REVISED 12/18/2014	REV. INI-07-W	

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PHASE I A & B CULTURAL RESOURCES SURVEY
PLOT 19, WATER ISLAND
ST. THOMAS, U.S. VIRGIN ISLANDS

Prepared for:

Barry Osborn

Prepared by:

CocoSol International Inc.
1225 Moselle Ave. Apt. 16
Orlando, FL 32807

November 29, 2020

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1.0 INTRODUCTION

Cocosol International Inc., (CocoSol) performed a Phase I Cultural Resources Survey (*Survey*) for approximately four acres of land located on Plot 19, Water Island, St. Thomas, U.S. Virgin Islands (Figures 1 and 2). The *Survey* was performed for Mr. Barry Osborn (Client) during the month of November 2020.

Figure 1: Google Earth image of Water Island depicting the location of the survey area

1.1 Proposed Development

We understand that our Client proposes to rehabilitate two existing buildings on the subject property, demolish one or possibly two, and construct other amenities and infrastructure to develop an eco-resort. Said development will require earth change activities.

1.2 Regulatory Framework

Because of the earth change activities necessary to develop the resort, the project is required to comply with Title 29, Chapter 17, Section 959, of the Virgin Islands Code, also known as the Virgin Islands Antiquities and Cultural Properties Act. The *Survey* performed for the subject property complies with the requirements cited above.

