GOVERNMENT OF PUERTO RICO
PUERTO RICO PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU

IN RE:	**CASE NO. NEPR-MI-2021-0002**
IN RE: REVIEW OF THE PUERTO RICO ELECTRIC POWER AUTHORITY'S 10-YEAR INFRASTRUCTURE PLAN-DECEMBER 2020	**SUBJECT: Submission of Sixty Scopes of Work and List of Updated Projects and Request for Confidentiality and Supporting Memorandum of Law**

MOTION SUBMITTING SIXTY SCOPES OF WORK AND UPDATED LIST OF PROJECTS AND REQUEST FOR CONFIDENTIALITY AND SUPPORTING MEMORANDUM OF LAW

TO THE PUERTO RICO ENERGY BUREAU:

COME NOW LUMA Energy, LLC[1], and **LUMA Energy ServCo, LLC** (jointly referred to as "LUMA"), through the undersigned legal counsel and respectfully submits the following:

I. Submittal of Scopes of Work and Request for Confidentiality

1. On March 26, 2021, this Puerto Rico Energy Bureau ("Energy Bureau") issued a Resolution and Order in the instant proceeding (the "March 26 Order"), ordering, in pertinent part, that the Puerto Rico Electric Power Authority ("PREPA") submit to the Energy Bureau the specific projects to be funded with Federal Emergency Management Agency ("FEMA") funds or any other federal funds at least thirty (30) calendar days prior to submitting these projects to the Puerto Rico Central Office for Recovery, Reconstruction and Resiliency ("COR3"), FEMA or any other federal agency. *See* March 26 Order on pages 18-19. This Energy Bureau thereafter determined that this directive applied to both PREPA and LUMA. *See* Resolution and Order of August 20, 2021 ("August 20 Order") on page 3.

[1] Register No. 439372.

2. Consequently, LUMA has submitted to this Energy Bureau several Transmission and Distribution projects ("T&D Projects") on July 8, 2021 (twenty-eight (28) Scopes of Work and an itemized list of T&D Projects), August 30, 2021 (twenty-nine (29) SOWs and an updated list of T&D Projects) and October 4, 2021 (thirty-eight (38) SOWs and an updated list of T&D Projects), February 2, 2022 (three (3) SOWs and an updated list of T&D Projects), May 20, 2022 (one (1) SOW and an updated list of T&D Projects), July 29, 2022 (four (4) SOWs and an updated list of T&D projects), and August 10, 2022 (two (2) SOWs and an updated list of T&D projects). The Energy Bureau has approved all the T&D Project SOWs submitted by LUMA as of this date.

3. In accordance with the March 26 Order, LUMA hereby submits to the Energy Bureau sixty (60) SOWs for T&D Projects for this Energy Bureau's review and approval prior to submittal to COR3 and FEMA in thirty (30) days for the following projects: "Distribution Feeders - Arecibo Short Term Group 3", dated June 6, 2022; "Distribution Feeders - Arecibo Short Term Group 4" dated June 9, 2022; "Distribution Feeders - Arecibo Short Term Group 5", dated June 9, 2022; "Distribution Feeders - Arecibo Short Term Group 6", dated June 9, 2022; "Distribution Feeders - Arecibo Short Term Group 7", dated June 9, 2022; "Distribution Feeders - Arecibo Short Term Group 8", dated June 10, 2022; "Distribution Feeders - Arecibo Short Term Group 9", dated June 10, 2022; "Distribution Feeders - Arecibo Short Term Group 10", dated June 10, 2022; "Distribution Feeders - Arecibo Short Term Group 11", dated June 10, 2022; "Distribution Feeders - Arecibo Short Term Group 12", dated June 10, 2022; "Distribution Feeders - Bayamón Short Term Group 4", dated June 20, 2022; "Distribution Feeders - Bayamón Short Term Group 5", dated June 20, 2022; "Distribution Feeders - Bayamón Short Term Group 6", dated June 20, 2022; "Distribution Feeders - Bayamón Short Term Group 7", dated June 20, 2022; "Distribution Feeders

- Bayamón Short Term Group 8", dated June 20, 2022; "Distribution Feeders - Bayamón Short Term Group 9", dated June 20, 2022; "Distribution Feeders - Caguas Short Term Group 9", dated June 22, 2022; "Distribution Feeders - Caguas Short Term Group 10", dated June 20, 2022; "Distribution Feeders - Caguas Short Term Group 11", dated June 20, 2022; "Distribution Feeders - Caguas Short Term Group 12", dated June 20, 2022; "Distribution Feeders - Caguas Short Term Group 13", dated June 20, 2022; "Distribution Feeders - Caguas Short Term Group 14", dated June 20, 2022; "Distribution Feeders - Caguas Short Term Group 15", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 5", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 6", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 7", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 8", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 9", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 10", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 11", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 12", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 13", dated June 20, 2022; "Distribution Feeders - Mayagüez Short Term Group 14", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 3", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 4", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 5", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 6", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 7", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 8", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 9", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 10", dated June 20, 2022; "Distribution Feeders - Ponce Short Term Group 11", dated June 20,

2022; “Distribution Feeders - Ponce Short Term Group 12”, dated June 20, 2022; “Distribution Feeders - Ponce Short Term Group 13”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 4”, dated June 20, 2202; “Distribution Feeders - San Juan Short Term Group 5”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 6”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 7”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 8”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 9”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 10”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 11”, dated June 20, 2022; “Distribution Feeders - San Juan Short Term Group 12”, dated June 20, 2022; “Sabana Llana TC”, dated November 7, 2022; “Guayanilla TC - New Substation TC”, dated November 7, 2022; “Jobos TC”, dated November 7, 2022; “San Juan SP TC”, dated November 7, 2022; “Salinas TC - New Substation”, dated November 7, 2022; “New Substation Culebra”, dated August 29, 2022; and “New Substation Vieques”, dated August 29, 2022. *See Exhibit 1*.

4. LUMA also submits to this Energy Bureau an updated Project List, containing a current list of the total initial SOWs submitted to the Energy Bureau, a list of approved projects by the Energy Bureau with assigned FEMA Accelerated Awards Strategy (“FAASt”) numbers and a list of projects with approved FEMA funding obligations. *See Exhibit 2*.[2]

[2] LUMA has removed the “FAASt [Equipment and Materials]” FEMA approval from the list of projects, considering that it is not a project *per se* but funds obligated to cover damaged equipment and components throughout facilities. It is a sub-project created by FEMA to assist in the purchase of selected materials and minimize potential delays in the construction schedules due to delivery of equipment and materials with long lead times from the manufacturer. The equipment and materials covered under the sub-project will be destined for projects in the distribution, transmission, and telecommunications systems, as well as substations. The utilization of the material and equipment will be tracked under each individual project. It should be noted that the sub-project amounts to $656.1 million. Thus, the list of projects currently reflects a deduction of said amount from the total listed.

5. Section 428 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (known as the "Stafford Act") administered by FEMA, provides funding through grants to states, local, tribal, and territorial governments through its Public Assistance Program to help communities respond to and recover from major disasters. LUMA has presented and received approval from the Energy Bureau for 142 initial SOWs for projects under Section 428 as of this date. The Energy Bureau's approval of these SOWs allows LUMA to engage with COR3 and federal agencies to seek different federal funding sources. These include FEMA Hazard Mitigation under Section 406 of the Stafford Act. Section 406 provides FEMA with discretionary authority to fund mitigation measures and repair disaster-damaged facilities. The application for and determination of Section 406 funding is part of the preliminary design phase for projects approved by the Energy Bureau and assigned FAASt numbers by FEMA to receive Section 428 funding. At the time of submission of the initial SOW to the Energy Bureau, it is unknown whether and in what amounts funding through Section 406 will be available, if any. LUMA develops proposals for additional hazard mitigation measures consistent with the damages. The proposals are reviewed and approved by FEMA and COR3. LUMA's efforts to add mitigation measures under Section 406 are consistent with LUMA's commitment to pursue federal funding from all potential sources, maximize available funds, and efficiently execute proposed projects.

6. LUMA hereby requests that *Exhibit 1* be maintained confidential and is submitting a redacted version for public disclosure and an unredacted non-public version under seal of confidentiality. LUMA submits below its Memorandum of Law stating the legal basis for which the unredacted version of *Exhibit 1* should be filed under seal of confidentiality. As will be explained below, portions of the sixty (60) SOWs in *Exhibit 1* should be protected from public

disclosure as these documents contain confidential information associated with Critical Energy Infrastructure Information ("CEII") as defined in federal regulations, 18 C.F.R. §388.113; 6 U.S.C. §§ 671-674, and per the Energy Bureau's Policy on Management of Confidential Information (the "SOWs with CEII"). *See* Energy Bureau's Policy on Management of Confidential Information, CEPR-MI-2016-0009 ("Policy on Management of Confidential Information"), issued on August 31, 2016, as amended by the Resolution dated September 20, 2016. In addition, all sixty (60) SOWs include personal identifying information of individuals who are LUMA staff or contractors that are protected under Puerto Rico's legal framework on privacy emanating from the Puerto Rico Constitution and should also be protected pursuant to the Energy Bureau's Policy on Management of Confidential Information.

II. Memorandum of Law in Support of Request for Confidentiality

A. Applicable Laws and Regulations to Submit Information Confidentially Before the Energy Bureau

7. The bedrock provision on the management of confidential information filed before this Energy Bureau is Section 6.15 of Act 57-2014, known as the "Puerto Rico Energy Transformation and Relief Act.". It provides, in pertinent part, that: "[i]f any person who is required to submit information to the [Energy Bureau] believes that the information to be submitted has any confidentiality privilege, such person may request the [Energy Bureau] to treat such information as such […]" 22 LPRA §1054n. If the Energy Bureau determines, after appropriate evaluation, that the information should be protected, "it shall grant such protection in a manner that least affects the public interest, transparency, and the rights of the parties involved in the administrative procedure in which the allegedly confidential document is submitted." *Id.* §1054n(a).

8. Access to confidential information shall be provided "only to the lawyers and external consultants involved in the administrative process after the execution of a confidentiality agreement." *Id.* §1054n(b). Finally, Act 57-2014 provides that this Energy Bureau "shall keep the documents submitted for its consideration out of public reach only in exceptional cases. In these cases, the information shall be duly safeguarded and delivered exclusively to the personnel of the [Energy Bureau] who needs to know such information under nondisclosure agreements. However, the [Energy Bureau] shall direct that a non-confidential copy be furnished for public review." *Id.* §1054n(c).

9. Relatedly, in connection with the duties of electric power service companies, Section 1.10 (i) of Act 17-2019 provides that electric power service companies shall provide the information requested by customers, except for confidential information in accordance with the Puerto Rico Rules of Evidence.

10. Moreover, the Energy Bureau's Policy on Management of Confidential Information details the procedures a party should follow to request that a document or portion thereof be afforded confidential treatment. In essence, the referenced Policy requires identifying confidential information and filing a memorandum of law explaining the legal basis and support for a request to file information confidentially. *See* CEPR-MI-2016-0009, Section A, as amended by the Resolution of September 20, 2016, CEPR-MI-2016-0009. The memorandum should also include a table that identifies the confidential information, a summary of the legal basis for the confidential designation, and why each claim or designation conforms to the applicable legal basis of confidentiality. *Id.* at ⁋ 3. The party who seeks confidential treatment of information filed with the

Energy Bureau must also file both a "redacted" or "public version" and an "unredacted" or "confidential" version of the document that contains confidential information. *Id.* at ¶ 6.

11. The Energy Bureau's Policy on Management of Confidential Information states the following with regard to access to validated Trade Secret Information and CEII:

> 1. Trade Secret Information
>
> > Any document designated by the [Energy Bureau] as Validated Confidential Information because it is a trade secret under Act 80-2011 may only be accessed by the Producing Party and the [Energy Bureau], unless otherwise set forth by the [Energy Bureau] or any competent court.
>
> 2. Critical Energy Infrastructure Information ("CEII")
>
> > The information designated by the [Energy Bureau] as Validated Confidential Information on the grounds of being CEII may be accessed by the parties' authorized representatives only after they have executed and delivered the Nondisclosure Agreement.
> >
> > Those authorized representatives who have signed the Non-Disclosure Agreement may only review the documents validated as CEII at the [Energy Bureau] or the Producing Party's offices. During the review, the authorized representatives may not copy or disseminate the reviewed information and may bring no recording device to the viewing room.

Id. at § D (on Access to Validated Confidential Information).

12. Energy Bureau Regulation No. 8543, *Regulation on Adjudicative, Notice of Noncompliance, Rate Review, and Investigation Proceedings*, also includes a provision for filing confidential information in proceedings before this Energy Bureau. To wit, Section 1.15 provides that "a person has the duty to disclose information to the [Energy Bureau] considered to be privileged pursuant to the Rules of Evidence, said person shall identify the allegedly privileged information, request the [Energy Bureau] the protection of said information, and provide

supportive arguments, in writing, for a claim of information of privileged nature. The [Energy Bureau] shall evaluate the petition and, if it understands [that] the material merits protection, proceed according to […] Article 6.15 of Act No. 57-2015, as amended." *See also* Energy Bureau Regulation No. 9137 on *Performance Incentive Mechanisms*, § 1.13 (addressing disclosure before the Energy Bureau of Confidential Information and directing compliance with Resolution CEPR-MI-2016-0009).

B. Request for Confidentiality

13. The SOWs with CEII included in *Exhibit 1* contain portions of CEII that, under relevant federal law and regulations, are protected from public disclosure. LUMA stresses that the SOWs with CEII warrant confidential treatment to protect critical infrastructure from threats that could undermine the system and negatively affect electric power services to the detriment of the interests of the public, customers, and citizens of Puerto Rico. In several proceedings, this Energy Bureau has considered and granted requests by PREPA to submit CEII under seal of confidentiality.[3] In at least two proceedings on Data Security,[4] and Physical Security,[5] this Energy

[3] *See e.g., In re Review of LUMA's System Operation Principles*, NEPR-MI-2021-0001 (Resolution and Order of May 3, 2021); *In re Review of the Puerto Rico Power Authority's System Remediation Plan*, NEPR-MI-2020-0019 (order of April 23, 2021); *In re Review of LUMA's Initial Budgets*, NEPR-MI-2021-0004 (order of April 21, 2021); *In re Implementation of Puerto Rico Electric Power Authority Integrated Resource Plan and Modified Action Plan*, NEPR MI 2020-0012 (Resolution of January 7, 2021, granting partial confidential designation of information submitted by PREPA as CEII); *In re Optimization Proceeding of Minigrid Transmission and Distribution Investments*, NEPR MI 2020-0016 (where PREPA filed documents under seal of confidentiality invoking, among others, that a filing included confidential information and CEII); *In re Review of the Puerto Rico Electric Power Authority Integrated Resource Plan*, CEPR-AP-2018-0001 (Resolution and Order of July 3, 2019 granting confidential designated and request made by PREPA that included trade secrets and CEII) *but see* Resolution and Order of February 12, 2021 reversing in part, grant of confidential designation).

[4] *In re Review of the Puerto Rico Electric Power Authority Data Security Plan*, NEPR-MI-2020-0017.

[5] *In re Review of the Puerto Rico Electric Power Authority Physical Security Plan*, NEPR-MI-2020-0018.

Bureau, *motu proprio*, has conducted proceedings confidentially, thereby recognizing the need to protect CEII from public disclosure.

14. Additionally, this Energy Bureau has granted requests by LUMA to protect CEII in connection with LUMA's System Operation Principles. *See* Resolution and Order of May 3, 2021, table 2 on page 4, Case No. NEPR-MI-2021-0001 (granting protection to CEII included in *LUMA's Responses to Requests for Information*). Similarly, in the proceedings on LUMA's proposed Initial Budgets and System Remediation Plan, this Energy Bureau granted confidential designation to several portions of LUMA's Initial Budgets and Responses to Requests for Information. *See* Resolution and Order of April 22, 2021, on Initial Budgets, table 2 on pages 3-4, and Resolution and Order of April 22, 2021, on *Responses to Requests for Information*, table 2 on pages 8-10, Case No. NEPR-MI-2021-0004; Resolution and Order of April 23, 2021, on Confidential Designation of Portions of LUMA's System Remediation Plan, table 2 on page 5, and Resolution and Order of May 6, 2021, on Confidential Designation of Portions of LUMA's Responses to Requests for Information on System Remediation Plan, table 2 at pages 7-9, Case No. NEPR-MI-2020-0019.

15. As mentioned above, the Energy Bureau's Policy on Management of Confidential Information provides for the management of CEII. It directs that the parties' authorized representatives access information validated as CEII only after executing and delivering a Non-Disclosure Agreement.

16. Generally, CEII or critical infrastructure information is exempted from public disclosure because it involves assets and information which pose public security, economic, health, and safety risks. Federal Regulations on CEII, particularly 18 C.F.R. § 388.113, state that:

> Critical energy infrastructure information means specific engineering, vulnerability, or detailed design information about proposed or existing critical infrastructure that:
>
> (i) Relates details about the production, generation, transportation, transmission, or distribution of energy;
> (ii) Could be useful to a person in planning an attack on critical infrastructure;
> (iii) Is exempt from mandatory disclosure under the Freedom of Information Act, 5 U.S.C. 552; and
> (iv) Does not simply give the general location of the critical infrastructure.

Id.

17. Additionally, "[c]ritical electric infrastructure means a system or asset of the bulk-power system, whether physical or virtual, the incapacity or destruction of which would negatively affect national security, economic security, public health or safety, or any combination of such matters. *Id.* Finally, "[c]ritical infrastructure means existing and proposed systems and assets, whether physical or virtual, the incapacity or destruction of which would negatively affect security, economic security, public health or safety, or any combination of those matters." *Id.*

18. The Critical Infrastructure Information Act of 2002, 6 U.S.C. §§ 671-674 (2020), part of the Homeland Security Act of 2002, protects critical infrastructure information ("CII").[6]

[6] Regarding the protection of voluntary disclosures of critical infrastructure information, 6 U.S.C. § 673 provides in pertinent part, that CII:

> (A) shall be exempt from disclosure under the Freedom of Information Act;
> (B) shall not be subject to any agency rules or judicial doctrine regarding ex parte communications with a decision-making official;
> (C) shall not, without the written consent of the person or entity submitting such information, be used directly by such agency, any other Federal, State, or local authority, or any third party, in any civil action arising under Federal or State law if such information is submitted in good faith;
> (D) shall not, without the written consent of the person or entity submitting such information, be used or disclosed by any officer or employee of the United States for purposes other than the purposes of this part, except—
> (i) in furtherance of an investigation or the prosecution of a criminal act; or
> (ii) when disclosure of the information would be--

CII is defined as "information not customarily in the public domain and related to the security of critical infrastructure or protected systems [...]" 6 U.S.C. § 671 (3).[7]

19. The SOWs with CEII in *Exhibit 1* qualify as CEII because each of these documents contains the express coordinates to power transmission and distribution facilities (18 C.F.R. § 388.113(iv)), and these specific coordinates could potentially be helpful to a person planning an attack on the energy facilities listed as part of these SOWs. The information identified as confidential in this paragraph is not common knowledge and is not made publicly available. Therefore, it is respectfully submitted that, on balance, the public interest in protecting CEII

(I) to either House of Congress, or the extent of matter within its jurisdiction, any committee or subcommittee thereof, any joint committee thereof or subcommittee of any such joint committee; or

(II) to the Comptroller General, or an authorized representative of the Comptroller General, in the course of the performance of the duties of the Government Accountability Office

(E) shall not be provided to a State or local government or government agency; of information or records;

(i) be made available pursuant to any State or local law requiring disclosure of information or records;

(ii)otherwise be disclosed or distributed to any party by said State or local government or government agency without the written consent of the person or entity submitting such information; or

(iii)be used other than for the purpose of protecting critical Infrastructure or protected systems, or in furtherance of an investigation or the prosecution of a criminal act.

(F) does not constitute a waiver of any applicable privilege or protection provided under law, such as trade secret protection.

[7] CII includes the following types of information:

(A)actual, potential, or threatened interference with, attack on, compromise of, or incapacitation of critical infrastructure or protected systems by either physical or computer-based attack or other similar conduct (including the misuse of or unauthorized access to all types of communications and data transmission systems) that violates Federal, State, or local law, harms interstate commerce of the United States, or threatens public health or safety;

(B)the ability of any critical infrastructure or protected system to resist such interference, compromise, or incapacitation, including any planned or past assessment, projection, or estimate of the vulnerability of critical infrastructure or a protected system, including security testing, risk evaluation thereto, risk management planning, or risk audit; or

(C)any planned or past operational problem or solution regarding critical infrastructure or protected systems, including repair, recovery, construction, insurance, or continuity, to the extent it is related to such interference, compromise, or incapacitation.

weighs in favor of protecting the relevant portions of the SOWs with CEII in Exhibit 1 from disclosure, given the nature and scope of the details included in those portions of the Exhibit.

20. Based on the above, LUMA respectfully submits that the SOWs with CEII should be designated as CEII. This designation is a reasonable and necessary measure to protect the specific location and other engineering and design information of the energy facilities listed or discussed in these SOWs in *Exhibit 1*. Given the importance of ensuring the safe and efficient operation of the generation assets and the T&D System, LUMA respectfully submits that these materials constitute CEII that should be maintained confidentially to safeguard their integrity and protect them from external threats.

21. In addition, each SOW in *Exhibit 1* contains the name, signature, and role of two individuals who are LUMA employees and a contractor, respectively, who reviewed the SOW as part of LUMA's internal review and approval of each document.[8] LUMA respectfully requests that information on the names, signatures, and roles of these individuals be maintained confidentially in the context that these reveal details of their employment duties and that their protection is in the public interest and aligned with Puerto Rico's legal framework on privacy which protects from the disclosure of personal information. *See, e.g.*, Const. ELA, Art. II, Sections 8 and 10, which protect the right to control personal information and distinctive traits, which applies *ex proprio vigore* and against private parties. *See also e.g. Vigoreaux v. Quiznos*, 173 D.P.R. 254, 262 (2008); *Bonilla Medina v. P.N.P.*, 140 D.P.R. 294, 310-11 (1996), *Pueblo v. Torres Albertorio*, 115 D.P.R. 128, 133-34 (1984). *See also* Act 122-2019, Article 4(vi) (which

[8] This employee and contractor are different from the top tier employees who have in the past signed these documents and who may be publicly known.

provides, as an exception to the rule on public disclosure, information the disclosure of which could invade the privacy of third parties or affect their fundamental rights); and Article 3(c) of Act 122-2019 (stating that personnel files and similar information does not constitute public information subject to disclosure). It is respectfully submitted that the redaction of the aforementioned information does not affect the public's or the Energy Bureau's review of the SOWs nor interfere with processes before this Energy Bureau. Therefore, on balance, the public interest to protect privacy weighs in favor of protecting the relevant portions of the SOWs.

C. Identification of Confidential Information

22. In compliance with the Energy Bureau's Policy on Management of Confidential Information, CEPR-MI-2016-0009, below, find a table summarizing the hallmarks of this request for confidential treatment.

Document	**Name**	**Pages in which Confidential Information is Found, if applicable**	**Summary of Legal Basis for Confidentiality Protection, if applicable**	**Date Filed**
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 3	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 4	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 5	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 6	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 7	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 8	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 9	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 10	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 11	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113;	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
			6 U.S.C. §§ 671-674.	
Exhibit 1	Distribution Feeders - Arecibo Short Term Group 12	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Bayamón Short Term Group 4	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Bayamón Short Term Group 5	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Bayamón Short Term Group 6	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Bayamón Short Term Group 7	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Bayamón Short Term Group 8	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Bayamón Short Term Group 9	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
Exhibit 1	Distribution Feeders - Caguas Short Term Group 9	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Caguas Short Term Group 10	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Caguas Short Term Group 11	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Caguas Short Term Group 12	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113;	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
			6 U.S.C. §§ 671-674.	
Exhibit 1	Distribution Feeders - Caguas Short Term Group 13	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Caguas Short Term Group 14	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Caguas Short Term Group 15	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 5	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 6	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 7	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 8	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113;	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
			6 U.S.C. §§ 671-674.	
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 9	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 10	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 11	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 12	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 13	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 14	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Mayagüez Short Term Group 15	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 3	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 4	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 5	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
Exhibit 1	Distribution Feeders - Ponce Short Term Group 6	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 7	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 8	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 9	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113;	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
			6 U.S.C. §§ 671-674.	
Exhibit 1	Distribution Feeders - Ponce Short Term Group 10	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 11	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 12	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - Ponce Short Term Group 13	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - San Juan Short Term Group 4	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - San Juan Short Term Group 5	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - San Juan Short Term Group 6	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
Exhibit 1	Distribution Feeders - San Juan Short Term Group 7	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - San Juan Short Term Group 8	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - San Juan Short Term Group 9	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - San Juan Short Term Group 10	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113;	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
			6 U.S.C. §§ 671-674.	
Exhibit 1	Distribution Feeders - San Juan Short Term Group 11	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Distribution Feeders - San Juan Short Term Group 12	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Sabana Llana TC	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Guayanilla TC - New Substation TC	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Jobos TC	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	San Juan SP TC	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	Salinas TC - New Substation	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022

Document	Name	Pages in which Confidential Information is Found, if applicable	Summary of Legal Basis for Confidentiality Protection, if applicable	Date Filed
Exhibit 1	New Substation Culebra	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022
Exhibit 1	New Substation Vieques	Page 1	Right to privacy (*see, e.g.*, Const. ELA, Art. II, Sections 8 and 10)	November 11, 2022
		Page 5	Critical Energy Infrastructure Information, 18 C.F.R. § 388.113; 6 U.S.C. §§ 671-674.	November 11, 2022

WHEREFORE, LUMA respectfully requests that the Energy Bureau **take notice** of the aforementioned; **approve** the sixty (60) SOWs for T&D Projects with the excel attachment submitted as *Exhibit 1* to this Motion; **grant** the request for confidential treatment of *Exhibit 1* and **accept** the updated list of T&D projects submitted as *Exhibit 2* to this Motion.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 11th November 2022.

I hereby certify that I filed this Motion using the electronic filing system of this Energy Bureau and that I will send an electronic copy of this Motion to the attorneys for PREPA, Joannely Marrero-Cruz, jmarrero@diazvaz.law, and Katiuska Bolaños-Lugo, kbolanos@diazvaz.law.

DLA Piper (Puerto Rico) LLC
500 Calle de la Tanca, Suite 401
San Juan, PR 00901-1969
Tel. 787-945-9132
Fax 939-697-6102

/s/ Yahaira De la Rosa Algarín
Yahaira De la Rosa Algarín
RUA Núm. 18,061
yahaira.delarosa@us.dlapiper.com

Exhibit 1

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Bayamón Short Term Group 4

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Bayamón Short Term Group 4
Project Type:	Restoration to Codes/Standards
Region:	Bayamón
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Bayamón Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Bayamón Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
RIO BAYAMÓN	1709-02	[redacted]		13.2
RIO BAYAMÓN	1709-03			13.2
RIO BAYAMÓN	1709-05			13.2
CANA	1710-04			13.2
CANA	1710-05			4.16
BAYAMÓN TC 13KV #1	1711-01			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.39M**
Estimated Budget for Procurement & Construction:	**$23.90M**
Estimated Overall Budget for the Project:	**$26.29M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

Note: If available, detailed engineering cost estimates will be included as an attachment.

