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# FLOOD HAZARD PERMIT

## Environmental Assessment Report

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**Applicant:** Government of the US Virgin Islands – Dept. of Public Works

**Project:** VI ST ER STX(003): Storm Damage Repair to Roadways, Culverts, Embankments, Bridges, and Other Roadway Features on St. Croix, USVI

**Site:** Rt. 72 – MP 1.4 Midland Road Bridge

**JULY 2022**

Prepared by: Tysam Tech, LLC



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## 1.00 NAME AND ADDRESS OF APPLICANT

### **Government of the US Virgin Islands Department of Public Works**

**Mailing Address:**

6002 Annas Hope  
Christiansted, VI 00820

**Physical Address:**

6002 Annas Hope  
Christiansted, VI 00820

## 2.00 LOCATION OF PROJECT

The project is located at the following physical address:

**Rt. 72 – MP 1.4 Midland Road Bridge  
Christiansted, VI 00820**

The Rt. 72 – MP 1.4 Midland Road Bridge project site is located in central St. Croix, in Estate Colquohoun. The site is positioned at 17°44'20.9"N, 64°47'53.3"W, along Highway 72, at the intersection with Farrelly-Soto Avenue and Route 65. Figures 2.00.1 and 2.00.2 below are a Location and Agency Review Map and Vicinity Map, respectively.