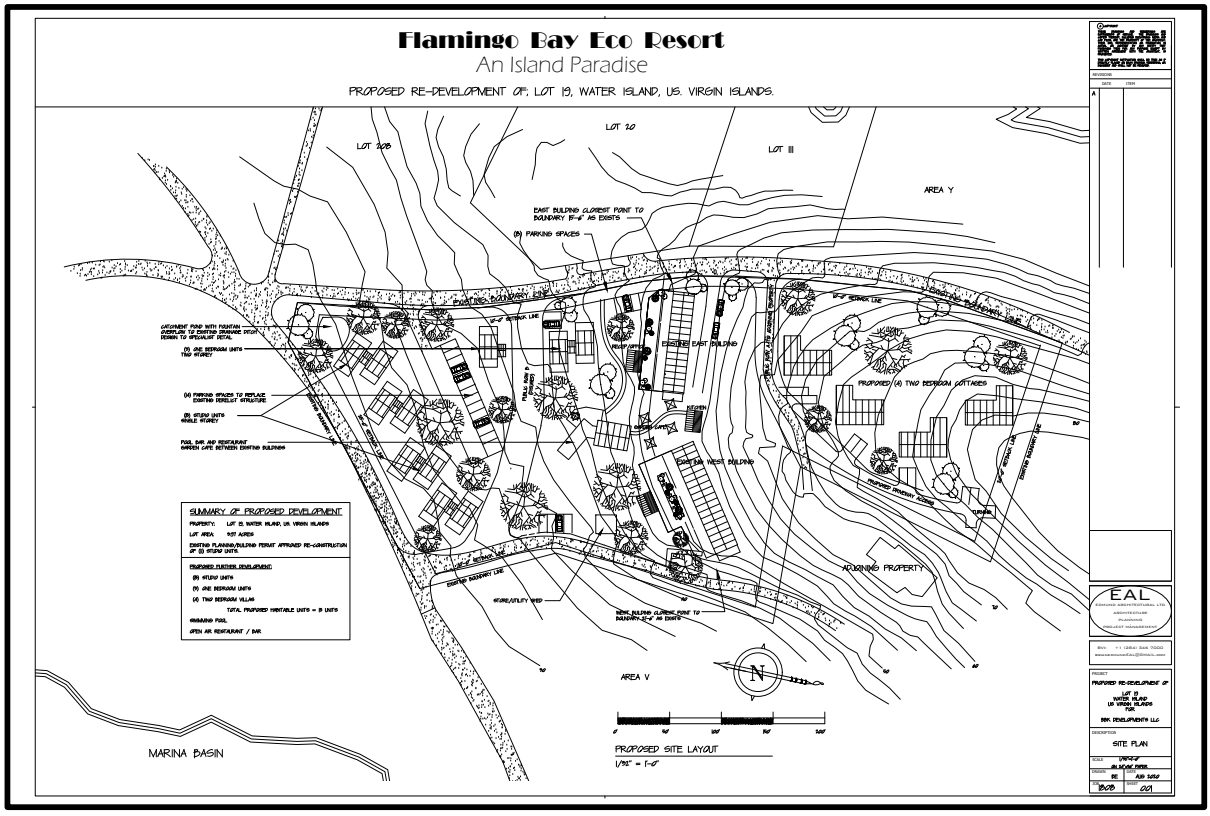

Figure 2: Plan for the proposed development

1.3 Environmental Setting

The subject property is located on the southeastern part of Water Island with Flamingo Bay to the west and the Caribbean Sea immediately to the east (Figure 1). The subject property is located on sloping ground, with the highest elevations located on the south part and the lower parts on the north. The soil consists of very gravelly clay with large quantities of loose rock in surface contexts, particularly at the highest elevations. The subject property was found to be densely vegetated with secondary growth; a few mature trees are interspersed throughout. The subject property currently contains construction debris and general trash.

2.0 SURVEY METHODS

The *Survey* methods employed are described below.

2.1 Literature and Records Search

The literature and records search included a review of the readily available published and unpublished literature. The VISHPO's Senior Archaeologist was consulted regarding cultural resources of record within the subject property and immediate vicinity. The results for this task are provided in Section 3.0 of this report.

2.2. Field Survey

The initial task performed was to make a reconnaissance of the subject property to assess existing conditions. The reconnaissance was followed by clearing of transects to access buildings contained in the bush and for shovel testing purposes (Figures 3 and 4). Shovel testing was performed on the more gently sloping ground in the southern parts of the subject property as the northern parts were found to be either disturbed and/or eroded leaving exposed a kind of rock armored surface. The shovel tests measured at least 30 centimeters in diameter and were excavated to depths no longer considered to have the potential for containing non-random artifact bearing matrices Figure 5.

Figure 3: Photograph of hand clearing of vegetation to expose the exterior of Building A south east corner wall

Figure 4: Photograph of shovel testing activities in progress

Figure 5: Photograph of example shovel test

3.0 FINDINGS

Our findings for the literature and records search, and the field survey are presented below.

3.1 Literature and Records Search

Extensive archaeological and historical research was performed for Water Island in conjunction with the U.S. Government's transfer from public to private ownership in the 1990s. The result of that work was published by the National Park Service in 2003 and provides detailed archaeological and historical information for Water Island. That Survey draws from the herculean efforts of David G. Anderson, David W. Knight, Emily M. Yates and multiple contributors including Mr. David Brewer the current VISHPO Senior Archaeologist. Additionally, we reviewed information from a Draft National Register Multiple Property Documentation Form for U.S. Military Resources, St. Thomas, U.S. Virgin Islands that was prepared by Panamerican Consultants, as well as historic photographs and maps compiled by the US Army Corps of Engineers.

3.1.1 Precolonial Period

There is no clear evidence that permanent precolonial settlements existed on Water Island. The extensive archaeological surveys and testing performed by the National Park Service (Anderson, Knight and Yates, 2003) indicate that the precolonial archaeological resources identified to date consist of temporary activity areas likely associated with the procurement of subsistence resources such as conch by inhabitants of St. Thomas island which is located approximately 600 meters to the north.

Ceramics recovered by the NPS team at Banana Bay were assigned an Elenan Ostionoid provenance, though they acknowledge some may actually have a colonial (Afro-Crucian) provenance. Four conch shells associated with the Banana Bay assemblage were subjected to radiometric determinations which yielded dates ranging from A.D 1090 +-40 to 1390 +- 70. Other precolonial components on the island have been recorded for Elephant Bay, Tamarind Tree Bay and Druid/Honeymoon Beach Bay, these sites were also considered to represent the remains of temporary or limited use activity areas. The NPS also tested a number of bays and coves considered to have the potential for containing precolonial cultural resources but no additional precolonial contexts were discovered. (Anderson, Knight and Yates 2003:107)

3.1.2 Colonial Period

The colonial settlement of Water Island appears to have started during the second decade of the 18th century. Initially, the island was mined for limestone to produce lime for use as bonding agent for the stone and coral block buildings on St. Thomas this industry is reported to have lasted for some decades (Anderson Knight and Yates 2003:134). Agricultural pursuits on Water Island began in earnest towards the end of the 18th century, cotton appears to have been the principal crop with other acreage dedicated to provision grounds and pastures. All of the early colonial settlements were contained on the northern part of the island as depicted in the 1778 Oxholm map (Figures 6 and 7), the southern part of the island remained undeveloped.