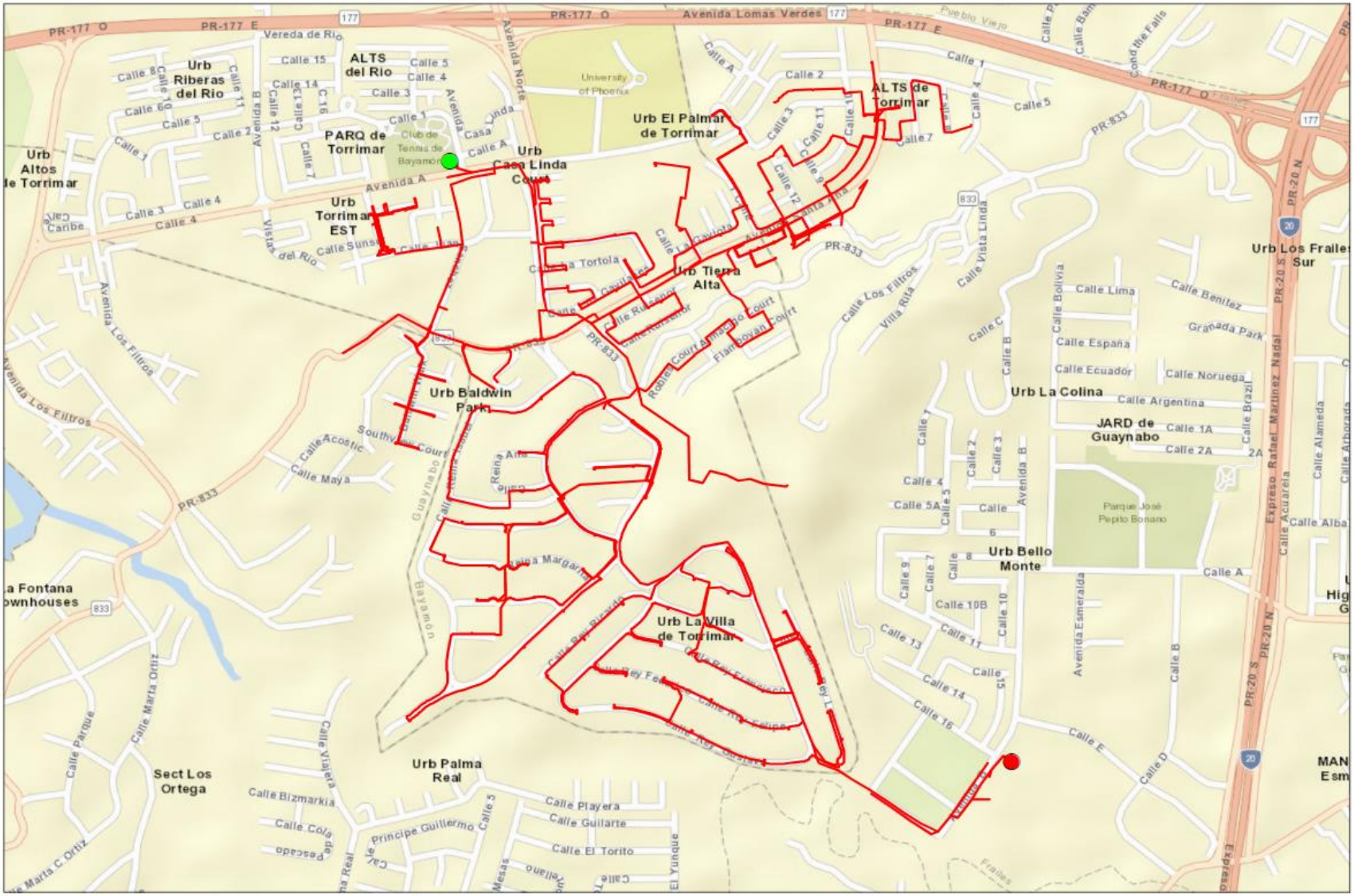
Environmental & Historic Preservation Requirements

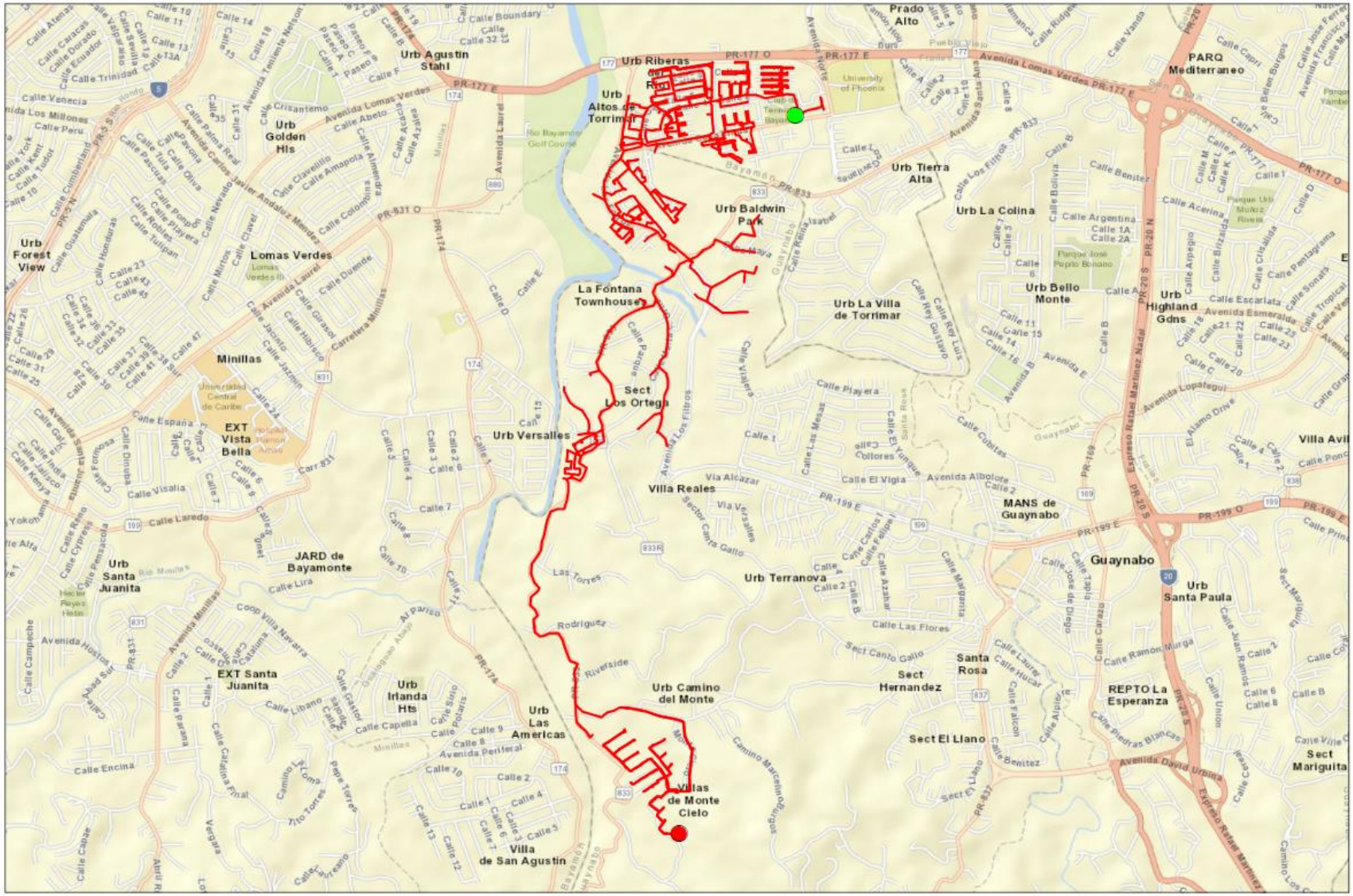
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Bayamon Short Term Group 4 Location Maps	Location Maps and Site Picture


Villa de Caparra
JARD de Caparra
Villa de San Miguel
BDA Buen Samaritano
Urb Garden Court
Urb Gardenville
Urb Garden Hts EST
Urb Prado Alto
Urb Torrimar
Urb Martin Court
EST de Torrimar
Urb Riberas del Rio
ALTS del Rio
PARQ de Torrimar
Urb Casa Linda Court
Urb El Palmar de Torrimar
ALTS de Torrimar
Urb Altos de Torrimar
Urb Torrimar EST
Urb Tierra Alta
Urb Los Frailes Sur
Avenida Ramirez de Arellano
Avenida Los Filtros
Avenida Santa Ana
Avenida Lomas Verdes
PR-177
PR-833
Legend
Start Point
End Point
Circuit
1:11,380
Miles
0
0.075
0.15
0.3
1 of 1
N
LUMA
Circuit 1709-02


PR-177 O
PR-177 E
Avenida Lomas Verdes
Urb Riberas del Rio
ALTS del Rio
PARQ de Torrimar
Urb Altos de Torrimar
Urb Torrimar EST
Urb Casa Linda Court
Urb El Palmar de Torrimar
ALTS de Torrimar
Urb Tierra Alta
Urb Baldwin Park
Urb La Villa de Torrimar
Urb Palma Real
Sect Los Ortega
Urb La Colina
JARD de Guaynabo
Urb Bello Monte
Urb Los Frailes Sur
PR-833
Avenida Los Filtros
Avenida Norte
Bayamón
Legend
Start Point
End Point
Circuit
1:10,970
1
of 1
N
LUMA
Circuit 1709-03



Legend

- Start Point
- End Point
- Circuit

1:25,710

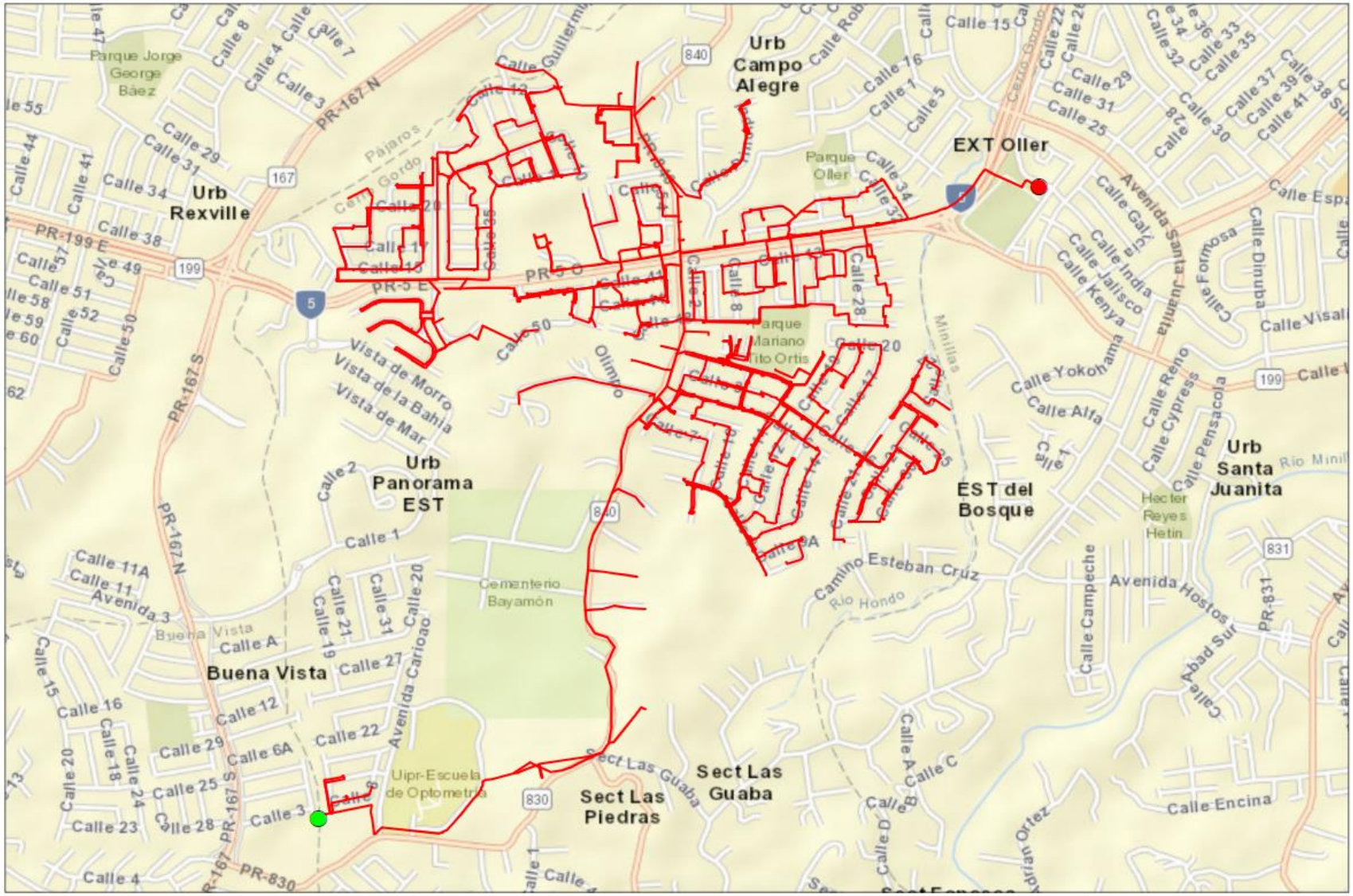
0 0.2 0.4 0.8 Miles

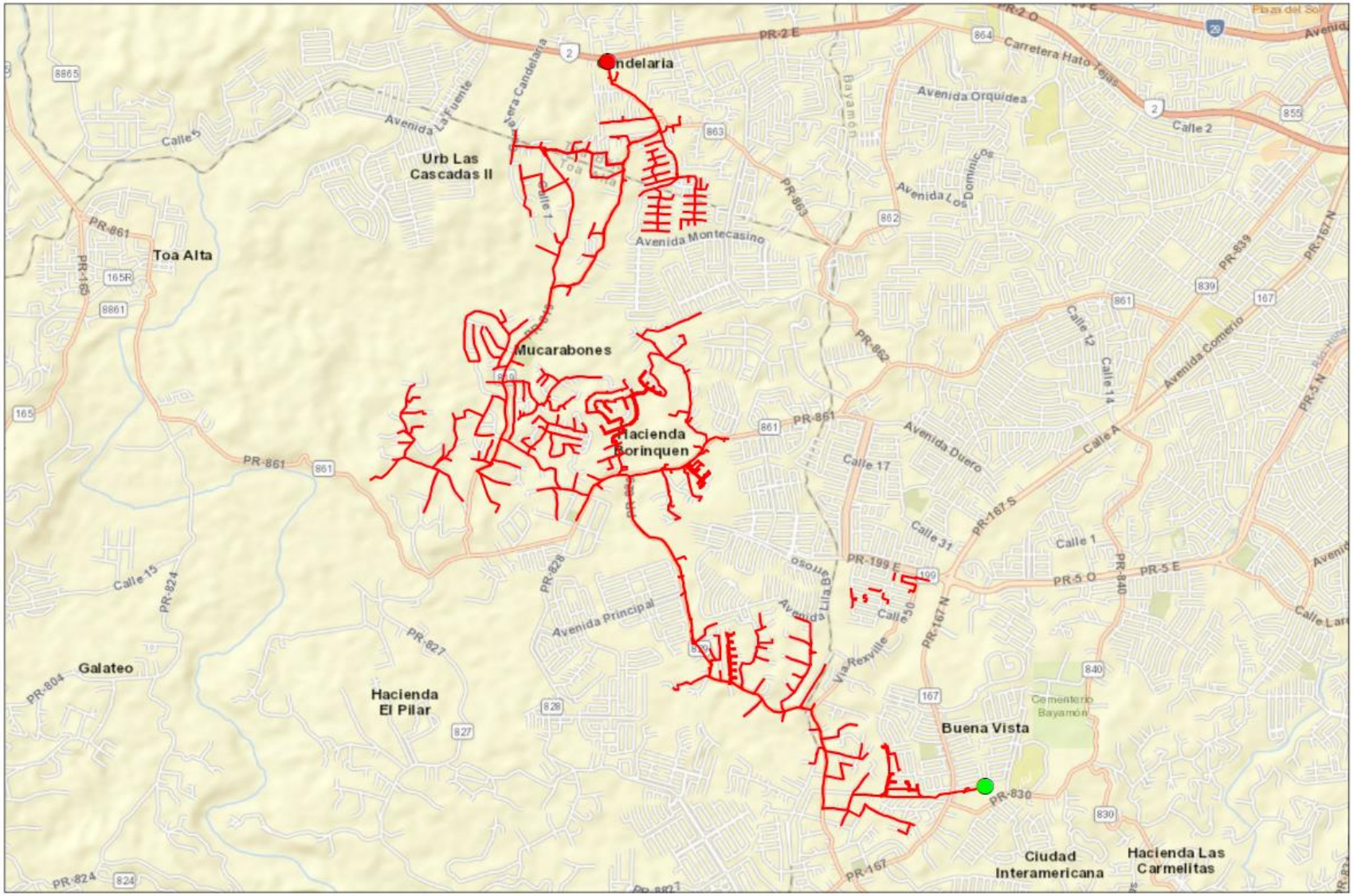
1 of 1

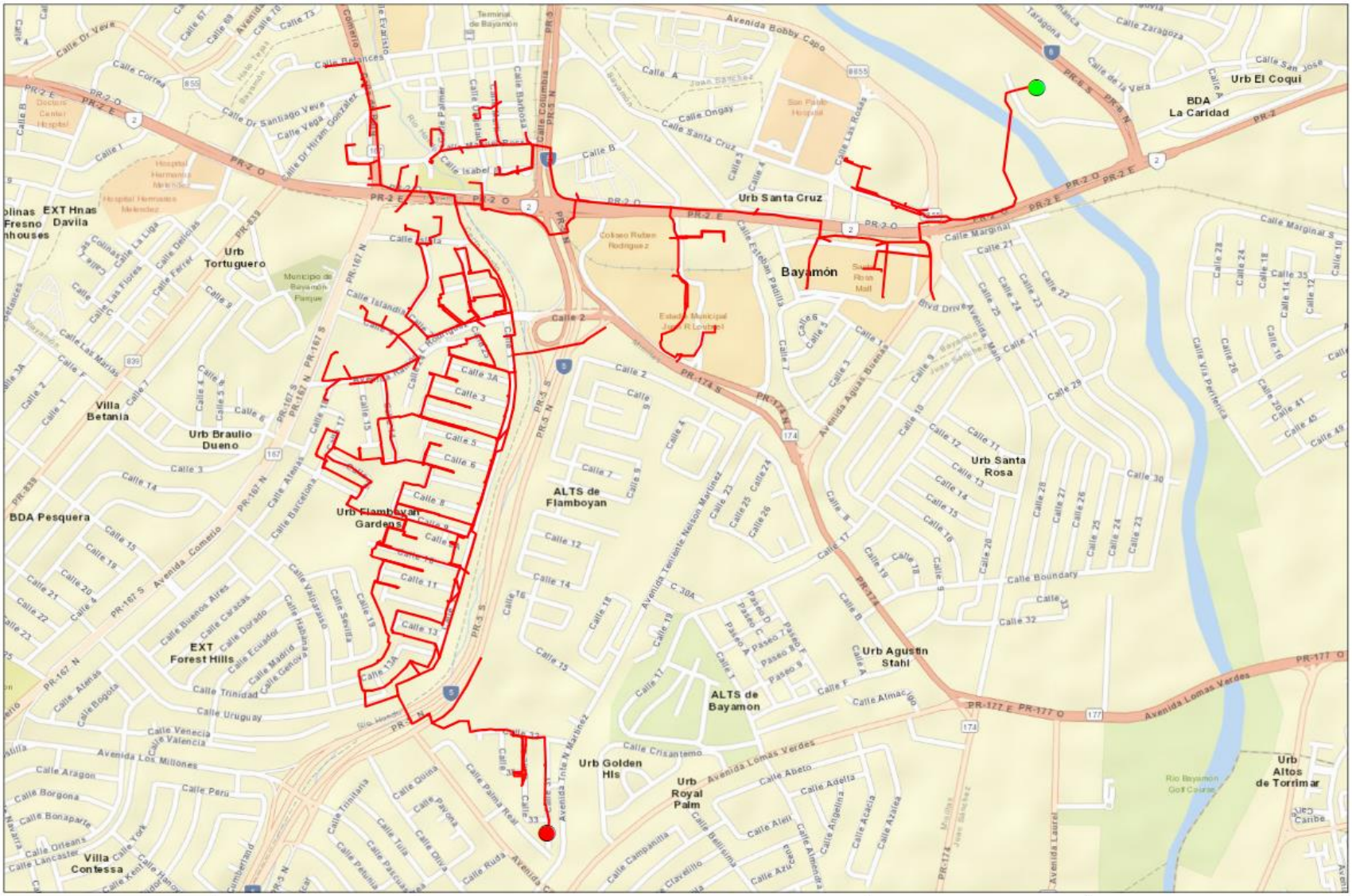
N

LUMA

Circuit 1709-05


Urb Campo Alegre
EXT Oller
Urb Rexville
Urb Panorama EST
EST del Bosque
Urb Santa Juanita
Buena Vista
Sect Las Piedras
Sect Las Guaba
Cementerio Bayamón
Uipr-Escuela de Optometría
Parque Oller
Parque Mariano Tito Ortis
Parque Jorge George Báez
Vista de Morro
Vista de la Bahía
Vista de Mar
Olimpo
Camino Esteban Cruz
Río Hondo
Avenida Hostos
Calle Encina
Legend
Start Point
End Point
Circuit
1:14,710
0
0.1
1
of 1
N
LUMA
Circuit 1710-04


Candelaria
Urb Las Cascadas II
Toa Alta
Mucarabones
Hacienda Borinquen
Galateo
Hacienda El Pilar
Buena Vista
Ciudad Interamericana
Hacienda Las Carmelitas
Avenida Montecasino
Avenida Orquidea
Carretera Hato Tejas
Avenida Duero
Avenida Principal
Avenida Comercio
Avenida Los Dominicos
Avenida La Fuente
Vía Rexville
Calle 1
Calle 2
Calle 5
Calle 12
Calle 14
Calle 15
Calle 17
Calle 30
Calle 31
Calle A
PR-2 E
PR-2 O
PR-861
PR-862
PR-863
PR-827
PR-828
PR-824
PR-804
PR-830
PR-167
PR-167 N
PR-167 S
PR-199 E
PR-5 E
PR-5 O
PR-5 N
PR-839
PR-840
Cementerio Bayamón
Legend
Start Point
End Point
Circuit
1:38,810
N
1 of 1
LUMA
Circuit 1710-05


Urb El Coqui
BDA La Caridad
Urb Santa Cruz
Bayamón
EXT Hnas Davila
Urb Tortuguero
Villa Betania
Urb Braulio Dueno
BDA Pesquera
Urb Flamboyan Gardens
ALTS de Flamboyan
Urb Santa Rosa
EXT Forest Hills
ALTS de Bayamon
Urb Agustin Stahl
Urb Golden Hls
Urb Royal Palm
Urb Altos de Torrimar
Villa Contessa
Avenida Bobby Capo
Avenida Lomas Verdes
Calle Marginal S
Boulevard Avenida Main
Avenida Aguas Buenas
Calle Boundary
Calle Esteban Padilla
Calle Las Rosas
Calle Ongay
Calle Santa Cruz
Calle Dr Santiago Veve
Calle Dr Hiram Gonzalez
Calle Dr Vera
Calle Zaragoza
Calle San Jose
Calle Correa
Calle Vega
Calle Isabel
Calle Islandia
Calle Las Marias
Calle Las Flores
Calle Ferrer
Calle Delicias
Calle La Liga
Calle Colinas
Calle Buenos Aires
Calle Caracas
Calle Dorado
Calle Ecuador
Calle Madrid
Calle Genova
Calle Trinidad
Calle Uruguay
Calle Venecia
Calle Valencia
Avenida Los Millones
Calle Aragon
Calle Borgona
Calle Bonaparte
Calle Orleans
Calle Lancaster
Calle York
Calle Kentucky
Calle Hampshire
Calle Cumberland
Calle Trinitaria
Calle Tulipa
Calle Petunia
Calle Palmera
Calle Olivia
Calle Ruda
Calle Palma Real
Calle Crisantemo
Calle Abeto
Calle Adelfa
Calle Alelí
Calle Angelina
Calle Acacia
Calle Azalea
Calle Almendra
Calle Campanilla
Calle Bellísima
Calle Clavellito
Calle Azuceno
Calle Valparaiso
Calle Habana
Calle Sevilla
Calle Barcelona
Calle Atenas
Calle Bogota
Avenida Comercio
Avenida Teniente Nelson Martinez
Avenida Tnte N Martinez
Avenida Laurel
Paseo A
Paseo B
Paseo C
Paseo D
Paseo E
Paseo F
Paseo 9
Rio Bayamon Golf Course
Mar Caribe
PR-2 E
PR-2 O
PR-167 N
PR-167 S
PR-5 N
PR-5 S
PR-174 S
PR-174 N
PR-177 O
PR-177 E
PR-839
PR-836
PR-8855
Legend
Start Point
End Point
Circuit
1:13,350
0
1
of 1
N
LUMA
Circuit 1711-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Bayamón Short Term Group 5

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Bayamón Short Term Group 5
Project Type:	Restoration to Codes/Standards
Region:	Bayamón
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Bayamón Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Bayamón Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
BAYAMÓN TC 13KV #1	1711-04	[redacted]		13.2
BAYAMÓN TC 13KV #1	1711-05			13.2
CANA (INTERAMERICANA)	1719-15			13.2
CANA (INTERAMERICANA)	1719-18			13.2
BUENA VISTA	1734-01			4.16
BUENA VISTA	1734-02			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.68M**
Estimated Budget for Procurement & Construction:	**$26.82M**
Estimated Overall Budget for the Project:	**$29.50M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

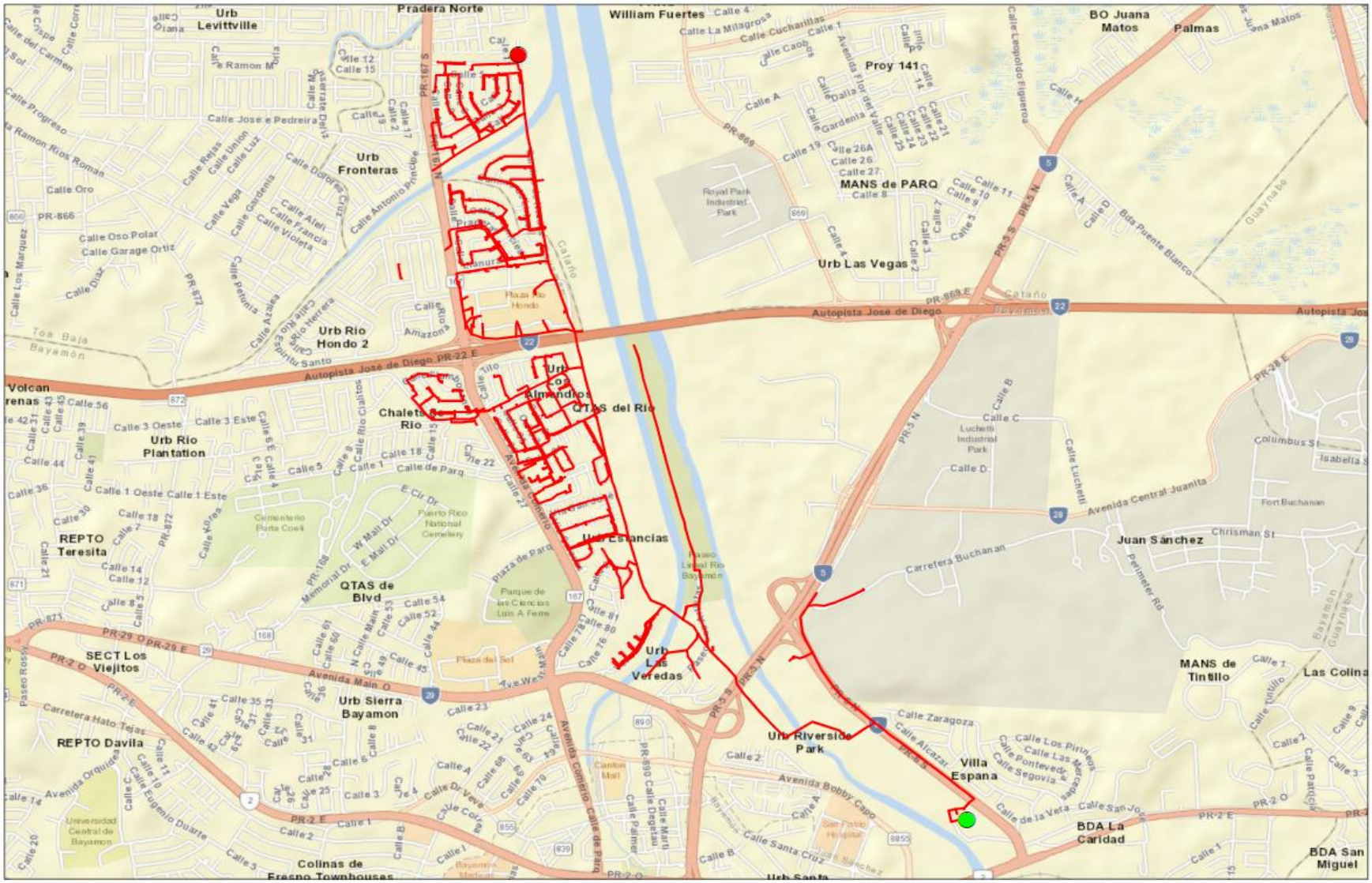
Note: If available, detailed engineering cost estimates will be included as an attachment.

