INTRODUCTION

The VIRGIN ISLANDS WATER AND POWER AUTHORITY (VIWAPA) is proposing the burial of utility lines in Cruz Bay St. John. The purpose of the project is to provide improved electrical power resilience for the citizens of St. John in the event of future catastrophic weather events.

VIWAPA has been working at placing transmission and distribution feeders in areas of essential services underground so that these critical services can be restored immediately after the occurrence of major storm events. Underground lines also provide improved reliability and reduce outage frequency caused by overhead obstructions and faults.

Cruz Bay, St. John is the central governmental and business district for the island. Cruz Bay provides basic services such as groceries and supplies for the St. John community. Phase I will include the area between the Frank Bay Substation and Mongoose Junction.

PROJECT LOCATION

The proposed underground project is located on the western end of the island of St. John and the full project will extend from the VIWAPA Substation on Frank Bay, to Maho Bay, to the Westin Resort and to Myrah Keating Smith Health Clinic. Phase I of the project will extend from the Frank Bay Substation just past Mongoose Junction, Phase II will extend to the Myrah Keating Smith Health Clinic, and later Phases will extend to Westin and Maho Bay.
Figure 1. Project location in Cruz Bay, St. John.

A portion of the project area is outside Coastal Zone Management first tier jurisdiction, however since a large portion of the project is within CZM jurisdiction the entire project is a part of this request.
Figure 2. Relationship between project and Coastal Zone Management first tier jurisdiction.

Feeder 7E from St. John Substation to Maho Bay: 18.355640° Latitude, -64.746008° Longitude to 18.33387924 Latitude, -64.7921894 Longitude

Feeder 9E from St. John Substation to Myrah Keating Smith Health Clinic: 18.32768311 Latitude, -64.79694777 Longitude to 18.3406233 Latitude, -64.77542731 Longitude

Feeder 9E from St. John Substation to the Westin Hotel: 18.32768311 Latitude, 64.79694777 Longitude to 18.32400815 Latitude, 64.78425045 Longitude
PROJECT DESCRIPTION

VIWAPA provides power to the island of St. John by means of submarine cables from St. Thomas originating from Red Hook, and Great Bay. The submarine cables land in Frank Bay which is located to the south of the town of Cruz Bay. The electrical power is generated at the Randolph Harley Power Plant and is transmitted through overhead and underground lines across St. Thomas to the submarine lines. At present St. John does not have the ability to produce its own electrical power.

VIWAPA is proposing an underground installation on Feeders 7E and 9E to individual customer’s meters in the Cruz Bay. In Phase II VIWAPA will extend the underground service to the Myrah Keating Smith Health Clinic on Centerline road and in later phases, along North Shore road up to Maho Bay in the National Park and to the south to the Westin Resort.

Overhead primary and secondary lines will be removed and replaced with underground service to the customer’s meter. Pad mounted transformers and pad mounted switches will replace overhead devices and equipment.

It is anticipated that Phase I will take 11 months to construct.

Primary and secondary duct banks be constructed to accommodate the underground facilities. Duct banks shall be 9-way with 6-electrical conduits (6”) and 3 communications conduits (4”).

Figure 3. Main 9-way duct bank.

Electrical duct bank shall consist of electrical PVC conduits (6” and 4”) excavated at 60” below grade and encased in concrete and replaced with native fill and surfaced to grade with asphalt. The trench width shall be 35” wide.

Phase I of the project will service a total of 1,800 customers including:

- Gallows Point
ENVIRONMENTAL IMPACTS

Climate/Weather

The burial of the underground lines will not be affected by climate or weather once completed. During construction rainfall will affect trenching activities and burial. Sedimentation and erosion will be implemented to ensure rainfall during installation will not impact the marine environment.

Landform Geology, Soils and Historic Land Sse

The utility lines are being buried under existing roadways and all work is being done in areas that are already disturbed. The soils within the area are primarily Fredriksdal-Susannberg and Ustorthents.
Drainage, Flooding and Erosion Control

Sedimentation and Erosion Control will be implemented during all phases of the project. Ben Keularts of the Division of Environmental Projection, Department of Planning and Natural Resources was contacted in regard to the need for a Stormwater Pollution Prevention Plan. Mr. Keularts responded that since no more than 1 acre of land would be disturbed at anyone time coverage under the General TPDES Permit was not required (Oct 24, 2019).

Drainage Patterns

The project will have no impact on existing drainage patterns once complete the utility lines will be underground and will not change any existing drainage patterns.

Coastal Floodplain

The project route does cross through areas that have been designated to flood during the 100-year coastal flood. The presence of the flood zone will not have an impact on the utility burial and once the lines are buried flooding should not impact these utility lines. The Federal Emergency Management
Agency as part of their NEPA review In consultation with USFWS initiated determined that the project is not located in the Coastal Barrier Resource System.

Figure 5. FEMA FIRM Maps 32 and 47 of 94 covering the project area.

Fresh Water Resources

The project will occur in previously disturbed areas and involves the burial of utility lines and will have no impact on Fresh Water Resources. No freshwater ponds or streams occur within the project footprint.

Oceanography

The project occurs entirely in upland areas and will only be affected by oceanographic factors during major storm events. The proposal is to place the lines underground and in some areas of the project alignment, Frank Bay, Caneel Bay, Trunk Bay and Maho Bay, waves may overtop the roadway during significant storm events. Because the utility lines will be buried this should have no impact on the utility lines.

Marine Resources

The property is located 100% inland and will have no direct impact on the marine environment. During excavation immediately along the shoreline, BMPs for sedimentation and erosion control will be implemented to prevent any impacts due to sediment laden runoff.

Terrestrial Resources

The project is within the roadway and previously developed areas. No natural terrestrial resources or any native flora or fauna will be impacted during the installation of these buried utility lines.

Wetlands

There are wetlands adjacent to the property alignment at Frank Bay near the cable landings and substation and along the route to Maho Bay (near Caneel Bay, Trunk Bay and Hawknest). These areas have large mangrove wetlands to the landside of the coastal roadway, and some have culverts to the seaside. VIWAPA will be working with the Virgin Islands Department of Public Works to protect this infrastructure and ensure that no blocking or damage to culverts occurs. Since the alignment is in the existing roadway the project will have no impact on these wetlands.
The project is within existing roadways and developed areas. No endangered species or endangered species habitat exists within the roadway and therefore no federal or local endangered or threatened species will be impacted. FEMA, in consultation with the United States Fish and Wildlife Service (USFWS), has determined the proposed undertaking is not likely to adversely affect federally listed or candidate species or designated critical habitat when recommended conservation measures are followed.
Air Quality

All of St. John and St. Thomas is 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). During construction trenchers will be used and will create combustion engine exhaust during use. Upon the completion of the installation air quality will return to pre-construction conditions.

IMPACT ON MAN’S ENVIRONMENT

Land and Water Use Plans

The burial of the utility lines is in keeping with USVI laws and regulations.

Visual Impacts

The removal of the overhead lines and the burial of the utility lines is a visual improvement to the landscape.

Social Impacts and Economic Impacts

Providing more reliable power that can be quickly restored to the town of Cruz Bay will improve the social and economic welfare of the people of the town of Cruz Bay. Stores and other businesses will be able be conduct business more consistently and be able to open to assist the public more quickly after storms.

Historical and Archaeological Resources

The project involves the installation of underground utilities in existing roadways and in previously disturbed areas. Cruz Bay Underground Power Construction Project for Feeder 7E was previously consulted on with the SHPOs office. Per consultation with the SHPO initiated on September 18, 2020 and completed on October 7 14, 2020. FEMA has determined that the proposed scope of work will not have an adverse effect to historic properties with conditions.

Waste Disposal and Accidental Spills

Throughout the project equipment will be kept in good operating conditions. Equipment will not be fueled on site. Any excess excavated material and debris will be collected, taken off-site and properly disposed of.