The collapse of the cotton based economy of the island's plantation was likely the reason for the depopulation of the island that in 185 had 111 inhabitants to no more than 10 during the rest of the 19th-Century. The island was used by residents of St. Thomas for cultivation of small plots, fishing and other activities.

3.1.3 Water Island in the 20th Century

Following the acquisition of the Danish Virgin Islands by the U.S. government in 1917, the island continued to be owned by the Danish East Asiatic Company until 1944 when it was acquired by the US government through a condemnation process (Anderson, Knight and Yates 2003:24). The island was then transformed largely into a military post named Fort Segarra. Following World War II the military continued to use parts of Water Island for testing of chemical munitions.

In 1950 the U.S. Defense Department turned Water Island over to the U.S. Department of Interior which in turn, leased it to a private developer. When the 40 year lease ended, the U.S. Government transferred Water Island to the Government of the Virgin Islands in 1996, and island residents were afforded the opportunity to purchase the land and homes they occupied.

Fort Segarra was developed during the later stages of World War II as part of the defenses for St. Thomas and as part of the Greater Caribbean Defenses for the Allied forces. Cartographic sources such as the map provided in Figure 8, shows that most of the Fort Segarra post was concentrated on the south side of the island with a few scattered buildings on the north side of the island. A subterranean fortification and gun battery constructed on Flamingo Point was largely completed but was never armed as construction was suspended before the cannons were mounted.

An inventory of real and installed property dated 1950 (USACE: 2001) lists all of the Fort Segarra buildings including, administrative buildings, PX and recreation halls, mess halls, barracks, cisterns, power plant, watch and water towers, latrines, maintenance buildings, and others. The buildings located on the subject property are shown in Figure 8. Description of these buildings are provided in the inventory and describe Buildings A, B and C as barracks and Building D as a mess hall. We note that the hand drawn map shows that Building A's long axis is oriented north to south, when multiple aerial and satellite imagery show it as oriented east west. A small building shown to the west of Building A is described as a latrine, this building is likely on the adjacent property and was not visited during this *Survey*.