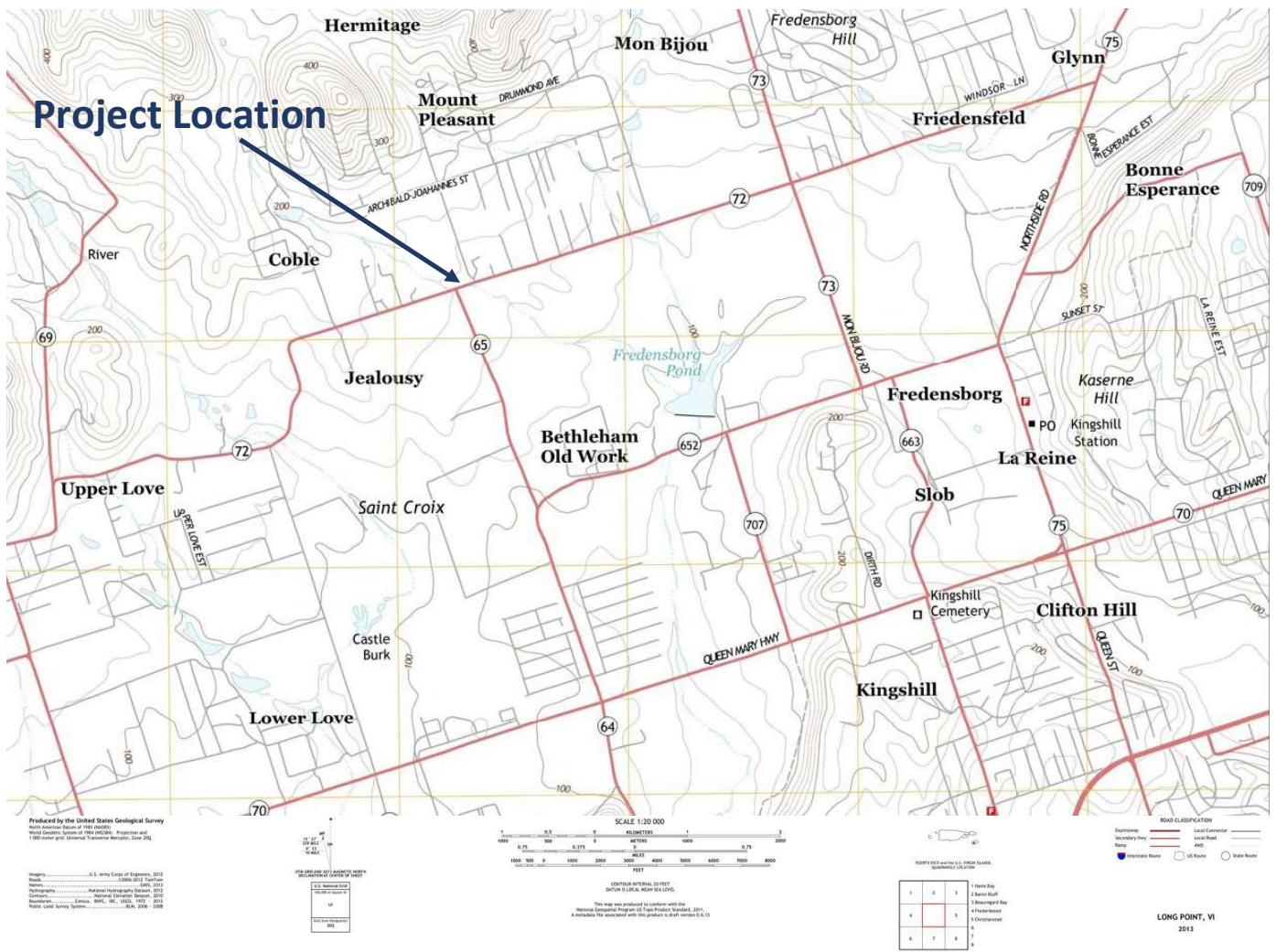


Figure 2.00.1 – Location and Agency Review Map (USGS Quadrangle Map, Long Point, VI, 2013)

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Figure 2.00.2 –Vicinity Map Showing Location of Facility (Google Earth).

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## 3.00 ABSTRACT

### **SUMMARY OF WORK FOR ALL 15 SITES**

Significant damage to roads, gut crossings and bridges occurred as a result of the landfall of Hurricane Maria in 2017 to the island of St. Croix, USVI. To provide the necessary repair to the damaged infrastructure, the USVI Department of Public Works (DPW) has contracted VI Paving, Inc. (VIP) to undertake the repairs at 15 different sites around St. Croix. These sites consist of different types of rehabilitation work and different project scale. Of the 15 sites, three are bridge rehabilitations, seven are culvert rehabilitations, and the remaining five are strictly roadway rehabilitations. This project is funded through the US Department of Transportation (USDOT), Federal Highway Administration, Eastern Federal Lands Highway Division and is in partnership with the USVI Department of Public Works (DPW).

The project involves the removal of damaged asphalt and concrete pavement, pipe culverts, bridges, guardrails, retaining walls, embankment material, utility lines and poles, and other debris. The damaged infrastructure will be replaced by new culverts, bridges, headwalls, guardrails, rip rap and gabion baskets, concrete retaining walls, embankment stabilization materials, drainage inlets, aggregate base, asphalt pavement, and concrete pavement. Also included in the scope of work is the clearing and cleaning of existing drainage structures and the reconditioning of shoulders and ditches. The aforementioned activities will restore the proposed project areas to full and improved function and prevent similar damage to occur during future storm events.

### **ROUTE 72 – MIDLAND ROAD BRIDGE**

For this site under project VI ST ER STX(003), 285 linear feet of roadway over the Midland Road Bridge on Route 72 will be rehabilitated. This will occur after the existing box culverts and bridge are removed and replaced with new box culverts and a cast in place concrete bridge structure in the same location as the existing structure. A new sidewalk will be installed on the south side of the roadway, along with guardrails and sidewalls. The culvert inlet will be lined with rip rap to slow the water flow and 3-6-foot boulders installed at culvert outlet to further improve stability. The project will not require a temporary road structure to cross the Gut as a detour around existing roadways will be employed. A 12-inch temporary waterline will be installed no more than 50 feet from existing road edge and a new permanent 12-inch waterline will be mounted to the new box culverts after construction of the bridge. The gut is anticipated to be dry during the work schedule timeline; however, there is no work expected to be done directly within the typical waterline of the Gut when water is flowing. All necessary precautions will be taken in the event there is water at the site and additional stormwater BMPs are required.

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## Project Assurances

- Employees' and the public's health and safety are protected with the best available systems and technologies.
- Environmental impact is considered at all times.
- No significant negative impact to environment.
- Air quality is protected.
- Stormwater quality is protected.
- Nearshore water quality is protected.

## 4.00 STATEMENT OF OBJECTIVES SOUGHT BY THE PROPOSED PROJECT

VIP seeks to replace the Midland Road Bridge and box culverts due to structural damage that was exacerbated by Hurricane Maria. The proposed box culverts and replacement bridge will fully replace the degrading bridge, and provide long-term structural integrity, as well as pedestrian safety with a sidewalk proposed for the South side of the roadway. Riprap placed at culvert inlet and outlet will allow runoff to be channel effectively through the culverts, protect the Gut profile and prevent erosion while adding stability to the new infrastructure.

