- **Facility Type:** Building
- **Building Type:** Rehabilitation Center
- **Facility:** Service Bathrooms
- **Facility Description:** Service Bathrooms annex for maintenance shop
- **Approx. Year Built:** 1970
- **GPS Latitude/Longitude:** 18.11584, -66.17425
- **Number of Stories:** 1

Damage #270617; Centro de Servicios Transicionales a Vida Independiente Cayey-Bldng. 1

General Facility Information:

- **Facility Type:** Building
- **Building Type:** Rehabilitation Center
- **Facility:** Centro Transicional a Vida Independiente Cayey Building 1
- **Facility Description:** This facility is a 230' x 70' Psycho-social Center building. Material construction consist of original roof wood framing. Two story building constructed of brick walls finished with plaster, roofing has an asphalt membrane over corrugated galvanized steel over a wood frame.
- **Approx. Year Built:** 1910
- **GPS Latitude/Longitude:** 18.11657, -66.17354
- **Number of Stories:** 2

Damage #271083; Centro de Servicios Transicionales a Vida Independiente Cayey (Maintenance Shop)

General Facility Information:

- **Facility Type:** Building
- **Building Type:** Rehabilitation Center
- **Facility:** Transicional a la Vida Independiente Cayey-Maintenance Shop
- **Facility Description:** One story facility used as a maintenance shop, concrete walls, rolling doors, concrete roof with a waterproofing membrane.
- **Year Built:** 1950
- **GPS Latitude/Longitude:** 18.11577, -66.17435
- **Number of Stories:** 1

Final Scope

143326 **Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2**

**********Version 1**********

Version 1 created to capture Applicant's provided Method of Repair for the repairs of the disaster related damages in Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2. In Version 0 a total of **$93,522.33** was awarded in support to the Applicant for the development of their Method of Repair. Applicant has submitted an MOR for FEMA's review. FEMA developed a cost per Applicant's request.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

Work to be completed

The applicant will utilize contracts for repairs to the **Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2**

to restore this facility as per applicable codes and standards within the existing footprint.

Work to be completed

The applicant will utilize contracts for repairs to the **Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2** to restore this facility as per applicable codes and standards within the existing footprint.

Building Damage:

Building Exterior:

Contents:

A. Remove and replace 2 Electric Water Heater 50 Gallon - 240 Volt.

Exterior Walls:

A. Prepare and paint in kind 19,560 SF of Latex Wall Paint (Includes connection building), 652 FT long x 30 FT wide.

Roof:

A. Remove and replace in kind 12,348 SF of Metal Standing seam roof deck. See scope note 1.

B. Remove and replace in kind Aluminum Colored Metal siding, 520 FT long x 3 FT high.

C. Remove and replace in kind Aluminum Angle metal flashing, 110 LF long.

Annex:

A. Remove and replace in kind 2,412 SF of Modified Bitumen Roofing Membrane. See scope note

Site:

Basketball Court:

A. Prepare 5,500 SF of Pressure Washing of Latex Paint, 55 FT long x 100 FT wide.

B. Paint in kind 5,500 SF of Latex Paint (Side Lines, Base Lines, Three-point Lines, Free throw lane and Center jump Circle Markings), 55 FT long x 100 FT wide.

C. Remove and replace in kind 1 Basket Backboard.

D. Remove and replace in kind 1 Basket Supporting Post.

Chain link fence:

A. Remove and replace in kind 3,384 SF of Metal Replace Chain Link Fence 8 ft (H), 423 FT long x 8 FT high.

Generator Building:

Building Exterior:

A. Prepare and paint in kind 1,200 SF of Latex Wall Paint.

Roof:

A. Remove and replace in kind 750 SF of Elastomeric Roof sealing.

Building Interior:

A. Prepare and paint in kind 1,300 SF of Latex Wall Paint.

B. Remove and replace in kind 1 Aluminum Louvers, 4 FT long x 7 FT high.

Building Interior:

Contents:

A. Replace 1 White Top-Freezer Refrigerator 18.3 Cu.

B. Replace 20 Oscillating Wall Fan 24 in.

C. Replace 2 Large Capacity Electric Dryer Machine 7.3 Cu.

D. Replace 3 Oscillating Pedestal Fan, Adjustable Height, 3 Speeds 18 in.

E. Replace 1 High-Performance Vertical Shop/Auto Air Compressor 27 Gallon 200 PSI.

F. Replace 5 White Top Freezer Refrigerator GE 21.9 Cu.

G. Replace 7 Wooden Folding 8-Foot Rectangular Table.

H. Replace 11 Laminate wood nightstand with 2 Drawers 21.5 in (D) x 16 in (W) x 18 in (H).

I. Replace 3 Charcoal Grey Vinyl Loveseat 30.5 in (D) x 51.5 in (W) x 29.5 in (H).

J. Replace 3 Lab Storage Cabinet with 3 Doors 71 in (W) x 22 in (D) x 29 in (H).

K. Replace 3 Business Furniture Desk, 72 in (W) x 30 in (D), Mocha Cherry.

L. Replace 1 Wooden Standing 5-Shelf Bookcase Rack 11.4 in (D) x 28.4 in (W) x 72 in (H).

M. Replace 4 L-Shaped Office Computer Desk with File Drawer, CPU Tower 65.13 in (D) x 39.25 in (W) x 29.63 in (H).

N. Replace, 12 Vinyl Waiting Reception Arm less Guest Chair.

O. Replace 6 Wooden 5 Drawer Chest 16 in (D) x 31.5 in (W) x 45.25 in (H).

P. Replace, 2 Home Wood Base Accent Chair-Navy.

Q. Replace 20 Institutional Twin Mattress 38 in (W) x 75 in (L) x 6 in (Th).

R. Replace 2 Wooden Twin Bed Frame 81.4 in (L) x 41.3 in (W) x 35.5 in (H).

S. Replace 2 Regular Twin Mattress 38 in (W) x 75 in (L) x 10 in (Th).

T. Replace 2 Regular Twin Box Spring Mattress 38 in (W) x 75 in (L) x 9 in (Th).

Second floor:

Conference Room:

A. Remove and replace 1 Aircon (Daikin) ACN-8OFCT-EV 48000 BTU/hr-(4Tons) AC Unit.

First floor:

A. Remove and replace in kind 10 Aluminum Jalousie windows, 4 FT wide x 5 FT high.

B. Remove and replace in kind 8,820 SF of Fiber Mineral 2 ft (W) x 4 ft (L) Acoustical Ceiling Tiles, 140 FT long x 63 FT wide.

C. Prepare and paint in kind 30,150 SF of Interior Wall paint, 2,412 FT long x 12.5 FT high.

D. Remove and replace in kind 64 Fluorescent Ceiling luminaires, 4 FT long x 2 FT wide.

E. Remove and replace in kind 8,820 SF of Vinyl Floor Tiles, 140 FT long x 63 FT wide.

F. Remove and replace in kind 29,425 SF of Gypsum Board Walls with metal frame, 2,354 FT long x 12.5 FT high.

G. Remove and replace in kind 7 Wooden Double wood door with a 18 in (L) x 20 in (H) glass vision panels, Frames and Hardware, 5 FT wide x 7 FT high.

H. Remove and replace in kind 8 Wooden Single doors with a glass panel of 40 inches (H) x 11 inches (W), Frames and Hardware, 3 FT wide x 7 FT high.

I. Remove and replace in kind 27 Wooden Single office doors with recessed paneling, Frames and Hardware, 3 FT wide x 7 FT high.

J. Remove and replace 8,820 SF of Electrical distribution system (panelboards not considered) Electrical system.

K. Remove and replace 8,820 SF of Data system.

L. Remove and replace 8,820 SF of Fire alarm system and paneling.

M. Remove and replace in kind Vinyl 4-inch vinyl baseboard, 1,863 LF long.

N. Remove and replace in kind 8 Metal Single door, Frames and Hardware, 3 FT wide x 7 FT high.

O. Remove and replace in kind 8,820 SF of Suspension System Acoustical, 140 FT long x 63 FT wide.

P. Remove and replace 8,820 SF of Communication Telephone system.

Second Floor:

A. Remove and replace in kind 14 Aluminum Jalousie windows, 4 FT wide x 5 FT high.

B. Remove and replace in kind 12,600 SF of Fiber Mineral Acoustical Ceiling tiles 2 ft (W) x 4 Ft (L).

C. Remove and replace in kind 3,096 SF of Gypsum board Walls and metal frame.

D. Remove and replace in kind 9,770 SF of Vinyl 12 in x 12 in floor tiles.

E. Prepare and paint in kind 11,000 SF of Latex Interior wall paint.

F. Remove and replace in kind 18 Wooden Interior doors, Frames and Hardware, 3 FT wide x 7 FT high.

G. Remove and replace in kind 3 Wooden Double door with glass panels of 11 inches x 40 inches each, Frames and Hardware, 6 FT wide x 7 FT high.

H. Remove and replace in kind 80 Fluorescent Surface Mounted Ceiling luminaries 120V.

I. Remove and replace 9,770 SF of Fire alarm system.

J. Remove and replace 9,770 SF of Electrical system and its components.

K. Remove and replace 9,770 SF of Data system.

L. Remove and replace in kind Vinyl Floor tiles baseboard 4 in (H), 1,023 FT long.

M. Remove and replace 9,770 SF of Telephone system.

N. Remove and replace in kind 8,026 SF of Wooden Groove and tongue (Wood plank ceiling).

Work to be completed: $6,396,801.86

Scope Notes:

1. Quantities modified as per BBA Scope Survey document labeled *DR4339PR-157312- BBA Scope Survey - Final- 4-02-2024,* to comply with Puerto Rico Building Code 2018, Chapter 15, Roof Assemblies and Rooftop structures.

2. The BBA percentage was calculated as 40% based on the approved BBA Scope. ($977,270.24 / $2,472,533.68 = 40%). Please refer to document labeled: SP157312 - DR4339PR – Cost Estimate.xlsx.

Project Notes:

1. All site estimates for work to be completed were generated using RS means Software Data/Year 2024 Quarter 1 – PUERTO RICO / URBAN (PRU) and Future Price Factors for Zone 1-Urban. See document labeled *SP157312 - DR4339PR – Cost Estimate.xlsx.* CEF cost estimate in GM may vary from CEF cost estimate worksheet due to rounding. The worksheet cannot be adjusted to correct the difference.

2. A Cost Estimating Format (CEF) has been created for this project, see attachment labeled: *SP157312 - DR4339PR - CEF.xlsx.*

3. This project is a PA Alternative Procedures project, involves a Critical Service, CTVI de Cayey, and the disaster damage impacts the function of educational facility. For each site (as defined in the BBA Policy) in this project where disaster damage meets the large project threshold of $123,100, the Bipartisan Budget Act (BBA) applies.

4. Disaster damaged components at this site were comingled with pre-existing damage/deterioration. After conducting a site inspection and evaluating all available documentation, FEMA was unable to distinguish and separate disaster-related damage from pre-existing damage/deterioration. This Project/PW/Project provides funding for repairs to disaster-damaged components that also had pre-existing conditions based on the authorities in Section 20601 of the Bipartisan Budget Act of 2018 as defined in FEMA's Recovery Policy FP- 104-009-5, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.

5. Bipartisan Budget Act (BBA): As authorized by the BBA additional flexibilities were applied to this Project/PW as authorized and detailed within the scope of work. If the Subrecipient wishes to use these funds toward an Alternate Project, the Alternate Project must still provide a BBA-eligible critical service and must be constructed to the approved industry standard(s). FEMA will evaluate the proposed use for reasonableness. If funds not used toward a BBA eligible project, FEMA will have to re-scope the project taking out all work authorized under BBA and the estimate will be adjusted based on the new SOW.

6. This project meets the requirements of (A) Applicability, (B) Eligible Industry Standards and (C) Cost Eligibility Work and Cost defined in Section 20601 of the 2018 Bipartisan Budget Act (BBA). See Implementing Section 20601 of the 2018 BBA through PA, FEMA Recovery Policy FP-104-009-5, V.2, 9/11/2019 and FEMA Regional II Memo dated on 30/10/2019.

7. **Determination Memorandum:** this project contains an official Determination Memo for Scope that has been deemed ineligible before costing. For all information pertaining to this determination memo see documents titled: *DM32180 4339ASSMCAGM157312_PW8108 DM 20240409.*

8. For detailed information on the Method of Repairs (MOR) of wood ceilings and roofs, please refer to the document labeled: RFI_PRJ_106752_line_item_4.

406 HMP Scope

1. Damage #143326; Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2

(I) Facility Hazard Data:

For any mitigation strategy applied to the following facilities related to high winds, please follow the PRBC 2018 and any other related local construction codes to identify the correct wind speed requirement.

(II) Eligible Damages to be Mitigated:

Roof:

A. Remove and replace 12,348 SF of Metal Standing seam roof deck. See scope note 1.

Generator Building:

Roof:

A. Remove and replace 750 SF of Elastomeric Roof sealing.

Chain link fence:

A. Remove and replace 3,384 SF of Metal Replace Chain Link Fence 8 ft (H), 423 FT long x 8 FT high.

Building Exterior:

Contents:

A. Remove and replace 2 Electric Water Heater 50 Gallon - 240 Volt.

First Floor:

D. Remove and replace 64 Fluorescent Ceiling luminaires, 4 FT long x 2 FT wide.

Second floor:

Conference Room:

J. Remove and replace 8,820 SF of Electrical distribution system (panelboards not considered) Electrical system.

L. Remove and replace 8,820 SF of Fire alarm system and paneling.

Second Floor:

I. Remove and replace 9,770 SF of Fire alarm system.

J. Remove and replace 9,770 SF of Electrical system and its components.

First Floor: Windows

b. Remove and replace 1 Aluminum Louvers, 4 FT long x 7 FT high.