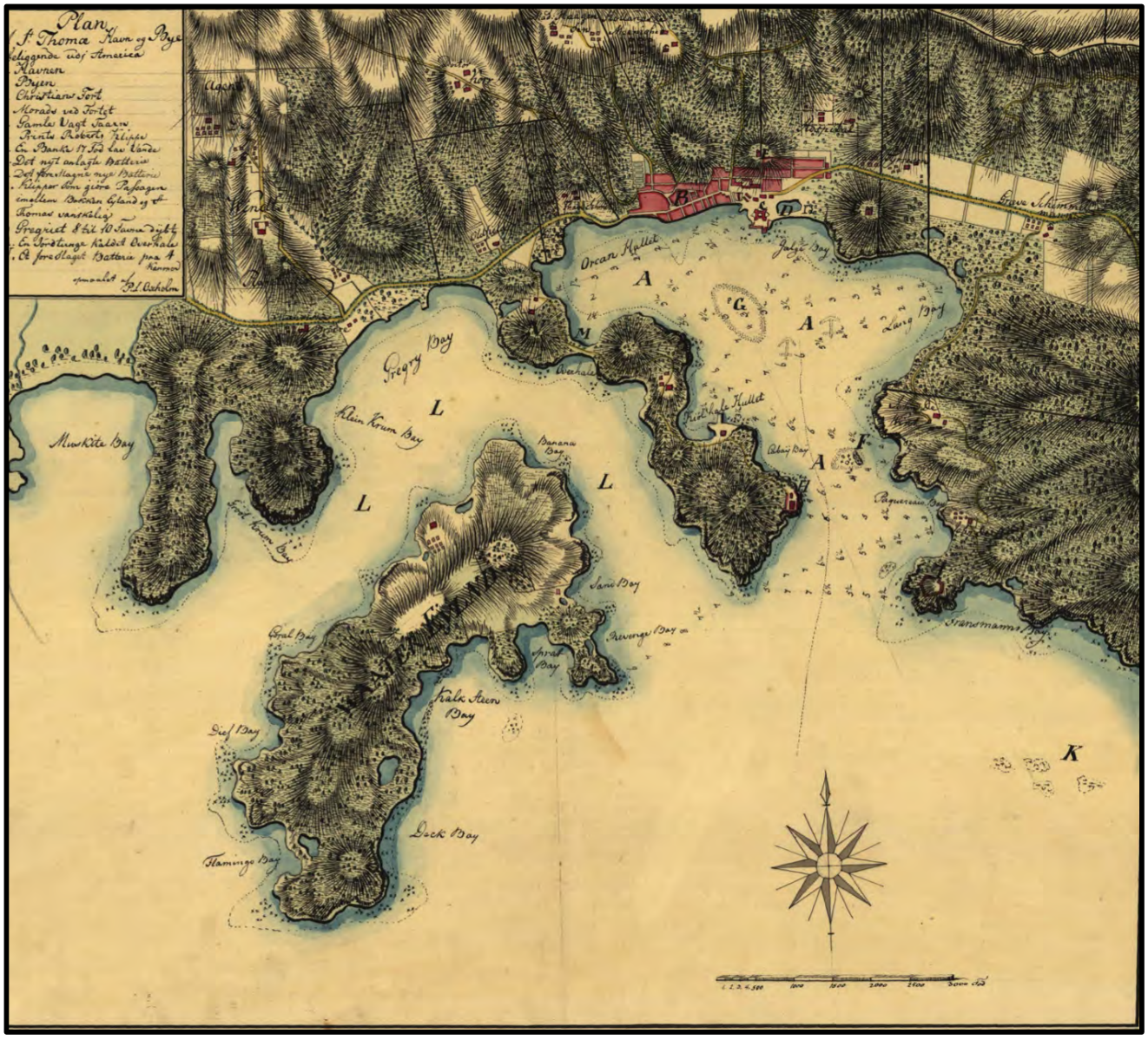

Figure 6: Oxholm map of south central part of St. Thomas, Water and Hassel Islands

Figure 7: Expanded view of Water Island from the Oxholm map depicting the settlements and cleared fields on the north side of the island

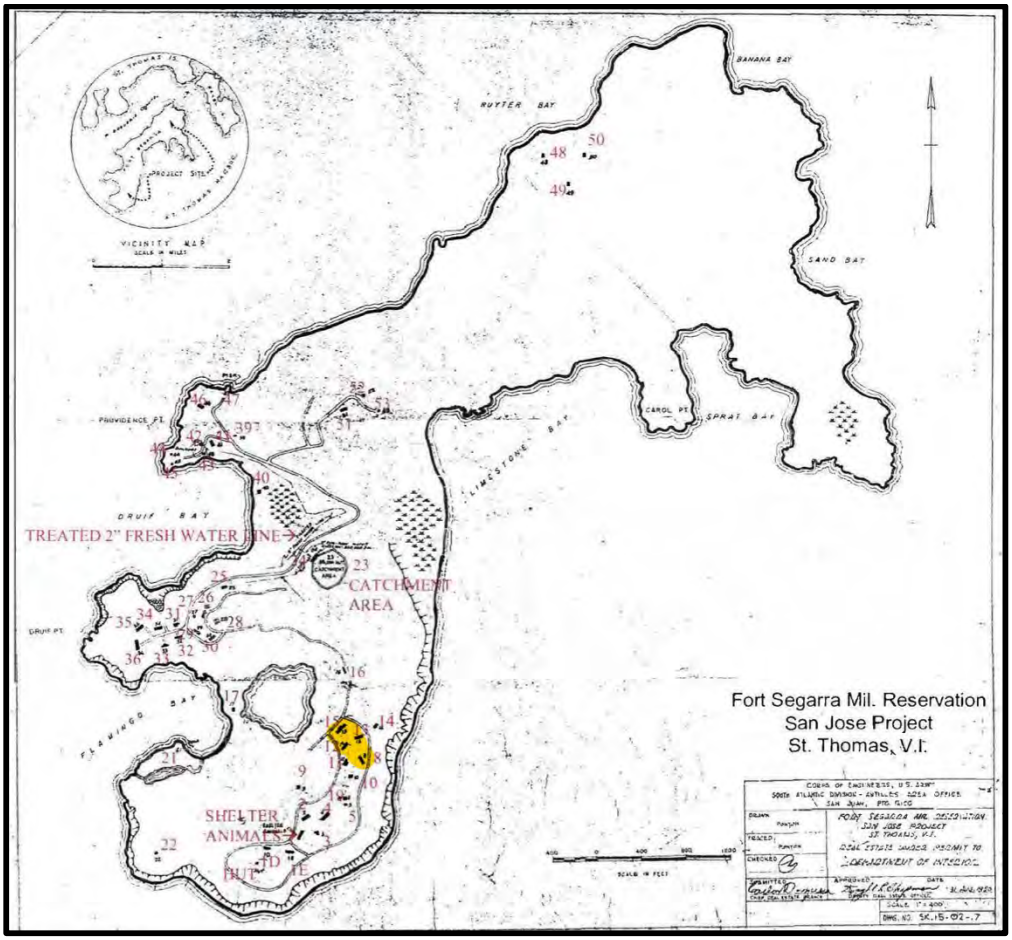

Figure 8: 1950 map of Fort Segarra area highlighted in yellow depicts the general area of subject property and buildings