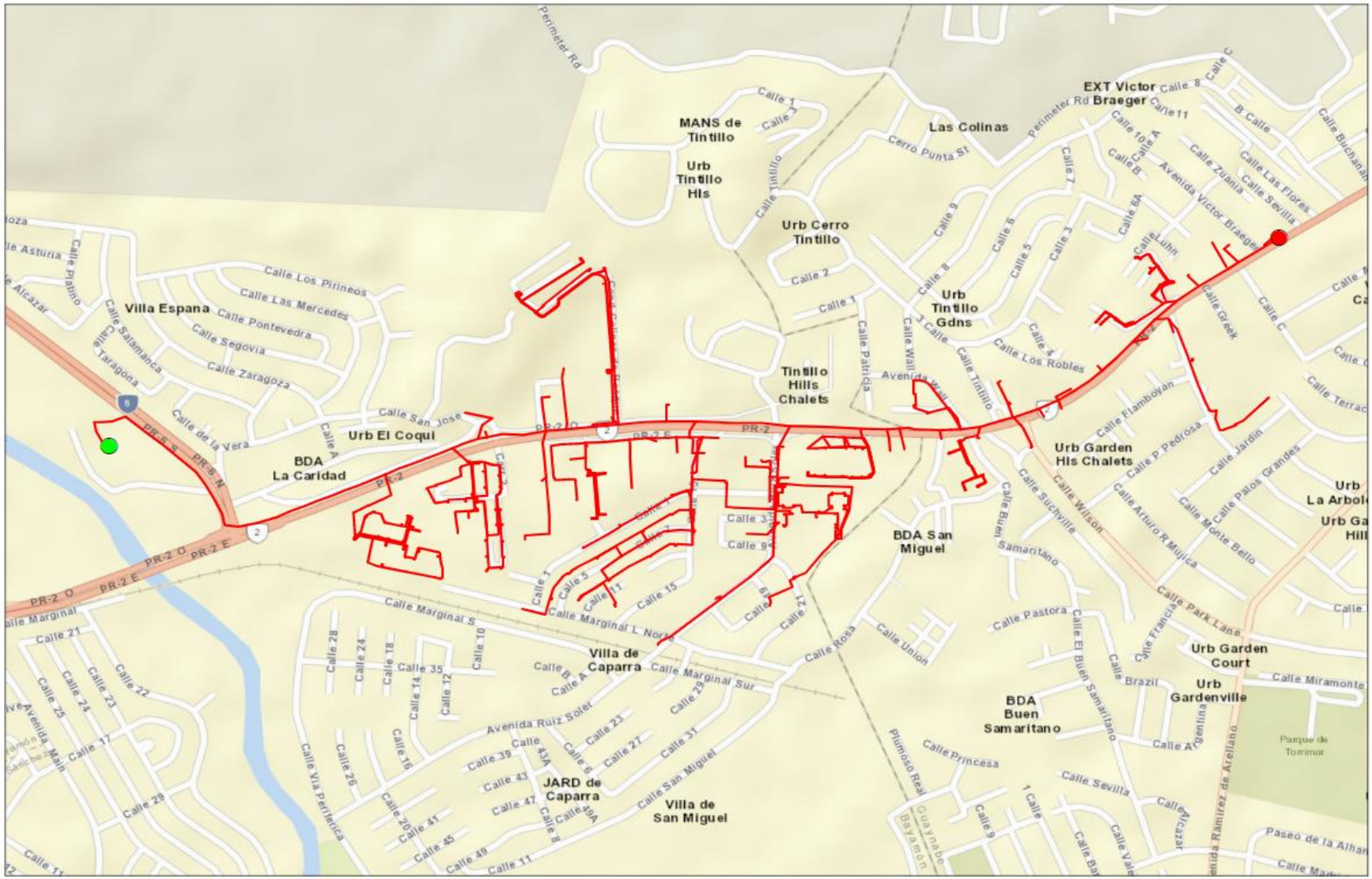
Environmental & Historic Preservation Requirements

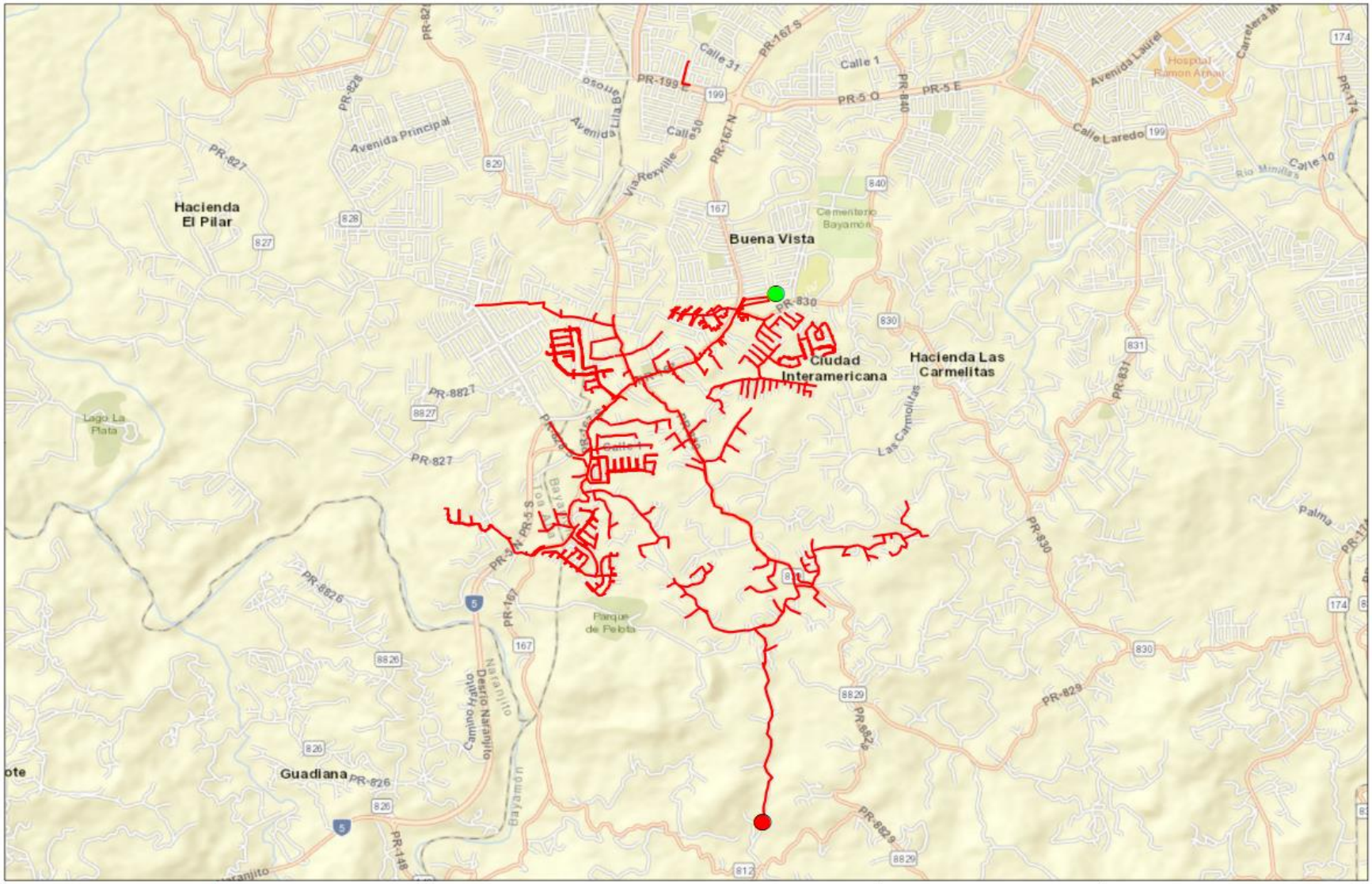
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

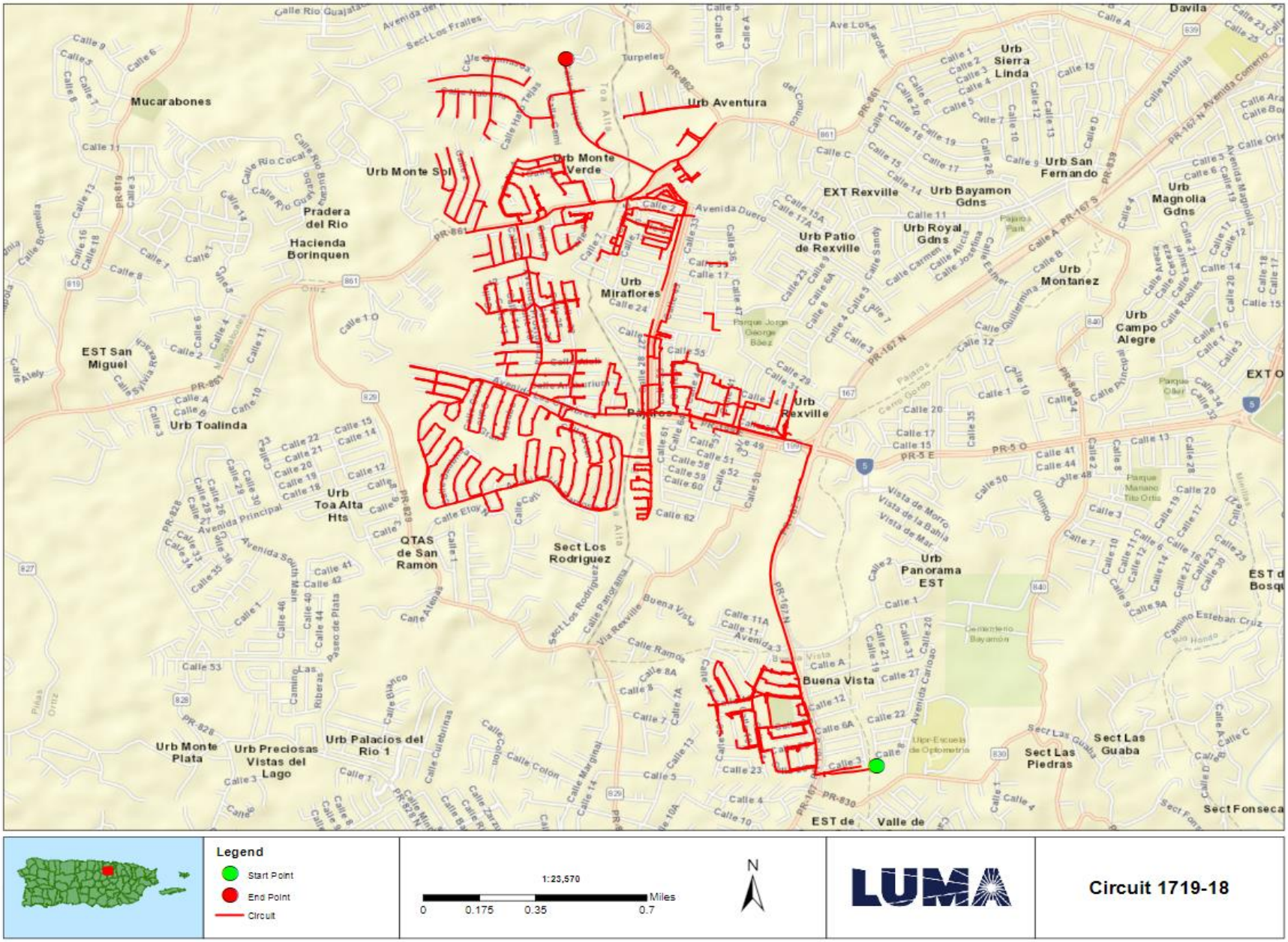
Attachments

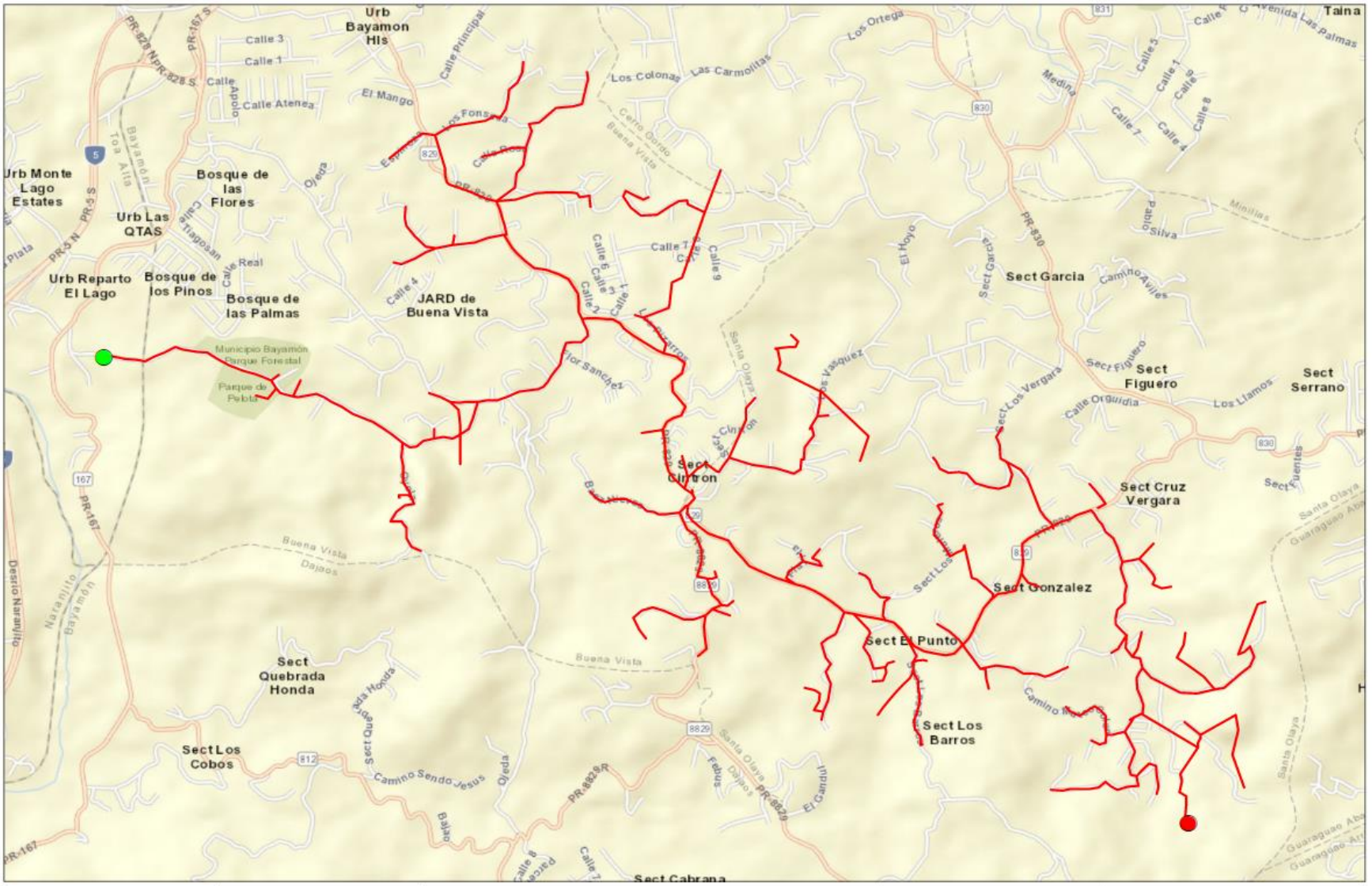
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Bayamon Short Term Group 5 Location Maps	Location Maps and Site Picture

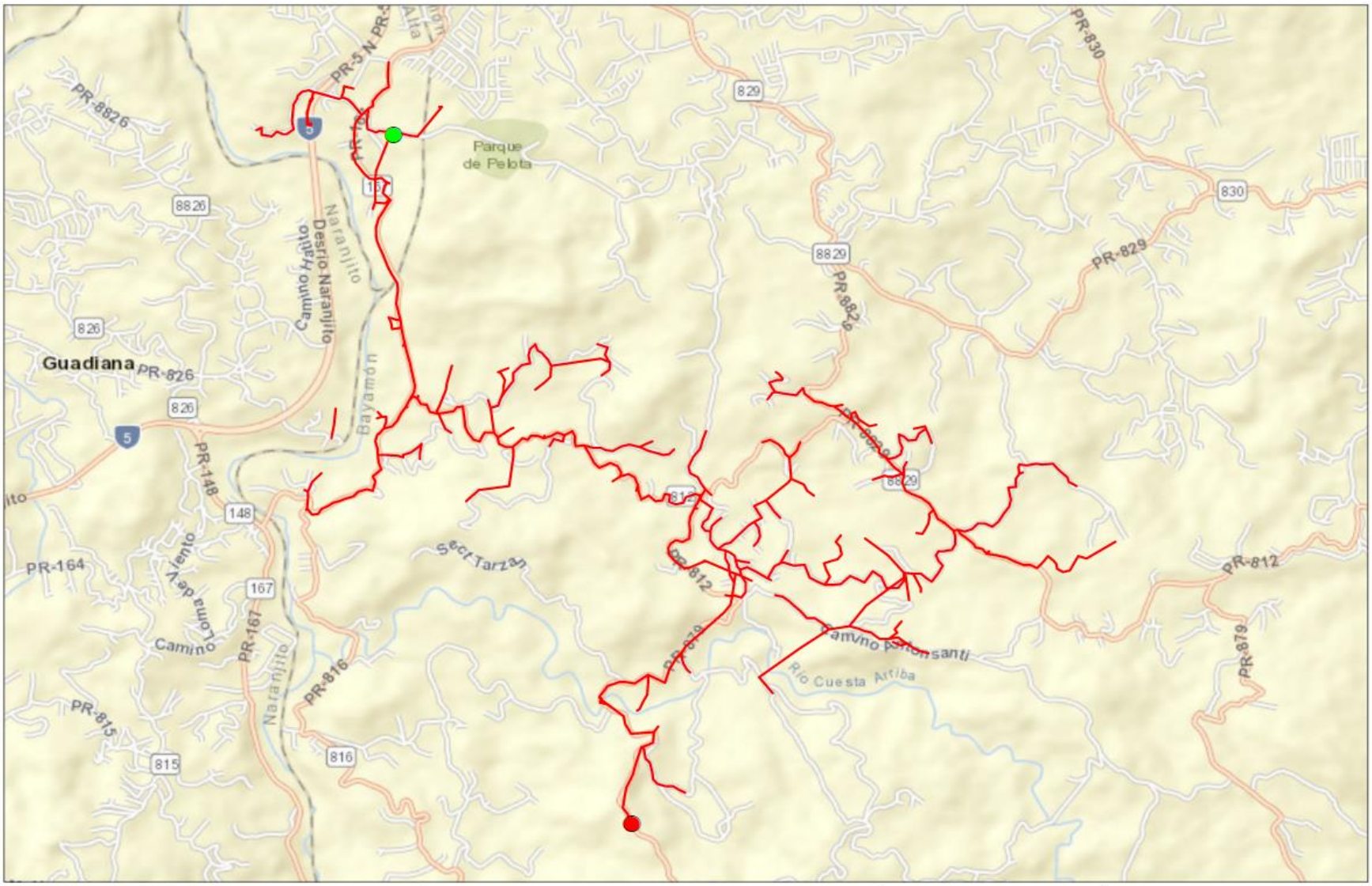

Pradera Norte
William Fuertes
BO Juana Matos
Palmas
Urb Levittville
Proy 141
MANS de PARQ
Urb Las Vegas
Urb Fronteras
Urb Rio Hondo 2
Autopista Jose de Diego
Autopista Jose de Diego PR-22 E
Urb Almendros
QTAS del Rio
Chalets de Rio
Urb Rio Plantation
Urb Estancias
REPTO Teresita
QTAS de Blvd
Urb Las Veredas
SECT Los Viejitos
Urb Sierra Bayamon
REPTO Davila
Urb Riverside Park
Villa Espana
MANS de Tintillo
Las Colinas
Juan Sanchez
Avenida Central Juanita
Carretera Buchanan
BDA La Caridad
BDA San Miguel
Colinas de Fresno Townhouses
Legend
Start Point
End Point
Circuit
1:24,220
0
1
of 1
N
LUMA
Circuit 1711-04


Perimeter Rd
MANS de Tintillo
Urb Tintillo Hls
Las Colinas
EXT Victor Braeger
Urb Cerro Tintillo
Urb Tintillo Gdns
Tintillo Hills Chalets
Villa Espana
Urb El Coqui
BDA La Caridad
Urb Garden Hls Chalets
BDA San Miguel
Villa de Caparra
JARD de Caparra
Villa de San Miguel
BDA Buen Samaritano
Urb Garden Court
Urb Gardenville
Parque de Torrimar
PR-2
PR-2 O
PR-2 E
PR-5 S
PR-5 N
Calle Marginal S
Calle Marginal L Norte
Avenida Ruiz Soler
Avenida Victor Braeger
Calle Tintillo
Calle Los Robles
Calle Samaritano
Calle Pastora
Calle Princesa
Calle Sevilla
Calle Miramonte
Calle Park Lane
Calle Wilson
Calle Suchville
Calle Rosa
Calle Union
Calle San Miguel
Plumoso Real
Guayabo
Bayamon
Legend
Start Point
End Point
Circuit
1:11,000
0
0.075
0.15
1
of 1
N
LUMA
Circuit 1711-05


Hacienda El Pilar
Buena Vista
Ciudad Interamericana
Hacienda Las Carmelitas
Guadiana
Lago La Plata
Parque de Pelota
Cementerio Bayamón
Hospital Ramón Ruiz Arnau
Avenida Principal
Avenida Laurel
Calle Laredo
Calle 1
Calle 31
Calle 50
Calle 10
Las Carmelitas
Río Minillas
Palma
PR-827
PR-828
PR-829
PR-830
PR-831
PR-826
PR-8827
PR-8826
PR-8829
PR-167
PR-167 S
PR-167 N
PR-199
PR-5 O
PR-5 E
PR-5 S
PR-148
PR-174
Naranjito
Canino Naranjito
Desvío Naranjito
Bayamón
Toa Alta
Vía Rexville
Avenida Lilia Blanco
Avenida Principal
Calle 1
Calle 31
Calle 50
Calle Laredo
Las Carmelitas
Río Minillas
Palma
Parque de Pelota
Cementerio Bayamón
Hospital Ramón Ruiz Arnau
Avenida Laurel
Lago La Plata
Hacienda El Pilar
Buena Vista
Ciudad Interamericana
Hacienda Las Carmelitas
Guadiana
Legend
Start Point
End Point
Circuit
1:40,450
0
1
of 1
N
LUMA
Circuit 1719-15


Mucarabones
Urb Monte Sol
Urb Monte Verde
Urb Aventura
Urb Sierra Linda
Davila
Urb San Fernando
EXT Rexville
Urb Bayamon Gdns
Urb Magnolia Gdns
Pradera del Rio
Hacienda Borinquen
Urb Patio de Rexville
Urb Royal Gdns
Urb Montanez
Urb Miraflores
Urb Campo Alegre
EST San Miguel
Urb Toalinda
Urb Rexville
Urb Toa Alta Hts
QTAS de San Ramon
Sect Los Rodriguez
Urb Panorama EST
Buena Vista
Urb Monte Plata
Urb Preciosas Vistas del Lago
Urb Palacios del Rio 1
Sect Las Piedras
Sect Las Guaba
Sect Fonseca
EST de Valle de
Legend
Start Point
End Point
Circuit
1:23,570
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 1719-18


Urb Bayamon Hls
Calle 3
Calle 1
Calle Apolo
Calle Atenea
Calle Principal
El Mango
Los Colonas
Las Carmelitas
Los Ortega
Taina
Urb Monte Lago Estates
Urb Las QTAS
Bosque de las Flores
Bosque de los Pinos
Bosque de las Palmas
Urb Reparto El Lago
Calle Real
Calle 4
JARD de Buena Vista
Municipio Bayamón Parque Forestal
Parque de Pelota
Sect Garcia
Sect Figuero
Sect Serrano
Sect Cruz Vergara
Sect Gonzalez
Sect El Punto
Sect Los Barros
Sect Clinton
Sect Quebrada Honda
Sect Los Cobos
Sect Cabrana
Buena Vista
Dajaos
Santa Olaya
Camino Sendo Jesus
Los Llamos
Calle Orquidia
Minillas
Camino Aviles
Legend
Start Point
End Point
Circuit
1:21,970
1 of 1
N
LUMA
Circuit 1734-01