## 5.00 DESCRIPTION OF PROJECT

### 5.01 SUMMARY OF PROPOSED ACTIVITY

#### *a) Purpose of Project*

The purpose of the project is to replace the degrading bridge at Route 72 – MP 1.4 and associated infrastructure as well as rehabilitate a 285-foot section of associated roadway which was further damaged from Hurricane Maria in 2017. The existing bridge and box culverts will be removed and replaced by four (4) 10-ft by 7-ft high box culverts below a cast in place concrete bridge deck. The footprint of these structures will remain the same, though the existing gut will be lined with riprap and scour protection to help to slow stormwater and channel it into the new box culvert. Class IX, 3–6-foot boulders will be placed at culvert outlet for enhanced stability. The project will replace the currently

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degrading bridge and ensure that the bridge and roadway for this Gut crossing is built to endure future storms and perform over the long-term. The addition of a sidewalk on the south end of the roadway will allow pedestrians to safely cross the bridge even during higher traffic.

#### *b) Presence and Location of any Critical Areas and Possible Trouble Spots*

The project area is in close proximity to residential and farming areas of central St. Croix. This particular project site services multiple neighborhoods in the area and is in close proximity to a frequently used bus stop. The project site is not directly adjacent to any building structures, however, both sides of the roadway are well vegetated upstream and downstream and bridges a major drainage route. As such, the clearing of debris, demolition and construction, along with the repair of the roadway has potential to impact the surrounding areas, flood patterns, water quality and existing habitats for wildlife.

Site slope is 2-5%. Project site elevation is between approximately 140 and 155 feet above sea level.

A review of the U.S. Fish & Wildlife Information for Planning and Consultation (IPaC) indicate that there are no endangered or threatened species, migratory birds, or sensitive facilities directly in or around the project area.

Due to the nature of the project, there exists potential for sedimentation and erosion during project activities. Sedimentation can cause several harmful outcomes if unmitigated and must be minimized. Construction is scheduled to ensure work in and around the Gut is performed when no water is present. However, if storm events occur that cause runoff through this area, it is not anticipated that the project activities will occur within the water line, and all appropriate protective Best Management Practices (BMPs), including Type II Turbidity Curtains, will be employed if needed, in accordance with minimum requirements of the VI Environmental Protection Handbook (2002). Further details on these BMPs are outlined in Section 5.01(e).

#### *c) Proposed Method of Land Clearing and Construction*

No temporary detour route will be needed for this project. The roadway will be closed for project duration and existing roads as detour routes will be utilized. However, a temporary 12-inch waterline will be installed 40 to 50 feet north of the existing road edge.

During removal of the existing culverts and bridge structure, the project area will be directly within the open water channel that crosses directly below the bridge and through the culverts. Turbidity curtains will be used if current water elevation requires any work to occur within the water line or will cause sediment to be discharged to gut water flow.

After removal of all existing material and structure, new box culverts will be installed. Turbidity curtains will be used if water is present in the gut, to prevent sediment plume

migration, but activity will be performed carefully to ensure no agitation of water or sediment occurs.

Once the box culverts are installed, the bridge deck will be cast in place to complete the base structure. Permanent pipelines and infrastructure will be placed along with the appropriate aggregate base to meet the substrate profile provided in the cross-sectional detail drawings. Six inches of asphalt surface will be installed across its 31-foot width, with profile allowing for drainage of stormwater. Nine feet of concrete sidewalks, curbs and FDOT Handrails will be installed on one side of the road, providing for a bridge with forty (40) foot in total width.

Any brush and debris requiring removal in order to access the existing bridge, roadway and/or related infrastructure, will be cut and transported off-site as green waste for disposal at the Waste Management Authority Transfer Station.

#### *d) Provisions to Limit Site Disturbance*

In order to limit site disturbance, proposed work timeline will be the minimum time required to perform each task, as to limit soil exposure to the environment. The project will stay almost exclusively within the existing footprint of the existing culverts, bridge and along the 285-foot length of the existing roadway, and minimal disturbance outside the project activities.

As the work entails demolition and installation of structures in or adjacent to an ephemeral stream (i.e. Gut), site disturbance will be both minimized and carefully performed where required to avoid any activities within water that passes through the water course way. Any earth disturbance will be monitored and managed through site BMPs at all times and no in-water activities are anticipated. After each stage of site disturbance, stabilization and scour protection will be implemented immediately upon achievement of final grade.

A Storm Water Pollution Prevention Plan (SWPPP) complying with the Department of Planning and Natural Resources' VI Construction General Permit requirements will be implemented during project activities, to ensure all site disturbance activities are minimized and BMPs appropriate to the location are in place.

#### *e) Erosion and Sediment Control Devices to be Implemented*

The following Best Management Practices (BMPs) will be implemented on the site to control runoff and protect natural resources:

**Turbidity Curtain** – Due to the proposed project located directly adjacent to an open channel, a turbidity curtain may be used minimize sedimentation during deconstruction and construction. These curtains are flexible, impermeable barriers which are weighted at the bottom to ensure that sediment does not travel underneath and are supported at the top

through a flotation system. If the water level at time of project implementation does not require use, these curtains may not be utilized. This BMP will only be used if water is present in the Gut and site activities will be performed in close vicinity to running water.