3.2 Field Survey

The field survey resulted in the identification of four concrete structures, three of which were once U.S. Army barracks and herein designated as Buildings A, B and C. Building D was a mess hall. Locations of the buildings are shown on Figure 9 below. Descriptions of each of the structures are provided below.

Figure 9: Google Earth image depicting the location of Buildings A – D)

3.2.2 Building A

Building A is an open bay rectangular building located in the southernmost part of the subject property and at the highest elevation. The building measures approximately 29 meters (m) along its east to west axis by approximately 7 m along its east to west axis. An entrance door is discernable on the east end of the building, the west end of the building may have contained another entrance or a set of windows. This section of the building is largely collapsed and would require removal of rubble to discern the use. The highest preserved walls are on the south side of the building and extend approximately 2.7 m high from the interior concrete floor (Figure 11). The top of the horizontal column for this wall contains a few remaining rafter holders for a hipped roof that was likely covered with galvanized steel sheets. The building contains six large windows on its north and south elevations (Figure 12). Each of the long walls contain concrete blocks that were laid so that the block openings are open to the interior and exterior for what we interpret to have provided additional ventilation.

The structure is poorly preserved, with the north, east and west elevations largely collapsed. The south elevation is better preserved but does contain collapsed sections and a multitude of diagonal fissures. We did not note interior plumbing in the building but did note wall plugs for electricity.

Figure 10: Photograph of the southeastern corner of Building A

Figure 11: Photograph of the north wall axis, view to the west

Figure 12: Photograph of south wall details, note the large window openings and ventilation features near the base of the wall

Figure 13: Window casing detail

3.2.3 Buildings B and C

Buildings B and C were barracks buildings likely of similar plan and construction as Building A. These buildings were converted for use as a hotel in the past and have been extensively damaged by hurricanes. Our Clients propose to rehabilitate the buildings. The existing modifications to the buildings primarily consist of the subdivision of the open bays into 6 hotel rooms per building, each room appears to have had a kitchenette and bathroom. The large window casings were partially sealed to make individual entrances and windows. Both buildings contain terraces on top of large cisterns that may have been added for the hotel's purposes. The east elevation of Building C (Figure 18) appears to have had a rock façade added, as no evidence of such facing was observed on the other buildings. A plywood workshop was recently built on the terrace of Building C.

3.2.3.1 Building B

Figure 14: East elevation of Building B

Figure 15: North elevation of Building B

Figure 16: Typical kitchen

Figure 17: Typical bathroom

3.2.3.2 Building C

Figure 18: Rock faced east elevation of Building C

Figure 18: Partial view of the north elevation of Building C

3.2.4 Building D

Building D is the northern most building located on the subject property. Building D is scheduled for demolition and its footprint will serve as a parking area. The building is generally of the same open bay plan (Figure 19) and construction as Building A, except that it contains attached spaces on the west and northwest ends, and a constructed bar or large counter top (Figure 20). The open bay and attached room on the west end measure approximately 42 m along its east to west axis by approximately 7m in width. An attached room on the northwest corner of the building extends from the exterior northwest wall of the open bay for approximately 7.5 m along its east to west axis, its width is estimated to be 3.5 m. At the time of our *Survey*, Building D contained a metal container that appears to have been used for domestic purposes and large amount of recent trash throughout the building interior and exterior.

Figure 19: Building D interior, view to west

Figure 20: Photograph of the west end of Building D

3.2.5 Historic Photos of Similar buildings

Signal Corps photographs of similar buildings located on Water Island are shown below and provide other construction details such as that the large window openings framed three individual jalousie windows (Figures 22 and 23).