Legend

- Start Point
- End Point
- Circuit

1:29,380

0 0.225 0.45 0.9 Miles

N

LUMA

Circuit 1734-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Bayamón Short Term Group 6

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Review

Contents

Overview

Project Name:	Distribution Feeders - Bayamón Short Term Group 6
Project Type:	Restoration to Codes/Standards
Region:	Bayamón
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Bayamón Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Bayamón Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
UNIBON	9501-01	[redacted]		8.32
GUAYNABO	1901-01			4.16
GUAYNABO	1901-04			4.16
GRANA PDS	1907-04			13.2
GRANA PDS	1907-05			13.2
GRANA PDS II	1909-08			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.11M**
Estimated Budget for Procurement & Construction:	**$21.12M**
Estimated Overall Budget for the Project:	**$23.23M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

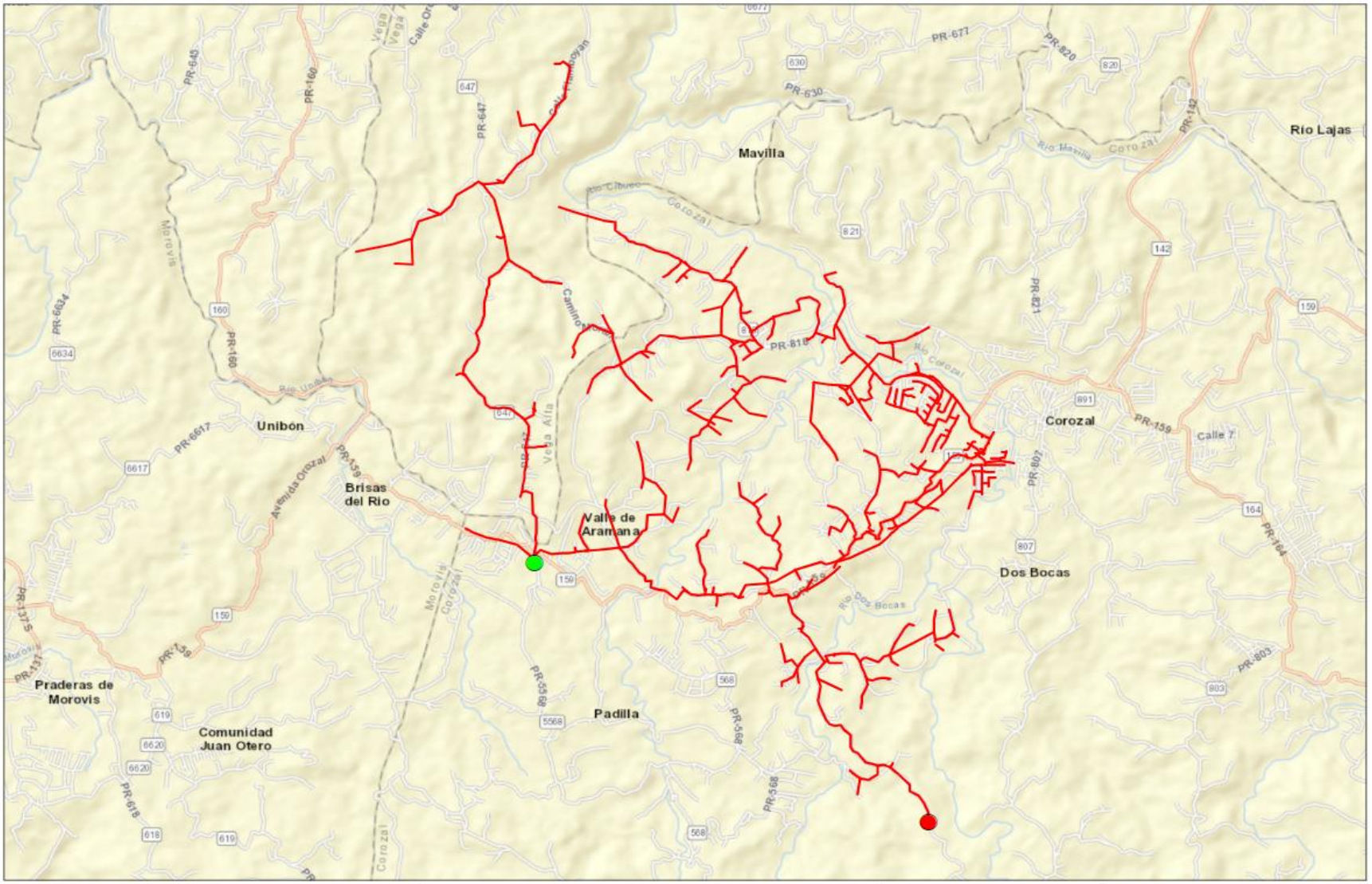
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Bayamon Short Term Group 6 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

1:43,840

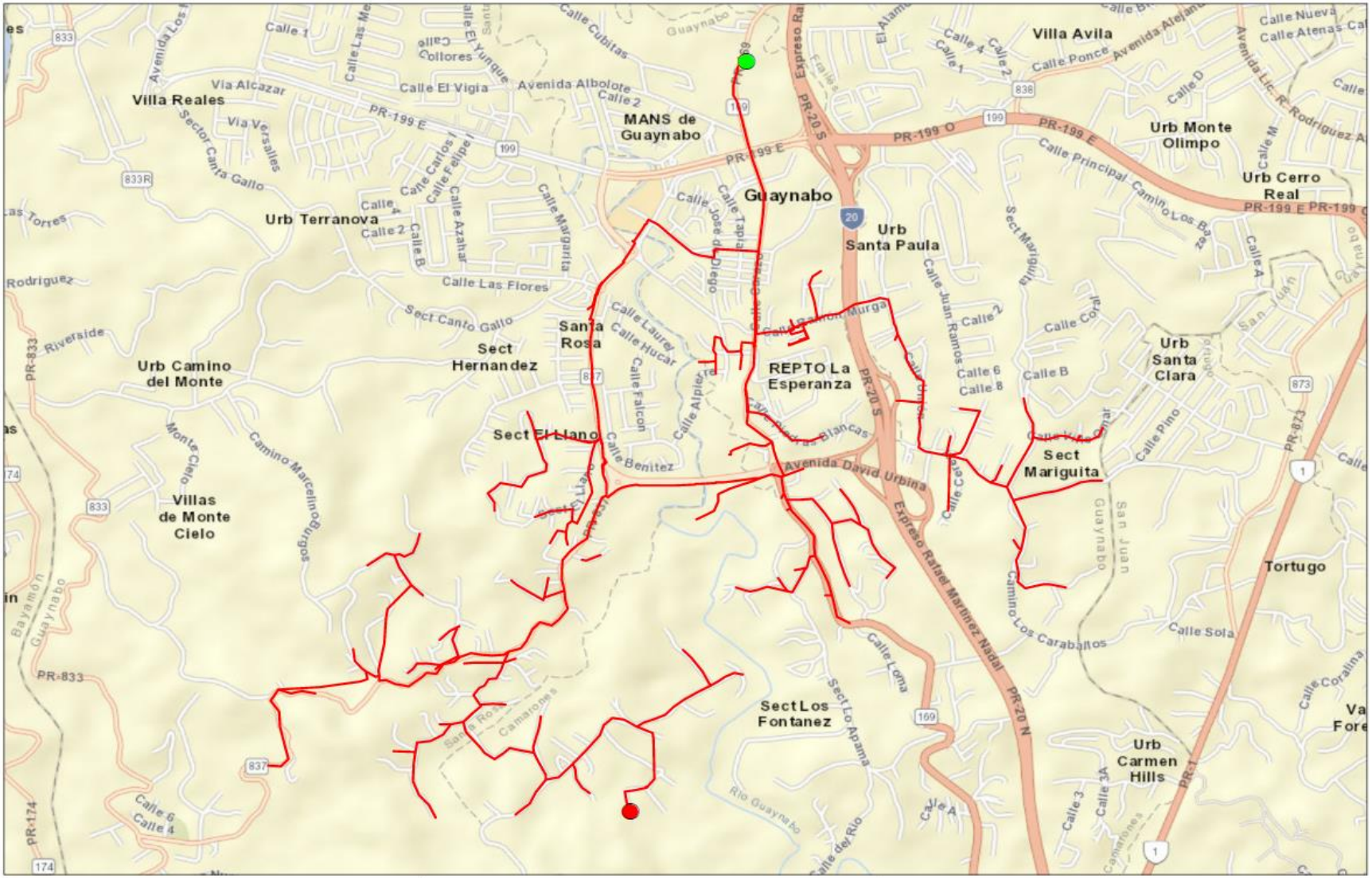
0 0.35 0.7 1.4 Miles

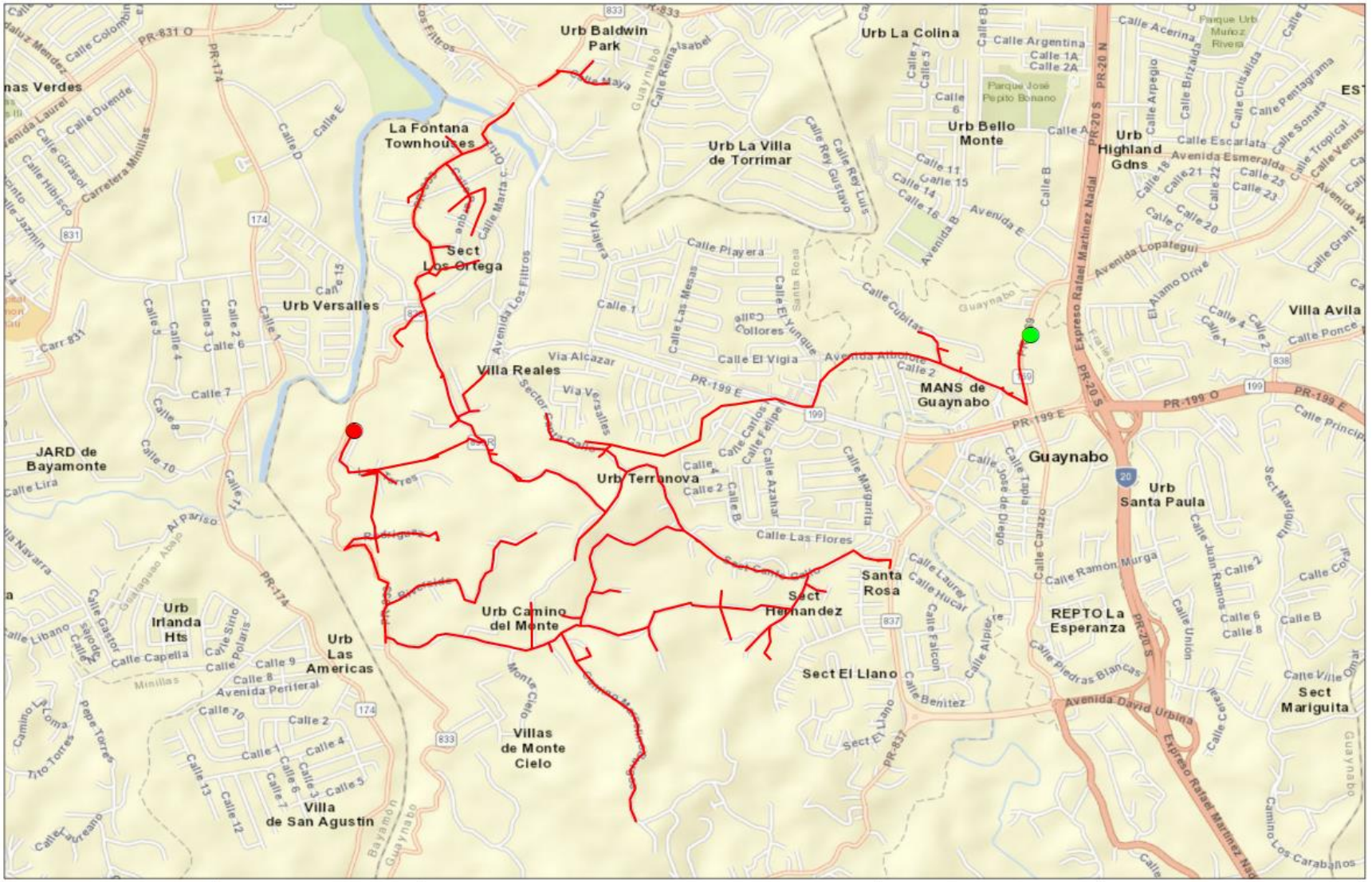
1 of 1

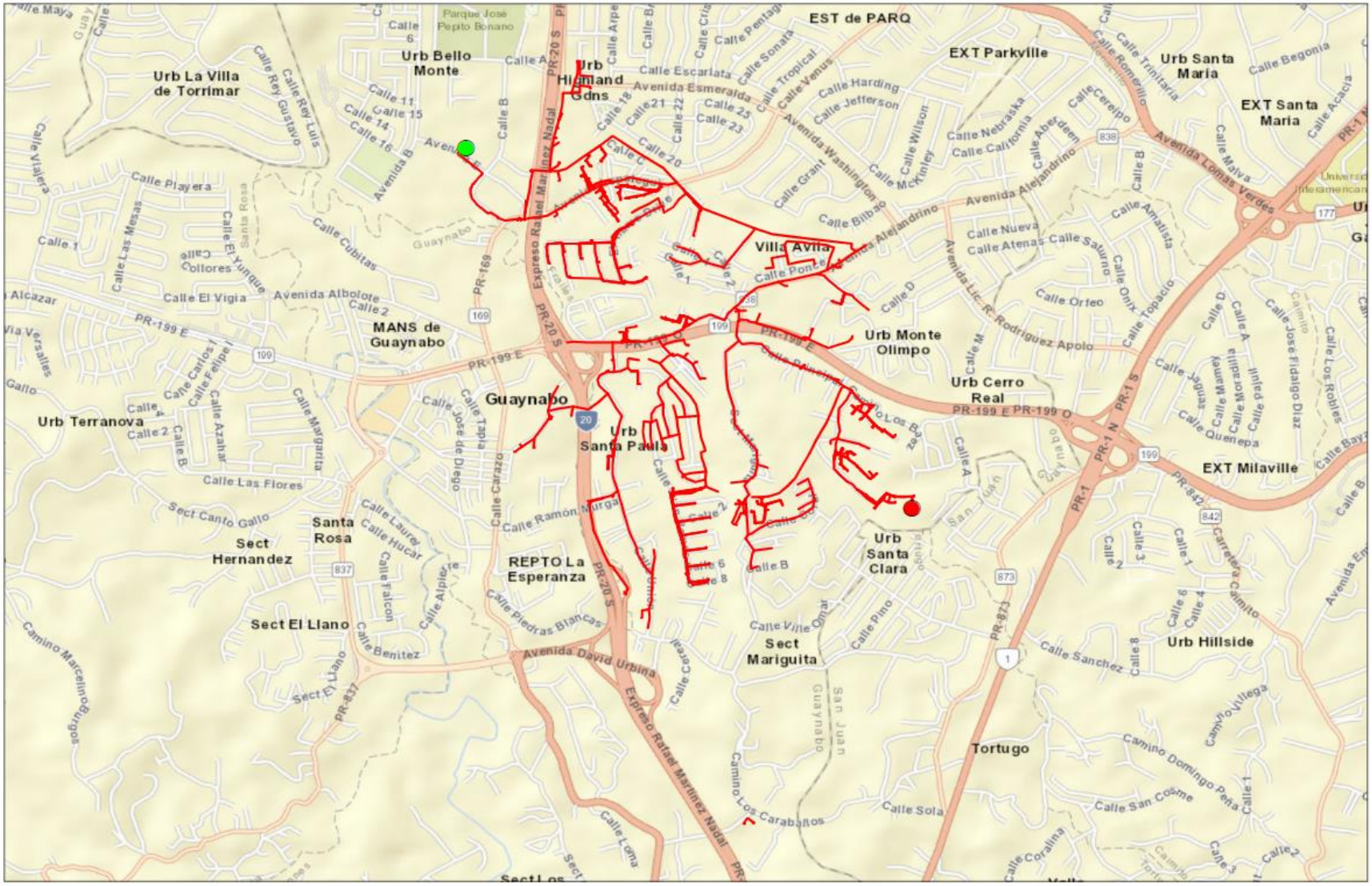
N

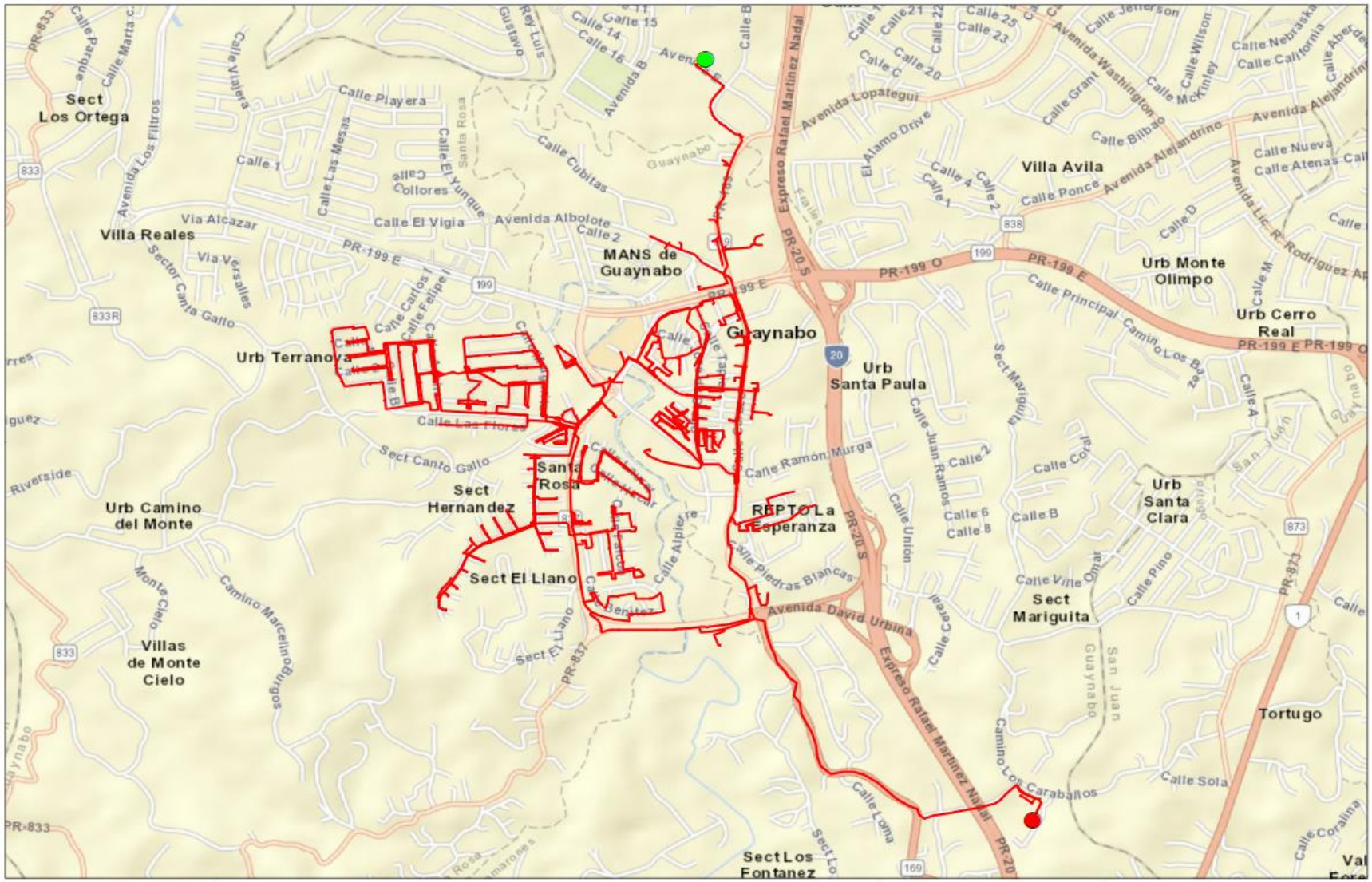
LUMA

Circuit 9501-01


Villa Reales
Via Alcazar
Via Versalles
Sector Canto Gallo
Calle El Vigia
Avenida Albolote
MANS de Guaynabo
PR-199 E
Urb Terranova
Calle Las Flores
Sect Canto Gallo
Santa Rosa
Sect Hernandez
Urb Camino del Monte
Riverside
Villas de Monte Cielo
Sect El Llano
Calle Benitez
Guaynabo
Villa Avila
Calle Ponce
Avenida Alejandrino
PR-199 O
Urb Monte Olimpo
Urb Cerro Real
Calle Principal Camino Los Baez
Urb Santa Paula
REPTO La Esperanza
Avenida David Urbina
Sect Mariguita
Urb Santa Clara
Tortugo
Expreso Rafael Martinez Nadal
PR-20 S
PR-20 N
Sect Los Fontanez
Urb Carmen Hills
Camino Los Caraballos
Calle Sola
Rio Guaynabo
Legend
Start Point
End Point
Circuit
1:18,840
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 1901-01


Urb Baldwin Park
Urb La Colina
La Fontana Townhouses
Urb La Villa de Torrimar
Urb Bello Monte
Urb Highland Gdns
Sect Los Ortega
Urb Versalles
Villa Reales
MANS de Guaynabo
Villa Avila
JARD de Bayamon
Urb Terranova
Guaynabo
Urb Santa Paula
Urb Irlanda Hts
Urb Las Americas
Urb Camino del Monte
Santa Rosa
Sect Hernandez
REPTO La Esperanza
Sect El Llano
Villas de Monte Cielo
Villa de San Agustin
Sect Mariguita
Legend
Start Point
End Point
Circuit
1:20,860
1 of 1
LUMA
Circuit 1901-04


Urb La Villa de Torrimar
Urb Bello Monte
Urb Highland Gdns
EST de PARQ
EXT Parkville
Urb Santa Maria
EXT Santa Maria
Villa Avila
MANS de Guaynabo
Guaynabo
Urb Monte Olimpo
Urb Cerro Real
Urb Terranova
Urb Santa Paula
EXT Milaville
Santa Rosa
Sect Hernandez
REPTO La Esperanza
Urb Santa Clara
Sect El Llano
Sect Mariguita
Urb Hillside
Tortugo
Expreso Rafael Martinez Nadal
PR-20 S
PR-199 E
PR-1 S
PR-1 N
PR-873
PR-837
Avenida Lomas Verdes
Avenida Alejandrino
Avenida David Urbina
Calle Ramon Murga
Calle Las Flores
Calle Piedras Blancas
Calle Sola
Calle San Cosme
Camino Los Caraballos
Camino Domingo Pena
Camino Villega
Legend
Start Point
End Point
Circuit
1:20,160
0
1
of 1
N
LUMA
Circuit 1907-04


Sect Los Ortega
Villa Reales
Urb Terranova
Urb Camino del Monte
Villas de Monte Cielo
Sect El Llano
Sect Hernandez
Santa Rosa
MANS de Guaynabo
Guaynabo
RBPTO La Esperanza
Urb Santa Paula
Villa Avila
Urb Monte Olimpo
Urb Cerro Real
Urb Santa Clara
Sect Mariguita
Tortugo
Sect Los Fontanez
Calle Playera
Calle Cubitas
Avenida Lopategui
Calle Ponce
Calle Principal Camino Los Bo
Calle Ramon Murga
Calle Piedras Blancas
Avenida David Urbina
Calle Sola
Legend
Start Point
End Point
Circuit
1:18,400
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 1907-05


Urb La Villa de Torrimar
Calle Rey Ricardo
Calle Rey Francisco
Calle Rey Federico
Calle Rey Felipe
Calle Rey Gustavo
Calle Rey Luis
Urb Palma Real
EST Reales
Colinas Metropolitana
Villa Reales
QTAS Reales
MANS Reales
MANS de Guaynabo
Urb Terranova
Urb Riberas de Honduras
Urb Pineiro
Guaynab
Avenida Esmeralda
Avenida B
Calle B
Calle D
Calle E
Calle 10B
Calle 10
Calle 11
Calle 13
Calle 14
Calle 15
Calle 16
Fraile
Expreso Rafael Martinez Nadal
PR-199
PR-169
Calle Principe de Gales
Calle Reina Victoria
Calle Juana de Borbon
Paseo de la Reina
Calle Amapola
Calle Jazmin
Calle Violeta
Calle Rosa
Calle Cecilio Urbina
Calle Tapia
Calle Colon
Coliseo Mano Quijote Morales
Rio Guaynabo
PR-837
Legend
Start Point
End Point
Circuit
1:8,720
0 0.05 0.1 0.2 Miles
N
LUMA
Circuit 1909-08

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Bayamón Short Term Group 7

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Bayamón Short Term Group 7
Project Type:	Restoration to Codes/Standards
Region:	Bayamón
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Bayamón Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Bayamón Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
MONTERREY	9502-03	[redacted]		8.32
MONTERREY PDS 13KV	9503-06			13.2
DORADO PUEBLO	9202-04			8.32
DORADO TC	9203-04			8.32
DORADO TC PDS 13KV	9207-08			13.2
NARANJITO	9801-01			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.81M**
Estimated Budget for Procurement & Construction:	**$28.10M**
Estimated Overall Budget for the Project:	**$30.91M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

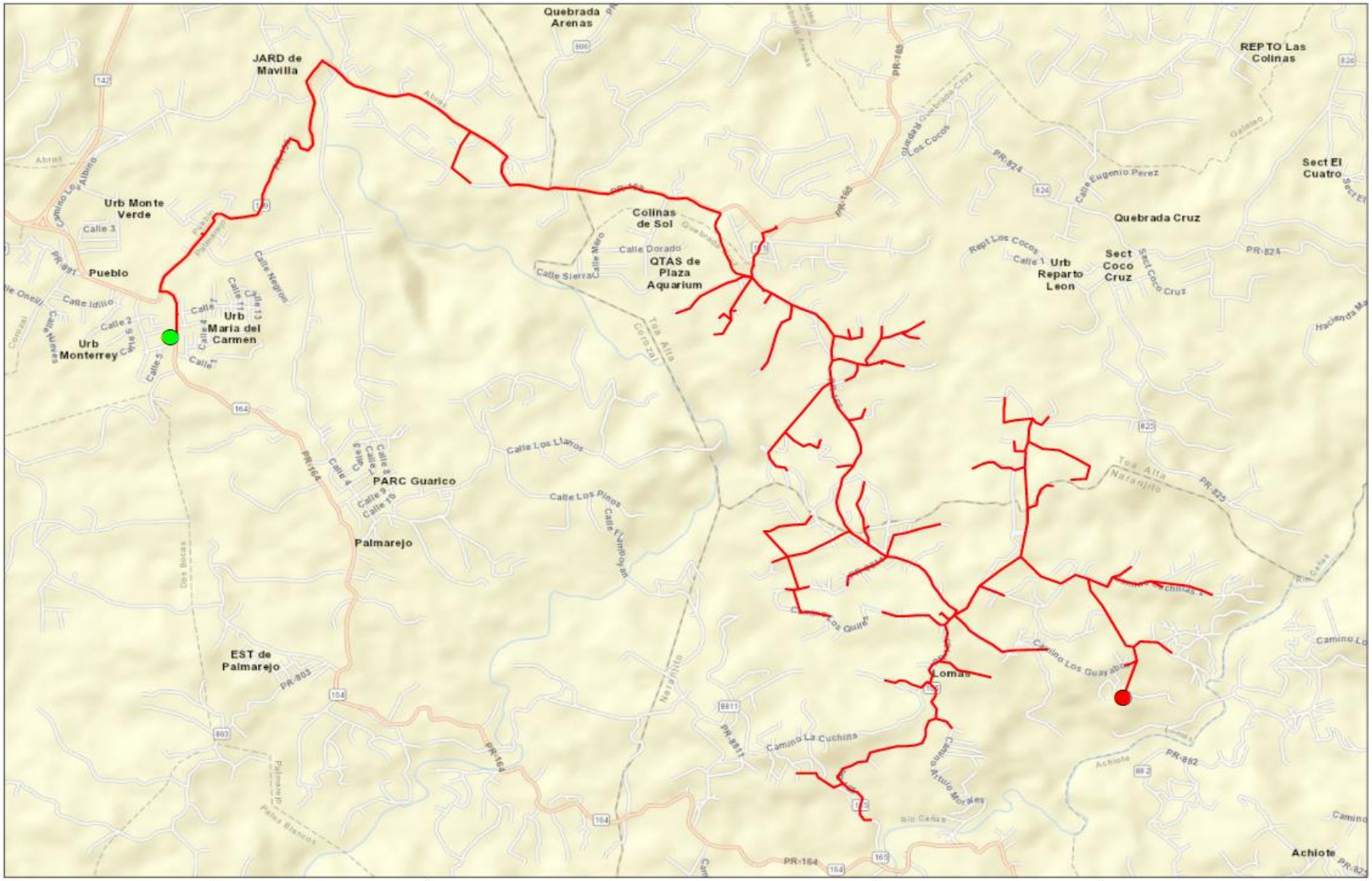
Note: If available, detailed engineering cost estimates will be included as an attachment.