First Floor: Doors

n. Remove and replace 8 each of Metal Single door, Frames and Hardware, 3 FT wide x 7 FT high, Damaged due to water intrusion, strong hurricane winds, bent and twisted. 0% work completed.

Second floor: Doors

g. Remove and replace 3 Wooden Double doors with glass panels of 11 inches x 40 inches each, Frames and Hardware, 6 FT wide x 7 FT high.

(III) Hazard Mitigation Proposal (HMP) Scope of Work:

Damages to be mitigated as follow as per PA Scope of Work: To prevent or reduce future damages from similar events, the applicant proposed the following mitigation:

Roof:

A. Remove and replace 12,348 SF of Metal Standing seam roof deck. See scope note 1.

Roof Mitigation:

Roof Area of the building: 12,348 SF.

Dimensions: 196 FT x 63FT

It will be used a reinforced metal roof assembly including: Steel roofing panels corrugated 24 gauge. Drip Edge Flashing, and Exterior Metal Panel Fastening to prevent future wind and water damages and subsequent water intrusion.

Replacement Mitigation:
Install 12,348 SF of Reinforced Metal Deck with Roofing Panel Assembly. Reinforcing structure and improving drainage capacity of metal roofs will help prevent wind and water damages and subsequent water intrusion.

Supplementary Mitigation:
Install 12,348 SF of Waterproof Metal Roof Coating; the measure will mitigate interior damages by preventing water infiltration through seams and fasteners penetration during high-driven wind events. This mitigation is intended to add a protective coating for corroded metal roofs.

Supplementary Mitigation:

Reinforce Metal Structures - Add Units / Increase Thickness of Girts or Purlins

Install 173 L.F. of 2" Girt / 12" purlins 12 ga with thicker, stronger units. This mitigation will help prevent flexure and detachment due to high velocity wind and pressure that could cause subsequent water intrusion and interior damages. (ie: Replace 16 gauge with 14 gauge, the lower the gauge the stronger the unit.) Mitigation would place 1 Ea. additional strap over a 3 ft span.

Supplementary Mitigation:

Exterior Metal Panel Fastening - Metal Roof

Add 3 additional non-corrosive screws w/neoprene washers every 12 SF on 12,348 SF=1,029 SF of damaged metal panels to reinforce fastening pattern thus protecting the building envelope. Improve exterior metal

panel fastening by including additional fasteners protect the building envelope and prevent flexure, displacement and subsequent water infiltration damages.

Supplementary Mitigation:

Install 12,348 SF of reinforced SBS waterproofing system bituminous membrane layer on metal deck roof to reinforce waterproofing system, prevent wind and water damages. Improve exterior metal panel fastening by including additional fasteners protect the building envelope and prevent flexure, displacement and subsequent water infiltration damages.

It will be used a SBS waterproofing system bituminous membrane, termination bar, L flashing (not visible from outside) to anchor membrane. To prevent future wind and water damages and subsequent water intrusion.

Supplementary Mitigation:

Gutter

Anchor 173 LF of damaged gutter using 1 Ea. hanger every 3 LF to prevent displacement due to high velocity wind. Decrease hanger spacing from standard 6 LF to 3 LF to prevent displacement due to high velocity wind. Mitigation would place 1 Ea. additional strap over a 6 ft span.

Downspout

Anchor 104 LF of damaged downspout using 1 Ea. strap every 5 LF to prevent displacement due to high velocity wind. Decrease downspout strap spacing from standard 10 L.F. to 5 L.F. to prevent displacement due to high velocity wind. Mitigation would place 1 Ea. additional strap over a 10 L.F. span.

Generator Building:

Roof:

B. Remove and replace 750 SF of Elastomeric Roof sealing.

Supplementary Mitigation:

Install 750 SF of reinforced SBS waterproofing system bituminous membrane layer on metal deck roof to reinforce waterproofing system, prevent wind and water damages. Improve exterior metal panel fastening by including additional fasteners protect the building envelope and prevent flexure, displacement and subsequent water infiltration damages.

It will be used a SBS waterproofing system bituminous membrane, termination bar, L flashing (not visible from outside) to anchor membrane. To prevent future wind and water damages and subsequent water intrusion.

Chain link fence:

A. Remove and replace 3,384 SF of Metal Replace Chain Link Fence 8 ft (H), 423 FT long x 8 FT high.

Replacement Mitigation:

Install 423 LF of Break-Away Fencing (7.5-ft prefabricated Fence Panels, 8-ft on center post to post setting).

1) The proposed mitigation measures for the fence are:
   a) Replace 10-ft on center to 8-ft on center to allow for the 7.5-ft break-away panels (for a 423 LF section this will change from 43 posts to 54 posts).
   b) Bury posts 3-ft deep instead of 2-ft deep. Each post will change from 8 ft long total to 9 ft long total. This will also include additional concrete for the footing and labor for excavation/installation for the extra 1-ft depth. (8 ft height to 2 Ft deep, it will change to 8 ft to 3 Ft deep)
   c) Replace posts from 2-inch diameter to 3-inch diameter.

Original Fence : 423 LF, 8-ft on center, 8 ft height to 2 Ft deep, posts from 2-inch diameter. Total posts:43
New Fence : 423 LF, 8-ft on center, 8 ft height to 3 Ft deep, posts from 3-inch diameter. Total posts:54

Building Exterior:

Contents:

A. Remove and replace 2 Electric Water Heater 50 Gallon - 240 Volt.

First Floor:

D. Remove and replace 64 Fluorescent Ceiling luminaires, 4 FT long x 2 FT wide.

First floor:

J. Remove and replace 8,820 SF of Electrical distribution system (panelboards not considered) Electrical system.

L. Remove and replace 8,820 SF of Fire alarm system and paneling.

Second Floor:

I. Remove and replace 9,770 SF of Fire alarm system.

J. Remove and replace 9,770 SF of Electrical system and its components.

Supplementary Mitigation:

Install one (1) Ea. low surge protective devices to protect (luminaries) and prevent damages from voltage fluctuations and power surges caused by heavy rain and high velocity wind events. Specifications: 120v Single Phase (low) Individual Equipment Protection: Power supply, Fire alarm, IT Data Center.

Install two (2) Ea. medium surge protective devices to protect (Electric Water Heater) and prevent damages from voltage fluctuations and power surges caused by heavy rain and high velocity wind events. Specifications: 240/120v Split Phase Individual Equipment Protection: Power supply, Fire alarm, IT Data Center.

Install four (4) Ea. high surge protective devices to protect (Fire alarm, Electrical system) and prevent damages from voltage fluctuations and power surges caused by heavy rain and high velocity wind events. Specifications: 480/277v 3-Phase Individual Equipment Protection: Power supply, Fire alarm, IT Data Center.

First Floor: Windows

b. Remove and replace 1 Aluminum Louvers, 4 FT long x 7 FT high.

Replacement Mitigation:

Install 28 S.F. of aluminum louver windows with impact resistant will contribute to reinforce the building envelope and will prevent breakage and displacement that can cause subsequent water intrusion and interior damages.

First Floor: Doors

n. Remove and replace 8 each of Metal Single door, Frames and Hardware, 3 FT wide x 7 FT high, Damaged due to water intrusion, strong hurricane winds, bent and twisted. 0% work completed.

Second floor: Doors

g. Remove and replace 3 Wooden Double doors with glass panels of 11 inches x 40 inches each, Frames and Hardware, 6 FT wide x 7 FT high.

Supplementary Mitigation:

Install 294 S.F. of Storm Panel Shutter to the door. Total: eleven (11) Storm Shutters one for each door.

(IV) Hazard Mitigation Proposal (HMP) Cost:

–

Damage #143326; Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2:

Total Cost for Pre-disaster (PA) Repair/Replacement SOW for Eligible Damages to be Mitigated = $ 1,332,816.98

Total Net Hazard Mitigation Cost (Base Cost) = 825,831.53

(V) Cost Effectiveness Calculation:

Damage #143326; Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2

HMP Cost/ Benefit = ($ 825,831.53 / $ 1,332,816.98) x 100

Ratio of HMP C/B = 61.96 % (< 100% and Appendix J)

(Use for 100%)

In accordance with FEMA Public Assistance Program and Policy Guide (PAPPG) V3.1 April 2018, Chapter 2.VII. Section C cost effectiveness is achieved when" the mitigation measure is specifically listed in Appendix J: Cost-Effective

Hazard Mitigation Measures, and the cost of the mitigation measure does not exceed 100 percent of the eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measure applies."

The Hazard Mitigation Proposed cost estimate is listed in the Appendix J and within 100% of the eligible repair and restoration costs and meets cost effective requirements.

–

210267 Centro de Servicios Transicionales a Vida Independiente Cayey (concrete house)

********** Version 1**********

Version 1 created to capture Applicant's provided Method of Repair for the repairs of the disaster related damages in Centro de Servicios Transicionales a Vida Independiente Cayey (concrete house). In Version 0 a total of**$10,711.56** was awarded in support to the Applicant for the development of their Method of Repair. Applicant has submitted a MOR for FEMA's review. FEMA developed a cost per Applicant's request.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

Work to be completed

The applicant will utilize A&E firm to design for the**Centro de Servicios Transicionales a Vida Independiente Cayey (concrete house)** to restore this facility as per applicable codes and standards within the existing footprint.

Building Damage:

Exterior:

A. Prepare and paint in kind 2,352 SF of Latex Wall paint.

B. Remove and replace in kind 6 Aluminum Jalousie windows, 2.5 FT wide x 5 FT high.

C. Remove and replace in kind 2 Aluminum Jalousie windows, 2.5 FT wide x 2.5 FT high.

D. Remove and replace in kind 1 Aluminum Jalousie windows, 4 FT wide x 5 FT high.

E. Remove and replace in kind 1 Aluminum Jalousie windows, 2 FT wide x 2 FT high.

F. Remove and replace in kind 1 Aluminum Jalousie windows, 2.5 FT wide x 4 FT high.

Exterior :

A. Remove and replace in kind 3 Aluminum door, frame and hardware set, 2.5 FT wide x 7 FT high.

Interior :

A. Prepare and paint in kind 5,928 SF of Latex Wall and ceiling paint.

Roof:

A. Remove and replace in kind 2,400 SF of Asphalt Membrane roofing.

Work to be completed: $288,522.08

Scope Notes:

1. Quantities modified as per BBA Scope Survey document labeled*DR4339PR-157312- BBA Scope Survey - Final- 4-02-2024,* to comply with Puerto Rico Building Code 2018, Chapter 15, Roof Assemblies and Rooftop structures.

2. The BBA percentage was calculated as 46% based on the approved BBA Scope. ($61,135.21 / $132,951.56 = 46%). Please refer to document labeled: SP157312 - DR4339PR – Cost Estimate.xlsx.

406 HMP Scope

Damage #210267; Centro de Servicios Transicionales a Vida Independiente Cayey (concrete house)

(I) Damages Description & Dimensions (DDD):

Items in the PA repair Scope of Work of damaged envelope elements to be mitigated.:

Roof:

a. Remove and replace 2,400 SF of Asphalt Membrane roofing.

Exterior:

b. Remove and replace 6 Aluminum Jalousie windows, 2.5 FT wide x 5 FT high.
c. Remove and replace 2 Aluminum Jalousie windows, 2.5 FT wide x 2.5 FT high.
d. Remove and replace 1 Aluminum Jalousie windows, 4 FT wide x 5 FT high.
e. Remove and replace 1 Aluminum Jalousie windows, 2 FT wide x 2 FT high.
f. Remove and replace 1 Aluminum Jalousie windows, 2.5 FT wide x 4 FT high.

Note: PA Estimate Cost replace 11 windows impact resistant, 4 FT wide x 5 FT high

Exterior:

g. Remove and replace 3 Aluminum door, frame and hardware set, 2.5 FT wide x 7 FT high.

(II) Hazard Mitigation Proposal (HMP) Scope of Work:

To prevent or reduce future damages from similar events, were proposed the following mitigation measures:

a. Roof Mitigation:

- Remove and replace 2,400 SF of Asphalt Membrane roofing.

Replacement Mitigation:

Install 2,400 SF of reinforced SBS waterproofing system bituminous membrane layer on concrete roof to reinforce waterproofing system, prevent wind and water damages.

It will be used a SBS waterproofing system bituminous membrane, termination bar, L flashing (not visible from outside) to anchor membrane and scupper roof drain. To prevent future wind and water damages and subsequent water intrusion.

b. Openings Mitigation:

Windows:

Supplementary Mitigation:

Install 220 S.F. of removable Metal Panel Storm Shutter to the windows. Total: eleven (11) Storm Shutters one for each window.

Doors:

Supplementary Mitigation:

Install 52.5 S.F. of removable Metal Panel Storm Shutter to the door. Total: three (3) Storm Shutters one for each door.