**Silt Fence** – Due to working in a drainage route and close proximity to the open channel, silt fencing shall be used to protect the downstream water and vegetated areas and control runoff and sediment loss. The proposed location for silt fencing placement is indicated in the attached Erosion Control Plan figure.

**Containment Berms** – A containment berm will be constructed, if needed, to support the silt fencing in containing stormwater and retaining sediment.

Design of these BMPs will follow the minimum standards of the VI Environmental Protection Handbook (2002).

#### *f) Schedule for Earth Changing Activities & Implementation of Erosion/Sediment Control Measures*

No earth change activities will take place until the BMPs are installed at the site. Erosion and sediment control for the project construction include:

1. Ensure silt fencing and other BMPs, if necessary, are setup before work begins.
2. Minimize earth work in the removal of the existing culverts and bridge structure.
3. Installation of new box culverts and cast in place concrete deck.
4. Installation of aggregate base and utility lines and infrastructure.
5. Installation of sidewalks, handrails, and guardrails.
6. Final asphalt paving of road and road profile contouring.

#### *g) Maintenance of Erosion and Sediment Control*

Turbidity curtains, if necessary for in-water work, and silt fencing will be inspected daily during in-water or water-adjacent work, with additional monitoring of performance during storms or increased flow and/or wind events. Any visible plume of cloudy water passing beyond the curtain from the construction area will constitute inadequate performance of the curtain, and cessation of work until the faulty portion of the curtain can be modified, adjusted, or repaired to correct the inadequacy.

Inspections will be performed every 14 days and after any rain event greater than 0.25 inches in a 24-hour period, to ensure silt fencing and curtains are operating correctly and

not damaged. Any deficiency noted will be recorded and addressed within seven (7) days of discovery.

The site will be cleaned on a daily basis of litter, debris and materials such as paper, wood, concrete, etc. to prevent discharge into the water.

#### *h) Stormwater Management*

Management of stormwater for the duration of the project will be limited to ensuring no discharge of contaminated stormwater from the site boundaries, and prevention of erosion of project areas through controlled release from site discharge points.

All stormwater control devices will be inspected every 14 calendar days and after all heavy rainfall of 0.25 inches or more. If defects or damage are noted in the measures, the defect or damage will be immediately reported and repaired. If the measures prove to be inadequate to control stormwater flow, changes will be made to the design and additional measures will be added as necessary.

#### *i) Maintenance Schedule of Stormwater Facilities*

Sediment control devices, including dikes swales, and outlets, will be inspected every 14 calendar days and after any heavy rainfall of 0.25 inches or more. If defects or damage are noted in the measures, the defect or damage will be immediately reported and repaired. If the measures prove to be inadequate to control erosion, changes will be made to the design and additional measures will be added as necessary.

Accumulated sediment will be removed when it reaches 40% of the height of the silt fencing, and in accordance with the approved SWPPP requirements. Worn, torn or otherwise damaged silt fencing will be fixed or replaced. The site will be cleaned on a daily basis of litter, debris, and materials such as paper, wood, concrete, etc.

#### *j) Sewage Disposal*

Project sewage management will be limited to maintaining portable restrooms on site, and ensuring they are emptied by a qualified waste management company at an appropriate frequency to minimize spills or discharges from the site.

There are no existing sewer lines (either private or municipal) in the project area.

## 5.02 SITE PLANS (See Attached Drawings)

- 5.02.01 Lot Layout (See Attached Engineer/Surveyor drawings)
- 5.02.02 Road Layouts (See Attached Engineer/Surveyor drawings)
- 5.02.03 Position of Structures (See Attached Engineer/Surveyor drawings)
- 5.02.04 Septic System/wastewater Treatment (Not Applicable)
- 5.02.05 Stormwater Drainage (See Attached Engineer/Surveyor drawings)
- 5.02.06 Stormwater Facilities (See Attached Engineer/Surveyor drawings)
- 5.02.07 Erosion and Sediment Control Plan (See Attached Spec Sheets)
- 5.02.08 Landscaping Plan (Not Applicable)
- 5.02.09 Other Required Drawings (See Attached Engineer/Surveyor drawings)
- 5.02.10 Required Maps (See Attached: Official Zoning Map, Parcel Map, FIRM)

## 5.03 PROJECT WORKPLAN

The project is proposed to be performed as four phases, in sequential order with some overlapping tasks. It will entail site preparation and mobilization, demolition and earth work, construction and finally demobilization and cleanup.