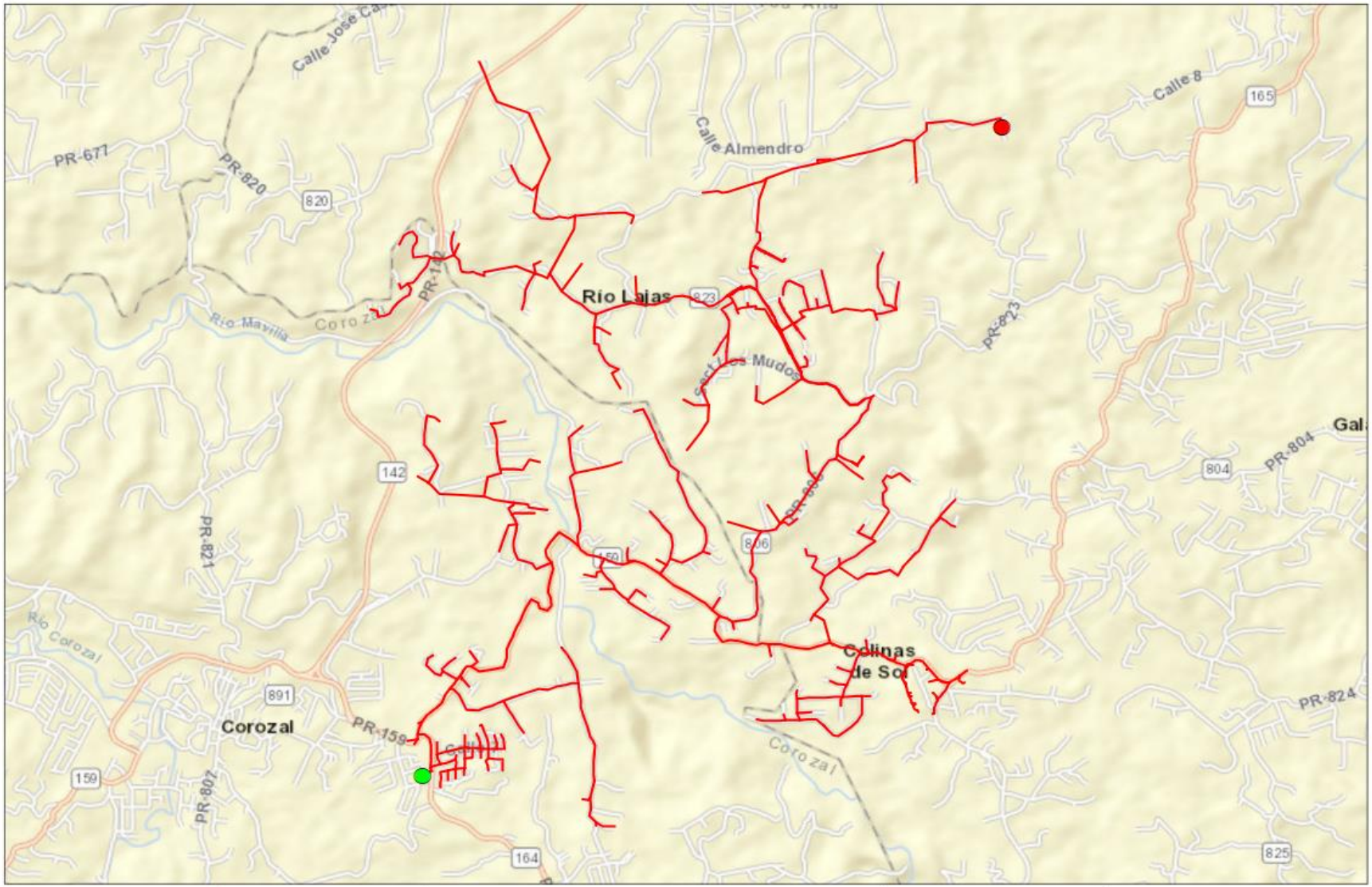
Environmental & Historic Preservation Requirements

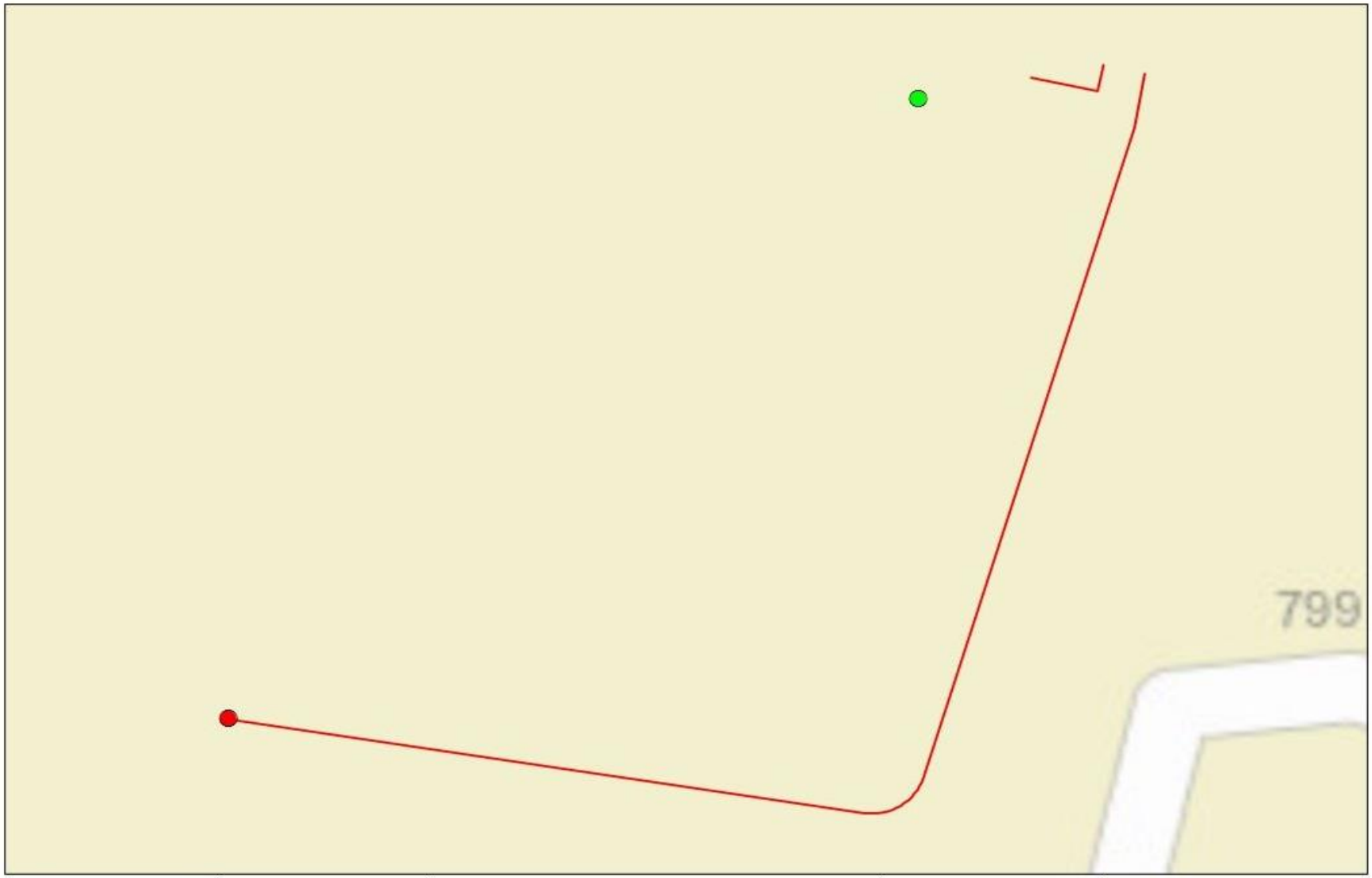
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Bayamon Short Term Group 7 Location Maps	Location Maps and Site Picture


Quebrada Arenas
JARD de Mavilla
REPTO Las Colinas
Sect El Cuatro
Urb Monte Verde
Colinas de Sol
Quebrada Cruz
Pueblo
QTAS de Plaza Aquarium
Urb Reparto Leon
Sect Coco Cruz
Urb Maria del Carmen
Urb Monterrey
PARC Guarico
Palmarejo
EST de Palmarejo
Lomas
Achiote
Legend
Start Point
End Point
Circuit
1:25,570
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 9502-03


Calle Jose Ca
PR-677
PR-820
820
Calle Almendro
Calle 8
165
PR-142
Rio Lajas
823
Rio Mavilla
Coro zal
PR-823
Cart Los Mudos
142
PR-804
804
Gal
PR-821
PR-805
806
150
Rio Corozal
Colinas de So
891
Corozal
PR-159
PR-824
Coro zal
159
PR-807
164
825
Legend
Start Point
End Point
Circuit
1:29,780
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 9503-06



Legend

- Start Point
- End Point
- Circuit

1:290

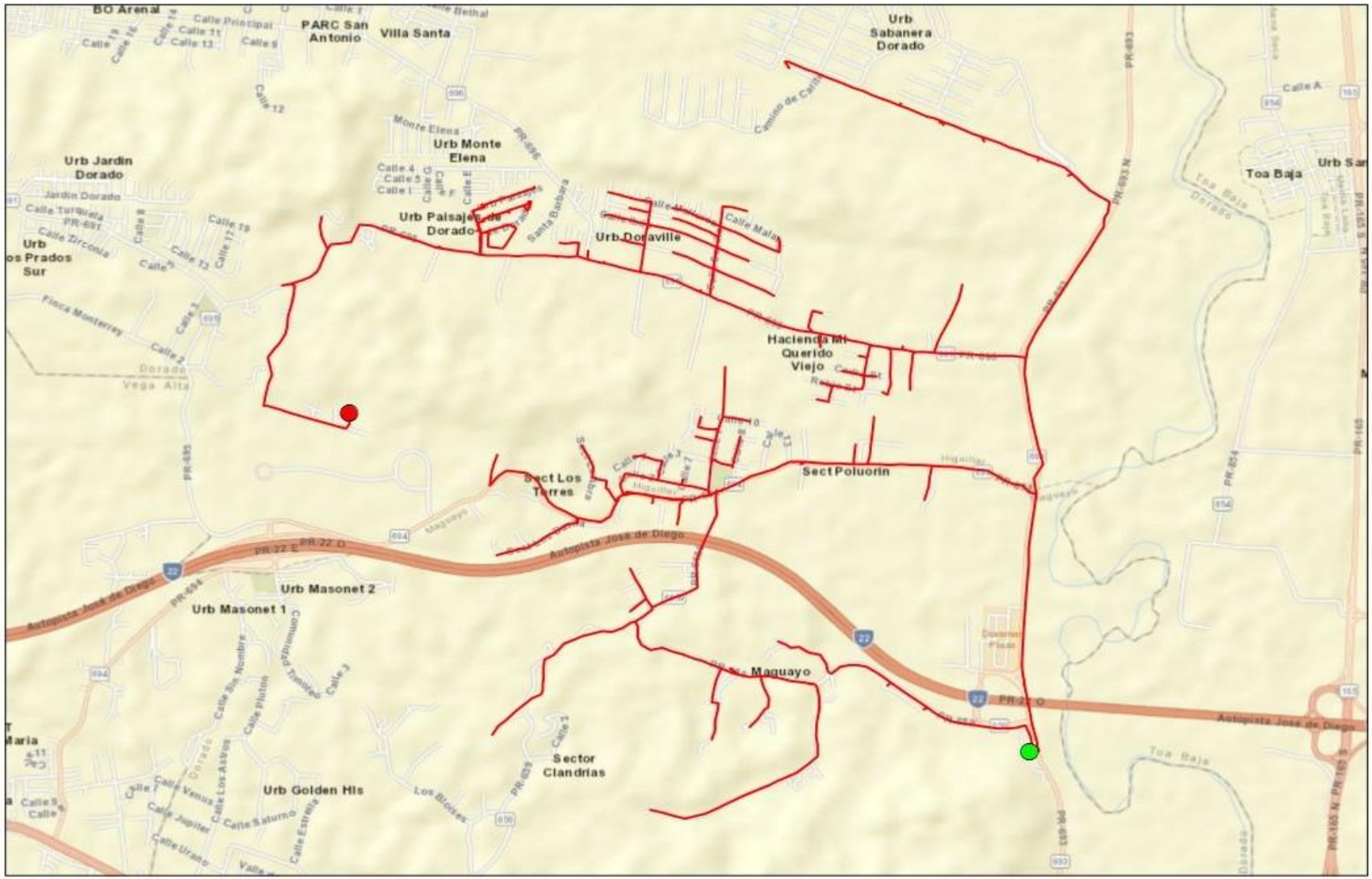
Miles

N

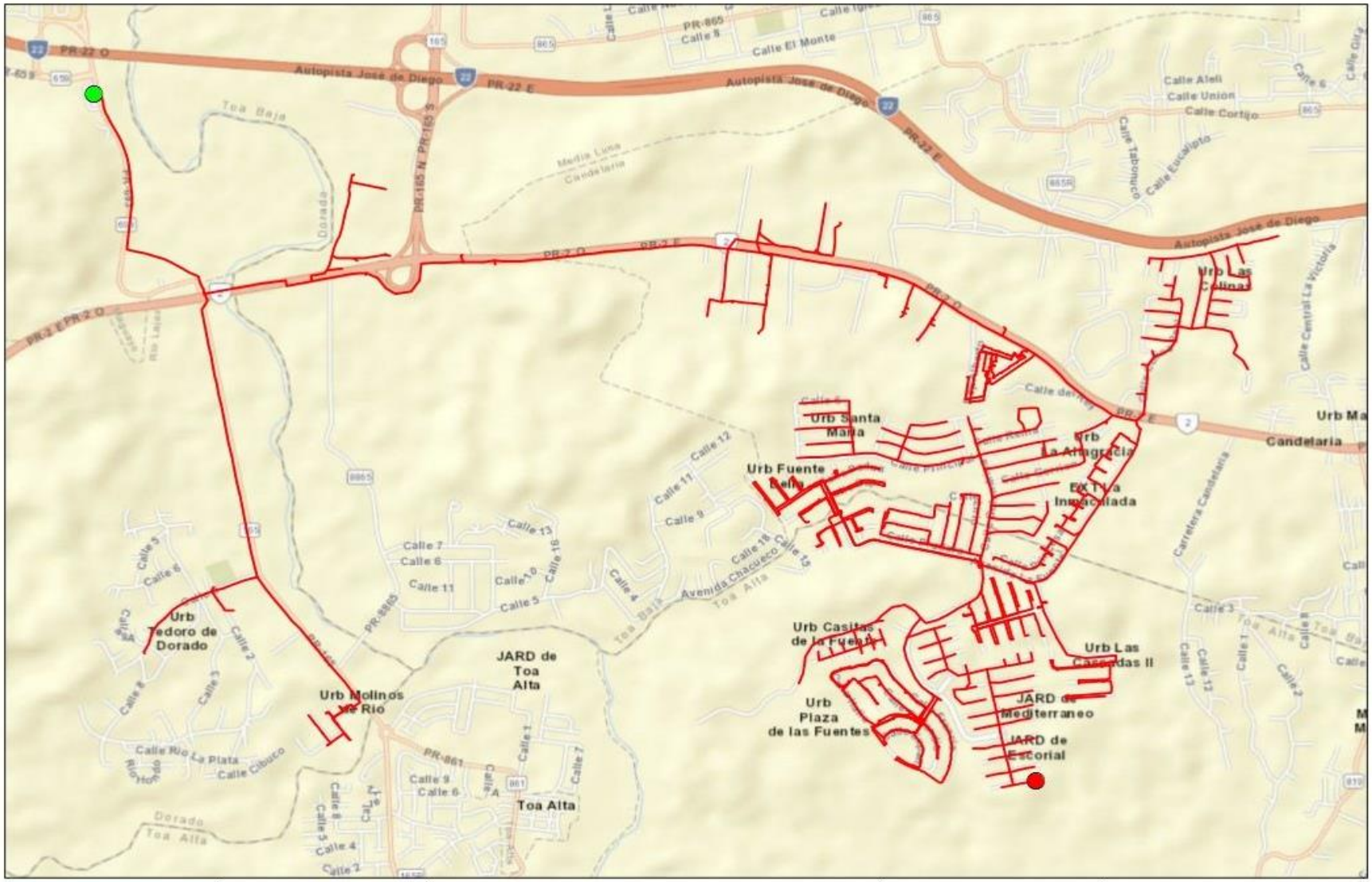
LUMA

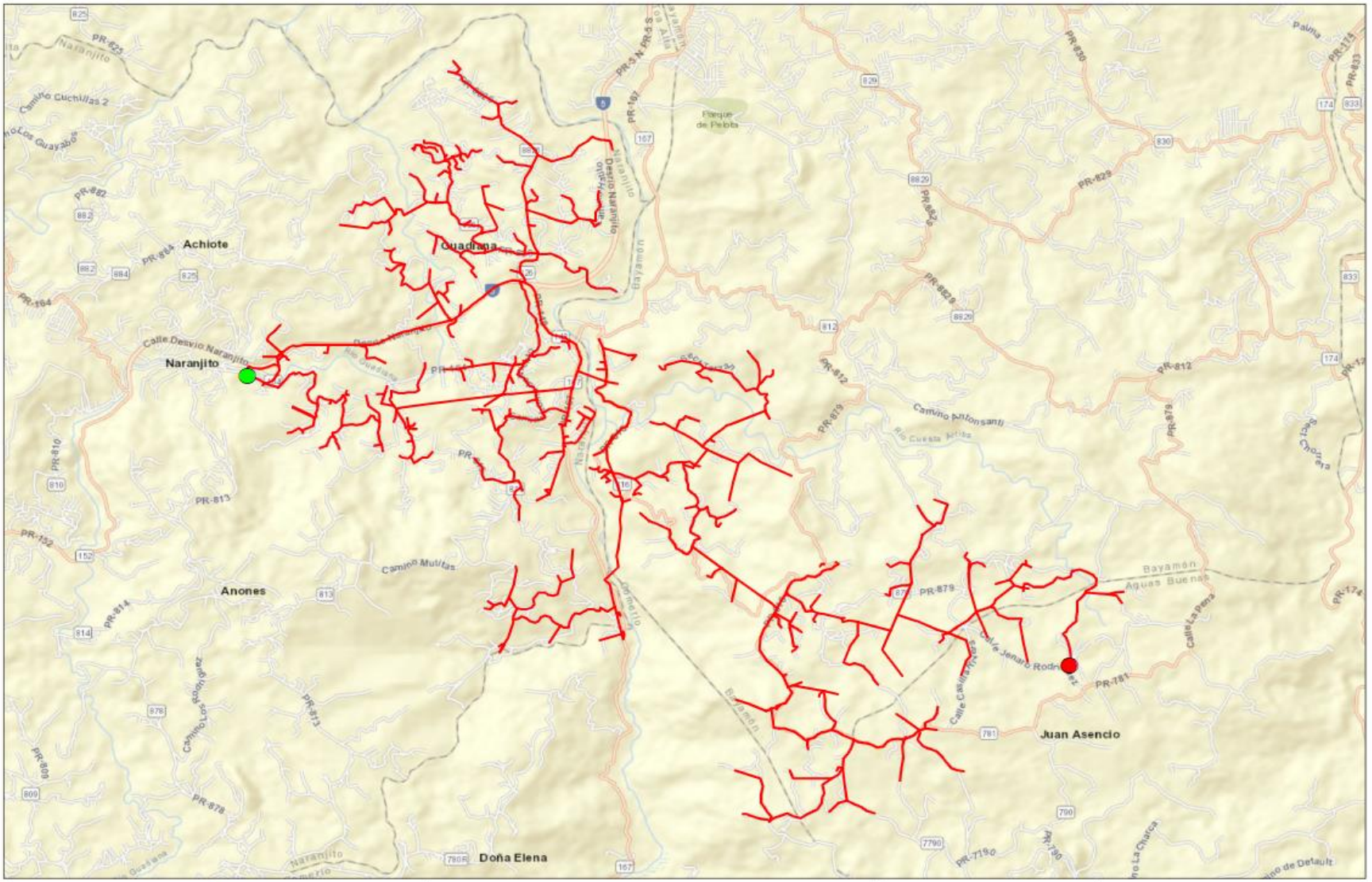
Circuit 9202-04

Circuit_9202-04.pdf



Circuit_9203-04.pdf


Autopista José de Diego
PR-22 O
PR-22 E
PR-2 O
PR-2 E
PR-165
PR-865
PR-8865
PR-861
Toa Baja
Dorado
Toa Alta
Candelaria
Media Luna
Urb Santa Maria
Urb Fuente Bella
Urb La Milagrosa
Urb La Inmaculada
Urb Las Colinas
Urb Casitas de la Fuente
Urb Las Cascadas II
Urb Plaza de las Fuentes
JARD de Mediterraneo
JARD de Escorial
JARD de Toa Alta
Urb Molinos del Rio
Urb Tedoro de Dorado
Avenida Chacueco
Calle El Monte
Calle Union
Calle Cortijo
Calle Eucalipto
Calle Tabonuco
Calle Central La Victoria
Carretera Candelaria
Calle Rio La Plata
Calle Ciburco
Legend
Start Point
End Point
Circuit
1:21,220
Miles
N
LUMA
Circuit 9207-08
Circuit_9207-08.pdf


Naranjito
Achiote
Guadiana
Anones
Doña Elena
Juan Asencio
Bayamón
Aguas Buenas
Palma
Parque de Pelota
Río Guadiana
Río Cuesta Arriba
Río Bayamón
Río La Charca
Calle Desvio Naranjito
Camino Antonsanti
Camino Mutitas
Camino Los Guayabos
Camino Cuchillas 2
Calle La Pera
Calle Jenaro Rodríguez
Calle Carolina
PR-167
PR-829
PR-830
PR-812
PR-879
PR-781
PR-878
PR-813
PR-814
PR-873
PR-882
PR-884
PR-164
PR-810
PR-152
PR-809
PR-825
PR-174
PR-833
PR-7190
PR-780
Legend
Start Point
End Point
Circuit
1:48,310
0
0.4
0.8
1.6
Miles
N
LUMA
Circuit 9801-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Bayamón Short Term Group 8

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Bayamón Short Term Group 8
Project Type:	Restoration to Codes/Standards
Region:	Bayamón
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Bayamón Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Bayamón Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
NARANJITO	9801-02	[redacted]		8.32
NARANJITO	9801-03			7.2
NARANJITO 2	9802-04			8.32
TOA ALTA	9401-02			4.16
BARRIO PIÑAS	9403-01			4.16
BARRIO PIÑAS 13 KV	9405-05			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.25M**
Estimated Budget for Procurement & Construction:	**$22.55M**
Estimated Overall Budget for the Project:	**$24.80M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

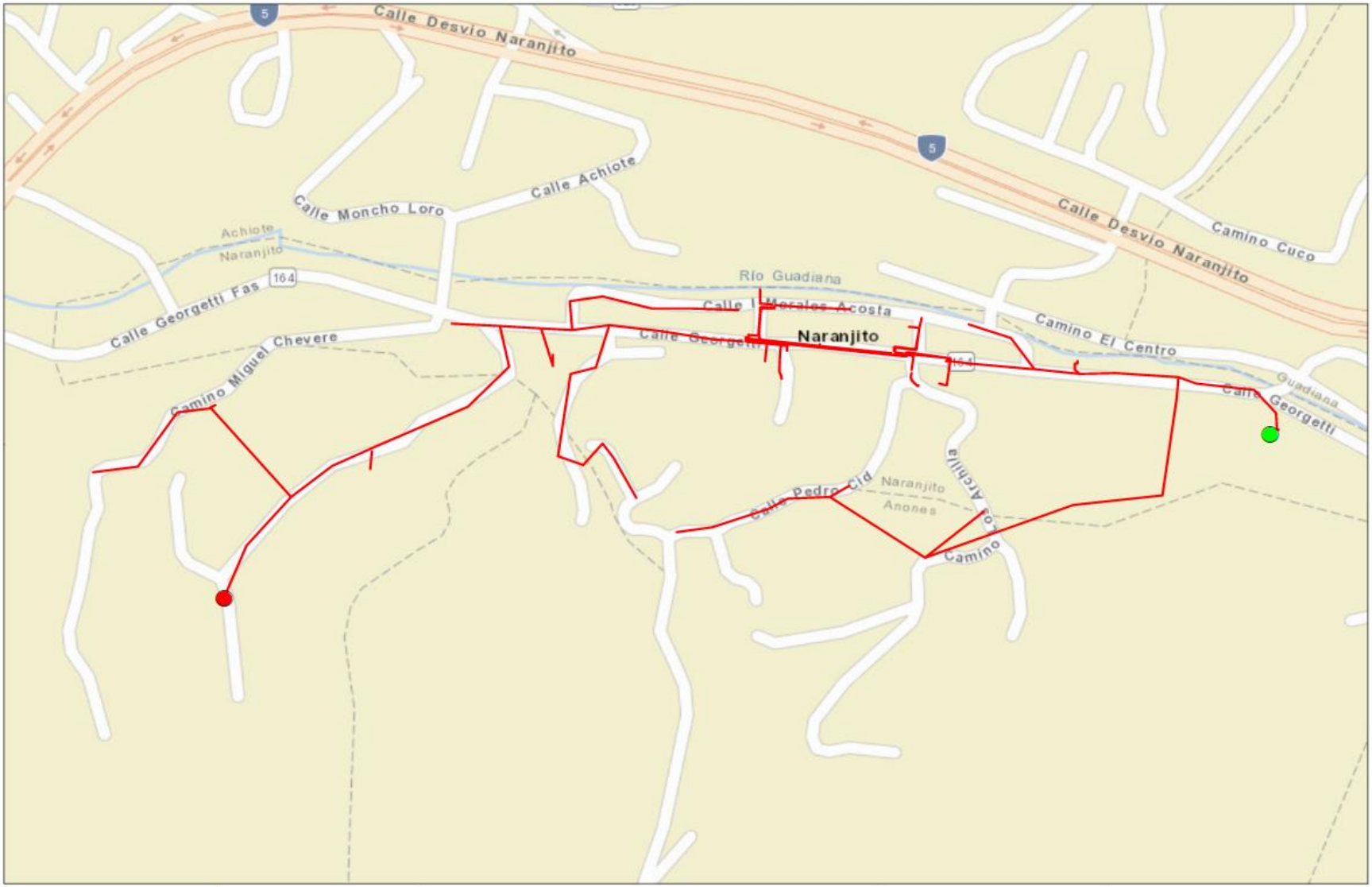
Note: If available, detailed engineering cost estimates will be included as an attachment.