Summary Total Storm Shutter to the Windows in SF:

- 11 Storm Shutter windows = 220 SF

Summary Total Storm Shutter to the doors in SF:

- 3 Storm Shutter doors = 52.5 SF

c. Load path

No Load Path issues are addressed in this project. Facility is a reinforced concrete building with no roof mounted equipment or other load path vulnerabilities observed.

- .

(III) Hazard Mitigation Proposal (HMP) Cost

Net Wind Retrofit Package (WRP) Cost = $ 55,897.37

25% of BRV = $ 154,761.60

(See Attachment #3 - Project # 157312 HMP_BRV)

Ratio of HMP: $ 55,897.37 / $ 619,046.40 x 100 = 9.03 %

Wind Retrofit Package = 9.03% < 25% of BRV. This Project is Cost Effective.

(IV) Facility Hazard Data

Facility Wind Data:
Event Wind Speed

Hurricane María Wind Speed – **120** mph

Attachment 1 - GM Project **157312** HMP_Hurricane Maria Event Wind Speed

Hazard Mitigation Measure Design Wind Speed

ASCE-07-2016 Section 1.5.1 Structure Wind Risk Category Risk Category: **IV**

For municipalities with PRBC 2018 Microzoning Analysis:

Puerto Rico Building Code (PRBC) 2018, Appendix P-Microzone Wind Speed: **172** mph

Attachment 2 - GM Project **157312** HMP_Design Wind Speed – Microzone Analysis

Mitigation Design Wind Speed:

Based on the best available data, the mitigation measure will be implemented to protect the facility up to a Design Wind Speed of 170 mph.

Facility Flood Data:

Flood Zone = **Zone X**

(V) HMP Cost-Effectiveness Calculations

The cost of this Hazard Mitigation Proposal (HMP) **is less than** 25% of the BRV and is deemed cost effective per FEMA Pre-Calculated Benefit Non-Residential Wind Retrofit Memo. This Hazard Mitigation Proposal meets eligible repair and restoration cost effective requirements.

***Cost effective calculation should be taken before CEF Factors, Soft Costs, or other Factors.**

****See Mitigation Profile Documents Tab in Grants Manager for complete version of this HMP and supporting documents.** ***(HMP, HMP cost estimate, Supporting documents for WR: Appendix D, Appendix B, BRV, WR Memo)***

Version 1 created to capture Applicant's provided Method of Repair for the repairs of the disaster related damages in Centro de Servicios Transicionales a Vida Independiente Cayey (Bathrooms annex). In Version 0 a total of **$3,214.18** was awarded in support to the Applicant for the development of their Method of Repair. Applicant has submitted an MOR for FEMA's review. FEMA developed a cost per Applicant's request.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

Work to be completed

The applicant will utilize contracts for repairs to the **Centro de Servicios Transicionales a Vida Independiente Cayey (Bathrooms annex)** to restore this facility as per applicable codes and standards within the existing footprint.

Building Damage:

Exterior:

Bathrooms annex:

A. Remove and replace in kind 2,280 SF of Metal Corrugated roof / wood Building roof, 60 FT long x 38 FT wide.

B. Prepare and paint in kind 2,352 SF of Latex Wall paint.

C. Remove and replace in kind 15 Aluminum Jaloise windows, 30 IN long x 60 IN high.

D. Remove and replace in kind 6 Aluminum Jaloise windows, 30 IN long x 30 IN high.

E. Remove and replace in kind 1 Aluminum Jaloise windows, 48 IN long x 60 IN high.

F. Remove and replace in kind 1 Aluminum Jaloise windows, 24 IN long x 24 IN high.

G. Remove and replace in kind 1 Aluminum Jaloise windows, 30 IN long x 48 IN high.

Interior:

A. Remove and replace 2,280 SF of Electrical System.

Bathrooms annex:

A. Remove and replace in kind 3 Aluminum Door, frame and hardware, 30 IN long x 84 IN high.

Roof:

Bathrooms annex:

A. Remove and replace in kind 2,500 SF of Elastomeric Roof Sealing.

Work to be completed: $270,731.97

Scope Notes:

1. Quantities modified as per BBA Scope Survey document labeled*DR4339PR-157312- BBA Scope Survey - Final- 4-*

02-2024, to comply with Puerto Rico Building Code 2018, Chapter 15, Roof Assemblies and Rooftop structures.

2. The BBA percentage was calculated as 48% based on the approved BBA Scope. ($70,950.72 / $149,284.88 = 48%). Please refer to document labeled: SP157312 - DR4339PR – Cost Estimate.xlsx.

406 HMP Scope

Damage #210297; Centro de Servicios Transicionales a Vida Independiente Cayey (Bathrooms annex)

(I) <u>Damages Description & Dimensions (DDD):</u>

Items in the PA repair Scope of Work of damaged envelope elements to be mitigated.:

Exterior:

Bathrooms annex:

a. Remove and replace 2,280 SF of Metal Corrugated roof / wood Building roof, 60 FT long x 38 FT wide.

b. Remove and replace 2,500 SF of Elastomeric Roof Sealing.

Exterior:

Bathrooms annex:

c. Remove and replace 15 Aluminum Jaloise windows, 30 IN long x 60 IN high.

d. Remove and replace 6 Aluminum Jaloise windows, 30 IN long x 30 IN high.

e. Remove and replace 1 Aluminum Jaloise windows, 48 IN long x 60 IN high.

f. Remove and replace 1 Aluminum Jaloise windows, 24 IN long x 24 IN high.

g. Remove and replace 1 Aluminum Jaloise windows, 30 IN long x 48 IN high.

Note: PA Estimate Cost replace 24 Aluminum Jalousie windows impact resistant, 4 FT wide x 5 FT high.

Bathrooms annex:

a. Remove and replace 3 Aluminum Door, frame and hardware, 30 IN long x 84 IN high.

(II) <u>Hazard Mitigation Proposal (HMP) Scope of Work</u>:

To prevent or reduce future damages from similar events, were proposed the following mitigation measures:

a. Roof Mitigation:

- Remove and replace 2,280 SF of Metal Corrugated roof / wood Building roof, 60 FT long x 38 FT wide.
- Remove and replace 2,500 SF of Elastomeric Roof Sealing.

Replacement Mitigation:

Install 2,500 SF of Metal Deck with Roofing Panel Assembly. Reinforcing structure and improving drainage capacity of metal roofs will help prevent wind and water damages and subsequent water intrusion.

Supplementary Mitigation:

Install 2,500 SF of Waterproof Metal Roof Coating; the measure will mitigate interior damages by preventing water infiltration through seams and fasteners penetration during high-driven wind events. This mitigation is intended to add a protective coating for corroded metal roofs.

Supplementary Mitigation:

Reinforce Metal Structures - Add Units / Increase Thickness of Girts or Purlins

Install 65 L.F. of 2" Girt / 12" purlins 12 ga with thicker, stronger units. This mitigation will help prevent flexure and detachment due to high velocity wind and pressure that could cause subsequent water intrusion and interior damages. (ie: Replace 16 gauge with 14 gauge, the lower the gauge the stronger the unit.) Mitigation would place 1 Ea. additional strap over a 3 ft span.

Supplementary Mitigation:

Exterior Metal Panel Fastening - Metal Roof

Add 3 additional non-corrosive screws w/neoprene washers every 12 SF on 2,500 SF=208.3 SF of damaged metal panels to reinforce fastening pattern thus protecting the building envelope. Improve exterior metal panel fastening by including additional fasteners protect the building envelope and prevent flexure, displacement and subsequent water infiltration damages.

Supplementary Mitigation:

Install 2,500 SF of reinforced SBS waterproofing system bituminous membrane layer on metal deck roof to reinforce waterproofing system, prevent wind and water damages. Improve exterior metal panel fastening by including additional fasteners protect the building envelope and prevent flexure, displacement and subsequent water infiltration damages.

It will be used a SBS waterproofing system bituminous membrane, termination bar, cap L flashing (not visible from outside) to anchor membrane. To prevent future wind and water damages and subsequent water intrusion.

Supplementary Mitigation:

Gutter

Anchor 65 LF of damaged gutter using 1 Ea. hanger every 3 LF to prevent displacement due to high velocity wind. Decrease hanger spacing from standard 6 LF to 3 LF to prevent displacement due to high velocity wind. Mitigation would place 1 Ea. additional strap over a 6 ft span.

Downspout

Anchor 39 LF of damaged downspout using 1 Ea. strap every 5 LF to prevent displacement due to high velocity wind. Decrease downspout strap spacing from standard 10 L.F. to 5 L.F. to prevent displacement due to high velocity wind. Mitigation would place 1 Ea. additional strap over a 10 L.F. span.

b. Openings Mitigation:

Windows:

Supplementary Mitigation:

Install 480 S.F. of removable Metal Panel Storm Shutter to the window. Total: twenty-four (24) Storm Shutters one for each

window.

Doors:

Supplementary Mitigation:

Install 17.5 S.F. of removable Metal Panel Storm Shutter to the doors. Total: three (3) Storm Shutters one for each door.

Summary Total Storm Shutter to Windows in SF:

- 24 Storm Shutter - windows = 480 SF

Summary Total Storm Shutter to Doors in SF:

- 3 doors = 17.5 SF

c. Load path

No Load Path issues are addressed in this project. Facility is a reinforced concrete building with no roof mounted equipment or other load path vulnerabilities observed.

(III) Hazard Mitigation Proposal (HMP) Cost

Net Wind Retrofit Package (WRP) Cost = $ 113,625.39

(See Attachment # 4 - Project #157312 HMP_BRV)

Ratio of HMP: $113,625.39119/ $ 490,450.00 x 100 = 23.17 %

Wind Retrofit Package = 23.17 % < 25% of BRV. This Project is Cost Effective.

(IV) HMP Cost-Effectiveness Calculations

The cost of this Hazard Mitigation Proposal (HMP) **is less than** 25% of the BRV and is deemed cost effective per FEMA Pre-Calculated Benefit Non-Residential Wind Retrofit Memo. This Hazard Mitigation Proposal meets eligible repair and restoration cost effective requirements.

***Cost effective calculation should be taken before CEF Factors, Soft Costs, or other Factors.**

****See Mitigation Profile Documents Tab in Grants Manager for complete version of this HMP and supporting documents.**
(HMP, HMP cost estimate, Supporting documents for WR: Appendix D, Appendix B, BRV, WR Memo)

(IV) Facility Hazard Data

Facility Wind Data:
Event Wind Speed

Hurricane María Wind Speed **– 120** mph

Attachment 1 **-** GM Project **157312** HMP_Hurricane Maria Event Wind Speed

Hazard Mitigation Measure Design Wind Speed

ASCE-07-2016 Section 1.5.1 Structure Wind Risk Category Risk Category: **IV**

For municipalities with PRBC 2018 Microzoning Analysis:

Puerto Rico Building Code (PRBC) 2018, Appendix P-Microzone Wind Speed: **172** mph

Attachment 2 **-** GM Project **157312** HMP_Design Wind Speed **–** Microzone Analysis

Mitigation Design Wind Speed:

Based on the best available data, the mitigation measure will be implemented to protect the facility up to a Design Wind Speed of 170 mph.

-

-

Facility Flood Data:

Flood Zone = **Zone X**

270617 Centro de Servicios Transicionales a Vida Independiente Cayey-Bldng. 1

**********Version 1**********

Version 1 created to capture Applicant's provided Method of Repair for the repairs of the disaster related damages in Centro de Servicios Transicionales a Vida Independiente Cayey-Bldng. 1. In Version 0 a total of**$81,041.78** was awarded in support to the Applicant for the development of their Method of Repair. Applicant has submitted an MOR for FEMA's review. FEMA developed a cost per Applicant's request.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

Work to be completed

The applicant will utilize contracts for repairs to the **Centro de Servicios Transicionales a Vida Independiente Cayey-Bldng. 1** to restore this facility as per applicable codes and standards within the existing footprint.