### **Phase 1 – Site Preparation**

This phase will consist of mobilization and initial survey and staking. After establishing the layout, Erosion & Sediment control will be set up, to include turbidity curtains (if necessary) and silt fencing. Mobilization of machinery and equipment will follow proper site setup for safety and protection of workers and environment.

***Approximate Timeline – 138 days***

### **Phase 2 – Demolition**

This phase will begin with initial site clearing and basic grubbing to prepare for demolition. Vegetation will be removed and sent to the WMA Transfer station for green waste.

A temporary rerouting of utilities will follow, to ensure uninterrupted utility services. This will include a temporary 12-inch waterline installed 40 to 50 feet from the edge of the existing roadway.

Demolition of the existing culverts and bridge structure will occur next, with C&D waste disposed of in the Anguilla Landfill via permitted dump trucks. After full demolition and removal of C&D waste, preparation work will begin for new bridge construction.

***Approximate Timeline – 12 days***

### **Phase 3 – Culvert and Bridge Construction**

This phase will entail culvert construction and installation of cast in place bridge deck structure. Four (4) box culverts each 10 feet by 7 feet high will be installed, a cast in place bridge deck, and riprap and other scour protection installation along culvert entrance and exit. Once the culverts are installed, the cast in place concrete deck will be placed.

***Approximate Timeline – 40 days***

### **Phase 4 – Roadway Construction**

This final phase will focus on roadway construction and profile. A new concrete sidewalk will be installed on the south side of the road according to included site plan drawings, and new permanent utility infrastructure will be installed. After compaction and final grading is complete, final asphalt layers will be applied per road construction specifications, to provide correct profile for safe driving conditions and to allow for proper drainage and storm resistance. Finally, installation of signage and pavement markings will complete the construction work, and the site will be stabilized and closed through any necessary landscaping and site cleanup as required by environmental standards and regulation.

***Approximate Timeline – 12 days***

All work on this road project will follow Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, as well as local building, environmental and safety regulations.

**Total estimated time for construction completion is estimated at 202 days.**

## 6.00 SETTING AND PROBABLE IMPACT ON THE NATURAL ENVIRONMENT

### 6.01 DRAINAGE, FLOODING AND EROSION CONTROL

#### *a) Drainage Patterns*

Runoff currently flows from the north side of the road to the south and continues southeast towards Fredensborg Pond through one of the primary Guts in the Bethlehem watershed. Near area drainage consists of sheet flow and shallow concentrated flow before reaching this main water course way.

#### *b) Proposed Alterations to Drainage Patterns*

There are no proposed alterations to drainage patterns. The only change to drainage and stormwater flow is to reinforce the entrance, spillway and outlet structure to ensure washout does not occur in the future and long-term stability of the bridge structure is maintained. This will include adding a rip rap lined gut of Class VI rip rap and stabilizing the outlet with Class IX rip rap.

#### *c) Relationship of Project to Coastal Floodplain*

Review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for U.S. Virgin Islands Index indicate that the project area is within the flood zone rated A. See below in Figure 6.01.1 which is a portion of FIRM Panel 0069G, increased in size for clarity, depicting exact site location (red star icon) relative to flood zones. Possible flooding is anticipated for this section of roadway in its current use during flood conditions.



Figure 6.01.1 – Section of Flood Insurance Rate Map (FIRM) Panel 0069G, 69 of 94. April 16, 2007

d) *Peak Stormwater Flow Calculations*

The purpose of the project is solely to replace the existing culverts and bridge with reinforced and stabilized infrastructure within the previous road conditions, profile and footprint. A hydrologic and hydraulic study (H&H Study) was performed for this project site to support the engineering design of these infrastructures. Peak storm flow calculations and other calculations relevant to the H&H Study is attached.

e) *Existing Stormwater Disposal Structures*

There are no known existing stormwater disposal structures save the existing box culverts. All existing structures will be removed in their entirety before being replaced.

f) *Proposed Stormwater Control Facilities*

No proposed changes to stormwater flows, quantities or direction are proposed for this project with the exception of the above-mentioned rip rap to be placed at culvert inlet to slow the flow through the culverts. Management of stormwater for the duration of the project will be limited to ensuring no discharge of contaminated stormwater from the site boundaries, and prevention of erosion of project areas through controlled release from site discharge points.

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*g) Impacts to Terrestrial and Shoreline Erosion*

The project area is in close proximity residential and farming areas in Estate Colquohoun. This particular project site is not directly adjacent to any building structures. There is minimal sloping (2-5%) with vegetation at both the inlet and outlet of current structure.