COASTAL CONSISTENCY

The project has a negligible potential of impacting, environmental resources, or ambient water quality during construction and a sedimentation and erosion control plan will be implemented during construction as necessary. The construction is proposed only within previously disturbed areas and has a negligible potential of impacting historical or cultural resources.

The Coastal Zone Management Act of 1972 requires federal actions to be consistent to the maximum extent practicable with the enforceable policies of a coastal state’s federally approved Coastal Management Plan. The Cruz Bay Underground Construction Feeder 7E as proposed will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the U.S.
Virgin Islands Coastal Zone Management Program. This federal consistency determination demonstrates the project's compliance with the U.S. Virgin Islands Coastal Zone Management Program.

The following policies are set forth in the Virgin Islands Code Title Twelve Conservation, Chapter 21 § 903 (b).

1) protect, maintain, preserve and, where feasible, enhance and restore, the overall quality of the environment in the coastal zone, the natural and man-made resources therein, and the scenic and historic resources of the coastal zone for the benefit of residents of and visitors of the United States Virgin Islands;

   • Project is designed to be within previously impacted and developed areas. The project will not impact any natural resources and will improve the visual landscape of the town of Cruz Bay by removing overhead utility lines and poles.

   The underground project as designed protects, maintains, preserves and enhances the overall quality of the environment in the coastal zone, the natural and man-made resources therein, and the scenic and historic resources of the coastal zone for the benefit of residents of and visitors of the United States Virgin Islands and therefore is consistent with this policy of the Virgin Islands Code Title Twelve Conservation, Chapter 21 § 903 (b).

2) promote economic development and growth in the coastal zone and consider the need for development of greater than territorial concern by managing: (1) the impacts of human activity and (2) the use and development of renewable and nonrenewable resources so as to maintain and enhance the long-term productivity of the coastal environment;

   This project promotes the economic development and growth in the coastal zone by providing more reliable, resilient electrical transmission to critical resources.

3) assure priority for coastal-dependent development over other development in the coastal zone by reserving areas suitable for commercial uses including hotels and related facilities, industrial uses including port and marine facilities, and recreation uses;

   This project involves the burial of utility lines and therefore, this goal is not applicable to this project.

4) assure the orderly, balanced utilization and conservation of the resources of the coastal zone, taking into account the social and economic needs of the residents of the United States Virgin Islands;

   The burial of the utility lines will provide more reliable and resilient power to the citizens of Cruz Bay and therefore will meet and protect the economic needs of the residents.

5) preserve, protect and maintain the trust lands and other submerged and filled lands of
the United States Virgin Islands so as to promote the general welfare of the people of the United States Virgin Islands;

- The project will not impact public trust or other submerged and filled lands of the Virgin Islands.

(6) preserve what has been a tradition and protect what has become a right of the public by insuring that the public, individually and collectively, has and shall continue to have the right to use and enjoy the shorelines and to maximize public access to and along the shorelines consistent with constitutionally-protected rights of private property owners;

- The project will in no way affect public access or use of the shoreline or access to and along the shoreline.

(7) promote and provide affordable and diverse public recreational opportunities in the coastal zone for all residents of the United States Virgin Islands through acquisition, development and restoration of areas consistent with sound resource conservation principles;

- The project will not affect public recreational opportunities in the coastal zone.

(8) conserve ecologically significant resource areas for their contribution to marine productivity and value as wildlife habitats, and preserve the function and integrity of reefs, marine meadows, salt ponds, mangroves and other significant natural areas;

- The project is designed so that it impacts only previously disturbed areas and will have no impact on natural resources. The project will utilize BMPs and will minimize areas of disturbance to protect both terrestrial and marine habitats.

(9) maintain or increase coastal water quality through control of erosion, sedimentation, runoff, siltation and sewage discharge;

- The project will have no long-term change on sedimentation or erosion. The project will result in no creation of wastewater. During construction, the project will implement BMPs as necessary to prevent loss of sediment from the project site.

The project as designed maintains coastal water quality through control of erosion, sedimentation, runoff, and siltation and therefore is consistent with this policy of the Virgin Islands Code Title Twelve Conservation, Chapter 21 § 903 (b).
PHASE I DRAWINGS
Section C
Drawings
VIRGIN ISLANDS WATER AND POWER AUTHORITY
ST. JOHN, UNITED STATES VIRGIN ISLANDS

CONTRACT DRAWINGS - ISSUE FOR BID
FOR THE
CRUZ BAY UNDERGROUND ELECTRIC CONSTRUCTION
FEEDER 7E
05/24/19

DRAWING INDEX

PROJECT LOCATION

LOCAL MAP

FXB ENGINEERING

CORI-TEC

REVIEW SET
NOT FOR CONSTRUCTION
FEMA DOCUMENTATION
Hazard Mitigation Proposal: STJ Permanent Electrical Repairs

APPLICANT: Virgin Islands Water & Power Authority

FACILITY TYPE: Power Generation, Transmission, and Distribution

GPS: 18.32783, -64.79128

Overview

The Virgin Islands Water & Power Authority (VI WAPA) operates as the sole Water and Electrical utility to the U.S. Virgin Islands. This includes providing service to the islands of St. Croix by means of the Richmond Power Plant and the islands of St. Thomas, St. John and Water Island via the Harley Power Plant.

In current state, the St. John component of the infrastructure is connected by two underwater submarine cables that if damaged or severed would lead to a total loss of the ability to import power from the Harley Power Plant.

The need to mitigate and harden the electrical infrastructure on this island is critical as highlighted in the aftermath of the 2017 hurricanes Irma and Maria to which electrical service could not be fully restored to the island for up to 45 days after the storm.

This was as a result of losing a significant portion of the St. John electrical transmission and distribution infrastructure.

Damage, Descriptions, And Dimensions (DDD)

Disaster-related damages occurred when strong winds snapped power poles, caused trees and broken limbs to fall into and across overhead electric distribution circuits (includes St John Substation Feeders 7E/9E and secondary circuits) damaging approximately:

- 366,000 feet of 13.8 kV and 34.5 kV 3-phase
- 397 AAAC Primary Conductor (length for all phases & neutral)
- 510,900 feet of 13.8 kV single phase (1/0 and/or #2 AAAC wire)
- 1,104,750 feet of Secondary of various sizes, e.g. #2 Triples, 1/0 Triplex, 1/0 Quad
- Replace 1536 ea.(various sizes) wooden power poles and other pole structural related accessories (pole guying, crossarms, insulators, etc.)
- 520 ea. pole mount transformers (47 ea. - 10 kVA, 156 ea. 15 kVA, 135 ea. 25 kVA, 48 ea. 37.5 kVA, 82 ea. 50 kVA, 25 ea. – 75 kVA and 13 ea. – 100 kVA)
- Two (2) Automatic Circuit Reclosers
- Eleven (11) Scada-Mates load interrupter switches
- Two (2) Capacitors Banks (300 kVAR)
- 15 ea. one (1) kVA Instrument Transformers.
- 497 ea. Pole Mount Street lights and related accessories

Coordinates (18.32783, -64.79128) was taken at the St. John Substation.

The St. John substation has two main feeders (No. 07E & 09E) providing electric service to more than 2,910 meters feeding 91.28 Circuit Miles of Distribution.
Proposed Measures for Mitigating

Per FEMA guidance, mitigative measures for Infrastructure – Electric Power Distribution includes the following:

1. Pad-Mounted Transformers – elevating above the base flood elevation, or lowering them or burying them in non-flood, high wind areas.
3. Burying Lines
5. Replacing poles with a higher-class pole or with a different material - poles such as replacing wood poles with concrete.
8. Providing looped distribution service or other redundancies in the electrical service to critical facilities.

In response to hardening the transmission and distribution infrastructure, VIWAPA has been implementing several undergrounding projects throughout the territory for the past 10 years as a means of mitigating the transmission and distribution systems by protecting them from future damages.