Building Damage:

Building Exterior:

Roof:

A. Remove and replace in kind 16,100 SF of Galvanized Corrugated metal roofing. See scope note 1.

B. Remove and replace in kind 16,100 SF of Asphalt Roof Membrane. See scope note 1.

C. Remove and replace in kind 16,100 SF of Wooden Substructure batters 2 in x 4in x 20 Ft (L). See scope note 1.

D. Remove and replace in kind, 26 Wooden Rafters Planks 3 in x10 in x 35 Ft (L) rough cut.

E. Remove and replace in kind 14 Wooden Collar Ties planks 3 in x10 in x 24ft (L) rough cut.

F. Remove and replace in kind 8 Wooden Joist below collar ties 3 in x 10 in x20 ft (L) rough cut.

G. Remove and replace in kind 6 Wooden Studs for Joists 4 in x4 in x 20 ft (L).

H. Remove and replace in kind 14 Wooden Roof Joist 3 in x 10 in x 35ft (L).

Vent Ridge:

Framing:

A. Remove and replace in kind 6 Wooden Ridge Vent Corner Studs 4 in x4 in x 20 ft (L).

B. Remove and replace in kind 9 Wooden Ridge Vent Side Studs 2 in x4 in x 20 ft (L).

C. Remove and replace in kind 6 Wooden Ridge Board 3 in x10 in x 20 ft.

D. Remove and replace in kind 12 Wooden Ridge Vent Batters, 6 batters 3 at each side 2 in x 4 in x 20ft rough cut.

E. Remove and replace in kind 18 Wooden Ridge Vent side sheeting 1 in x 4 in x 20 ft groove and tongue.

Walls:

A. Prepare and paint in kind 10,640.04 SF of Exterior Wall paint, 886.67 FT long x 12 FT high.

Building Interior:

Contents:

A. Replace 1 VHS VCR Four Head.

B. Remove and replace 2 Wall Mounted Chilled Drinking Fountain; Length: 19 in (W), 18 3/8 in (H), 19 13/16 in (D).

C. Remove and replace 20 Metal Ceiling Fan 42 Inch with Light, Pull Chain, Dual Finish Blades, Reversible Motor.

D. Replace 5 Oscillating Pedestal Fan, Adjustable Height, 3 Speeds 18 in Diam, White.

E. Replace 2 Electric Standing Stove 30 in. 5.3 cu.

F. Replace 1 Health-Rider Total Body Fitness (Without Monitor).

G. Replace 10 Rotary Upholstered Desk Chair.

H. Replace 13 Vinyl / Metal Reception Chair.

I. Replace 1 Commercial Style Pool Table 42 in (W) x 84 in (L) x 32 in (H).

J. Replace 36 Wooden 8-Foot Rectangular Folding Table.

K. Replace 8 Wooden/Metal Office Waiting Chair.

L. Replace 5 Wooden /Metal Desk 22.64 in (D) x 53.19 in (W) x 29.75 in (H).

M. Replace 13 Pedestal Steel Metal Desk 24 in (D) x 45.25 in (W) x 29.5 in (H).

N. Replace 19 Vinyl/Metal Arm less Guest Reception Chair.

O. Replace 15 Wooden / Vinyl Guest Chair Arm less 23.25 in (D) x 21.5 in (W) x 33.5 in (H).

P. Replace 2 Display Vitrine Cabinet Cherry-wood 42 in (W) x 18 in (D) x 24 in (H) with 4 doors.

Q. Replace 4 Upholstered Loveseat 2 Seat.

R. Replace 5 Detecto 339 Physician's Scale with Height Rod.

S. Replace 2 Lab Rolling Cart 2 Layer Medical Utility Cart with Wheels Mobile Clinic.

T. Remove and replace 4 Electric Water Heater 36 Gallon - 240 Volt.

U. Replace 1 Industrial 60 Qt Floor Mixer Bakery with Bowl Guard.

V. Replace 1 Stainless Steel Floor Blade 94 in Vertical Band Meat Saw - 3 hp, 220/240V, 3 Phase.

W. Replace 10 Wood Frame 24 in x 36 in Cork Bulletin Board.

X. Remove and replace 20 EST SIGA-IPHS Multi-Sensor Detector.

Y. Replace 2 All-in-One Hi-Fi Stereo CD Player Turntable & Digital AM/FM Radio Tuner Tape Cassette Player Mega Bass Reflex Stereo Sound System.

Z. Replace 1 of True Fitness 400P Non Folding Treadmill.

AA. Replace 3 Reversible Free Standing Green Composition Chalkboard 48 in x 72 in / Natural Cork Board with Satin Anodized Aluminum Frame.

BB. Replace 3 Table / Seating 30 in x 72 in Standard Height Recycled Wood Table with 8 Chairs.

CC. Replace 2 White Top Freezer Refrigerator 21.9 Cu.

DD. Remove and replace 1 Braun 800TSL 4-Pocket Washer Extractors.

EE. Replace 12 Fabric Stack-able Reception Chair with Padded Arm Rest.

First Floor:

A. Remove and replace in kind 12 Aluminum Jalousie windows, 4 FT wide x 5 FT high.

B. Remove and replace in kind, 4,095 SF of Vinyl Floor tiles.

C. Remove and replace in kind 9,459 SF of Wooden Tongue and groove plank ceiling, Broken and falling wood ceiling.

D. Remove and replace in kind 2,910 SF of Wood/Gypsum Partition walls and metal frame, 291 FT long x 10 FT high.

E. Remove and replace 9,759 SF of Electrical distribution system.

F. Prepare and paint in kind 11,140 SF of Interior paint.

G. Remove and replace in kind 3 Wood Double solid doors, Frames and hardware, 5 FT wide x 7 FT high.

H. Remove and replace 9,759 SF of Telephone/data system.

I. Remove and replace in kind 55 Fluorescent Surface Mounted Ceiling luminaries 120V, 4 FT long x 2 FT wide.

J. Remove and replace in kind Vinyl Baseboard 4 in, 326 LF long.

K. Remove and replace in kind 11 each of Wooden Single solid doors, frames and hardware.

Second Floor:

A. Remove and replace in kind 55 Fluorescent Surface Mounted Ceiling luminaries 120V, 4 FT long x 2 FT wide.

B. Remove and replace in kind 19 Aluminum Jalousie windows, 4 FT wide x 5 FT high.

C. Remove and replace in kind 9,759 SF of Vinyl 12 in x 12 in Floor tiles.

D. Remove and replace in kind 4,090 SF of Wood/Gypsum Partition Walls and metal frame, 409 FT long x 10 FT high.

E. Remove and replace 9,759 SF of Electrical system.

F. Prepare and paint in kind 13,500 SF of Latex Interior paint.

G. Remove and replace in kind 7 Wood Single solid doors, Frames and hardware, 3 FT wide x 7 FT high.

H. Remove and replace in kind 3 Wooden Double solid doors, frames and hardware, 5 FT wide x 7 FT high.

I. Remove and replace 9,759 SF of Telephone/data system.

J. Remove and replace in kind Vinyl Baseboard 4 in, 1,031 LF long.

Second Floor:

Ceiling:

Below attic level:

A. Remove and replace in kind 9,759 SF of Wooden Attic wood floor 1 in x 6 in x20ft (L) groove and tongue boards plank ceiling, Broken and falling wood ceiling.

Vehicle or Equipment Damage:

Building Exterior:

A. Remove and replace 1 Commercial Kitchen Exhaust Fan.

Building Interior:

First Floor:

A. Remove and replace in kind 1 Sedgwick geared automatic brake Hand power elevator, 6 FT long x 6 FT wide x 8 FT high. See scope note 2.

B. Remove and replace 9,759 SF of Fire alarm system.

Second Floor:

A. Remove and replace 9,759 SF of Fire alarm system.

Work to be completed: $5,577,841.23

Scope Notes:

1. Quantities modified as per BBA Scope Survey document labeled*DR4339PR-157312- BBA Scope Survey - Final- 4-02-2024,* to comply with Puerto Rico Building Code 2018, Chapter 15, Roof Assemblies and Rooftop structures.

2. Refer to document labeled: *DM32180 4339ASSMCAGM157312_PW8108 DM 20240409* for determination on this

item.

3. The BBA percentage was calculated as 33% based on the approved BBA Scope. ($811,487.04 / $2,428,573.17 = 33%). Please refer to document labeled: SP157312 - DR4339PR – Cost Estimate.xlsx.

406 HMP Scope

2. Damage #270617; Centro de Servicios Transicionales a Vida Independiente Cayey-Bldng. 1

(I) Facility Hazard Data:

For any mitigation strategy applied to the following facilities related to high winds, please follow the PRBC 2018 and any other related local construction codes to identify the correct wind speed requirement.

(II) Eligible Damages to be Mitigated:

Damage #270617; Centro de Servicios Transicionales a Vida Independiente Cayey-Bldng. 1

Building Exterior:

Roof:

A. Remove and replace 16,100 SF of Galvanized Corrugated metal roofing. See scope note 1.

B. Remove and replace 16,100 SF of Asphalt Roof Membrane. See scope note 1.

First Floor:

g. Remove and replace 3 Wood Double solid doors, Frames and hardware, 5 FT wide x 7 FT high.

Second Floor:

g. Remove and replace 7 Wood Single solid doors, Frames and hardware, 3 FT wide x 7 FT high.

h. Remove and replace 3 Wooden Double solid doors, frames and hardware, 5 FT wide x 7 FT high.

Note: HM Specialist in the Site Inspection Report counted quantity 16 doors with the total of 550.85 SFT. Wind Retrofit cover all exterior doors by this reason were added 3 doors of 5 FT wide x 7 FT high with the total of 567 SFT.

Building Exterior:

d. Remove and replace 1 Commercial Kitchen Exhaust Fan.

(III) Hazard Mitigation Proposal (HMP) Scope of Work:

Damages to be mitigated as follow as per PA Scope of Work: To prevent or reduce future damages from similar events, the applicant proposed the following mitigation:

Building Exterior:

Roof:

A. Remove and replace 16,100 SF of Galvanized Corrugated metal roofing. See scope note 1.

B. Remove and replace 16,100 SF of Asphalt Roof Membrane. See scope note 1.

Roof Mitigation:
Roof Area of the building: 16,100 SF.
Dimensions: 230 FT x 70FT

- Replace 16,100 SF of Metal Corrugated roof / wood Building roof, 230 FT long x 70 FT wide.
- Replace 16,100 SF of Elastomeric Roof Sealing.

It will be used a reinforced metal roof assembly including Steel roofing panels corrugated 24 gauge, SBS waterproofing system bituminous membrane, and Exterior Metal Panel Fastening to prevent future wind and water damages and subsequent water intrusion.

Replacement Mitigation:
Install 16,100 SF of Metal Deck with Roofing Panel Assembly. Reinforcing structure and improving drainage capacity of metal roofs will help prevent wind and water damages and subsequent water intrusion.

Supplementary Mitigation:
Install 16,100 SF of Waterproof Metal Roof Coating; the measure will mitigate interior damages by preventing water infiltration through seams and fasteners penetration during high-driven wind events. This mitigation is intended to add a protective coating for corroded metal roofs.

Supplementary Mitigation:
Install 200 L.F. of 2" Girt / 12" purlins 12 ga with thicker, stronger units. This mitigation will help prevent flexure and detachment due to high velocity wind and pressure that could cause subsequent water intrusion and interior damages. (ie: Replace 16 gauge with 14 gauge, the lower the gauge the stronger the unit.) Mitigation would place 1 Ea. additional strap over a 3 ft span.

Supplementary Mitigation:
Exterior Metal Panel Fastening - Metal Roof
Add 3 additional non-corrosive screws w/neoprene washers every 12 SF on 16,100 SF=1,342 SF of damaged metal panels to reinforce fastening pattern thus protecting the building envelope. Improve exterior metal panel fastening by including additional fasteners protect the building envelope and prevent flexure, displacement and subsequent water infiltration damages.

Supplementary Mitigation:
Install 16,100 SF of reinforced SBS waterproofing system bituminous membrane layer on metal deck roof to reinforce waterproofing system, prevent wind and water damages. Improve exterior metal panel fastening by including additional fasteners protect the building envelope and prevent flexure, displacement and subsequent water infiltration damages.

It will be used a SBS waterproofing system bituminous membrane, termination bar, L flashing (not visible from outside) to anchor membrane. To prevent future wind and water damages and subsequent water intrusion.

Supplementary Mitigation:
Gutter
Anchor 200 LF of damaged gutter using 1 Ea. hanger every 3 LF to prevent displacement due to high velocity wind. Decrease hanger spacing from standard 6 LF to 3 LF to prevent displacement due to high velocity wind. Mitigation would place 1 Ea. additional strap over a 6 ft span.

Downspout

Anchor 120 LF of damaged downspout using 1 Ea. strap every 5 LF to prevent displacement due to high velocity wind. Decrease downspout strap spacing from standard 10 L.F. to 5 L.F. to prevent displacement due to high velocity wind. Mitigation would place 1 Ea. additional strap over a 10 L.F. span.

First Floor:

g. Remove and replace 3 Wood Double solid doors, Frames and hardware, 5 FT wide x 7 FT high.

Second Floor:

g. Remove and replace 7 Wood Single solid doors, Frames and hardware, 3 FT wide x 7 FT high.

h. Remove and replace 3 Wooden Double solid doors, frames and hardware, 5 FT wide x 7 FT high.

Summary Total Doors in SF:

- 16 doors = 567 SF

Supplementary Mitigation:

Install 567 S.F. of Storm Panel Shutter to the doors. Total: Sixteen (16) Storm Shutters one for each door.

Building Exterior:

d. Remove and replace 1 Commercial Kitchen Exhaust Fan.

Supplementary Mitigation:

Install one (1) EA – 6 x 6 x 6 Equipment Anchoring Assembly for Commercial Kitchen Exhaust Fan to metal roof deck using an anchoring system such as wire rope tie downs to prevent overturning and displacement that can cause damages to waterproofing system and subsequent water infiltration.

(IV) Hazard Mitigation Proposal (HMP) Cost:

Damage #270617; Centro de Servicios Transicionales a Vida Independiente Cayey-Bldng. 1:

Total Cost for Pre-disaster (PA) Repair/Replacement SOW for Eligible Damages to be Mitigated = $ 1,188,608.47

Total Net Hazard Mitigation Cost (Base Cost) = $ 1,030,435.84

(V) Cost Effectiveness Calculation:

Damage #143326; Centro de Servicios Transicionales a Vida Independiente Cayey Bldng 2

HMP Cost/ Benefit = ($ 1,030,435.84/ $ $ 1,188,608.47) x 100

Ratio of HMP C/B = 86.7% (< 100% and Appendix J)

(Use for 100%)

In accordance with FEMA Public Assistance Program and Policy Guide (PAPPG) V3.1 April 2018, Chapter 2.VII. Section C cost effectiveness is achieved when" the mitigation measure is specifically listed in Appendix J: Cost-Effective

Hazard Mitigation Measures, and the cost of the mitigation measure does not exceed 100 percent of the eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measure applies."
The Hazard Mitigation Proposed cost estimate is listed in the Appendix J and within 100% of the eligible repair and restoration costs and meets cost effective requirements.