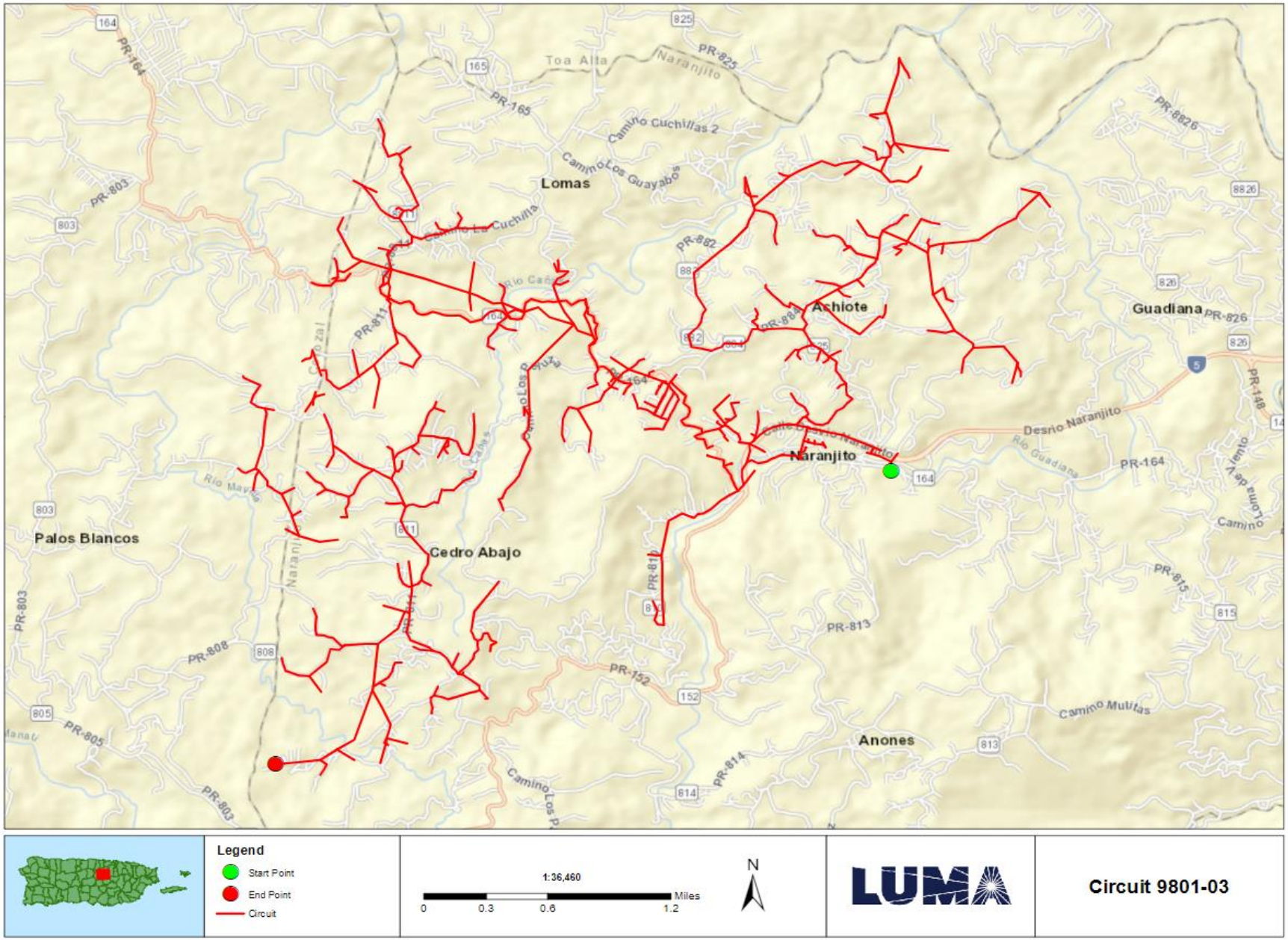
Environmental & Historic Preservation Requirements

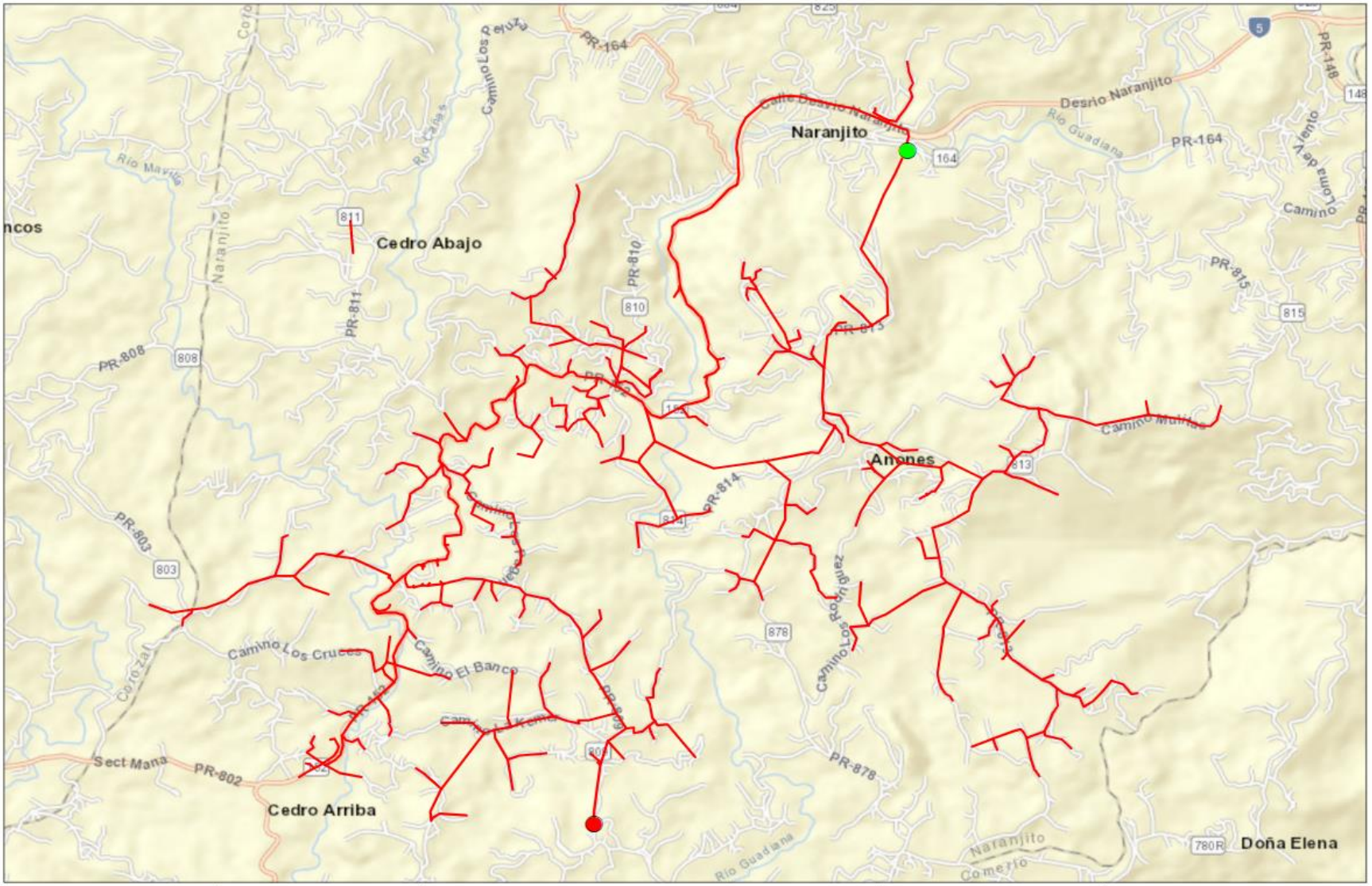
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

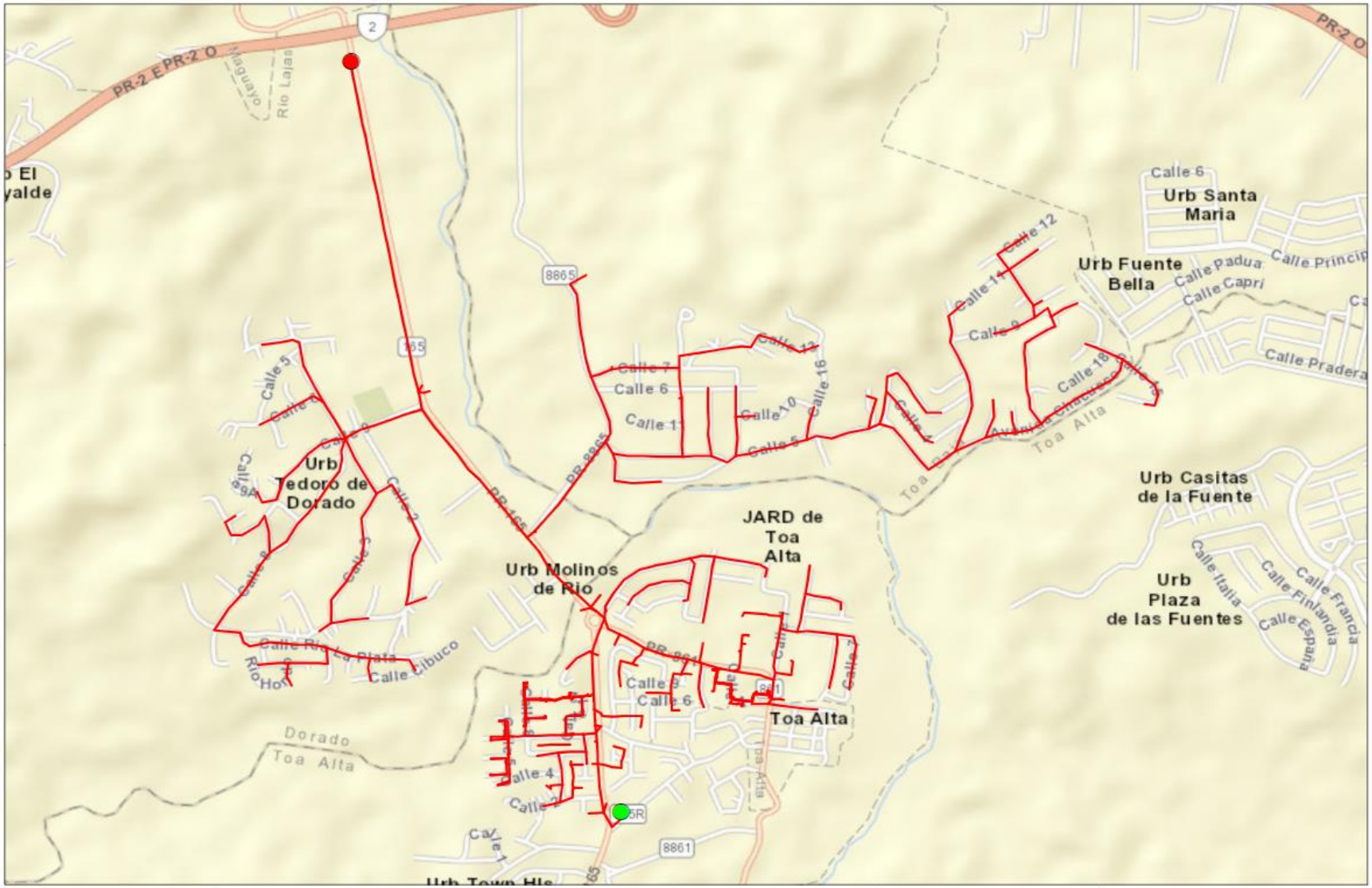
Attachments

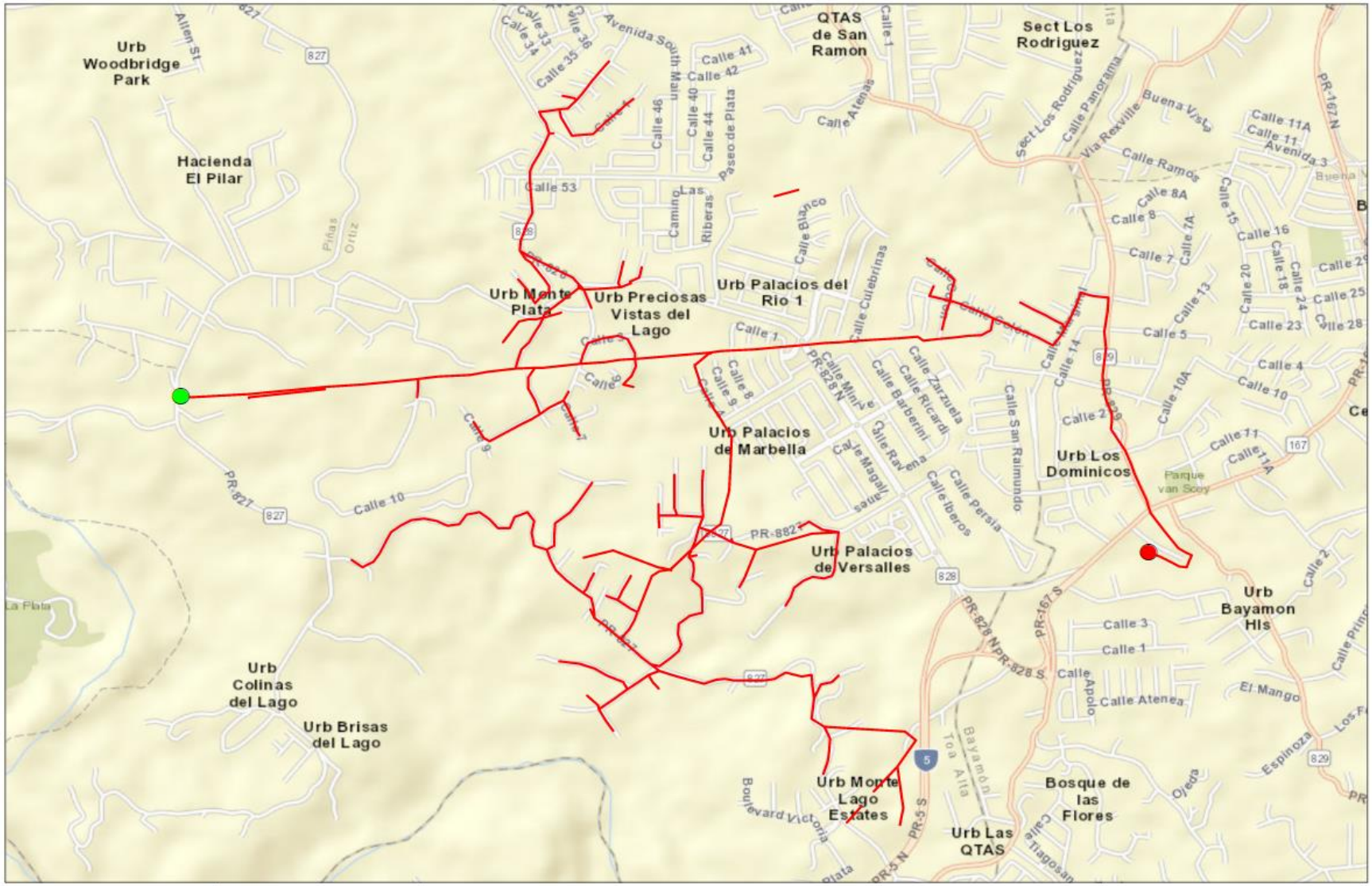
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Bayamon Short Term Group 8 Location Maps	Location Maps and Site Picture

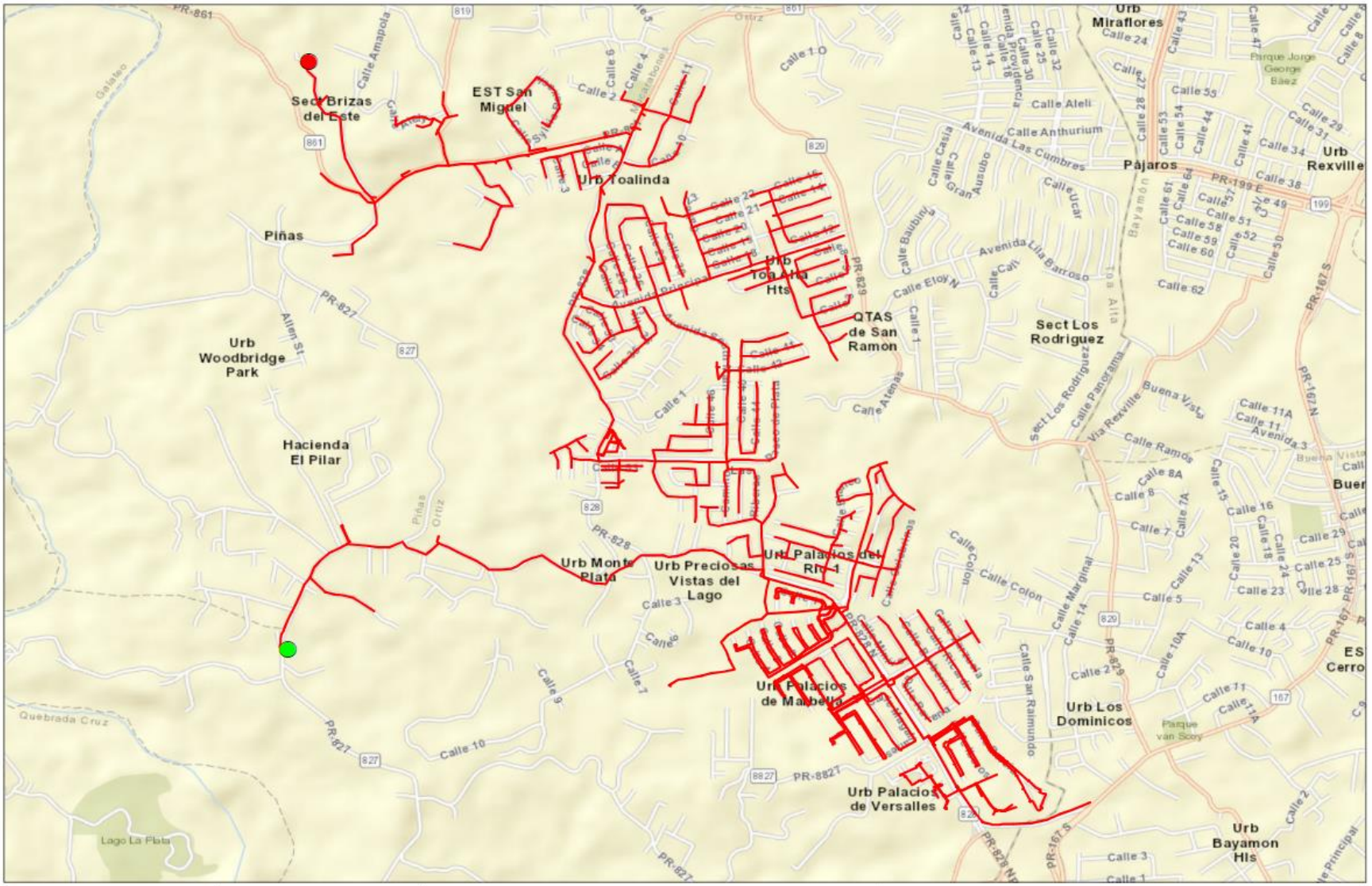

Calle Desvio Naranjito
Calle Moncho Loro
Calle Achiote
Achiote
Naranjito
Río Guadiana
Calle Georgetti Fas
164
Calle Morales Acosta
Naranjito
Camino Cuco
Camino El Centro
Camino Miguel Chevere
Guadiana
Calle Georgetti
Calle Pedro Cid
Naranjito
Anones
Camino
Legend
Start Point
End Point
Circuit
1:4,250
0
0.035
0.07
0.14
Miles
N
LUMA
Circuit 9801-02


Toa Alta
Naranjito
Lomas
Ashiote
Guadiana
Palos Blancos
Cedro Abajo
Anones
Desvio Naranjito
PR-164
PR-165
PR-825
PR-826
PR-803
PR-882
PR-811
PR-808
PR-152
PR-813
PR-815
PR-805
PR-814
Camino Cuchillas 2
Camino Los Guayabos
Camino La Cuchilla
Camino Mulitas
Río Mavilla
Río Guadiana
Legend
Start Point
End Point
Circuit
1:36,460
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 9801-03


Naranjito
Cedro Abajo
Cedro Arriba
Aibonito
Doña Elena
PR-164
PR-811
PR-810
PR-808
PR-803
PR-802
PR-814
PR-878
PR-815
Río Guadiana
Río Mavilla
Camino Los Cruces
Camino El Banco
Camino Los Rodríguez
Camino Molinos
Sect Mana
Corozal
Naranjito
Comerío
Legend
Start Point
End Point
Circuit
1:33,740
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 9802-04


PR-2 E PR-2 O
Río Lajas
Urb Santa Maria
Urb Fuente Bella
Calle Padua
Calle Capri
Calle Pradera
Urb Casitas de la Fuente
Urb Plaza de las Fuentes
Calle Italia
Calle Finlandia
Calle Francia
Calle España
Urb Teodoro de Dorado
Urb Molinos de Rio
JARD de Toa Alta
Toa Alta
Dorado
Toa Alta
Calle Libuco
Calle Río La Plata
8865
8861
Legend
Start Point
End Point
Circuit
1:15,840
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 9401-02


Urb Woodbridge Park
Hacienda El Pilar
QTAS de San Ramon
Sect Los Rodriguez
Urb Monte Plata
Urb Preciosas Vistas del Lago
Urb Palacios del Rio 1
Urb Palacios de Marbella
Urb Palacios de Versalles
Urb Los Dominicos
Urb Bayamon Hls
Urb Colinas del Lago
Urb Brisas del Lago
Urb Monte Lago Estates
Bosque de las Flores
Urb Las QTAS
Parque van Scoy
Legend
Start Point
End Point
Circuit
1:18,700
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 9403-01


Sect Brizas del Este
EST San Miguel
Urb Toalinda
Piñas
Urb Toa Alta Hts
QTAS de San Ramon
Urb Woodbridge Park
Hacienda El Pilar
Urb Monte Plata
Urb Preciosas Vistas del Lago
Urb Palacios del Rio 1
Urb Palacios de Marbella
Urb Palacios de Versalles
Sect Los Rodriguez
Urb Miraflores
Pájaros
Urb Rexville
Urb Los Dominicos
Urb Bayamon Hls
Quebrada Cruz
Lago La Plata
Legend
Start Point
End Point
Circuit
1:20,990
0 0.15 0.3 0.6 Miles
N
LUMA
Circuit 9405-05

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Bayamón Short Term Group 9

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Bayamón Short Term Group 9
Project Type:	Restoration to Codes/Standards
Region:	Bayamón
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Bayamón Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Bayamón Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
HATO TEJAS TC	1713-03	[redacted]		13.2
HATO TEJAS TC	1713-05			13.2
CREA	1717-01			13.2
CANDELARIA ARENAS	1718-03			13.2
LEVITTOWN	1806-01			13.2
LEVITTOWN	1806-03			13.2
DORADO TC	9203-02			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.72M**
Estimated Budget for Procurement & Construction:	**$27.24M**
Estimated Overall Budget for the Project:	**$29.96M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

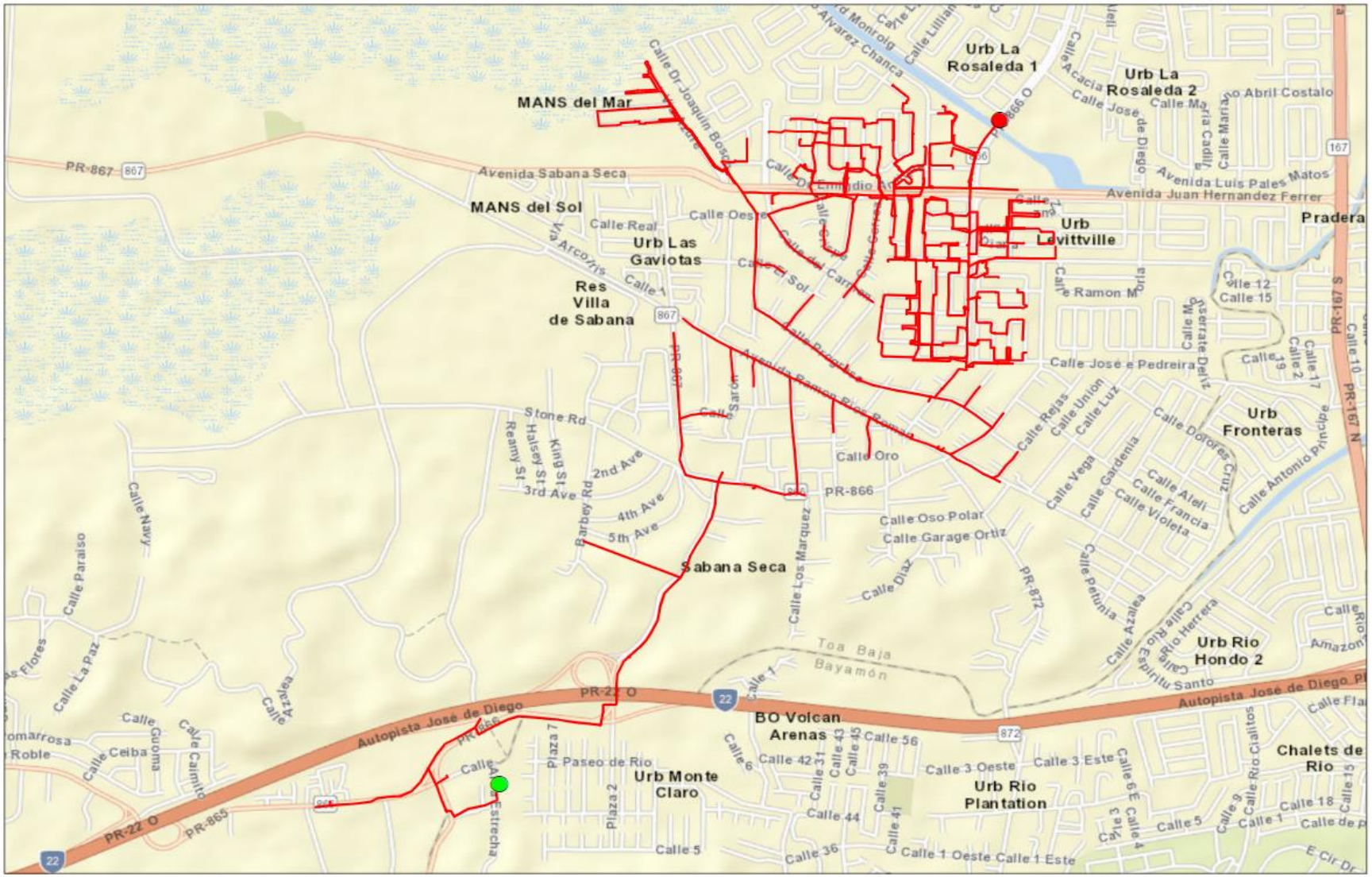
Note: If available, detailed engineering cost estimates will be included as an attachment.