In the already implemented areas, the networks are less susceptible to damages from natural disasters and power can be restored at a significantly faster rate than the traditional overhead lines. This means that the affected communities can be restored at a faster, safer, and more effective rate.

Mitigation work to be performed must be cost effective and reasonable as part of the work or measure must prove effective in reducing the potential for further damages into the infrastructure being mitigated.

This Hazard Mitigation Proposal (HMP) is a compressive portfolio of sub-projects, HMPs 1 & 2, that implement each of the listed measures above in order to protect the critical infrastructure on the island of St. John.

This HMP Narrative will be part of Project Worksheet reference number PW60, GM for the Virgin Island Water and Power Authority for the islands of St John. This proposal provides a cost-effective and eligible scope of work for hazard mitigation in accordance with Section 406 of the Stafford Act and FEMA Public Assistance Program and Policy Guide April 2017 Chapter 2 Section VII Part C Hazard Mitigation.

Project Costs

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<th>Proposed Hazard Mitigation</th>
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<td>In Kind Costs:</td>
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<tr>
<td>Hazard Mitigation Costs:</td>
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<td>HMP (1&amp;2) Total:</td>
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Project Description

HMP1:
- 1a - Cruz Bay Underground to Myrah Keating Clinic
- 1b - Cruz Bay and Coral Bay Backup Generation
- 1c - Composite Pole Installation

HMP 2:
- Pole to Pad Mount Transformers

Hazard Mitigation Proposal – St. John Electrical Permanent Repairs
FEMA 406 Hazard Mitigation

Project Scope

HMP1

Project 1a – Cruz Bay Undergrounding to Myrah Keating Clinic

To prevent future similar damages to the overhead infrastructure on St. John, VIWAPA is proposing the underground installation of a significant portions of feeders 7E and 9E 3-Phase lines in the Cruz Bay area.

Overhead primary and secondary lines will be removed and replaced with underground services to the customer’s meter. Pad mounted transformers and pad mounted switches will replace overhead devices and equipment. Primary and secondary duct banks will need to be constructed to accommodate the underground facilities. Duct banks shall be 9-way with 6-electrical conduits (6”) and 3 communications conduits (4”).

The project will remove 807 wood poles which will be replaced with undergrounding. This will include the approximate replacement of about 92,000 ft of primary wire and 62,000 ft of secondary wire which will mitigate electrical service for approximately 1,800 customers. The project has been broken down into 3 phases as outlined below. This HMP addresses the Phase I, Feeder 7E – St. John Substation to Maho Junction. Each additional phase will be addressed in a subsequent amendment request.

The following GPS coordinates outline the start and end points for the undergrounding of the electrical infrastructure within the areas listed:

- **Feeder 7E from St. John Substation to Maho Junction** – **Phase I**
  
  Start: 18.355640, -64.746008
  End: 18.33387924, -64.7921894

- **Feeder 9E from St. John Substation to Myrah Keating Smith Health Clinic** – **Phase II**
  
  Start: 18.3276831, -64.79694777
  End: 18.3406233, -64.77542731

- **Feeder 9E from St. John Substation to the Westin Hotel** – **Phase III**
  
  Start: 18.3276831, -64.79694777
  End: 18.32400815, -64.78425045

Proposed Facilities to be mitigated

- Gallows Point
- Police Station
- Legislature
- Julius Sprauve School
- Mongoose Junction
- U.S. Customs
- Health Clinic
- Emergency Health Services
- Dolphin Market
- Downtown Cruz Bay
- Starfish Market
- WAPA Customer Service Office
- VI Waste Management Authority
- WAPA Water Pump Station
- Port Authority Dock
- Westin Hotel
FEMA 406 Hazard Mitigation

- National Park Services

Project 1b – Cruz Bay and Coral Bay Backup Generation
Due to the isolated nature of the St. John electrical infrastructure, backup generation in the Cruz Bay and Coral Bay Area is being proposed. Backup generation is critical on St. John as their only means of power comes from the previously mentioned two submarine cables from St. Thomas and once that system goes down the island is dependent on repairs occurring on St. Thomas before power can be restored.

The proposed location of the Cruz Bay unit is 18.32783099, -64.79128933 and the proposed location of the Coral Bay unit is 18.34945531, -64.71582134.

Project 1c – Composite Pole Installation
For the remaining poles that will not be replaced by the undergrounding, VIWAPA has proposed the utilization of composite poles that can withstand winds of up to 200 miles per hour as stated in the product specifications. The high rated utility poles are proposed to be installed from the Myrah Keating Health Clinic up to the Calabash Boom area of Coral Bay.

The composite pole project proposes to harden the overhead system by installing composite poles on the main trunks of the transmission and distribution feeders in lieu of replacing wood poles. The installation will occur on damaged lines where undergrounding installation has not been proposed or is not physically feasible. Composite poles are stronger, lighter and more resilient to high wind events with the ability to flex as opposed to break, unlike wood poles. In addition to protecting the physical infrastructure against future storm damages, the composite pole installations will allow VIWAPA to be able to rebuild, restore, and respond to emergency situations with less losses in infrastructure and time.

This mitigation component will utilize approximately 1,960 composite poles including stub poles for bracing.

Figure 1: Cruz Bay Project Map
The starting point for the composite pole installation of Feeder 7E is 18.33387925 -64.79218941 with the anticipated end point of 18.3507153 -64.70554839. The starting point for the composite pole installation of Feeder 9E is 18.33988223 -64.77452943 with the anticipated end point of 18.33015611 -64.70552801.

In Kind Costs: $20,000,780.00
Hazard Mitigation Costs: + $162,051,220.92
HMP Sub Total: $182,052,000.92

HMP 2
Project 2 STJ Pole to Pad Mount Transformer Project
This project will replace the damaged pole-mounted transformers with pad mounted transformers. Large pole mounted transformers add substantial weight which exposes both the pole and transformer to damages incurred by strong wind events. By removing these transformers from the poles and installing them on the ground, damages will be eliminated or reduced. The locations of the five transformers are 18.32781157 -64.79136481 / 18.32939406, -64.79116415 / 18.32627779 -64.78970367 / 18.3414702 -64.76857869, and 18.3294859 -64.79144116.

In Kind Costs: $101,820.00
Hazard Mitigation Costs: + $320,475.00
HMP Sub Total: $422,295.00

Critical Action 500 Year Floodplain Requirement

Electrical utilities are considered a critical action under Presidential Executive Order 11988 – Floodplain Management and as such required to reach the 500-year flood elevation as opposed to the Base Flood Elevation. For WAPA this will be applicable towards Substation equipment. Flood risks for a community
FEMA 406 Hazard Mitigation

are determined by reviewing Digital Flood Insurance Rate Maps (DFIRMS) found on FEMA’s Map Service Center.
The flood boundary for the 500 year floodplain is the extent of the Shaded X zone, if no shaded x zone exists the boundary will be the extent of the flood zone which extends inland greatest. The 500 year flood elevation for United States Virgin Islands is determined by identifying the effective 2007 DFRIM, determining the base flood elevation for the proposed project location and adding an additional three feet on top of it.

Feasibility and Cost-Effectiveness of Mitigation Proposed

FEMA Public Assistance Program and Policy Guide April 2017 Chapter 2 Section VII Part C Hazard Mitigation states that for mitigation measures which exceed 100% of the damage costs incurred, a benefit-cost analysis is required to demonstrate cost-effectiveness. For projects which cannot be pre-determined as cost-effective, the Grantee or subgrantee must demonstrate through an acceptable benefit-cost analysis (BCA) that the measure is cost-effective. If the resulting benefit-cost ratio (BCR) for the mitigation measure is greater than 1.0, then the proposed measure is cost-effective.

The VIWAPA territory wide mitigation has been subdivided into 2 districts:
- St. Croix
- St. Thomas: St. Thomas, St. John, Water Island
The cost effectiveness for this project was covered under the Benefit Cost Analysis for ST. Thomas. The proposals have yielded a BCR 1.49 and are therefore proven cost-effective.