The project does not propose to alter the existing drainage patterns of the site. Silt Fencing will be set up with reinforcing berms as needed to ensure catchment of direct runoff from the project area, thereby minimizing potential impact to receiving waters.

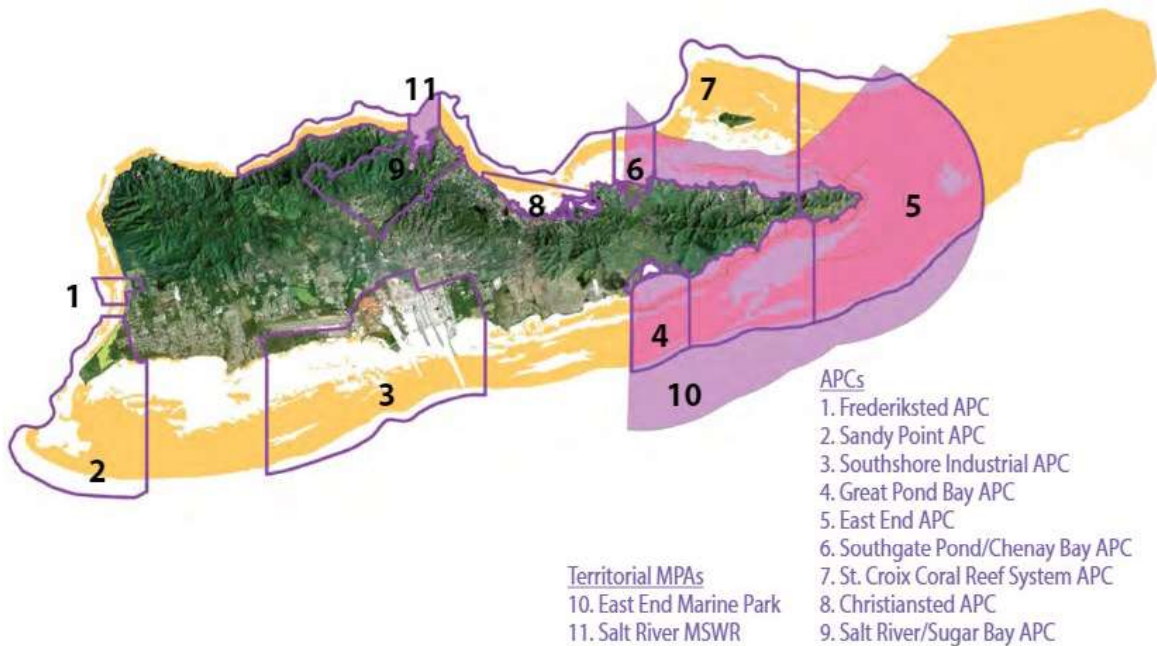
Sediment and siltation control devices (turbidity curtains, if necessary) will be implemented when performing any site work and will be maintained as discussed in Section 5.01(e). Permanent BMPs shall be maintained by DPW according to standard practices on a regular schedule and after storm events.

Due to the significant distance to the shoreline, no impacts are anticipated as part of this project.

## 6.02 MARINE RESOURCES AND HABITAT ASSESSMENT

The project area is in close proximity to residential neighborhoods and is located in central St. Croix, due North of Henry E. Rohlsen Airport.

NOAA and DPNR have established Southshore Industrial and Salt River/Sugar Bay as Areas of Particular Concern (APC). Figure 6.02.1 below depicts APCs of St. Croix, including the Southshore Industrial area (#3) and Salt River/Sugar Bay area (#9). Although the project site appears to be located just outside the boundaries of the Salt River/Sugar Bay APC, drainage could potentially reach the Southshore Industrial APC. It is extremely important to ensure that construction and deconstruction activities do not disturb any downstream resources or habitats.



Maps of Areas of Particular Concern (APC; purple outline) and Territorial MPAs (solid purple) of St. Thomas and St. John (top) and St. Croix (bottom). Brown shading represents shallow (<35 m) hard bottom substrate. MSWR= Marine Sanctuary and Wildlife Reserve.

Figure 6.02.1 –NOAA, NOAA Technical Memorandum NOS NCCOS 187, October 2014

A review of the U.S. Fish & Wildlife Information for Planning and Consultation (IPaC) indicate that there are no endangered species, migratory birds, or sensitive facilities directly in or around the project area.

The Environmental Sensitivity Index Map below (Figure 6.02.2) indicates downstream Fredensborg Pond as habitat for aquaculture projects managed by the UVI Extension Service.