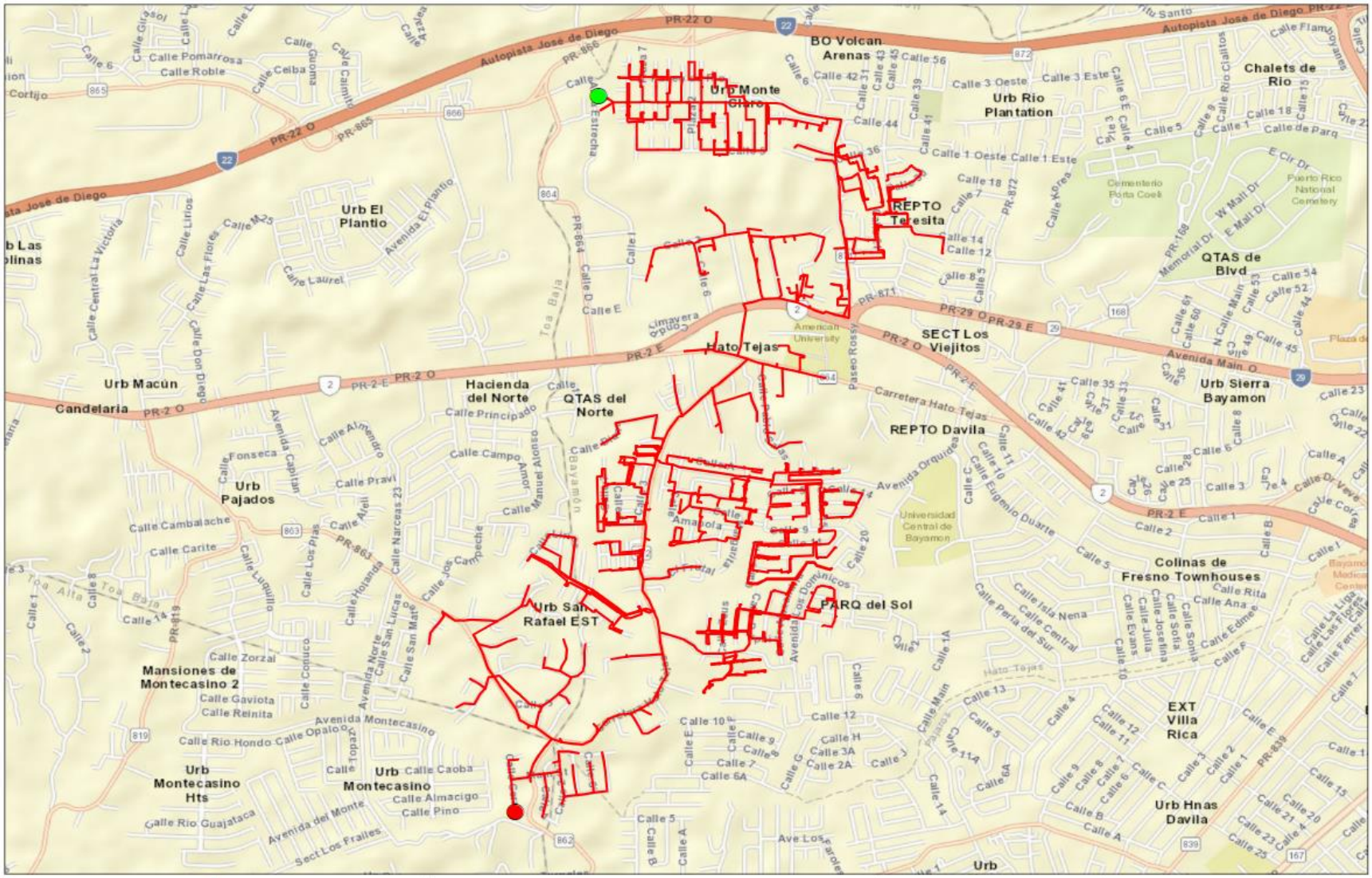
Environmental & Historic Preservation Requirements

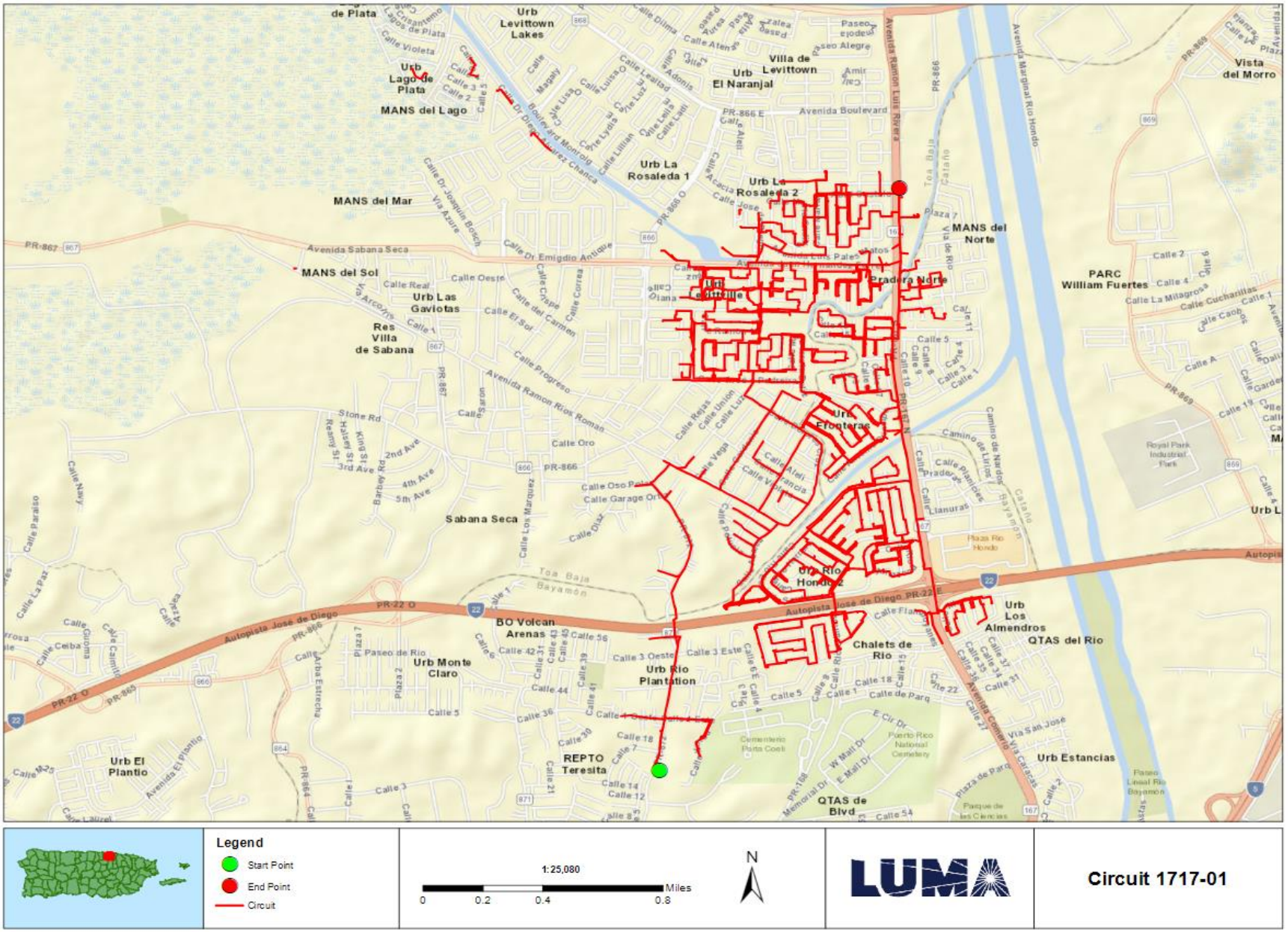
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

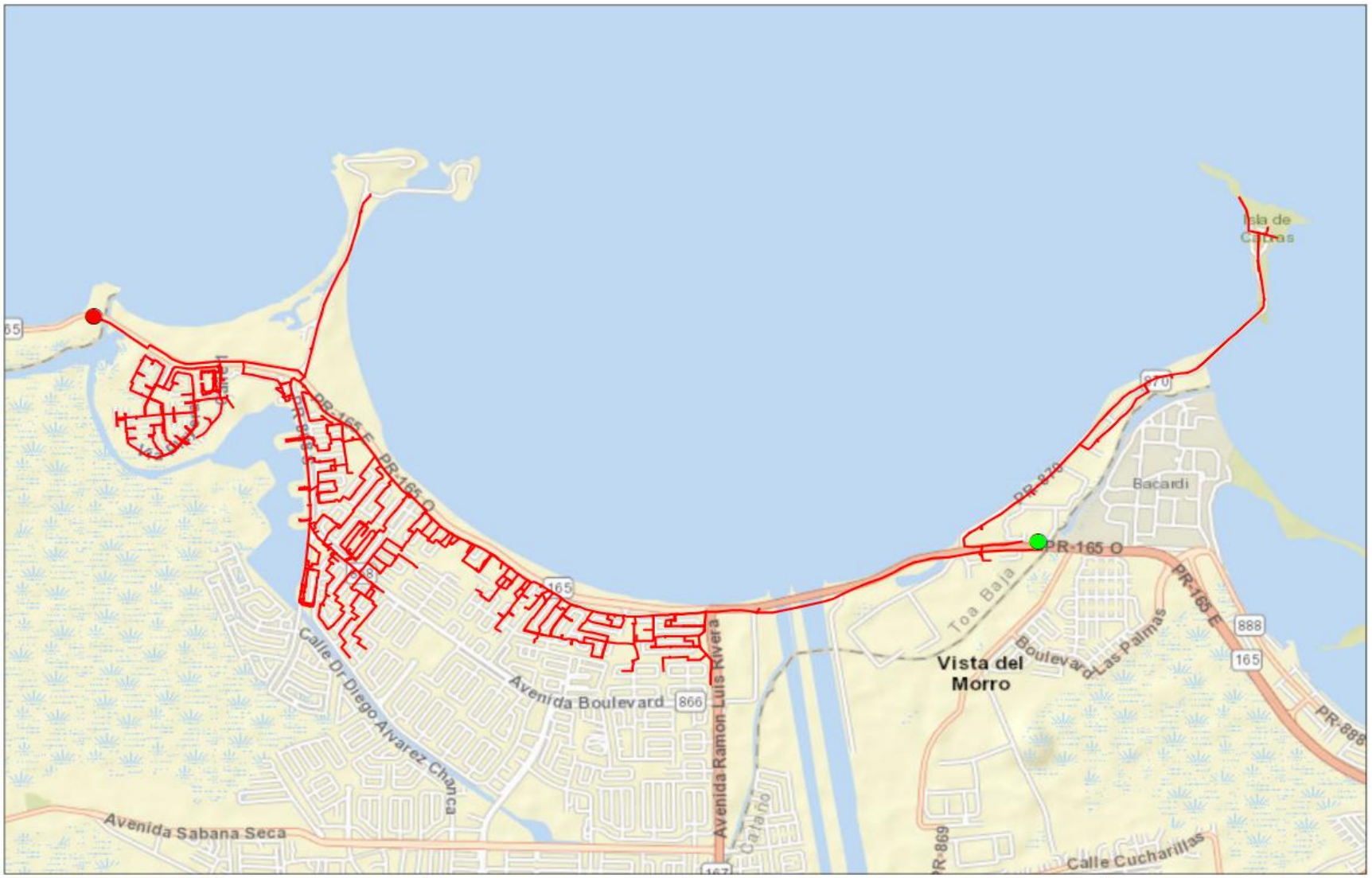
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Bayamon Short Term Group 9 Location Maps	Location Maps and Site Picture


MANS del Mar
MANS del Sol
Res Villa de Sabana
Urb Las Gaviotas
Urb La Rosaleda 1
Urb La Rosaleda 2
Urb Levittville
Pradera
Urb Fronteras
Urb Rio Hondo 2
Chalets de Rio
Urb Rio Plantation
BO Volcan Arenas
Urb Monte Claro
Sabana Seca
Avenida Sabana Seca
Avenida Luis Pales Matos
Avenida Juan Hernandez Ferrer
Autopista José de Diego
PR-867
PR-866
PR-22 O
PR-865
PR-872
PR-167 S
PR-167 N
Calle Real
Calle Oeste
Calle Oro
Calle Sol
Calle Navy
Calle Paraiso
Calle La Paz
Calle Ceiba
Calle Caimito
Calle Los Marquez
Calle Oso Polar
Calle Garage Ortiz
Calle Diaz
Calle Rejas
Calle Union
Calle Luz
Calle Vega
Calle Gardenia
Calle Violeta
Calle Dolores Cruz
Calle Antonio Pinto
Calle Jose e Pedreira
Calle Ramon M
Calle Petunia
Calle Azalea
Calle Rio Herrera
Calle Rio Cialitos
Calle Rio Amazonas
Calle Espiritu Santo
Calle Estrecha
Paseo de Rio
Plaza 1
Plaza 2
Stone Rd
Reamy St
Halsey St
King St
Barbey Rd
2nd Ave
3rd Ave
4th Ave
5th Ave
Toa Baja
Bayamón
Legend
Start Point
End Point
Circuit
1:18,260
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 1713-03


Autopista Jose de Diego
PR-22 O
Urb Monte Claro
BO Volcan Arenas
Urb Rio Plantation
Chalets de Rio
REPTO Telesita
Urb El Plantio
QTAS de Blvd
SECT Los Viejitos
Hato Tejas
Urb Macún
Candelaria
Hacienda del Norte
QTAS del Norte
Urb Sierra Bayamon
REPTO Davila
Urb Pajados
Colinas de Fresno Townhouses
PARQ del Sol
Urb San Rafael EST
Mansiones de Montecasino 2
EXT Villa Rica
Urb Montecasino Hts
Urb Montecasino
Urb Hnas Davila
Legend
Start Point
End Point
Circuit
1:21,990
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 1713-05


Urb Levittown Lakes
Urb Lago de Plata
MANS del Lago
Villa de Levittown
Urb El Naranjal
Urb La Rosaleda 1
Urb La Rosaleda 2
MANS del Mar
MANS del Norte
MANS del Sol
Urb Las Gaviotas
Res Villa de Sabana
Urb Pradera Norte
Urb Frontera
Urb Rio Hondo 2
PARC William Fuertes
Vista del Morro
Sabana Seca
BO Volcan Arenas
Urb Monte Claro
Urb Rio Plantation
Chalets de Rio
Urb Los Almendros
QTAS del Rio
Urb El Plantio
REPTO Teresita
QTAS de Blvd
Urb Estancias
Avenida Sabana Seca
Avenida Ramon Rios Roman
Avenida Boulevard
Avenida Ramon Luis Rivera
Avenida Marginal Rio Hondo
Autopista José de Diego PR-22 O
Autopista José de Diego PR-22 E
Calle Progreso
Calle Oro
Calle Oeste
Calle Real
Calle El Sol
Calle del Carmen
Calle Correa
Calle Crispe
Calle Los Marquez
Calle Union
Calle Reas
Calle Vega
Calle Garage Oro
Calle Oso Polar
Calle Dilia
Calle Aleli
Calle Francia
Calle Pradera
Calle Llanuras
Calle Planicies
Camino de Nardos
Calle Flamboyan
Calle Ceiba
Calle Paraiso
Calle Navy
Calle La Paz
Calle Laurel
Calle Violeta
Calle Magaly
Calle Lissa
Calle Luisa
Calle Lealtad
Calle Lydia
Calle Lillian
Calle Lelis
Calle Landi
Calle Jose
Calle Dr Emigdio Antiqua
Calle Dr Joaquin Bosch
Via Azure
Via Arcoiris
Stone Rd
Remy St
Hastel St
Wyoming St
3rd Ave
2nd Ave
4th Ave
5th Ave
Barbey Rd
Toa Baja
Bayamón
Plaza Rio Hondo
Royal Park Industrial Park
Cementerio Porta Coeli
Puerto Rico National Cemetery
Parque de las Ciencias
Paseo Linear Rio Bayamon
Legend
Start Point
End Point
Circuit
1:25,080
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 1717-01


Urb Las Colinas
Urb El Plantio
Urb Macún
Candelaria
Hacienda del Norte
QTAS del Norte
Urb Santa Maria
Urb Fuente Bella
Urb La Altagracia
EXT La Inmaculada
Urb Pajados
Urb Casitas de la Fuente
Urb Las Cascadas II
Urb Plaza de las Fuentes
JARD de Mediterraneo
JARD de Escorial
Mansiones de Montecasino 2
Urb Montecasino Ht
Urb Montecasino
Urb San Rafael EST
Autopista José de Diego
PR-22 E
PR-22 O
PR-2 E
PR-2 O
Toa Alta
Toa Baja
Legend
Start Point
End Point
Circuit
1:21,040
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 1718-03



Legend

- Start Point
- End Point
- Circuit

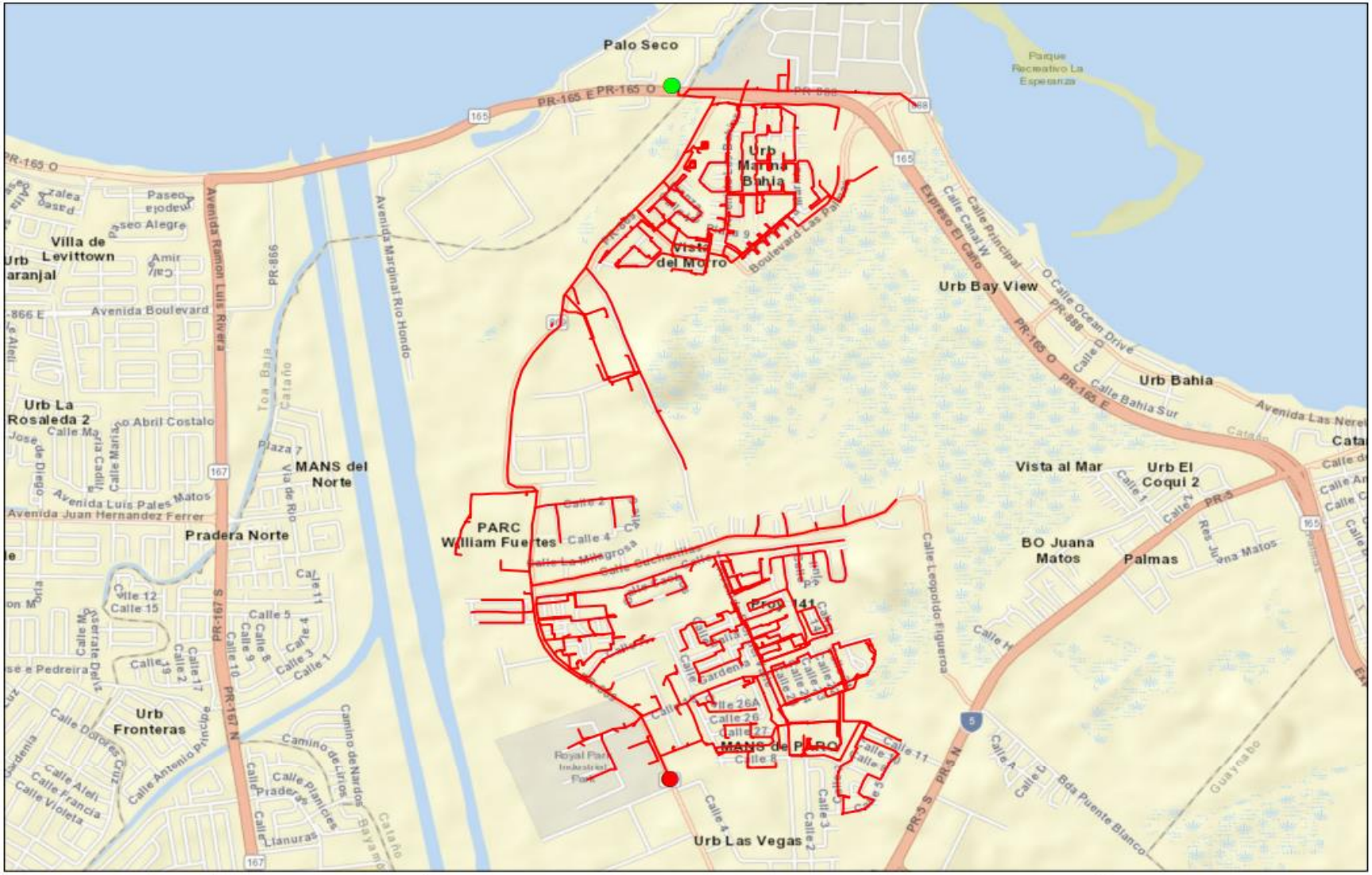
1:28,330

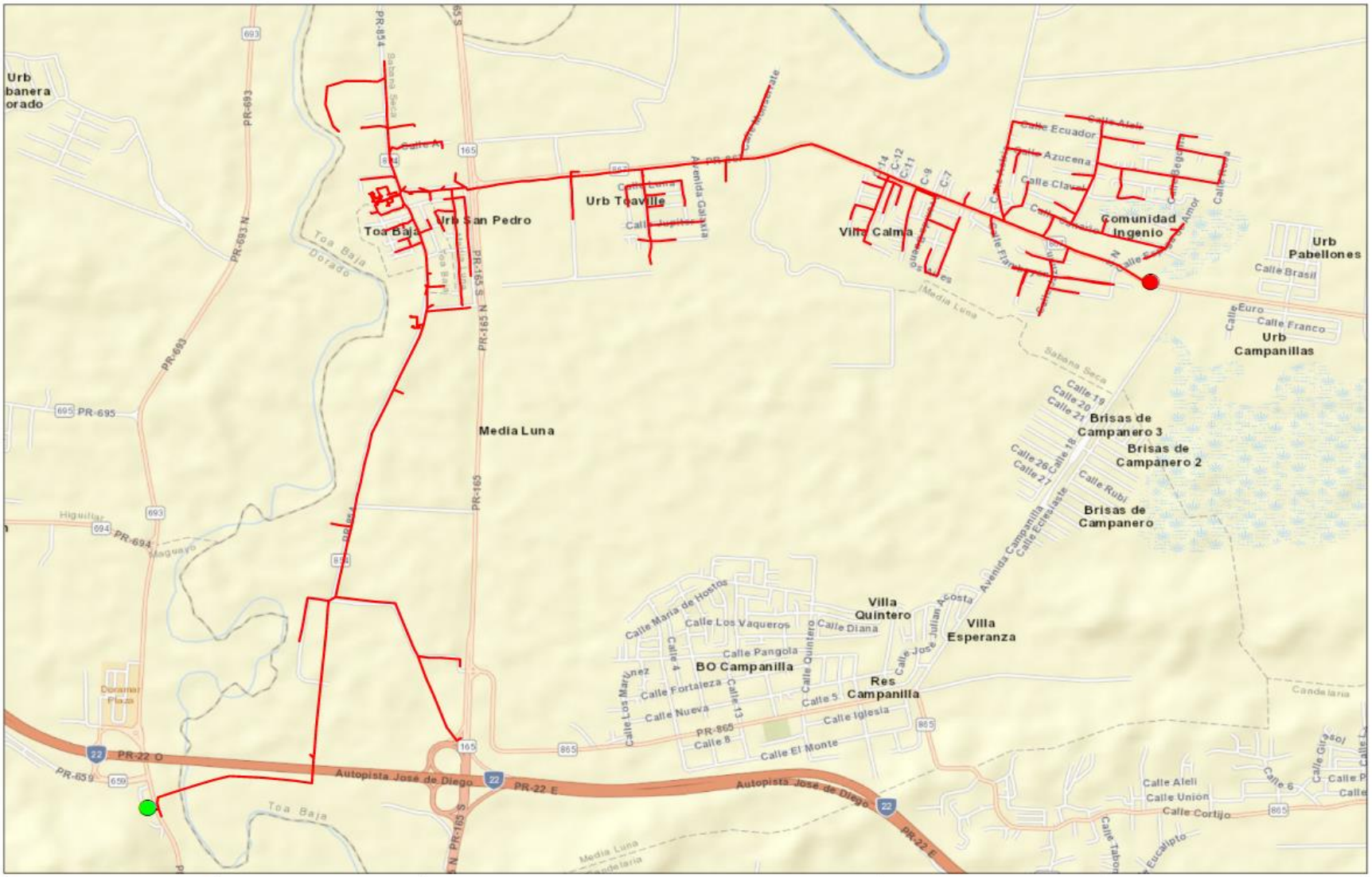
0 0.225 0.45 0.9 Miles

N

LUMA

Circuit 1806-01


Palo Seco
PR-165 E PR-165 O
Urb Marina Bahia
Vista del Morro
Urb Bay View
Urb Bahia
Villa de Levittown
Urb La Rosaleda 2
MANS del Norte
Pradera Norte
PARC William Fuentes
Vista al Mar
Urb El Coqui 2
BO Juana Matos
Palmas
Urb Fronteras
MANS de PARC
Urb Las Vegas
Avenida Ramon Luis Rivera
Avenida Marginal Rio Hondo
Avenida Boulevard
Avenida Luis Pales Matos
Avenida Juan Hernandez Ferrer
Calle Principal
Calle Bahia Sur
Calle Leopoldo Figueroa
Parque Recreativo La Esperanza
Legend
Start Point
End Point
Circuit
1:20,060
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 1806-03