Figure 21: Photograph of similar barracks, Building 33 "rear view." Source: US Army Forces Antilles, Signal Corps Photos, 1948

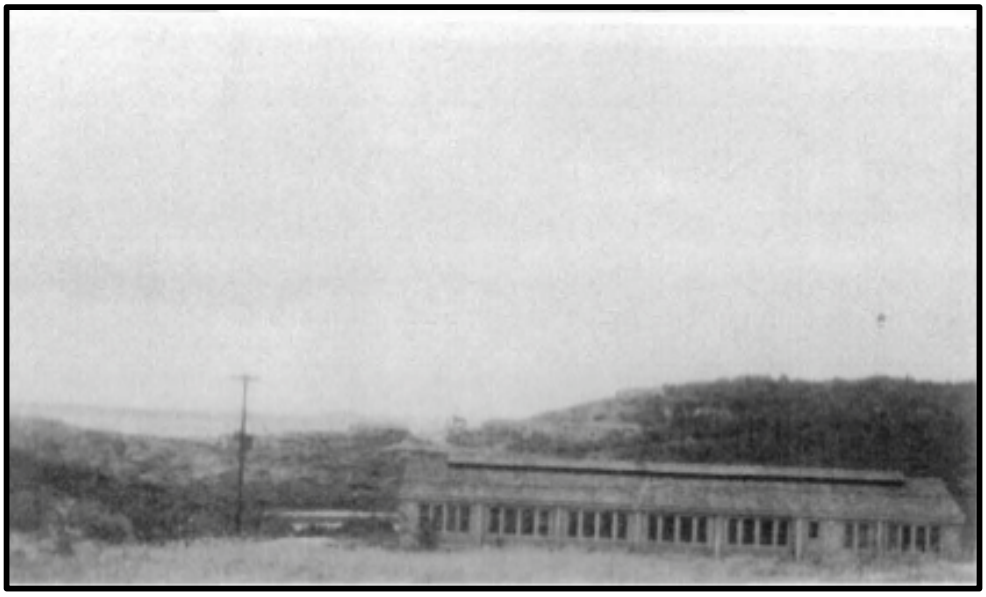

Figure 22: Photograph of similar barracks building. Source: US Army Forces Antilles, Signal Corps Photos, 1948

4.0 CONCLUSIONS AND RECOMMENDATIONS

The Phase I Cultural Resources Survey performed for Plot 19, Water Island, St. Thomas, U.S. Virgin Islands resulted in the identification of the remains of four Fort Segarra buildings (A-D). Two of the buildings (B and C) were extensively modified in the past to create a hotel venue. The other two buildings are in ruinous conditions but their basic plan and wall elevations remain partially preserved.

The U.S. Department of Interior, National Park Service recently commissioned the documentation of World War II era cultural resources on St. Thomas, including Water Island. We note that multiple officer, non-commissioned officer and enlisted barracks on St. Thomas are considered to represent contributing elements to the US Military Resources, St. Thomas , USVI and specifically to the *World War II, U.S. Military Installations and Facilities on St. Thomas (U.S. Navy, Marines, and Army)* (Longiaru: 2019:1 DRAFT).

The WWII barracks and other Army buildings built on Water Island are differentially preserved, some have been adaptively reused as residences (Patton Mulford, personal communication to Carlos Solís). In the case of Buildings B and C on the subject property, the open bays were subdivided and converted to hotel rooms. Both of these buildings have experienced extensive damage by hurricanes and were noted to be undergoing rehabilitation for future use within the current plan to develop an eco-resort on the subject property.

Buildings A and D appear to have also been damaged during multiple hurricanes. We note that further damage may have been caused by the "re-cycling" of cement blocks. The property records cited above indicate that Building A was a barracks and Building D a mess hall. Our observations are in line with the property records. Building A contains a wholly open bay while Building D contains a large open bay, and a bar or long countertop as shown in Figure 20. Additionally, the attached spaces on the west side of the building likely represent a kitchen and a storeroom. Although both buildings are poorly preserved, they retain sufficient features to contribute to a better understanding of the types of living quarters and mess halls built on the Fort Segarra post.

We consider the remains Buildings A and D to be contributing elements to the WWII US Army's complex of military buildings and fortifications on Water Island, in this case a barracks and a mess hall, both critical to the military mission on Water Island or any garrisoned force. Buildings B and C have been modified to such an extent that they are not considered to retain sufficient integrity to contribute significant information to architectural and engineering record of the WWII military post on Water Island.

We recommend that the VISHPO issue a conditioned finding of ***no objection*** to the proposed development of the eco-resort, the existing conditions of Buildings A and D should be documented through measured drawings and scale photographs of their plan, elevations and features. These should be submitted to the VISHPO prior to the demolition of Buildings A and D.

No further cultural resources management is considered warranted for Buildings B and C or the rest of the subject property, except as mentioned above for Buildings A and D.

5.0 REFERENCES

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