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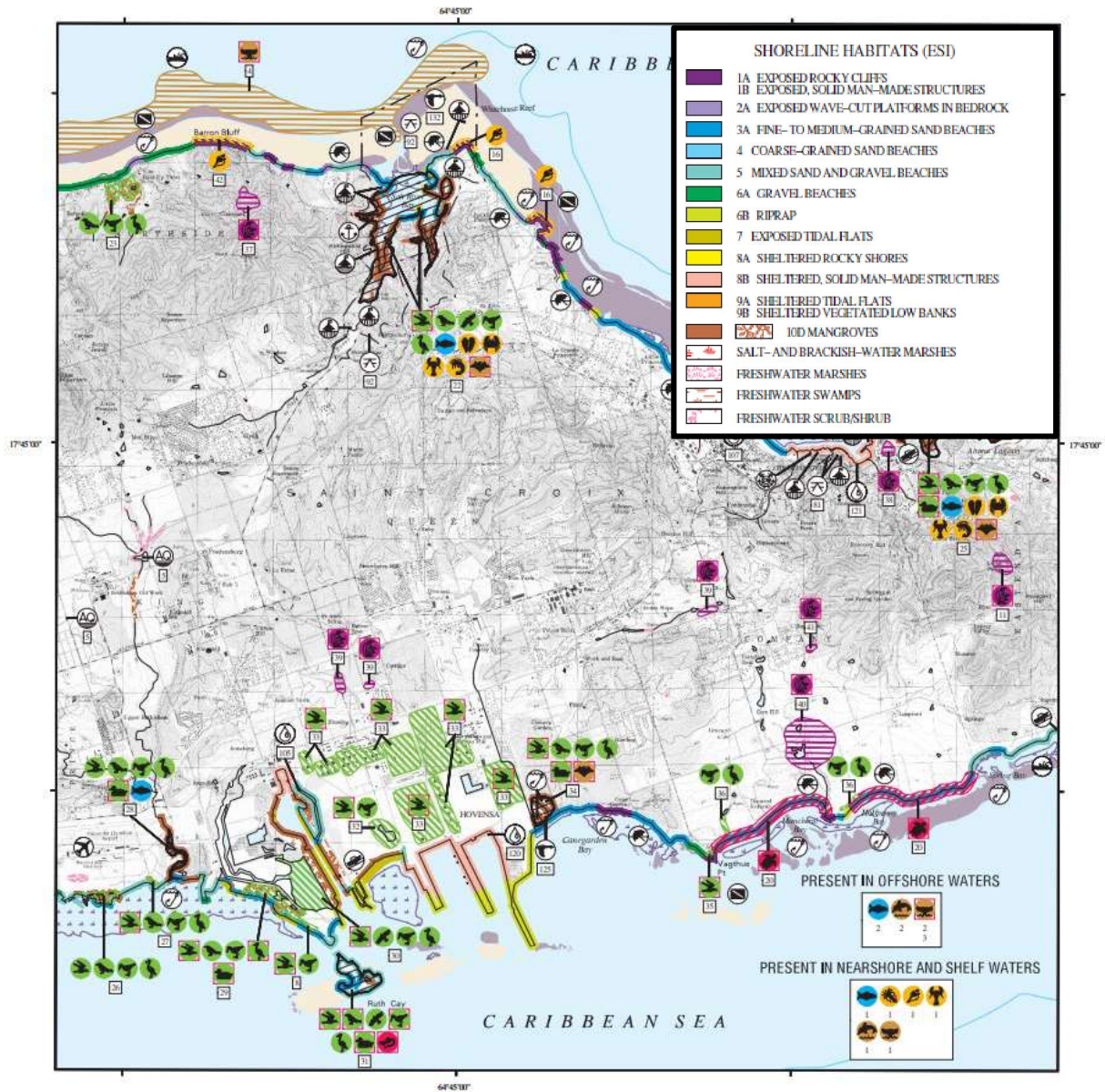


Figure 6.02.2 – Environmental Sensitivity Index Map VI-2, St. Croix, USVI

A review of the 2010 Wetland Inventory Survey Report prepared by UVI indicates bird presence of the American Coot, Black-crowned Night Heron, Black-necked Stilt, Brown Pelican, Cattle Egret, Common Moorhen, Great Egret, Green Heron, Killdeer, Least Tern, Little Blue Heron, Pied-billed Grebe, Ruddy Duck, Smowy Egret, and White-cheeked Pintail. It's known to be a breeding ground for the American Coot, but not known to be critical habitat for any protected species.