Date Downloaded: 1/15/26 4:48pm AST

271083

Centro de Servicios Transicionales a Vida Independiente Cayey (Maintenance Shop)

**********Version 1**********

Version 1 created to capture Applicant's provided Method of Repair for the repairs of the disaster related damages in Centro de Servicios Transicionales a Vida Independiente Cayey (Maintenance Shop). In Version 0 a total of **$4,161.98** was awarded in support to the Applicant for the development of their Method of Repair. Applicant has submitted an MOR for FEMA's review. FEMA developed a cost per Applicant's request.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

Work to be completed

The applicant will utilize contracts for repairs to the **Centro de Servicios Transicionales a Vida Independiente Cayey (Maintenance Shop)** to restore this facility as per applicable codes and standards within the existing footprint.

Building Damage:

Exterior:

A. Prepare and paint in kind 1,600 SF of Latex Wall Paint, 40 FT long x 40 FT wide x 10 FT deep.

B. Remove and replace in kind 2 galvanized steel Rolling Doors, 10 FT long x 10 FT high.

C. Remove and replace in kind 1,764 SF of Elastomeric roofing membrane.

D. Prepare and paint in kind 360 SF of Metal Rolling Doors Paint.

E. Remove and replace in kind 1 Metal Rolling Doors, 12 FT long x 10 FT high.

F. Prepare and paint in kind 1 Metal Doors Paint, 3 FT long x 7 FT high.

Roof:

A. Remove 270 SF of Metal Roofing coverage and replace in kind with 270 SF of water proofing system.

Work to be completed: $149,836.47

Scope Notes:

1. For small DI checklist refer document labeled *157312-DR4339PR-DI 271083 CERTIFICATION PROYECTO CTVI-CAYEY.pdf*.

406 HMP Scope

Damage #271083; Centro de Servicios Transicionales a Vida Independiente Cayey (Maintenance Shop)

(I) Damages Description & Dimensions (DDD):

Items in the PA repair Scope of Work of damaged envelope elements to be mitigated.:

Exterior:

Roof:

c. Remove and replace 1,764 SF of Elastomeric roofing membrane.

Remove 270 SF of Metal Roofing coverage and replace with 270 SF of water proofing system.

Note: Storage adjacent to the Maintenance Shop 270 SF + 1,764 SF = 2,034 SF.

Roof Area of the building: 2,034 SF.

Exterior:

- Remove and replace 2 galvanized steel Rolling Doors, 10 FT long x 10 FT high.
- Remove and replace 1 Metal Rolling Doors, 12 FT long x 10 FT high.

(II) Hazard Mitigation Proposal (HMP) Scope of Work:

To prevent or reduce future damages from similar events, the applicant proposed the following mitigation measures:

a. Roof Mitigation:

- Remove and replace 2,034 SF of Asphalt Membrane roofing.

Replacement Mitigation:

Install 2,034 SF of reinforced SBS waterproofing system bituminous membrane layer on concrete roof to reinforce waterproofing system, prevent wind and water damages.

It will be used a SBS waterproofing system bituminous membrane, termination bar, L flashing (not visible from outside) to anchor membrane. To prevent future wind and water damages and subsequent water intrusion.

b. **Openings Mitigation:**

Door:

Replacement Mitigation:

Install 320 S.F Reinforce 3 Ea. (size) Roll-Up/Overhead Panel garage door and hardware by including additional, stronger wall anchors, upgrading and protecting rail components to prevent damages from wind, pressure and flying debris impact. This mitigation will also help prevent water intrusion and subsequent water damages.

Note: The new windows or doors shall have the same profile, make and finish as the pre-disaster element. To qualify as in-kind repair/replacement, work shall be done in-kind to match all physical and visual aspects, including design, color, texture, hardware, profile, and workmanship to preserve the historic character of the building. Upgrades shall not alter the physical and visual aspects of the original item.

Summary Total Reinforce Rolling Doors in SF:

- Three (3) doors = 320 SF.

c. Load path

No Load Path issues are addressed in this project. Facility is a reinforced concrete building with no roof mounted equipment or other load path vulnerabilities observed.

(III) Hazard Mitigation Proposal (HMP) Cost

Net Wind Retrofit Package (WRP) Cost = $ 52,841.92

Ratio of HMP: $ 52,841.92 / $371,022.12 x 100 = 14.24 %

Wind Retrofit Package = 14.24 % < 25% of BRV. This Project is Cost Effective.

(IV) HMP Cost-Effectiveness Calculations

The cost of this Hazard Mitigation Proposal (HMP) **is less than** 25% of the BRV and is deemed cost effective per FEMA Pre-Calculated Benefit Non-Residential Wind Retrofit Memo. This Hazard Mitigation Proposal meets eligible repair and restoration cost effective requirements.

***Cost effective calculation should be taken before CEF Factors, Soft Costs, or other Factors.**

****See Mitigation Profile Documents Tab in Grants Manager for complete version of this HMP and supporting documents.** ***(HMP, HMP cost estimate, Supporting documents for WR: Appendix D, Appendix B, BRV, WR Memo)***

(IV) Facility Hazard Data

Facility Wind Data:
Event Wind Speed

Hurricane María Wind Speed – **120** mph

Attachment 1 - GM Project **157312** HMP_Hurricane Maria Event Wind Speed

Hazard Mitigation Measure Design Wind Speed

ASCE-07-2016 Section 1.5.1 Structure Wind Risk Category Risk Category: **IV**

For municipalities with PRBC 2018 Microzoning Analysis:

Puerto Rico Building Code (PRBC) 2018, Appendix P-Microzone Wind Speed: **172** mph

Attachment 2 - GM Project **157312** HMP_Design Wind Speed – Microzone Analysis

- Building Exterior, 5 each of Steel Solid metal doors 36in x 84in (w/frame, hinges, lockset), Damaged due to high winds and water intrusion, 0% work completed.
- Building Exterior, 1 each of Steel Solid metal double doors 60in x 84in (w/frame, hinges, lockset), Damaged due to high winds and water intrusion, 0% work completed.
- Building Exterior, 4 each of Steel Solid metal doors 36in x 84in with safety glass 24in x 30in (w/frame, hinges, lockset), Damaged due to high winds and water intrusion, 0% work completed.

Contents:

- Building Interior, 2 each of Metal Ceiling fans with three blades and a lamp, 36-inch diameter, Damaged due to water intrusion through the roof , 0% work completed.
- Contents, 1 each of Mini Compact Refrigerator 4.4 Cu, Damaged due to water intrusion, 0% work completed.
- Contents, 7 each of Cherry-wood Round Table 60 in Diameter x 29 1/8 in Height, Damaged due to water intrusion, 0% work completed.
- Contents, 36 each of Vinyl Arm less Guest Reception Chair, Damaged due to water intrusion, 0% work completed.
- Contents, 4 each of Wooden U Shaped Executive Office Desk with Pedestal and Hutch in bark Oak, 95.5 in (D) x 65.98 in (W) x 66.5 in (H), Damaged due to water intrusion, 0% work completed.
- Contents, 1 each of Key Entry Box, Clay, 60 Key Capacity, Damaged due to water intrusion, 0% work completed.
- Contents, 18 each of Vinyl / Metal Seat Waiting Room Chair , Damaged due to water intrusion, 0% work completed.
- Contents, 20 each of Steel Vertical File Collection 4 Drawer Vertical File Cabinet , 26.5 in Deep Legal Width, Damaged due to water intrusion, 0% work completed.
- Contents, 1 each of Safe and Vault Store Pharmacy Safe 60 in (H) x 32 in (W) x 16 in (D), Damaged due to water intrusion, 0% work completed.

Final Scope

143327 CTIAM de Cayey- Building A

**********Version 1**********

Version 1 created to capture Applicant's provided Method of Repair for the repairs of the disaster related damages in "CTIAM de Cayey Permanent Work". In Version 0 a total of$168,578.00 was awarded in support to the Applicant for the development of their Method of Repair. Applicant has submitted an MOR for FEMA's review. FEMA developed a cost per Applicant's request.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

Work to be completed

The applicant will utilize contracts for repairs to the **CTIAM de Cayey- Building A** to restore facilities back to pre-disaster design,

capacity and function within the existing footprint with in-kind materials.

Building Damage:

Admin/Warehouse:

Building Exterior:

A. Remove and replace in kind 15 Aluminum Jalousie Windows, 4 FT wide x 5 FT high.

B. Prepare and paint in kind 9,146 SF of Latex Wall paint.

C. Remove and replace in kind 4 Aluminum Jalousie windows, 3 FT long x 3 FT high.

D. Remove and replace in kind 2 Metal Double door, Frame and Hardware, 5 FT wide x 7 FT high.

E. Remove and replace 11 Packaged Air Conditioning, 12,000 BTU Window installation type.

F. Remove and replace 4 Split unit Model JS4BD-060KB (5 Tons) 208/230 volts (Condensing units, Evaporator and Condenser).

Roof:

A. Remove and replace in kind 9,556 SF of Asphalt Membrane Waterproofing , 178 FT long x 58 FT wide. See scope note 1.

B. Remove and replace in kind 9,556 SF of Galvanized Corrugated Metal Roof, 178 FT long x 58 FT wide. See scope note 1.

C. Replace in kind 1,020 SF of Wooden and Corrugated Metal Connector Canopy Gable Roof, 85 FT long x 12 FT wide.

Ridge Vents:

A. Remove and replace in kind 144 FT long Wooden 1 in x 4 in Planks for Vents.

B. Remove and replace in kind 24 FT long Wooden 2 in x 4 in Vent Frame.

C. Remove and replace in kind 90 FT long Wooden 3 in x 8 in Rafters.

D. Remove and replace in kind 48 FT long Wooden 1 in x 6 in Groove and Tongue Boards.

Building Interior:

A. Remove and replace 70 Fluorescent Ceiling Luminaire 120V, 4 FT long x 2 FT wide.

B. Remove and replace in kind 5,377 SF of Vinyl Composition Floor Tile 12 in x 12 in, 110 FT long x 48.5 FT wide.

C. Remove and replace 8,536 SF of Fire Alarm System and Paneling (17 Rooms), 176 FT long x 48.5 FT wide.

D. Prepare and paint in kind 13,960 SF of Latex Wall paint.

E. Remove and replace in kind 26 Wooden Semi Solid flush paneling Door, frame and hardware, 3 FT wide x 7 FT high.

F. Remove and replace 5 Recessed Ceiling lights, 2 FT long x 2 FT wide.

G. Remove and replace in kind 13,025 SF of Gypsum Drywall with Metal Frame (Studs, Tracks).

H. Remove and replace 5,377 SF of Electrical Distribution (Lighting and Power), 110 FT long x 48.5 FT wide.

I. Remove and replace 5,377 SF of Data System, 110 FT long x 48.5 FT wide.

J. Remove and replace in kind 1,598 FT long Vinyl baseboard, 4in.

K. Remove and replace in kind 3 Wooden Door with safety glass vision of 24in x 30in frame, frame and hardware, 3 FT wide x 7 FT high.

L. Remove and replace in kind 5,377 SF of Acoustic Suspension system Grid (Wall angles: 2,536 Ft (L), main tee, Cross Tee, Wire), 110 FT long x 48.5 FT wide.

M. Remove and replace 2 Electrical Metal blade Ceiling Fan 36-48 in.

N. Remove and replace 5,377 SF of Communication Telephone System, 110 FT long x 48.5 FT wide.

O. Remove and replace in kind 5,377 SF of Fiber Mineral 2 Ft (W) x 4 Ft (L) Acoustical Ceiling, 110 FT long x 48.5 FT wide.

P. Remove and replace 1 each of 36 in x 36 in Commercial Exhaust Fan.

Attic:

A. Remove and replace in kind 5,377 SF of Wooden Flooring Boards, 110 FT long x 48.5 FT wide.

Contents:

A. Replace 37 Wooden Dining Chairs with Backrest, Metal Legs, Comfortable Wide Seat, 18.9 in (W) x 21.2 in (D)x 29.9 in (H).

B. Replace 15 Metal Single Pedestal Desk 24 in (D) X 45 in (W) x 30 in (H).

C. Replace 2 Mobile Blood Pressure Monitor with Rolling Stand, Aneroid Sphygmomanometer, BP Cuff & Wheels, 223B.

D. Replace 3 Medical Utility Lab Rolling Cart 2 Layer Cart with Wheels Mobile Clinic.

Work to be Completed Total: $3,050,828.48

Versions and Amendments Summary:

Version 0: $0.00 Engineering and Design Services

Determination Memorandum: this project contains an official Determination Memo for Scope that has been deemed ineligible before costing. For all information pertaining to this determination memo see documents titled: *DM31811 ASSMCAGM65506_PW1084 DM 20240311.*

Scope Notes:

1. Quantities modified as per BBA Scope Survey document labeled*DR4339PR-65506 - MAMD061 CTIAM de Caye Permanent Work-BBA Scope Survey,*to comply with Puerto Rico Building Code 2018, Chapter 15, Roof Assemblies and Rooftop structures.

2. The BBA percentage was calculated as 24.76% based on the approved BBA Scope. ($439,209.50 /$ 1,773,621.76 = 24.76%). Please refer to document labeled: ST65506 - DR4339PR – Cost Estimate Rev1.xlsx.