The total calculated project benefits amounted to $1,146,512,207.00 The attached BCA Report and supporting zip file detail the methods and assumptions used for this analysis. The assessment was completed using the FEMA BCA software version 6.0, and the Historical Damages Module(HDM). The HDM module incorporates damages from multiple years to calculate the benefits and benefit-cost ratio.

The proposed mitigation will prevent future similar damages and has been deemed technically feasible based on preliminary design. Therefore, this HMP is cost effective and eligible under Title 44 CFR §206.226 Restoration of damaged facilities.

Cost Reasonableness

A cost is reasonable if, in its nature and amount, it does not exceed that which would be incurred by a prudent person under the circumstances prevailing at the time the Applicant makes the decision to incur the cost.

FEMA determines reasonableness by evaluating whether:
- The cost is of a type generally recognized as ordinary and necessary for the type of facility or work
- The cost is comparable to the current market price for similar goods or services based on:
  o Historical documentation
  o Average costs in the area, or
  o Published unit costs from national cost estimating databases

The review and determination of the cost reasonableness of this project as determined by FEMA has been approved and forwarded in writing to the applicant in a memo titled “Cost Reasonableness Signed” and is attached to the GM file for this project 70151.
Benefit Cost Analysis Methodology

District: St. Thomas: St. Thomas - St. John - Water Island (STT / STJ / WI) United States Virgin Islands

SOFTWARE OUTPUT

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<td>Total Mitigation Project Benefits</td>
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SOFTWARE INPUT

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Property Location
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Basis of Selection: St. Thomas Randolph Harley Generation Plant - Physical Address

Property Coordinates
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Basis of Selection: St. Thomas Randolph Harley Generation Plant Physical Address

Hazard Type
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Basis of Selection: User preference as available

Mitigation Action Type
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Basis of Selection: User preference as available

Property Type
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Basis of Selection: Default
References:
- FEMA Benefit-Cost Calculator V 6.0

Analysis Method Type
Input Selected: Historical Damages
Basis of Selection: The Historical Damages analysis was selected in order to account for real damages that were experienced by the applicant throughout the 32 years of recorded information.
FEMA 406 Hazard Mitigation

The damages are collective of categories A, B, E, and F projects as extracted from FEMA’s Enterprise Data Warehouse (EDW).

DAMAGES TOTAL

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- EDW Warehouse
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    - 1996
    - 1999
    - 2008
    - 2010
    - 2017
- AL052016_Earl .pdf
- AL161999_Lenny .pdf
- Hurricane Hugo .pdf
- marilyn .pdf
- Tropical Cyclone Report Omar .pdf

Project Useful Life
Input Selected: 50
Basis of Selection: Default value for the categorized mitigation action.
Reference:
- FEMA Benefit-Cost Calculator V 6.0

Project Costs
Input Selected: $675,205,206.09

Basis of Selection: DR 4335/4340 total project Category F awarded and proposed mitigation, and 404 proposed mitigation at the time of the analysis respective to the district proposing the scope.

Totals include all associated and direct project costs presented and awarded for the mentioned categories regardless of funding source.
FEMA 406 Hazard Mitigation

Projects compiled based on a data pull Grants Manager (GM) query performed in GM FEMA software on October 27, 2020.

The selected input total for the BCA was calculated on a basis above what was needed to perform the following projects listed in the Grants Manager FEMA software for the applicant:

Mitigation Costs = $675,205,206.09

<table>
<thead>
<tr>
<th>Description</th>
<th>Damages &amp; Repairs ($) (CRC Gross Costs)</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>STT Microgrid</td>
<td>$125,611,021.00</td>
<td></td>
</tr>
<tr>
<td>WAPA Randolph E. Harley Power Plant Repairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAPA Advanced Metering Infrastructure System</td>
<td>$4,664,462.98</td>
<td>$15,964,989.46</td>
</tr>
<tr>
<td>Feeder 13 Transmission UG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pad mounted Transformers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeder 5A UG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite Pole Installation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeder 7C &amp; 7D UG</td>
<td>$172,457,777.61</td>
<td>$95,519,303.00</td>
</tr>
<tr>
<td>Feeder 9A/10A UG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeder L3-0D0E2/RR UG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeder 7B/9B UG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeder 10B/9D UG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donald Francois Substation</td>
<td>$4,647,566.00</td>
<td>$10,865,244.00</td>
</tr>
<tr>
<td>DCF Roll Down Door</td>
<td>$5,500.00</td>
<td>$5,013.00</td>
</tr>
<tr>
<td>St John Substation</td>
<td>$682,500.00</td>
<td>$12,044,265.00</td>
</tr>
<tr>
<td>Sub Standby Generators</td>
<td>$90,491.00</td>
<td>$1,112,559.00</td>
</tr>
<tr>
<td>East End Substation</td>
<td>$1,378,619.00</td>
<td>$9,774,547.03</td>
</tr>
<tr>
<td>Cruz Bay UG</td>
<td>$4,333,395.00</td>
<td>$119,263,384.00</td>
</tr>
<tr>
<td>Pole to Pad Mount Transformers</td>
<td>$101,830.00</td>
<td>$320,475.00</td>
</tr>
<tr>
<td>Composite Pole Installation</td>
<td>$15,667,385.00</td>
<td>$146,844,022.37</td>
</tr>
<tr>
<td>Microgrid, Gen Sets, Battery Storage</td>
<td>$135,300,000.00</td>
<td></td>
</tr>
<tr>
<td>Feeder 5A Comp</td>
<td>$13,824,828.58</td>
<td>$2,580,383.23</td>
</tr>
<tr>
<td>Sub Totals</td>
<td>$213,671,545.17</td>
<td>$675,205,206.09</td>
</tr>
</tbody>
</table>

Reference:
  - Spreadsheets
    - Projects Export GM 102720
    - 2017 Damages
    - GM Extract STT Mitigation + 404

Number of Maintenance Years
Input Selected: 50
Basis of Selection: Based on Project Useful Life selected default value for Electrical Utilities Mitigation Projects.
Reference:
- FEMA Benefit-Cost Calculator V 6.0

Hazard Mitigation Proposal – St. John Electrical Permanent Repairs
Annual Maintenance Cost
Input Selected: $6,752,052.06
Basis of Selection: Based on the Overhead and Maintenance Costs value of 1% considered consistent with the analysis presented to FEMA by Star II on May 22, 2018 consistent with FEMA standard values.
Reference
- USVI_WAPA_BCA_Methodology_Report_052218.docx

Year of Analysis Conducted
Input Selected: 2020
Basis of Selection: Current Year Analysis

Year Property was Built
Input Selected: 1989
Basis of Selection: This was a year of significant reconstruction to the electrical system and the most recent documentation available for significant damages to the system as a result of Hurricane Hugo.
Reference:
- USVI_WAPA_BCA_Methodology_Report_052218.docx

Analysis Duration
Input Selected: 32 years
Basis of Selection: Default value based on Project Useful Life
Reference:
- FEMA Benefit-Cost Calculator V 6.0

Type of Service
Input Selected: Electrical
Basis of Selection: The Virgin Islands Water & Power Authority is the sole electrical service provider to the customer base of the United States Virgin Islands.

Number of Customers Served
Input Selected: 55,986
Basis of Selection: Reasonable expected data counts based on latest census provided for United States Virgin Islands STT / STJ / WI population.
Reference: 2010 USVI Census Demographic .pdf

Value of Unit Service
Input Selected: $174
Basis of Selection: 2020 updated default value for Electrical Utilities Loss of Service Value per person per day.
Reference:
- FEMA Benefit-Cost Calculator V 6.0

Historical Damages Before Mitigation
Input Selected: DR 4335/4340 total project Categories A, B, E, and F project costs for damages incurred from the listed events as appropriated to the district STT: STT / STJ / WI 2017.
Historical Project recorded damages compiled from historical 2018 BCA methodology report.
2017 event recorded damages compiled based on a data pull Grants Manager (GM) query performed in GM FEMA software on October 27, 2020.