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*Figure 6.02.3 – Fredensborg Pond, St. Croix, USVI*

A review of Benthic Habitat Maps is not necessary for this project as it is located sufficiently inland and would only potentially affect inland waterways and shores.

### 6.03 TERRESTRIAL RESOURCES

The Environmental Sensitivity Index (ESI) Map for the island of St. Croix notes no specific habitat of particular sensitivity in the area, as show in Figure 6.02.2 above.

Should any critical or protected plant or animal be encountered during construction activities, staff at VI DPNR – DFW will be contacted immediately at (340) 773-1082.

#### Impact of the Proposed Project

As part of recommendations set by the Section 7 CWA Endangered Species Act consultation with USFWS, VIP will minimize the footprint of work to the greatest extent possible and is not expected to extend farther than necessary beyond the road shoulder to complete repairs.

As compliance with both stormwater and air pollution permits will be ensured through the life of the facility, there are no anticipated negative impacts to these species or their habitat, neither in the nearshore waters nor on land.

## 6.04 WETLANDS

The U.S. Army Corps of Engineers 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." (U.S. Army Corps of Engineers, 1986).

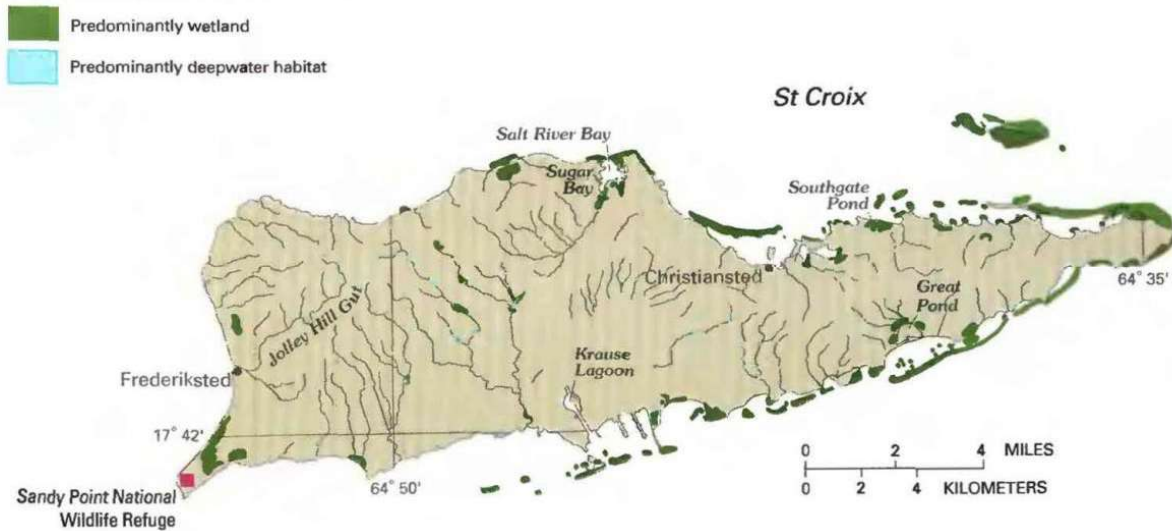


Figure 6.04.1 – Wetlands and Deepwater Habitats, U.S. Geological Survey Water Supply paper 2425.

The nearby inland waterway as well as Fredensborg Pond does exhibit wetland features as defined by ACOE and is indicated by the U.S. Geological Survey in Figure 6.04.1 as being predominantly wetland.

All required permits and preventative measures, including a stringent sedimentation control plan, will be implemented and maintained throughout the life of the project and operation to ensure no impact to this downstream wetland.

## 6.05 RARE AND ENDANGERED SPECIES

A review of the U.S. Fish & Wildlife Information for Planning and Consultation (IPaC) indicate that there are no endangered species, migratory birds, or sensitive facilities directly in or around the project area.

An assessment by Horsley Witten's Senior Ecologist at the site showed no specific species or habitat of particular concern.

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## 6.06 AIR QUALITY

No air quality issues are anticipated for this project. A minimum of soil exposure and earth movement will occur at the site. Stockpiling will be protected and kept to a minimum. If work is done during particularly dry and/or windy conditions, a water truck can be used to wet down the area to prevent fugitive dust from leaving the site. These water trucks will bring water from the VIP asphalt plant location, or from a commercial water provider. Dust control measures to ensure no air quality issues arise are outlined in the Storm Water Pollution Plan for this project.

## 7.00 REFERENCES

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### FLOOD HAZARD PERMIT

Environmental Assessment Report – Rt. 72 – MP 1.4 Midland Road Bridge

Applicant: Government of the US Virgin Islands – Dept. of Public Works

JULY 2022

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