Project Notes:

1. All site estimates for work to be completed were generated using RS means Software Data/Year 2024 Quarter 1 – PUERTO RICO / URBAN (PRU) and Future Price Factors for Zone 1-Urban. See document labeled *ST65506 - DR4339PR – Cost Estimate Rev1.xlsx.* CEF cost estimate in GM may vary from CEF cost estimate worksheet due to rounding. The worksheet cannot be adjusted to correct the difference.

2. A Cost Estimating Format (CEF) has been created for this project, see attachment labeled: *ST65506 - DR4339PR – CEF Rev1.xlsx.*

3. This project is a PA Alternative Procedures project, involves a Critical Service, CTIAM de Cayey, and the disaster damage impacts the function of educational facility. For each site (as defined in the BBA Policy) in this project where disaster damage meets the large project threshold of $123,100, the Bipartisan Budget Act (BBA) applies.

4. Disaster damaged components at this site were comingled with pre-existing damage/deterioration. After conducting a site inspection and evaluating all available documentation, FEMA was unable to distinguish and separate disaster-related damage from pre-existing damage/deterioration. This Project/PW/Project provides funding for repairs to disaster-damaged components that also had pre-existing conditions based on the authorities in Section 20601 of the Bipartisan Budget Act of 2018 as defined in FEMA's Recovery Policy FP- 104-009-5, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.

5. Bipartisan Budget Act (BBA): As authorized by the BBA additional flexibilities were applied to this Project/PW as authorized and detailed within the scope of work. If the Subrecipient wishes to use these funds toward an Alternate Project, the Alternate Project must still provide a BBA-eligible critical service and must be constructed to the approved industry standard(s). FEMA will evaluate the proposed use for reasonableness. If funds not used toward a BBA eligible project, FEMA will have to re-scope the project taking out all work authorized under BBA and the estimate will be adjusted based on the new SOW.

?**Hazard Mitigation Narrative**

During the incident period of Sunday, September 17, 2017, through Wednesday, November 15, 2017, Hurricane Maria produced high velocity wind and prolonged periods of rainfall that severely affected this facility's envelope elements and subsequent, significant interior damages that includes but not limited to interior paint, doors, acoustic ceiling tiles, Gypsum Board, vinyl flooring, luminary, fire alarm system, electric distribution system, data system, telephone system, office furniture, medical devices , ceiling fans, wall/window A/C units , equipment. To prevent future similar damages the Sub- Recipient is proposing the implementation of the Wind Retrofit Mitigation to this facility.

The project is a compound for two buildings, one story each: Building A (D#143327) Administration/Warehouse with a roofing area approximately of 176'x 48.5'(8,536SF) and a Canopy connection (corrugated metal) of 85'x12'(1020 SF), an approximate total area of 9,556 SF of roofing, asphalt membrane roofing system. The building is made up of reinforced concrete/CMU walls with timber roof framing supporting metal roofing system and traditional operable aluminum jalousie windows, 19 damaged windows of a total of 43 windows, 3 ridge vents, 11 window A/C damaged. Building B (D#208992) Methadone Clinic with a footprint area approximately of 180'x 34.66' (6,238 SF). The building is made up of reinforced concrete/CMU walls with timber roof framing supporting metal roofing system and traditional operable aluminum jalousie windows 25 damaged windows of a total of 37 windows, 16 window A/C damaged. Both buildings have a historic relevance. The EHP Specialist has identified this building to date back to the early 20th Century (1900-1910). Disaster-related damages to the envelope include over 70% of the total roofing system, electrical, fire, mechanical and data communications system, 44 damaged windows of 80 total, no load path damages. An approximate interior damages for Building A exceeded $700,000, and over $600,000 for Building B due to high-speed winds, flood and water intrusion. The attached Appendix D for each damage: Case-by-Case Checklist includes details of the documented damages.

Prudent Use of Wind Retrofit

A case-by-case analysis was conducted for both facilities. Based on the extent of the damages, it was determined to be Prudent and Cost Effective the implementation of Non-Residential Hurricane Wind Retrofit Measures using Pre- Calculated Benefits. This mitigation is intended to retrofit envelope components including roof, openings, and load path to prevent future, similar damages to the envelope, thus, protect the building interior. Data analyzed for this determination include: DDD, PA SOW, BBA Survey Scope, A&E Report, photographs, site inspection reports among other related documents.

Damage #143327; CTIAM de Cayey-Building A

(I) Damages Description & Dimensions (DDD):

1. "For a complete list of interior damages, as well as envelope damages, please refer to the project DDD document included in GM and Grants Portal."

(II) Hazard Mitigation Proposal (HMP) Scope of Work:

To prevent or reduce future damages from similar events, the applicant proposed the following mitigation measures:

A. Roof Mitigation: (Refer to WRF Calculator document for roofing details).

1. Replace PA SBS with a complete and reinforced SBS waterproofing on 9556 SF of metal roof to prevent wind and water damages to the system itself and subsequent water intrusion that could cause interior damages.

2. Add 3 additional non-corrosive screws w/neoprene washers every 12 SF on 9556 S.F. of damaged metal panels to reinforce fastening pattern thus protecting the building envelope.

3. Install 472 SF of non-corrosive metal L shape flashing along metal roof edges to prevent water infiltration through cracked plaster. EHP NOTES: L-shaped flashing will not be visible from the ground and will not affect the physical and visual aspect of the Historic Property façades.

4. 356 LF of galvanized steel gutters with gutter hangers to improve roof drainage capacity and prevent water damages.

5. Reinforce wood frame by installing 200 hurricane ties to strengthen roof elements connections and prevent future wind damages.

B. Openings Mitigation: Windows/Louvers and Doors

Windows/Louver:

1. Replace 3 Ea. aluminum louvers of ridge vents with impact resistant louvers of the same type and size

• . (15'x5.5')(3) = 247.5SF

Note: 19 damaged windows included in PA SOW and Cost Estimate to be impact resistant and 24 windows to be impact resistant covered by BBA. Window count and measurements obtained from site visit docs and A&E report.?

Doors:

1. Replace 11 Ea. Metal (3'x7') damaged exterior metal flush doors with wind, water and impact resistant doors of the same size and type to prevent flexure and displacement.

2. 11 Ea. Door-Weather Stripping will be added to prevent water intrusion, avoiding damages to interior finishes and content.

3. 440 L.F. of caulking to allow better adhesion to cement and prevent future water intrusion. Due to complexity, this measure was estimated based on standard 7' x 3' approx. Door. Perimeter of each door= 7 + 7 + 3 +3 = 20*2= 40 L.F. 11 doors x 40 L.F. = 440 L.F. of caulking

EHP NOTES: This is a Wind Retrofit Mitigation. For this mitigation the replacement of all windows(covered by PA/BBA) and doors, damaged and undamaged, is required by policy to ensure the reinforcement of the building envelope as a system. Replace doors with wind, water and impact resistant units of the same size and type as the existing. This mitigation work must be done to match all physical and visual aspects of the original elements, including design, color, texture, hardware, profile, and workmanship. Should the Applicant decide not to meet these requirements then a revised scope of work must be submitted to FEMA for approval and additional EHP review.

C. Load path.

1. No Load Path issues are addressed in this project.

(III) Hazard Mitigation Proposal (HMP) Cost

Net Wind Retrofit Package (WRP) Cost = $ 152,136.34
+ CEF =
Net Wind Retrofit Package Cost + CEF = Total Wind Retrofit Package C

Building Replacement Value (BRV) = $3,243,423.92 25% of BRV = $810,855.98
(See Attachment *"PN65506 - DR4339PR - DI#143327 - Building A - BRV REQUEST - WILFREDO OTERO (4-2-2024)")*

Ratio of HMP: $ 152,136.34 / $ 3,243,423.92 x 100 = 4.7 %

Wind Retrofit Package = 4.7% < 25% BRV. This Project is Cost Effective.

(IV) HMP Cost-Effectiveness Calculations

The cost of this Hazard Mitigation Proposal (HMP) is less than 25% of the BRV and is deemed cost effective per FEMA Pre-Calculated Benefit Non-Residential Wind Retrofit Memo. This Hazard Mitigation Proposal meets eligible repair and restoration cost effective requirements.

*Cost effective calculation should be taken before CEF Factors, Soft Costs, or other Factors.

**See Mitigation Profile Documents Tab in Grants Manager for complete version of this HMP and supporting documents. *(HMP, HMP cost estimate, Supporting documents for WR: Appendix D, BRV, WR Memo)*

POWER SURGE MITIGATION Building A (Doc.: "PN65506-DR4339PR HMP(Facility Power Surge Building A&B").

The project is a one-story building: **Building A** (DI#143327) Administration/Warehouse (176' x 48.5'). Damages to electrical components and equipment was documented for building. The proposed mitigation will provide power surge protection to the entire building. This will be accomplished by installing a facility power surge protector in building. This will provide protection to all the components and equipment connected to the building's power supply.

Damage #143327; CTIAM de Cayey-Building A

(I) Damages Description & Dimensions (DDD):

A. Building A

- Building Interior 8,536 SF of Fire Alarm System (17 rooms) w/smoke detectors, 176 FT long x 48.5 FT wide, Damaged due to power surge and Roof Leaks, 0% work completed.

(II) Hazard Mitigation Proposal (HMP) Scope of Work:

To prevent or reduce future damages from similar events, the applicant proposed the following mitigation measures:

- Install 2 Ea. Facility Power Surge Protection Device per Building A, total of 2) to protect electrical components and equipment of a facility from damage caused by power surge and unstable electrical service.

(III) Hazard Mitigation Proposal (HMP) Cost

- **DI#143327 -** Total Cost for Pre-disaster (PA) Repair/Replacement SOW for Eligible Damages to be Mitigated

PA = $54,735.03

Total Net Hazard Mitigation Cost (Base Cost) = $ 8,137.10

+ HM Soft Cost =

Net Hazard Mitigation cost + HM Soft Cost = Hazard Mitigation Total Cost

(IV) HMP Cost-Effectiveness Calculations

- **DI#143327**

HMR = (Total Net Hazard Mitigation Cost (Bases Cost) / Project Net In-Kind Repair Cost) x 100

HMR = $ 8,137.10/$54,735.03) x 100 =**14.87%**

The cost of this Hazard Mitigation Proposal (HMP) is 14.87% of the repair or restoration costs and is deemed cost effective per FEMA Public Assistance Program and Policy Guide (PAPPG) V3.1 April 2018, Chapter 2, VII., Section C, **X 15%Rule, __ 100% Rule, ___ BCA Rule**. This Hazard Mitigation Proposal meets eligible repair and restoration cost effective requirements.

***Cost effective calculation should be taken before CEF Factors, Soft Costs, or other Factors.**

****See Mitigation Profile Documents Tab in Grants Manager for complete version of this HMP and supporting documents.**

(V) Compliance and Assurance Requirements

HMP GENERAL NOTES:

HMP COST-EFFECTIVENESS RULES: FEMA Public Assistance Program and Policy Guide (PAPPG) Chapter 2. Section VII. C. defines cos effective mitigation as:

- 15% Rule: The cost for the mitigation measure does not exceed 15% percent of the total eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measures applies.
- 100% Rule (Appendix J) The mitigation measure is specifically listed in Appendix J: Cost-Effective Hazard Mitigation Measures, AND the cost of the mitigation measure does not exceed 100 percent of the eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measure applies.
- BCA Rule: The Hazard Mitigation Measure is cost effective through an acceptable Benefit Cost Analysis (BCA) with a resulting Benefit Cost Ratio equal to or greater than (1). Please see attached BCA.

By agreeing to implement the hazard mitigation measures in this HMP, the Applicant/Sub-Applicant is bound by the specific guidelines listed within this document.

SCOPE OF WORK DEVELOPMENT OF HAZARD MITIGATION: FEMA will evaluate each mitigation opportunity to first determine what measures or portions of solutions could be funded through Section 406 mitigation. FEMA analyzes the proposed mitigation measures for cost-effectiveness, technical feasibility, and compliance with EHP laws, regulations, and Eos. FEMA, the Applicant, Recipient, and Sub-recipients will develop and agree to scopes of work (SOW) and cost estimates to repair, restore, or replace eligible facilities including 406 hazard mitigation" (Page 6).

COMPLETION OF HAZARD MITIGATION SCOPE OF WORK: If this HMP is approved and the mitigation is not performed, the Applicant must apply for a change in the Scope of Work and a de-obligation of the HMP funding. Failure to complete the work of the HMP may limit future FEMA funding of repairs at the site in the event that a similar disaster event results in similar damage at the site.

CHANGES TO THE HAZARD MITIGATION SCOPE OF WORK FOR SMALL PROJECTS: All changes in SOW should be brought to

FEMAs and the Recipients attention, including those to the HMP SOW. Per the Public Assistance Program and Policy Guide (PAPPG), April 2018 "FEMA only adjusts the approved amount on individual Small Projects if one of the following conditions applies: The Subrecipient did not complete the approved SOW; the Subrecipient requests additional funds related to an eligible change in SOW; the PW contains inadvertent errors or omissions; or Actual insurance proceeds differ from the amount deducted in the PW..."