**Basis of Selection:** Recorded damages.

**Reference:**
- EDW Warehouse
  - Spreadsheets:
    - Projects Export GM 102720
    - 1989
    - 1995
    - 1996
    - 1999
    - 2008
    - 2010
    - 2017
- AL052016_Earl.pdf
- AL161999_Lenny.pdf
- Hurricane Hugo.pdf
- marilyn.pdf
- Tropical Cyclone Report Omar.pdf

**Expected Damages after Mitigation**

**Input Selected:**

<table>
<thead>
<tr>
<th>RI</th>
<th>Emergency Work</th>
<th>Permanent Work</th>
<th>Lost of Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>$183,306,202.70</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>50</td>
<td>$122,204,135.14</td>
<td>$231,650,995.56</td>
<td>$860,321,264.69</td>
</tr>
<tr>
<td>100</td>
<td>$61,102,067.57</td>
<td>$128,694,997.54</td>
<td>$477,956,258.16</td>
</tr>
<tr>
<td>250</td>
<td>$244,408,270.27</td>
<td>$128,694,997.54</td>
<td>$477,956,258.16</td>
</tr>
<tr>
<td>500</td>
<td>$244,408,270.27</td>
<td>$128,694,997.54</td>
<td>$477,956,258.16</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$855,428,945.95</strong></td>
<td><strong>$617,735,988.17</strong></td>
<td><strong>$2,294,190,039.17</strong></td>
</tr>
</tbody>
</table>

**Expected Damages after Mitigation**

**Input Selected:**

<table>
<thead>
<tr>
<th>RI</th>
<th>Emergency Work</th>
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<tbody>
<tr>
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<td><strong>$2,294,190,039.17</strong></td>
</tr>
</tbody>
</table>

**Basis of Selection:** Based on a regression analysis conducted by Star II and submitted to FEMA in 2018. The analysis calculates the expected damages as a function of the event recurrence interval and what the intended mitigation should be able to withstand during the respective categorized event. The expected damages after mitigation utilized the exact method offered by Star II with the refined data available for this analysis.

The following methodology was outlined in the submittal by Star II:

- The project will only be of limited effectiveness at reducing emergency work damages associated with debris removal and emergency protective measures (PA Categories A and B). Residual damages – estimated at 25 percent of inflated pre-mitigation damage – are expected to begin at the 25-year RI (ATC wind speed 112 mph) and increase steadily with
increasing wind speed. At the 250-year RI (project wind speeds 150 mph), no reduction in emergency work damages is expected to occur.

- The project will be very effective at eliminating permanent work damages and service losses to the WAPA (PA Category F) for smaller events; with zero residual damages estimated at the 25-year RI (ATC wind speed 112 mph) and 10% inflated of pre-mitigation damage at the 50-year RI (ATC wind speed 130 mph). However, once the 100-year RI is reached (ATC wind speed 143 mph) or exceeded, it is expected that significant damages will occur to above-ground lines and infrastructure – estimated at 50 percent of inflated pre-mitigation damages and service losses.

The regression is modeled by the expected percent of infrastructure that should be reasonably expected to withstand the categorized events at their respective intervals. The interval regression was set to the following sequence:

**Emergency Work**
- 25 Year Recurrence Event – 75% Effectiveness Expected
- 50 Year Recurrence Event – 50% Effectiveness Expected
- 100 Year Recurrence Event – 25% Effectiveness Expected
- 250 Year Recurrence Event – All Damages Expected
- 500 Year Recurrence Event – All Damages Expected

**Permanent Work**
- 25 Year Recurrence Event – 100% Effectiveness Expected
- 50 Year Recurrence Event – 90% Effectiveness Expected
- 100 Year Recurrence Event – 50% Effectiveness Expected
- 250 Year Recurrence Event – 50% Effectiveness Expected
- 500 Year Recurrence Event – 50% Effectiveness Expected

**Loss of Function**
- 25 Year Recurrence Event – 100% Effectiveness Expected
- 50 Year Recurrence Event – 90% Effectiveness Expected
- 100 Year Recurrence Event – 50% Effectiveness Expected
- 250 Year Recurrence Event – 50% Effectiveness Expected
- 500 Year Recurrence Event – 50% Effectiveness Expected

**Reference:**
- USVI_WAPA_BCA_Methodology Report 052218.docx
  - Pg 11. Expected Damages after Mitigation
- EDW Warehouse
  - Spreadsheets:
    - Projects Export GM 102720
    - 1989
    - 1995
    - 1996
    - 1999
    - 2008
    - 2010
    - 2017
    - AL052016_Earl .pdf
    - AL161999_Lenny .pdf
    - Hurricane Hugo .pdf
    - marilyn .pdf
    - Tropical Cyclone Report Omar .pdf
Compliance and Assurances

General

- FEMA will not pay for duplication in costs. FEMA will pay only the incremental difference in costs between repairs and mitigation, and will not duplicate funding for repair or replacement of eligible work.
- The Applicant must provide and maintain competent and adequate engineering design and supervision during the construction phase. This is to ensure that the completed work conforms to the approved plans, specifications and all applicable material and construction standards. The final design and choice of contractors and vendors are the responsibility of the Applicant.

Codes & Standards

- The applicant is responsible for the determination of and compliance with applicable requirements, codes, standards and specifications in connection with the project including but not limited to CFR 44 & ASCE/SEI 24 and receiving all applicable permits & approvals prior to construction.
Project Title: PA-02-VI-4340-PW-00060
70150 - JMUR801 - St. John Electrical Distribution Perm

Non Compliant Flag: No
EA Draft Date: 
EA Final Date: 
EA Public Notice Date: 
EA Fonsi: 
EIS Notice of Intent: 
EIS ROD Date: 
Comment: VI Water and Power Authority, St. John (island-wide), CAT F, 0% complete. $55,760,341.37. The applicant will use force account labor, equipment, material, and contractor services to replace and restoring approximately 366,000 feet of 13.8 kV and 34.5 kV 3-phase, 397 AAAC Primary Conductor, 510,900 feet (13.8 kV single phase), 1,104,750 feet of Secondary of various sizes, and replace 1536 ea.(40 FT, 55FT & 65FT) wooden power poles and other pole structural related accessories (pole guying, crossarms, insulators, etc.), 520 ea. pole mount transformers and two (2) Automatic Circuit Reclosers, eleven (11) Scada-Mates load interrupter switches, two (2) Capacitors Banks and 15 ea. one (1) kVA Instrument Transformers, and replace 497 ea. Pole Mounted Street lights. Applicant SOW includes project management/A&E costs. A HMP is also attached for the installation of composite poles, five (5) pad mounted transformer, two (2) emergency generators and underground work. EHP is only reviewing HMP 1C (Composite Pole Installation from Myrah Keating Clinic to Calabash Boom) and HMP 3 (Composite Pole Installation). HMP 1C: Applicant will utilize contract services to replace and install 212 composite poles along Feeder 7E and 9E within the right-of-way with the associated electrical components. HMP 3: Applicant will utilize contract services to replace and install 998 composite poles along Feeder 7E and 9E within the right-of-way with the associated electrical components. The reviewed HMP(s) will be performed in lieu of in-kind repairs of wooden poles. EHP is not reviewing HMP 1A: undergrounding, HMP 1B: generation house, and HMP 2: pad mounted transformers. These items will be reviewed when supporting documentation as a result of the A&E report is available. Any subsequent versions of this project will require an EHP review for compliance. Failure to do so may jeopardize federal funding. - dwoods13 - 02/20/2018 21:45:37 GMT

***Version 2*** The previous review applies in addition to the review of Cruz Bay Undergrounding HMP(406 Mitigation proposal). The SOW for the Cruz Bay undergrounding HMP involves replacing the overhead distribution system of Feeder 7E, originating from the Tabasco Road Substation with an underground distribution system and ending at Mongoose Junction. This includes constructing approximately 5013 ft L x 24 in. W x 2-6 ft D trenches, the installation of manholes, transformer pads and vaults, concrete duct banks, and secondary lines, and the removal of overhead lines, poles, lightning arresters, transformers, cable terminations and secondary cables. EHP has not reviewed Myrah Keating, Calabash Boom and Coral Bay portions of the undergrounding HMP, HMP 1B: generation house and HMP 2: pad mounted transformers for this project. Any subsequent versions of this project will require an EHP review for compliance. Failure to do so may jeopardize federal funding. - kjerris - 10/13/2020 12:48:22 GMT

CATEX CATEGORIES

<table>
<thead>
<tr>
<th>Catex Category Code</th>
<th>Description</th>
<th>Selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>*n7</td>
<td>(*n7) Federal Assistance for Structure and Facility Upgrades. Federal assistance for the reconstruction, elevation, retrofitting, upgrading to current codes and standards, and improvements of pre-existing facilities in existing developed areas with substantially completed infrastructure, when the immediate project area has already been disturbed, and when those actions do not alter basic functions, do not exceed capacity of other system components, or modify intended land use. This category does not include actions within or affecting streams or stream banks or actions seaward of the limit of moderate wave action (or V zone when the limit of moderate wave action has not been identified).</td>
<td>Yes</td>
</tr>
<tr>
<td>*n18</td>
<td>(*n18) Federal Assistance for Construction or Installation of Structures, Facilities, or Equipment to Ensure Continuity of Operations. Federal assistance for the construction or installation of measures for the purpose of ensuring the continuity of operations during incidents such as emergencies, disasters, flooding, and power outages involving less than one acre of ground disturbance. Examples include the installation of generators, installation of storage tanks of up to 10,000 gallons, installation of pumps, construction of structures to house emergency equipment, and utility line installation. This CATEX covers associated</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Project: PA-02-VI-4340-PW-00060
Title: 70150 - JMUR801 - St. John Electrical Distribution Perm

**Catex Category Code**

Description: ground disturbing activities, such as trenching, excavation, and vegetation removal of less than one acre, as well as modification of existing structures.

**EXTRAORDINARY**

Extraordinary Circumstance Code

Description: No Extraordinary Circumstances were selected

**ENVIRONMENTAL LAW / EXECUTIVE ORDER**

<table>
<thead>
<tr>
<th>Environmental Law/Executive Order</th>
<th>Status</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Air Act (CAA)</td>
<td>Completed</td>
<td>Project will not result in permanent air emissions - Review concluded</td>
<td></td>
</tr>
<tr>
<td>Coastal Barrier Improvement Act (CBIA)</td>
<td>Completed</td>
<td>Review concluded</td>
<td>The proposed project is located in or connected to an Otherwise Protected Area (OPA) VI-13P&gt;. Projects in OPA are not subject to limitations on federal expenditures under Section 5 of CBRA, but may be restricted from obtaining flood insurance. Subrecipient is responsible for complying with any applicable insurance requirements. - dwoods13 - 02/20/2018 21:24:19 GMT</td>
</tr>
<tr>
<td>Coastal Barrier Resources Act (CBRA)</td>
<td>Completed</td>
<td>Project is on or connected to CBRA Unit or otherwise protected area</td>
<td>In consultation with USFWS initiated on [1/24/2018] and completed on [01/25/2018], FEMA determined that the proposed scope of work is an eligible exception to the Coastal Barrier Resource Act. Please see attached correspondence. - dwoods13 - 02/20/2018 21:40:10 GMT<em><strong>Previous Review applies</strong></em> Version 2, Cruz Bay Undergrounding, adds: Per review of the USFWS Coastal Barrier Resources System (CBRS) mapper, accessed 10/08/2020, the project is not located in a CBRS Unit - kjerris - 10/13/2020 13:00:50 GMT</td>
</tr>
<tr>
<td>Clean Water Act (CWA)</td>
<td>Completed</td>
<td>Project would not affect any water of the U.S. - Review concluded</td>
<td></td>
</tr>
<tr>
<td>Coastal Zone Management Act (CZMA)</td>
<td>Completed</td>
<td>Project is located in a coastal zone area and/or affects the coastal zone</td>
<td>Activity meets the exemption outlined in 12 VIC 910(b)(2) and is therefore, deemed consistent with the VICZMA, see letter dated 01/19/2018 Federal Consistency</td>
</tr>
</tbody>
</table>

NOTE: All times are GMT using a 24-hour clock.
### Environmental Law/Executive Order

<table>
<thead>
<tr>
<th>Environmental Law/Executive Order</th>
<th>Status</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determination for VI Water and Power Authority Activities.</td>
<td>Completed</td>
<td>State administering agency requires consistency review - Review concluded</td>
<td>Previous Review Applies**** Version 2, Cruz Bay Undergrounding, adds: The VI Water and Power Authority is required to obtain and provide CZMA consistency determination documentation from DPNR. SEE CONDITION - kjerris - 10/13/2020 13:03:07 GMT</td>
</tr>
<tr>
<td>Executive Order 11988 - Floodplains</td>
<td>Completed</td>
<td>No effect on floodplain/flood levels and project outside floodplain - Review concluded</td>
<td>Project sites occur in multiple locations throughout the island of (St. John), some of which may be located in the 100-yr floodplain. There are no other practicable alternatives and the effects on the floodplain are temporary and will not cause any change to pre-existing floodplain values. The Initial Disaster Public Notice was published in the USVI Daily News throughout the territory on 11/18-19/2017. - dwoods13 - 02/20/2018 21:26:29 GMT</td>
</tr>
<tr>
<td>Executive Order 11990 - Wetlands</td>
<td>Completed</td>
<td>No effects on wetlands and project outside wetlands - Review concluded</td>
<td>Portions of the project may be located within wetlands. The Initial Disaster Public Notice was published in the USVI Daily News throughout the territory on 11/18-19/2017. The proposed project involves repair of a utility system extending island-wide, which is not likely to result in direct or indirect impacts that will adversely affect the natural values/function of wetlands. There are no practicable alternatives to the wetland action. - dwoods13 - 02/20/2018 21:37:34 GMT</td>
</tr>
<tr>
<td>Executive Order 12898 - Environmental Justice for Low Income and Minority Populations</td>
<td>Completed</td>
<td>No Low income or minority population in, near or affected by the project - Review concluded</td>
<td>FEMA, in consultation with the United States Fish and Wildlife Service (USFWS), has determined the proposed undertaking is not likely to adversely affect federally listed or candidate species or designated critical habitat when recommended conservation measures are followed. See attached correspondence dated (02/05/2018). - dwoods13 - 02/20/2018 22:29:41 GMT Previous review applies*** Version 2, Cruz Bay Undergrounding, adds: The US Fish and Wildlife Services Information, Planning, and Conservation System (IPaC), dated 10/09/2020 , and available at <a href="http://ecos.fws.gov/ipac/">http://ecos.fws.gov/ipac/</a>, indicates occurrences of the following</td>
</tr>
</tbody>
</table>

**Endangered Species Act (ESA)**: Completed Listed species and/or designated critical habitat present in areas affected directly or indirectly by the federal action.
### Environmental Law/Executive Order

<table>
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<tr>
<th>Environmental Law/Executive Order</th>
<th>Status</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmland Protection Policy Act</td>
<td>Completed</td>
<td>Project does not affect designated prime or unique farmland - Review concluded</td>
<td></td>
</tr>
<tr>
<td>Fish and Wildlife Coordination Act (FWCA)</td>
<td>Not Applicable</td>
<td>Project does not affect, control, or modify a waterway/body of water - Review concluded</td>
<td></td>
</tr>
<tr>
<td>Migratory Bird Treaty Act (MBTA)</td>
<td>Completed</td>
<td>Project located within a flyway zone</td>
<td></td>
</tr>
<tr>
<td>Magnuson-Stevens Fishery Conservation and Management Act (MSA)</td>
<td>Completed</td>
<td>Project not located in or near Essential Fish Habitat - Review concluded</td>
<td></td>
</tr>
<tr>
<td>National Historic Preservation Act (NHPA)</td>
<td>Completed</td>
<td>Standard Section 106 review</td>
<td></td>
</tr>
</tbody>
</table>