CHANGES TO THE HAZARD MITIGATION SCOPE OF WORK FOR LARGE PROJECTS:

Per typical FEMA PA Process (Section 406)all changes in the SOW should be brought to FEMA and the Recipient's attention, including those to the HMP SOW. Per the Public Assistance Program and Policy Guide (PAPPG FP 104-009-2 / April 2018). "If the project included approved hazard mitigation measures; FEMA does not re-evaluate the cost-effectiveness of the HMP based on the final actual cost. If during the review, FEMA determines that the Subrecipient performed work that was not included in the approved SOW, FEMA will designate the project as an Improved Project, cap the funding at the original estimated amount, and review the additional SOW for EHP compliance." (Page 144)

Per PAAP PA Process (Section 428), Guide for Permanent Work, February 10, 2020, "A Subrecipient may alter the 406 hazard mitigation SOW (HMP) after FEMA, the Recipient, and Subrecipient agree on the cost estimate for the initial proposal. After the project is obligated, the SOW for the HMP can be changed only once and the timeline for this change will be established based on a facility-by-facility basis. The proposed change will require evaluation by FEMA for eligibility and EHP. As part of the eligibility review, FEMA will evaluate the SOW, technical feasibility, the level of protection, the revised cost estimate, and cost effectiveness of the new hazard mitigation proposal, and, if approved, will adjust the scope and cost estimate accordingly." (Page 14)

HAZARD MITIGATION DESIGN: This HMP is for estimating purposes only and not to be construed as a project design. If the site's final placement and configuration are different than the preliminary estimate, the Applicant should submit a change in scope request. This HMP is subject to further review prior to award.

The Applicant is responsible for final design, placement, configuration, choice of contractors or vendors, permits and compliance with all regulatory codes and standards of the Commonwealth of Puerto Rico. FEMA will pay only the incremental difference in cost between repairs and mitigation and will not duplicate funding for repair or replacement of eligible work.

HAZARD MITIGATION CONTRUCTION: The Applicant must provide & maintain competent & adequate engineering design & supervis during the construction phase to ensure that the completed work conforms to the approved plans & specifications & all applicable material & construction standards.

As a condition of the FEMA mitigation grant, the Applicant is responsible for the determination of and compliance with all applicable requirements, codes, standards, and specifications in connection with the project, including but not limited to the Puerto Rico Building Code of 2018 (2018 PRBC), IBC, IRBC, NFIP Floodplain Management Regulations outlined in 44 C.F.R 60.3, ASCE 24, ASCE 7, and receiving all applicable permits approvals prior to construction.

MAINTENANCE OF HAZARD MITIGATION: The Applicant shall ensure proper maintenance of the installed mitigation measures, manufacturer and designer specifications. Any adaptations or installations not approved or that renders the hazard mitigation measure ineffective shall be removed by the Applicant. Examples include, but are not limited to, improper installation of roof-mounted equipment or installation of window-mounted air-conditioning units.

ENVIRONMENTAL AND HISTORIC PRESERVATION: Eligibility and funding for the mitigation at this site on this project will be subject to the compliance of all environmental laws, regulations, and executive orders applicable to the site. This project will undergo a EHP compliance review, after obligation any changes to the SOW will likely trigger an additional EHP compliance review of the revised SOW.

184179 MAMD061(v0) Cayey CTIAM - Permanent Work

********** Version 1**********

Version 1 created to de-obligates the previously awarded amount of $168,578.00 in this DI (184179). In Version 0 this amount was awarded for Architectural and Engineering Services as it is now included in the CEFs for DIs #143327 and #208992, which are the permanent work Damage Inventory Line Items for these facilities.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

A&E Version 0: $168,578.00

A&E (Version 1): - $168,578.00

A&E (Cost Estimating Format Total (Version 1)- A&E Version 0): -$168,578.00 + $168,578.00= $0

Versions and Amendments Summary:

Version 0: $168,578.00 Engineering and Design Services

406 HMP Scope

Hazard Mitigation Proposal

406 Hazard Mitigation cannot be applied to A&E Projects, however, hazard mitigation opportunities may exist and be applied to the Permanent Work Project developed for this Sub-applicant. Hazard Mitigation opportunities should be considered during development of the Public Assistance repair scope of work.

During the incident period that started on September 17, 2017 until November 15, 2017, ASSMCA Cayey CTIAM facility sustained damages to the exterior building envelope and interior content due to high driven winds, heavy rain, windborne debris and power outages caused by Hurricane Maria. The damages to be mitigated include, but

208992 CTIAM de Cayey- Building B

**********Version 1**********

Version 1 created to capture Applicant's provided Method of Repair for the repairs of the disaster related damages in "CTIAM de Cayey Permanent Work". In Version 0 a total of **$168,578.00** was awarded in support to the Applicant for the development of their Method of Repair. Applicant has submitted an MOR for FEMA's review. FEMA developed a cost per Applicant's request.

SOW from previous version has been removed from current SOW. It can be found in the "Versioning and Amendments" tab in GM.

Work to be completed

The applicant will utilize contracts for repairs to the **CTIAM de Cayey- Building B** to restore facilities back to pre-disaster design, capacity and function within the existing footprint with in-kind materials.

Building Damage:

Methadone Clinic:

Exterior:

A. Remove and replace in kind 13 Aluminum Jalousie Windows, 4 FT wide x 5 FT high.

B. Prepare and paint in kind 4,300 SF of Latex Wall Paint.

C. Remove and replace in kind 3 Steel Solid metal doors 36in x 84in (w/frame, hinges, lockset).

D. Remove and replace in kind 6 Aluminum Jalousie Windows, 3 FT wide x 3 FT high.

E. Remove and replace in kind 6 Aluminum Jalousie Windows, 4 FT wide x 4 FT high.

Roof:

A. Remove and replace in kind 6,238 SF of Asphalt Membrane Roofing/Waterproofing Membrane, 162 FT long x 36 FT wide. See scope note 1.

B. Remove and replace in kind 6,238 SF of Metal Corrugated roof sheets, 162 FT long x 36 FT wide. See scope note 1.

Attic:

A. Remove and replace in kind 4,305 SF of Wooden Floor 1in x 6 in x 20Ft (L) groove and tongue wood boards, 124 FT long x 34.66 FT wide.

Interior:

A. Remove and replace in kind 4,305 SF of Fiber Minerals Acoustic Ceiling Tiles 2 Ft x 4 Ft, 124 FT long x 34.66 FT wide.

B. Remove and replace 120 Fluorescent Ceiling Luminaires 120V 2 Ft x 4 Ft.

C. Remove and replace in kind 4,305 SF of Vinyl Composition Floor Tiles 12 in x 12 in, 180 FT long x 34.66 FT wide.

D. Remove and replace 4,305 SF of Fire Alarm System (15 rooms) w/smoke detectors, 180 FT long x 34.66 FT wide.

E. Remove and replace in kind 9,970 SF of Gypsum Partition Walls, 1,173 FT long x 8.5 FT high.

F. Remove and replace 16 Window installation type A/C 12,000 BTU.

G. Remove and replace 4 JS4BD-060KB (208/230 volts) split unit 5 TON.

H. Remove and replace in kind 3 cedar wood door with a 24in x 30in safety glass, frame and hardware, 36 IN wide x 84 IN high.

I. Remove and replace 4,305 SF of Electrical Distribution System (Lighting and Power) , 124 FT long x 34.66 FT wide.

J. Remove and replace 4,305 SF of Data-Telephone System , 124 FT long x 34.66 FT wide.

K. Remove and replace in kind 1,186 LF long Vinyl cove base, 4 in.

L. Remove and replace 1 wall exhaust fan 3ft x 3ft of 8,225 CFM.

M. Remove and replace in kind 1 Wood Attic Space 178ft x 48ft.

N. Remove and replace in kind 4,305 SF of Acoustic Suspension system Grid (Wall angles: 1,720 Ft (L), main tee, Cross Tee, Wire), 124 FT long x 34 FT wide.

O. Remove and replace 5 Fluorescent Ceiling Luminaires 120V 2 Ft x 2 Ft.

P. Prepare and paint in kind 8,896 SF of Latex Wall Paint, 1,046 FT long x 8.5 FT high.

Q. Remove and replace in kind 5 Steel Solid metal doors 36in x 84in (w/frame, hinges, lockset).

R. Remove and replace in kind 1 Steel Solid metal double doors 60in x 84in (w/frame, hinges, lockset).

S. Remove and replace in kind 4 Steel Solid metal doors 36in x 84in with safety glass 24in x 30in (w/frame, hinges, lockset).

Contents:

A. Remove and replace 2 Metal Ceiling fans with three blades and a lamp, 36-inch diameter.

B. Replace 1 Mini Compact Refrigerator 4.4 Cu.

C. Replace 7 Cherry-wood Round Table 60 in Diameter x 29 1/8 in Height.

D. Replace 36 Vinyl Arm less Guest Reception Chair.

E. Replace 4 each of Wooden U Shaped Executive Office Desk with Pedestal and Hutch in bark Oak, 95.5 in (D) x 65.98 in (W) x 66.5 in (H).

F. Replace 1 Key Entry Box, Clay, 60 Key Capacity.

G. Replace 18 Vinyl / Metal Seat Waiting Room Chair.

H. Replace 20 Steel Vertical File Collection 4 Drawer Vertical File Cabinet , 26.5 in Deep Legal Width.

I. Replace 1 Safe and Vault Store Pharmacy Safe 60 in (H) x 32 in (W) x 16 in (D).

Work to be Completed Total: $2,279,471.37

Versions and Amendments Summary:

Version 0: $0.00 Engineering and Design Services

Scope Notes:

1. Quantities modified as per BBA Scope Survey document labeled *DR4339PR-65506 - MAMD061 CTIAM de Cayey Permanent Work-BBA Scope Survey*, to comply with Puerto Rico Building Code 2018, Chapter 15, Roof Assemblies and Rooftop structures.

2. The BBA percentage was calculated as 24.85% based on the approved BBA Scope. ($342,790.52 / $ 1,379,501.52 = 24.85%). Please refer to document labeled: ST65506 - DR4339PR – Cost Estimate Rev1.xlsx.

406 HMP Scope

Hazard Mitigation Narrative

During the incident period of Sunday, September 17, 2017, through Wednesday, November 15, 2017, Hurricane Maria produced high velocity wind and prolonged periods of rainfall that severely affected this facility's envelope elements and subsequent, significant interior damages that includes but not limited to interior paint, doors, acoustic ceiling tiles, Gypsum Board, vinyl flooring, luminary, fire alarm system, electric distribution system, data system, telephone system, office furniture, medical devices , ceiling fans, wall/window A/C units , equipment. To prevent future similar damages the Sub- Recipient is proposing the implementation of the Wind Retrofit Mitigation to this facility.

The project is a compound for two buildings, one story each: Building A (DI#143327) Administration/Warehouse with a roofing area approximately of 176'x 48.5'(8,536SF) and a Canopy connection (corrugated metal) of 85'x12'(1020 SF), an approximate total area of 9,556 SF of roofing, asphalt membrane roofing system. The building is made up of reinforced concrete/CMU walls with timber roof framing supporting metal roofing system and traditional operable aluminum jalousie windows, 19 damaged windows of a total of 43 windows, 3 ridge vents, 11 window A/C damaged. **Building B** (D#208992) Methadone Clinic with a footprint area approximately of 180'x 34.66' (6,238 SF). The building is made up of reinforced concrete/CMU walls with timber roof framing supporting metal roofing system and traditional operable aluminum jalousie windows 25 damaged windows of a total of 37 windows, 16l window A/C damaged. Both buildings have a historic relevance. The EHP Specialist has identified this building to date back to the early 20th Century (1900-1910). Disaster-related damages to the envelope include over 70% of the total roofing system, electrical, fire, mechanical and data communications system, 44 damaged windows of 80 total, no load path damages. An approximate interior damages for Building A exceeded $700,000, and over $600,000 for Building B due to high-

speed winds, flood and water intrusion. The attached Appendix D for each damage: Case-by-Case Checklist includes details of the documented damages.

Prudent Use of Wind Retrofit

A case-by-case analysis was conducted for both facilities. Based on the extent of the damages, it was determined to be Prudent and Cost Effective the implementation of Non-Residential Hurricane Wind Retrofit Measures using Pre- Calculated Benefits. This mitigation is intended to retrofit envelope components including roof, openings, and load path to prevent future, similar damages to the envelope, thus, protect the building interior. Data analyzed for this determination include: DDD, PA SOW, BBA Survey Scope, A&E Report, photographs, site inspection reports among other related documents.

Damage #208992; CTIAM de Cayey-Building B

(I) Damages Description & Dimensions (DDD):

1. For a complete list of interior damages, as well as envelope damages, please refer to the project DDD document included in GM and Grants Portal."

(II) Hazard Mitigation Proposal (HMP) Scope of Work:

To prevent or reduce future damages from similar events, the applicant proposed the following mitigation measures:

A. Roof Mitigation: (Refer to WRF Calculator document for roofing details).

1. Replace PA SBS with a complete and reinforced SBS waterproofing on 6,238 SF of metal roof to prevent wind and water damages to the system itself and subsequent water intrusion that could cause interior damages.

2. Add 3 additional non-corrosive screws w/neoprene washers every 12 SF on 6,238 S.F. of damaged metal panels to reinforce fastening pattern thus protecting the building envelope.

3. Install 426 SF of non-corrosive metal L shape flashing along metal roof edges to prevent water infiltration through cracked plaster.