The NHPA review concerns only the undertaking Scope of Work stipulated in the Environmental Review: NEPA Determination. Additional items in this PW will be reviewed when supporting information is available. The proposed activity of the reviewed scope meets Tier II Allowance 2.D.1.a. of FEMA's Virgin Islands Programmatic Agreement executed on July 14, 2016. - cmorri27 - 02/20/2018 22:52:53 GMTVersion #2, Cruz Bay Underground Power Construction Project for Feeder 7E. Replace and mitigate primary overhead and secondary lines for Feeder 7E (up to the customer's meter) in the Cruz Bay, St. John area. Cruz Bay Underground Power Construction Project for Feeder 7E was previously consulted on with the SHPOs office. Per consultation with the SHPO initiated on September 18, 2020 and
### Project: PA-02-VI-4340-PW-00060  
**Title:** 70150 - JMUR801 - St. John Electrical Distribution Perm

<table>
<thead>
<tr>
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<tr>
<td>Building or structure 50 years or older or listed on the National Register in the project area and activity not exempt from review</td>
<td>Completed</td>
<td>Building or structure 50 years or older or listed on the National Register in the project area and activity not exempt from review</td>
<td>completed on October 7 14, 2020. FEMA has determined that the proposed scope of work will not have an adverse effect to historic properties with conditions. Please see attached correspondence. - cbommar3 - 10/08/2020 11:34:12 GMT</td>
</tr>
<tr>
<td>Determination of Historic Properties Affected (FEMA finding/SHPO/THPO concurrence attached)</td>
<td>Completed</td>
<td>Determination of Historic Properties Affected (FEMA finding/SHPO/THPO concurrence attached)</td>
<td></td>
</tr>
<tr>
<td>No Adverse Effect Determination (FEMA finding/SHPO/THPO concurrence attached) - Review concluded</td>
<td>Completed</td>
<td>No Adverse Effect Determination (FEMA finding/SHPO/THPO concurrence attached) - Review concluded</td>
<td></td>
</tr>
<tr>
<td>Project affects undisturbed ground</td>
<td>Completed</td>
<td>Project affects undisturbed ground</td>
<td></td>
</tr>
<tr>
<td>Project area has potential for presence of archeological resources</td>
<td>Completed</td>
<td>Project area has potential for presence of archeological resources</td>
<td></td>
</tr>
<tr>
<td>Determination of no historic properties affected (FEMA finding/SHPO/THPO concurrence attached) - Review concluded</td>
<td>Completed</td>
<td>Determination of no historic properties affected (FEMA finding/SHPO/THPO concurrence attached) - Review concluded</td>
<td></td>
</tr>
<tr>
<td>Resource Conservation and Recovery Act, aka Solid Waste Disposal Act (RCRA)</td>
<td>Completed</td>
<td>Review concluded</td>
<td>This debris shall be handled, managed and disposed of, including hazardous waste if applicable, in accordance with the FEMA/Territory Agreements for each disaster, signed September 16, 2017, in which the Territory agreed to comply with, and require all sub recipients to comply with, the requirements of all applicable laws and regulations including the Stafford Act, Title 44 of the Code of Federal Regulations (CFR) (Emergency Management and Assistance), 2 CFR Part 3002 (implementing 2 CFR Part 200 (Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards), and applicable FEMA policies and guidance. - kjerris - 10/13/2020 13:08:33 GMT</td>
</tr>
<tr>
<td>Wild and Scenic Rivers Act (WSR)</td>
<td>Completed</td>
<td>Project is not along and does not affect Wild and Scenic River</td>
<td>Review concluded</td>
</tr>
</tbody>
</table>

**NOTE:** All times are GMT using a 24-hour clock.
Special Conditions required on implementation of Projects:

In accordance with Section 307 A 1. (C) of the Coastal Zone Management Act of 1972 and Division 4 Federal Consistency Section 904-11 of the Code of Virgin Island Rules dated February 2006, the VI Water and Power Authority is required to obtain a consistency determination from the Virgin Islands Department of Planning and Natural Resources prior to commencement of work.

Source of condition: Coastal Zone Management Act (CZMA) Monitoring Required: No

Poles being replaced which require some level of vegetation clearing to access pole, the access road and a 10 foot diameter area around the pole should be surveyed prior to vegetation clearance.

Source of condition: Endangered Species Act (ESA) Monitoring Required: No

Avoid the removal of vegetation, fence installation, construction activities, and light installation within 50 meters inland from the high tide.

Source of condition: Endangered Species Act (ESA) Monitoring Required: No

If any street lighting is associated with pole replacement, lighting should meet the sea turtle friendly lighting criteria. All lighting sources should emit a wavelength of 450 nanometers or longer.

Source of condition: Endangered Species Act (ESA) Monitoring Required: No

Prepare and implement a comprehensive lighting plan to avoid detrimental impacts of artificial lighting on sea turtles. Plan is to be submitted and approved by USFWS prior to commencement of lighting work.

Source of condition: Endangered Species Act (ESA) Monitoring Required: No

Once the plan is fully implemented/post-construction, a lighting inspection should be conducted by a qualified biologist.

Source of condition: Endangered Species Act (ESA) Monitoring Required: No

FEMA or designee shall conduct unannounced site visits during the duration of work for this area to ensure subrecipient adherence to project conditions between 18.35890, -64.738834 to 18.3566660, -64.737715.

Source of condition: Endangered Species Act (ESA) Monitoring Required: No

Methods to reduce potential damages from vibrations adjacent to Historic Structures, please refer to Architecture section above for contributing historical buildings within the Cruz Bay Town Historic District.

a. Any construction that could potentially affect historic structures through vibration, as determined by a licensed engineer (i.e. within 25+ feet), requires vibration monitoring. Vibration monitoring will be performed continuously using threshold-type and fully automated seismographs. Seismograph will be installed in the lowest level of the 10 referenced buildings facing the project site. Prior to construction, ambient vibrations will be recorded, and a baseline vibration level will be established. The baseline vibration level will assist in distinguishing between the ambient vibrations and construction-induced vibrations.

b. The maximum permissible peak particle velocity shall be 0.5inches/second (in/sec) as determined by a licensed engineer. The seismographs will be connected to wireless modems and will be configured to have a trigger level of 0.4 in/sec. In an event of a construction-induced vibration exceeding 0.4 in/sec, an automatic electronic warning alert (email) will be sent out to designated recipients. Construction activities should be evaluated to determine the cause of vibrations and measures should be implemented to reduce construction-induced vibrations in the future. In the event of a measured vibration level exceeding 0.5 in/sec, construction activities at the site will cease and construction methods will be evaluated and modified accordingly; construction activity will not resume until measures are implemented to prevent vibrations exceeding 0.5 in/sec. Vibration monitoring is anticipated during the excavation and below-grade construction work. Once these activities are completed, vibration monitoring will cease, unless other construction related activities are anticipated to induce significant vibration levels.

c. Construction methods to be used to reduce vibration monitoring as determined by a licensed engineer of the above-mentioned historic buildings is as follows:

i. Oscillating rollers instead of vibratory rollers to compact pavement.

ii. Jetting of piles to reduce vibration from impact pile driving.

iii. Use of nonvibratory compaction methods.

iv. Prohibiting blasting in the vicinity of a masonry building.

v. Shoring of buildings during construction.

vi. Limiting the energy on pile driving hammers and pavement breakers.

vii. Using drilled shaft foundations in place of driven piles.