EHP NOTES: L-shaped flashing will not be visible from the ground and will not affect the physical and visual aspect of the Historic Property façades.

4. 360 LF of galvanized steel gutters with gutter hangers to improve roof drainage capacity and prevent water damages.

5. Reinforce wood frame by installing 200 hurricane ties to strengthen roof elements connections and prevent future wind damages.

B. Openings Mitigation: Windows and Doors

Windows:

Note: 25 damaged windows impact resistant to be covered by PA SOW and Cost Estimate. BBA will replace 12 impact resistant windows. A total of 37 impact resistant windows will be covered by PA/BBA funds. Window count and measurements obtained from site visit and A&E report.

Doors:

1. Replace 14 Ea. Metal (3'x7') damaged exterior metal doors with wind, water and impact resistant doors of the same size and type to prevent flexure and displacement.

2. 14 Ea. Door-Weather Stripping will be added to prevent water intrusion, avoiding damages to interior finishes and content.

3. 560 L.F. of caulking to allow better adhesion to cement and prevent future water intrusion. Due to complexity, this measure was estimated based on standard 7' x 3' approx. Door. Perimeter of each door= 7 + 7 + 3 +3 = 20*2= 40 L.F. 10 doors x 40 L.F.

= 560 L.F. of caulking

EHP NOTES: This is a Wind Retrofit Mitigation. For this mitigation the replacement of all windows and doors, damaged and undamaged, is required by policy to ensure the reinforcement of the building envelope as a system. Replace doors with wind, water and impact resistant units of the same size and type as the existing. This mitigation work must be done to match all physical and visual aspects of the original elements, including design, color, texture, hardware, profile, and workmanship. Should the Applicant decide not to meet these requirements then a revised scope of work must be submitted to FEMA for approval and additional EHP review.

C. Load path

1. No Load Path issues are addressed in this project.

(III) Hazard Mitigation Proposal (HMP) Cost(Building B)

Net Wind Retrofit Package (WRP) Cost = $ 106,043.50
+ CEF =

Net Wind Retrofit Package Cost + CEF = Total Wind Retrofit Package C

Building Replacement Value (BRV) = $2,366,011.02 25% of BRV = $591,502.75
(See Attachment "*PN65506 - DR4339PR - DI#143327 - Building A - BRV REQUEST - WILFREDO OTERO(4-2-2024)*")

Ratio of HMP: $ 106,043.50 / $2,366,011.02 x 100 = 4.5 %

Wind Retrofit Package = 4.5 %< 25%of BRV. This Project is Cost Effective.

(IV) HMP Cost-Effectiveness Calculations

The cost of this Hazard Mitigation Proposal (HMP) is less than 25% of the BRV and is deemed cost effective per FEMA Pre-Calculated Benefit Non-Residential Wind Retrofit Memo. This Hazard Mitigation Proposal meets eligible repair and restoration cost effective requirements.

*Cost effective calculation should be taken before CEF Factors, Soft Costs, or other Factors.

****See Mitigation Profile Documents Tab in Grants Manager for complete version of this HMP and supporting documents.** ***(HMP, HMP cost estimate, Supporting documents for WR: Appendix D, BRV, WR Memo)***

(V) Facility Hazard Data

Facility Wind Data:

Event Wind Speed

Hurricane María Wind Speed – 131 mph

Attachment "ATC Hazard by Location Building A- Wind Speed"

Hazard Mitigation Measure Design Wind Speed
ASCE-07-2016 Section 1.5.1 Structure Wind Risk Category Risk Category: **_II_**

For municipalities with PRBC 2018 Microzoning Analysis:
Puerto Rico Building Code (PRBC) 2018, Appendix P-Microzone Wind Speed: 161 mph Attachment "PN65506-HMP-Design Wind Speed – Microzone Analysis"

Mitigation Design Wind Speed:

Based on the best available data, the mitigation measure will be implemented to protect the facility up to a Design Wind Speed of 170 mph.

Facility Flood Data:

Flood Zone = **No Flood Zone**

(VI) Compliance and Assurance Requirements

HAZARD MITIGATION - WIND RETROFIT NOTES:

The Applicant is responsible for a vulnerability assessment of the existing structure to wind pressure, wind-borne debris, and wind-driven rain prior to the final design of the wind retrofit package. The assessment will determine the required mitigation design to bring the roof, opening protection, and load path into code compliance. The assessment and design should be endorsed by a licensed professional engineer qualified to certify that the proposed hazard mitigation Scope of Work will be compliant with current codes and standards.

If specific mitigation package components are shown to meet the current required standards in their existing condition and as indicated by a vulnerability assessment, then they may be excluded from the hazard mitigation SOW. For PA 406 Mitigation, if the facility includes undamaged elements and the Recipient/Subrecipient does not wish to retrofit all components of the mitigation package, the Non-residential Wind Retrofit Pre-Calculated Benefit may still be applied if the undamaged elements meet the current required standards indicated by the vulnerability assessment.

To ensure proper installation, the applicant-contracted design professional contractor must provide, for each structure incorporating wind retrofit mitigation measures, (1) justification that the constructed measures meet or exceed the wind-load design requirements for roofs, openings and load path (i.e., documentation of rating based on windborne debris load calculations) and (2) a post-construction inspection certification that is signed and sealed by a licensed design professional that post-construction conditions meet or exceed 2018 PRBC IBC/IEBC requirements. This certification form shall be submitted to FEMA for closeout.

The cost of the vulnerability assessment, certification of the design, and post-construction inspection should be included in the mitigation grant as an eligible architectural and engineering cost for projects that are deemed eligible, technically feasible, and cost-effective.
In the above estimate these costs are included in the cost estimate as a percentage of construction costs.

The building envelope is most significantly comprised of the Roof, Openings, and Load Path. To best maintain the benefits provided by the Wind Retrofit Mitigation, these building elements should not be altered in any way that will jeopardize the wind, flying debris, or wind driven rain resistance of the building envelope. Doing so could potentially jeopardize Hazard Mitigation Funding.

HMP GENERAL NOTES:

By agreeing to implement the hazard mitigation measures in this HMP, the Applicant/Sub-Applicant is bound by the specific guidelines listed within this document.

SCOPE OF WORK DEVELOPMENT OF HAZARD MITIGATION: FEMA will evaluate each mitigation opportunity to first determine what measures or portions of solutions could be funded through Section 406 mitigation. FEMA analyzes the proposed mitigation measures for cost-effectiveness, technical feasibility, and compliance with EHP laws, regulations, and Eos. FEMA, the Applicant, Recipient, and Sub-recipients will develop and agree to scopes of work (SOW) and cost estimates to repair, restore,

or replace eligible facilities including 406 hazard mitigation" (Page 6).

COMPLETION OF HAZARD MITIGATION SCOPE OF WORK: If this HMP is approved and the mitigation is not performed, Applicant must apply for a change in the Scope of Work and a de-obligation of the HMP funding. Failure to complete the work of the HMP may limit future FEMA funding of repairs at the site in the event that a similar disaster event results in similar damage at the site.

CHANGES TO THE HAZARD MITIGATION SCOPE OF WORK FOR SMALL PROJECTS: All changes in SOW should be brought to FEMAs and the Recipients attention, including those to the HMP SOW. Per the Public Assistance Program and Policy Guide (PAPPG), April 2018, "FEMA only adjusts the approved amount on individual Small Projects if one of the following conditions applies: The Subrecipient did not complete the approved SOW; the Subrecipient requests additional funds related to an eligible change in SOW; the PW contains inadvertent errors or omissions; or Actual insurance proceeds differ from the amount deducted in the PW..."

POWER SURGE MITIGATION Building B (Doc.: "PN65506-DR4339PR HMP(Facility Power Surge Building A&B").

Hazard Mitigation Narrative
During the incident period of Sunday, September 17, 2017, through Wednesday, November 15, 2017, Hurricane Maria produced high velocity wind and prolonged periods of rainfall that severely affected this facility's envelope elements and subsequent, significant interior damages. This Hazard Mitigation Proposal captures the damages caused by power surges as a result of power outages and unstable electrical service in the aftermath of Hurricane María.

The project is a compound of a one-story buildings: Building B (D#208992) Methadone Clinic (180'x34.66'). Damages to electrical components and equipment was documented for buildings. The proposed mitigation will provide power surge protection to the entire buildings. This will be accomplished by installing a facility power surge protector in each building. This will provide protection to all the components and equipment connected to the building's power supply.

Damage #208992; CTIAM de Cayey-Building B

A. Building B

(I) Damages Description & Dimensions (DDD):

* Building Interior, 4,305 SF of Fire Alarm System (15 rooms) w/smoke detectors, 180 FT long x 34.66 FT wide, Damaged due to power surge and Roof Leaks, 0% work completed.

(II) Hazard Mitigation Proposal (HMP) Scope of Work:

To prevent or reduce future damages from similar events, the applicant proposed the following mitigation measures:

▪ Install 2 Ea. Facility Power Surge Protection Device to Building B, total 2 to protect electrical components and equipment of a facility from damage caused by power surge and unstable electrical service.

(III) Hazard Mitigation Proposal (HMP) Cost

▪ **DI#208992 -** Total Cost for Pre-disaster (PA) Repair/Replacement SOW for Eligible Damages to be Mitigated

PA = $12,394.89

Total Net Hazard Mitigation Cost (Base Cost) = $ 8,137.10

+ HM Soft Cost =

Net Hazard Mitigation cost + HM Soft Cost = Hazard Mitigation Total Cost =

(IV) HMP Cost-Effectiveness Calculations

▪ **DI#208992**

HMR = (Total Net Hazard Mitigation Cost (Bases Cost) / Project Net In-Kind Repair Cost) x 100

HMR = $ 8,137.10/ $12,394.89) x 100 =**65.65%**

The cost of this Hazard Mitigation Proposal (HMP) is 65.65% of the repair or restoration costs and is deemed cost effective per FEMA Public Assistance Program and Policy Guide (PAPPG) V3.1 April 2018, Chapter 2, VII., Section C, **__ 15%Rule, X 100% Rule, ___ BCA Rule**. This Hazard Mitigation Proposal meets eligible repair and restoration cost effective requirements.

***Cost effective calculation should be taken before CEF Factors, Soft Costs, or other Factors.**

****See Mitigation Profile Documents Tab in Grants Manager for complete version of this HMP and supporting documents.**

(V) Compliance and Assurance Requirements

HMP GENERAL NOTES:

HMP COST-EFFECTIVENESS RULES: FEMA Public Assistance Program and Policy Guide (PAPPG) Chapter 2. Section VII. C. defines cost effective mitigation as:

- 15% Rule: The cost for the mitigation measure does not exceed 15% percent of the total eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measures applies.
- **100% Rule** (Appendix J) The mitigation measure is specifically listed in Appendix J: Cost-Effective Hazard Mitigation Measures, AND the cost of the mitigation measure does not exceed 100 percent of the eligible repair cost (prior to any insurance reductions) of the facility or facilities for which the mitigation measure applies.
- BCA Rule: The Hazard Mitigation Measure is cost effective through an acceptable Benefit Cost Analysis (BCA) with a resulting Benefit Cost Ratio equal to or greater than (1). Please see attached BCA.

By agreeing to implement the hazard mitigation measures in this HMP, the Applicant/Sub-Applicant is bound by the specific guidelines listed within this document.

SCOPE OF WORK DEVELOPMENT OF HAZARD MITIGATION: FEMA will evaluate each mitigation opportunity to first determine what measures or portions of solutions could be funded through Section 406 mitigation. FEMA analyzes the proposed mitigation measures for cost-effectiveness, technical feasibility, and compliance with EHP laws, regulations, and Eos. FEMA, the Applicant, Recipient, and Sub-recipients will develop and agree to scopes of work (SOW) and cost estimates to repair, restore, or replace eligible facilities including 406 hazard mitigation" (Page 6).

COMPLETION OF HAZARD MITIGATION SCOPE OF WORK: If this HMP is approved and the mitigation is not performed, the Applicant must apply for a change in the Scope of Work and a de-obligation of the HMP funding. Failure to complete the work of the HMP may limit future FEMA funding of repairs at the site in the event that a similar disaster event results in similar damage at the site.

CHANGES TO THE HAZARD MITIGATION SCOPE OF WORK FOR SMALL PROJECTS: All changes in SOW should be brought to FEMAs and the Recipients attention, including those to the HMP SOW. Per the Public Assistance Program and Policy Guide (PAPPG), April 2018 "FEMA only adjusts the approved amount on individual Small Projects if one of the following conditions applies: The Subrecipient did not complete the approved SOW; the Subrecipient requests additional funds related to an eligible change in SOW; the PW contains inadvertent errors or omissions; or Actual insurance proceeds differ from the amount deducted in the PW..."

CHANGES TO THE HAZARD MITIGATION SCOPE OF WORK FOR LARGE PROJECTS:

Per typical FEMA PA Process (Section 406)all changes in the SOW should be brought to FEMA and the Recipient's attention, including those to the HMP SOW. Per the Public Assistance Program and Policy Guide (PAPPG FP 104-009-2 / April 2018). "If the project included approved hazard mitigation measures; FEMA does not re-evaluate the cost-effectiveness of the HMP based on the final actual cost. If during the review, FEMA determines that the Subrecipient performed work that was not included in the approved SOW, FEMA will designate the project as an Improved Project, cap the funding at the original estimated amount, and review the additional SOW for EHP compliance." (Page 144)