Source of condition: National Historic Preservation Act (NHPA) Monitoring Required: Yes
Architecture Conditions
a. Consultant will write a Historic Resource Protection Plan for any potential impacts to historic buildings/structures beyond vibrations to submit to FEMA for approval. The plan will address the following
i. Where proposed work is located within the Frederiksted Historic District, to include: walls, canopies, retaining walls, fences, planting beds, and vegetation/groundcover; follow the procedures listed below for demolition, protection, and construction:
   1) Identify historic features of the sidewalks and streets, such as high or stepped curbs, stone or brick curbs, stamped concrete in the sidewalks, historic manhole covers, mosaic tile street names, tiled store entries, trolley tracks, and brick streets. Preserve them in place whenever possible.
   2) To minimize potential damage to historic structures and materials, contractor will saw cut existing sidewalk 8 to 12 inches away from the historic structure, canopy supports, fence, or retaining wall. When constructing the new sidewalk next to the saw cut edge, contractor will install an expansion joint between them.
   3) If the existing sidewalk is to be removed entirely, the sidewalk next to the historic structure, canopy supports, material, fence, or retaining wall will be removed by hand. An expansion joint will be placed between the historic structure, canopy support, material, fence, or retaining wall and new sidewalk.
   4) Prevention of damages to historic structures, canopy supports and their awning, materials, fences, retaining walls, including garden elements (planting beds, plantings), is the responsibility of the contractor during all of the construction work for the project. During the saw cut and hand removal process, contractor will exercise utmost caution and will physically protect historic structure foundation, canopy supports, materials, elevations, entryways with decorative flooring, fences, retaining walls, and landscape elements appropriately.
   5) Contractor to repair or replace in kind any historic materials damaged in the course of executing the work. Contractor is responsible for locating replacement historic materials for any damaged in the course of their work.

Architectural Conditions continued:
All trench work that crosses known historic sidewalks and/or walkways requires careful photographic documentation of the existing layout patterns of the stones, bricks, and/or paving stones before removal of materials. This photo documentation is for both a record of the resources prior to disturbance and as a guide for the reinstatement of the historic paving materials.

   i. All historic paving materials such as bricks, stones, and paver stones identified for temporary removal to allow for trenching work, shall be removed in a low impact method to prevent or lessen the chances of material breakage.
   ii. All historic paving materials removed from sidewalks and walkways are to be stored in safe areas and conditions to prevent the loss of these historic resources. During storage these historic paving materials will be prepared for reinstallation, i.e. the removal of dirt and mortar from the stones, bricks and pavers.
   iii. Once all trenching activities have concluded for the installation of the electrical and communication utility conduits, the removed and saved historic paving materials are to be reinstalled into the sidewalks and walkways using an approved historic mortar and following the historic layout pattern as photo-documented prior to the excavation work. In cases where the historic paving materials may have been previously disturbed, as defined in the Protection Plan, and not reset in a historically appropriate layout, the VISHPO shall be consulted for guidance on the revised pattern.
   c. For below ground street infrastructure, such as culverts, gutters, and tunnels, that will be impacted by trenching activities for new electrical and communication utility conduits, the same level of documentation, removal, and replacement of historic material will be required. For any anticipated penetrations through these historic features for the installation of conduits will have to be created by core drilling only. Any other means of penetration will have to be reviewed and approved by the FEMA/VISHPO prior to work taking place. The core drill holes for the planned conduits must also not be unnecessarily large to prevent excessive removal of historic fabric. In limited cases where core drilling may not be needed or is not possible, the opening for the conduits must be enclosed using similar building materials of the historic utility feature.
   d. In cases where associated utility conduit(s) penetrations are discovered in these historic infrastructure features, exploration will be made to determine if these existing openings can be used for the new conduits. In cases where this is not possible, the abandoned conduits will remain.
   e. Once all trenching, drilling, conduits installation is completed the restorative work shall be documented with photos for inclusion in the final report.
   f. All backfilling of these areas shall be completed using material appropriately sized and composed as to lessen and/or prevent damage to the newly completed restoration work.

Source of condition: National Historic Preservation Act (NHPA) Monitoring Required: Yes

3. Archaeology Conditions
a. Prior to commencement of any work, the archaeology consultant will provide workplans, completed by a qualified Archaeologist that meets the Secretary of the Interior Professional Qualification Standards for Archaeology and Historic Preservation (SOI), for FEMA approval through SHPO consultation.
   b. Conduct archaeological monitoring for:
      i. All trenching related excavation and ground disturbance within the Frederiksted Historic District.
      ii. Within ten feet of any property listed or potentially eligible for listing on National Register of Historic Places that is
outside the Frederiksted Historic District.

c. Monitoring must be done under the direction of; or by an SOI qualified Archaeologist.
d. Monitoring will include photography and reporting of any discerned archaeological features, either historic or prehistoric. Samples of significant retrieved diagnostic artifacts, as per the Project Specific Programmatic Agreement, will be mapped onto a site, bagged and labeled with the archaeological monitor's name, date, precise location, etc. (e.g. size, length, depth of deposit). All recovered materials will be washed, bags labeled and turned over to the VISHPO as per the Project Specific Programmatic Agreement.
e. Certain locations may require archaeological testing: these areas are outside of the linear trenching, where excavations will occur for manholes; or underground transformers, et al. For these types of locations, archaeological testing will be undertaken in consultation with FEMA/VISHPO for approval. Such testing may include, but no be limited to, shovel testing, backhoe monitoring, posthole auguring, etc. with all documentation completed in a letter memo for each testing area which will be then be combined into an overall monitoring/testing report for that portion of the project. In the event of observed significant archaeological features or artifact concentrations are encountered, FEMA/VISHPO will be consulted immediately, and proposed alternate locations surveyed for consideration.
f. In the case of any known, probable, or potential human burials or excavated human remains, work is to cease in the immediate area and FEMA will be contacted immediately to determine the path forward. Should human remains be verified, alternate routes will be considered; whereas FEMA and the VISHPO may decide to have the human remains removed and work may proceed apace.

4. Heritage Tree Conditions

a. There are numerous stately "heritage trees," along with other plantings, reflective of the town's rich cultural landscape located within the Cruz Bay Historical District. Among these trees are mature lignum vitae, tamarind, saman, mahogany, a wide variety of palms, and one particularly notable genip tree, which is believed to be more than 300-years old. Per VIWPA Cruz Bay Underground Electric Construction Specifications (Appendix A) temporary tree and plant protection should be adhered too as discussed in Section 015639 and as follows:
i. The identified Ancient Genip Tree located at 6E ¿ Vestergade, Block 6; Lot 6C, American Paradise Real Estate & Back Yard Bar must be identified by the Certified Arborist and added to the Tree-Protection Zone. The area surrounding the individual tree must be protected during construction and defined by a circular concentric with the tree with a radius 12 time the tree 6 s caliper size and with a minimum radius of 96 inches (2400 mm).
ii. The Certified Arborist and the designated SOI Archaeologist must identify mature lignum vitae, tamarind, saman, mahogany, a wide variety of palms within the Cruz Bay Historical District. These trees must be identified and added to the Tree-Protection Zone. The area surrounding the individual trees must be protected during construction and defined by a circular concentric with the tree with a radius 12 time the tree 6 s caliper size and with a minimum radius of 96 inches (2400 mm). Prior to any construction activities, the list of ancient and protected trees must be identified in a drawing, with description, possible age of tree and submitted to VISHPO for approval with a monitoring plan during construction activities.
iii. Any removal of trees must be followed by EHP-Tree Removal and Root Ball Guidance VISHPO Concurrence (Appendix B).

Source of condition: National Historic Preservation Act (NHPA)  Monitoring Required:  Yes

A disposal permit/approval letter must be provided prior to closeout.


Standard Conditions:

Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other Laws and Executive Orders.

This review does not address all federal, state and local requirements. Acceptance of federal funding requires recipient to comply with all federal, state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.

If ground disturbing activities occur during construction, applicant will monitor ground disturbance and if any potential archeological resources are discovered, will immediately cease construction in that area and notify the State and FEMA.