Urb banera orado
Toa Baja
Urb San Pedro
Urb Toaville
Villa Calma
Comunidad Ingenio
Urb Pabellones
Urb Campanillas
Media Luna
Brisas de Campanero 3
Brisas de Campanero 2
Brisas de Campanero
Villa Quintero
Villa Esperanza
BO Campanilla
Res Campanilla
PR-22 O
PR-22 E
Autopista José de Diego
PR-165
PR-693
PR-695
PR-694
PR-865
PR-859
Legend
Start Point
End Point
Circuit
1:22,850
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 9203-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Caguas Short Term Group 9

Revision: 0

Date: 22JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	22JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Caguas Short Term Group 9
Project Type:	Restoration to Codes/Standards
Region:	Caguas
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Caguas Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Caguas Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
AGUAS BUENAS	3701-02	[redacted]		8.32
AGUAS BUENAS	3701-04			8.32
AIBONITO	3501-01			8.32
AIBONITO	3501-02			8.32
AIBONITO	3501-03			8.32
AIBONITO PDS	3502-01			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$3.08M**
Estimated Budget for Procurement & Construction:	**$30.81M**
Estimated Overall Budget for the Project:	**$33.89M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

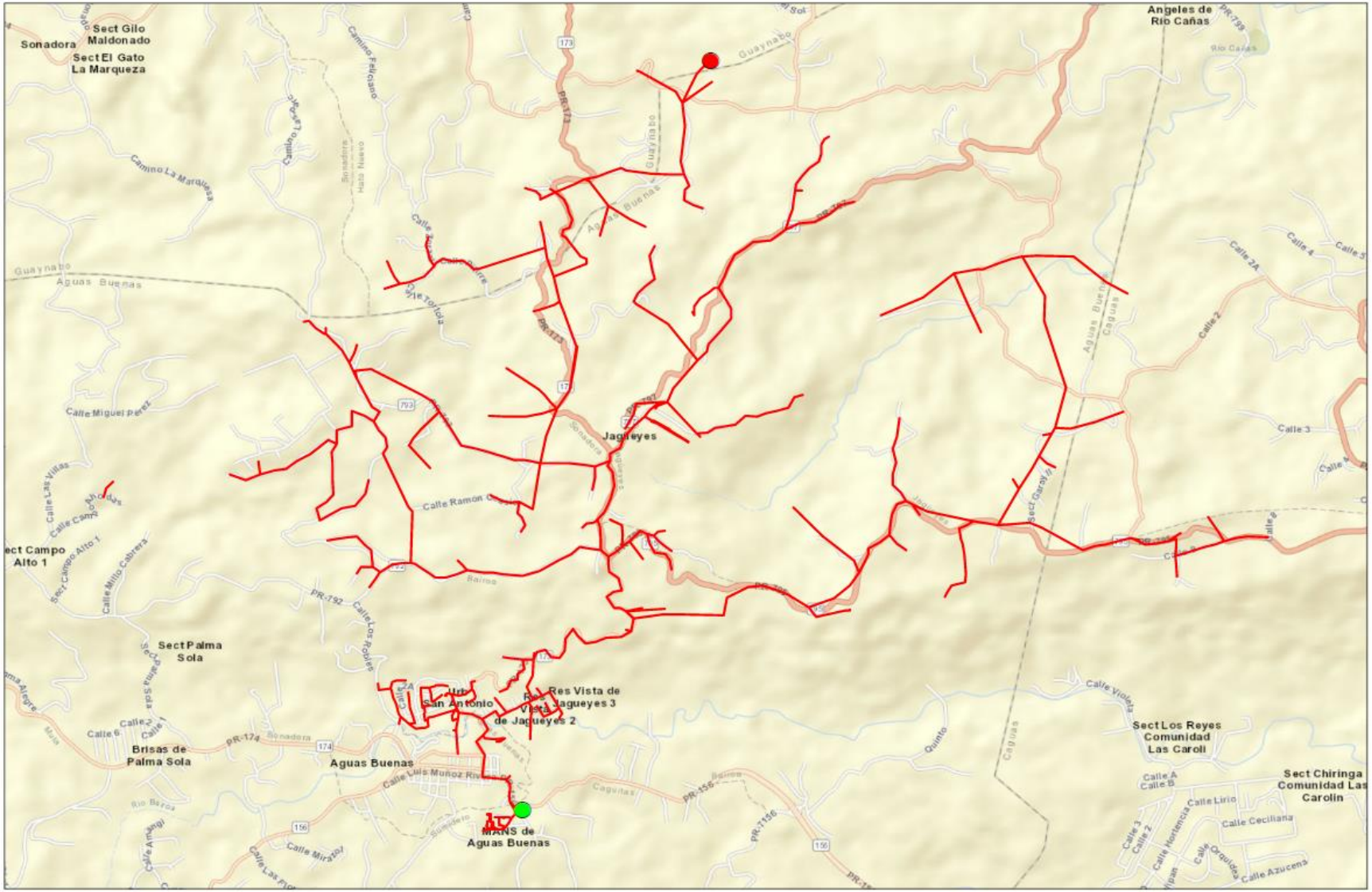
Note: If available, detailed engineering cost estimates will be included as an attachment.

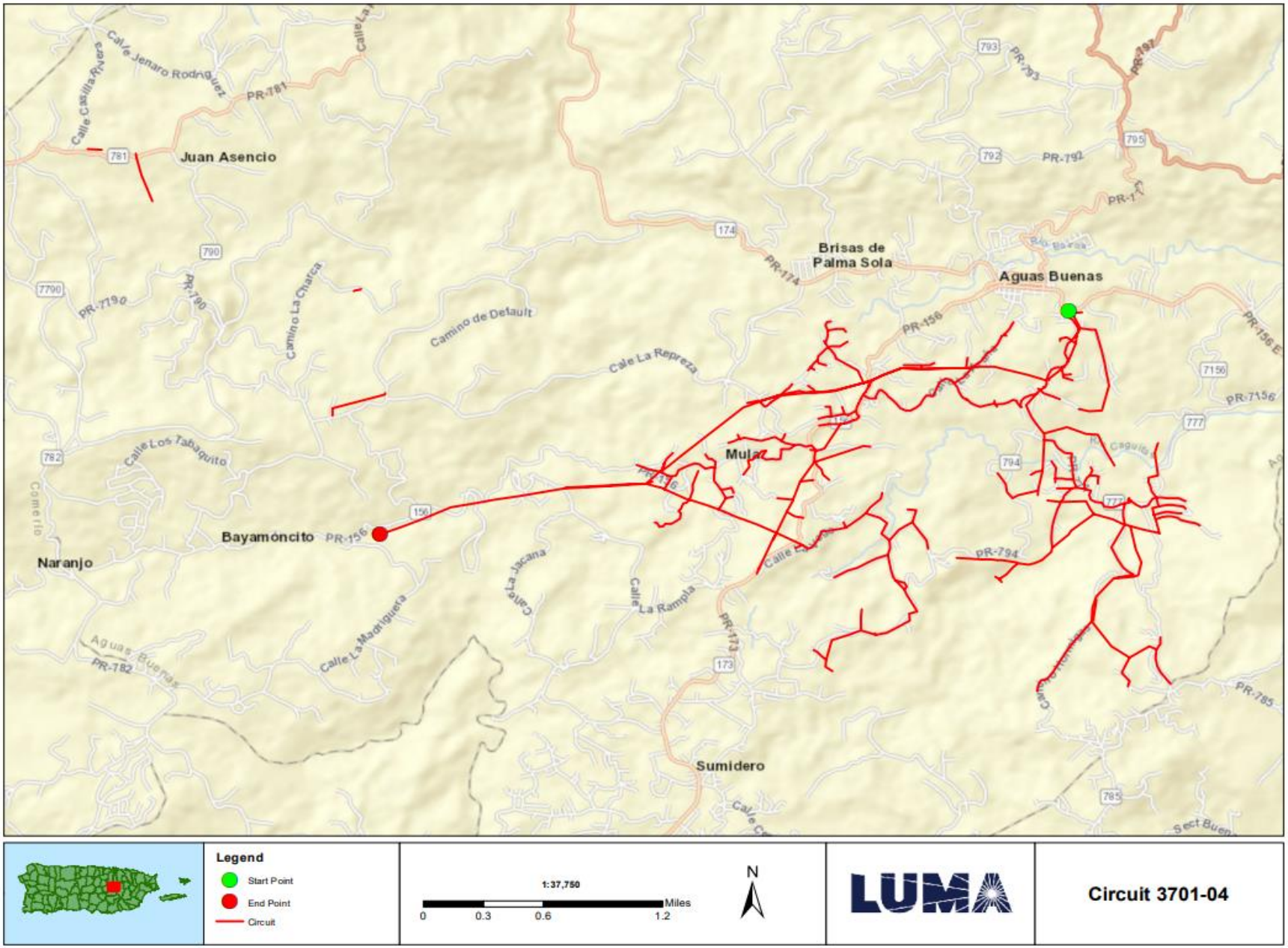
Environmental & Historic Preservation Requirements

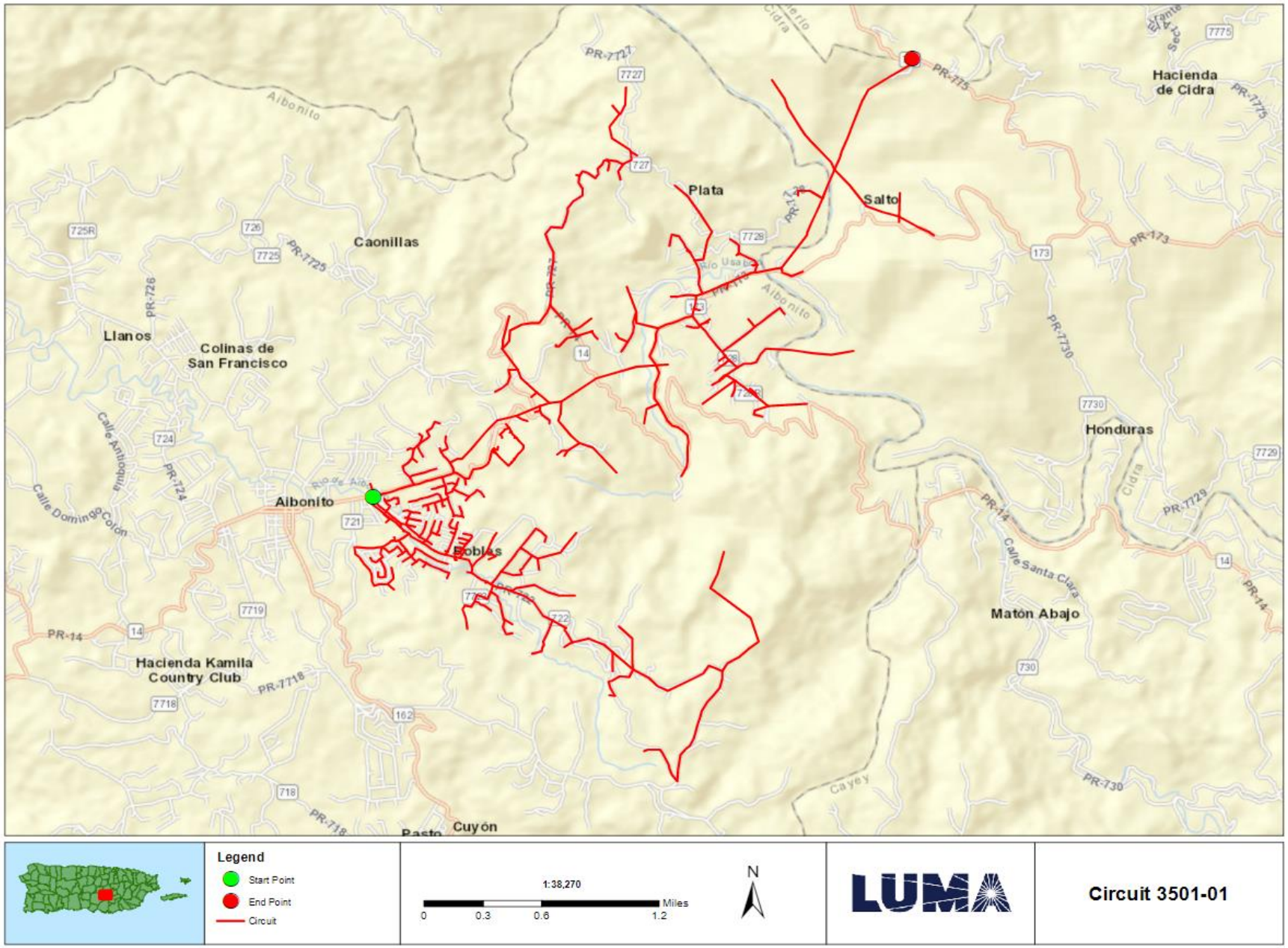
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

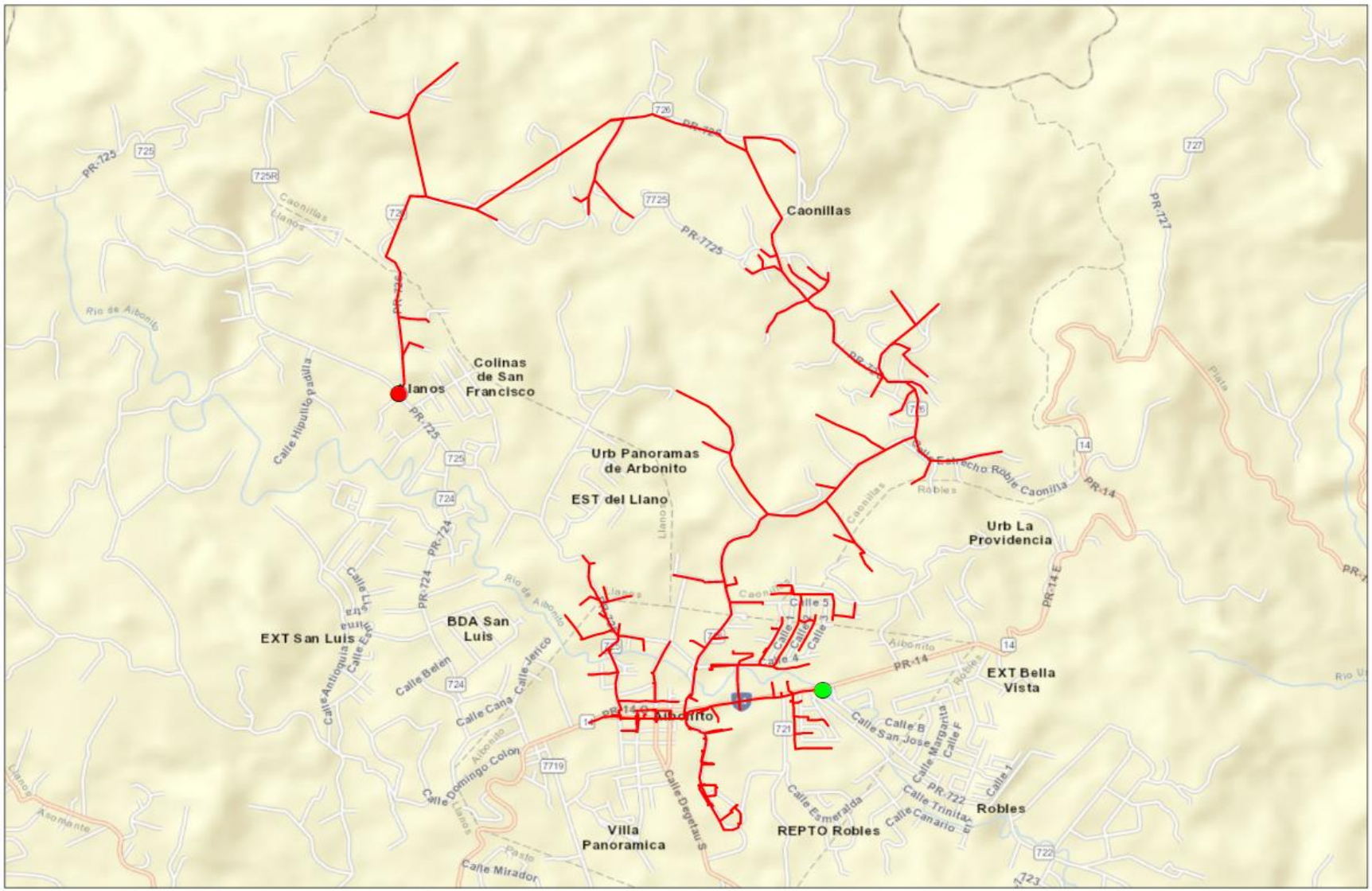
Attachments

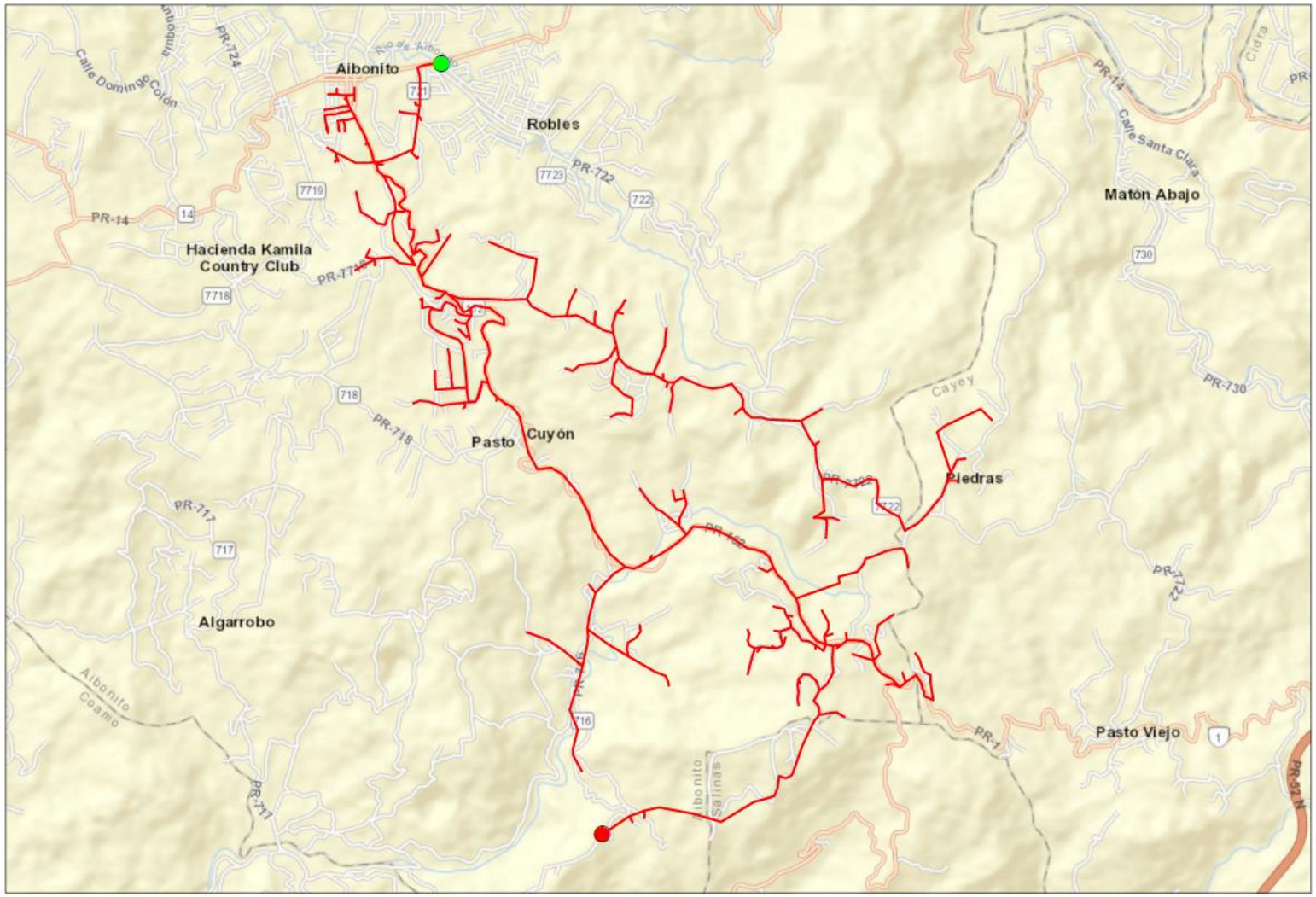
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Caguas Short Term Group 9 Location Maps	Location Maps and Site Picture

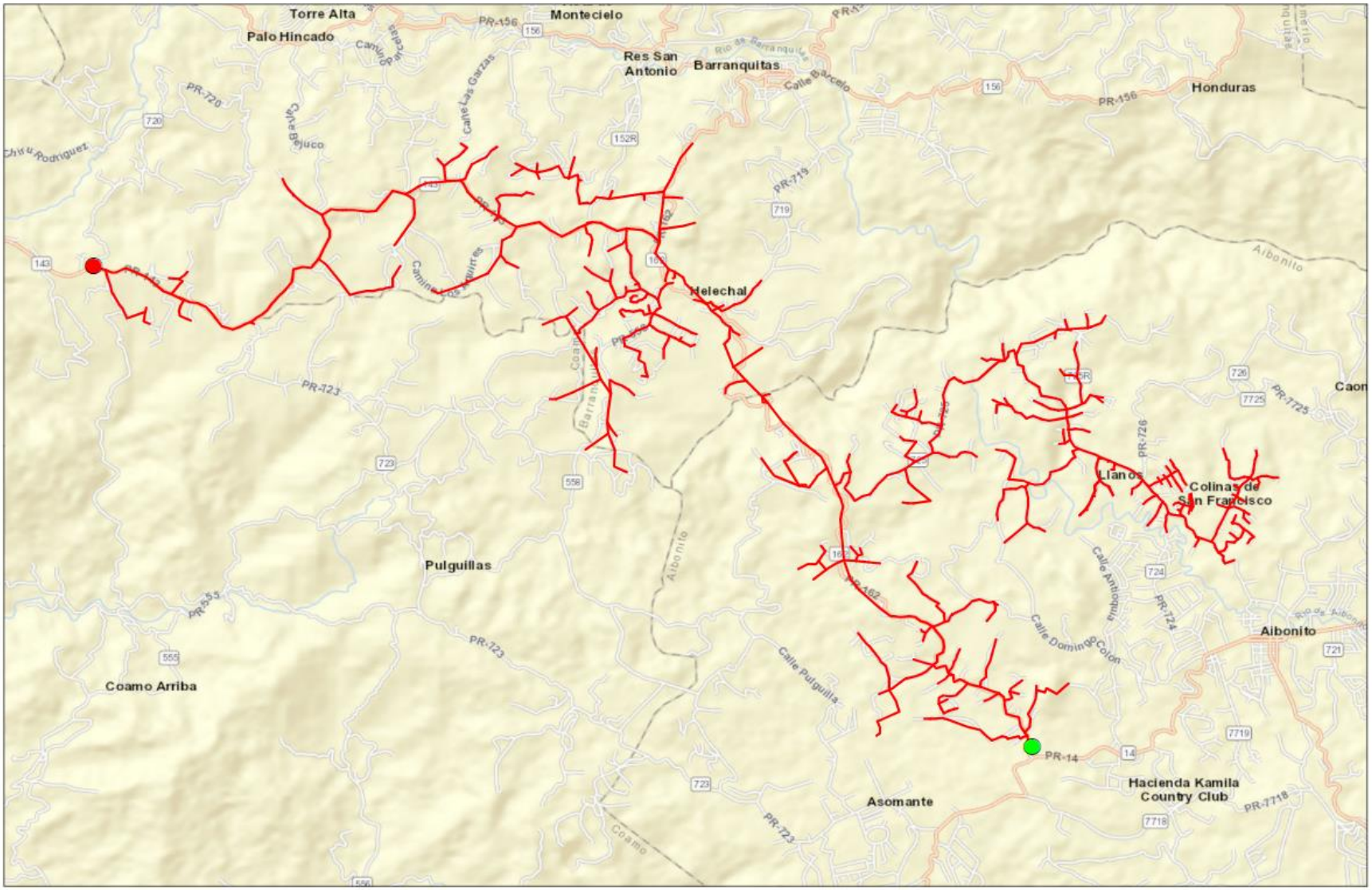

Sect Gilo Maldonado
Sonadora
Sect El Gato La Marqueza
Angeles de Rio Cañas
Guaynabo
Aguas Buenas
Jagueyes
Sect Palma Sola
Brisas de Palma Sola
Aguas Buenas
Res Vista de Jagueyes 3
Res Vista de Jagueyes 2
Urb San Antonio
MANS de Aguas Buenas
Sect Los Reyes Comunidad Las Caroli
Sect Chiringa Comunidad Las Carolin
Legend
Start Point
End Point
Circuit
1:25,980
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 3701-02


Juan Asencio
Brisas de Palma Sola
Aguas Buenas
Mula
Bayamoncito
Naranjo
Sumidero
Calle Jenaro Rodríguez
Calle Casilla Rivera
Camino La Charca
Camino de Default
Calle La Represa
Calle Los Tabaquito
Calle La Madrigueta
Calle La Rampla
Calle La Jacana
PR-781
PR-790
PR-7790
PR-174
PR-156
PR-7156
PR-792
PR-793
PR-794
PR-173
PR-782
PR-785
781
790
7790
174
156
7156
792
793
795
794
777
782
173
785
Legend
Start Point
End Point
Circuit
1:37,750
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 3701-04


Aibonito
Plata
Salto
Hacienda de Cidra
Caonillas
Llanos
Colinas de San Francisco
Honduras
Aibonito
Coamo
Hacienda Kamila Country Club
Maton Abajo
Cuyón
Calle Antioquia
Calle Domingo Colón
Calle Santa Clara
PR-14
PR-173
PR-7730
PR-7729
PR-7718
PR-730
Legend
Start Point
End Point
Circuit
1:38,270
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 3501-01


Caonillas
Colinas de San Francisco
Llanos
Urb Panoramas de Arbonito
EST del Llano
Urb La Providencia
EXT San Luis
BDA San Luis
EXT Bella Vista
Arbonito
Villa Panoramica
REPTO Robles
Robles
PR-725
PR-1725
PR-724
PR-14
PR-14 E
PR-722
PR-727
Calle Hipolito Pagan
Calle Belen
Calle Cana
Calle Jerico
Calle Domingo Colon
Calle Degetaus
Calle Esmeralda
Calle Mirador
Calle San Jose
Calle Trinitaria
Calle Canario
Calle Margarita
Calle 1
Calle 4
Calle 5
Rio de Arbonito
Legend
Start Point
End Point
Circuit
1:21,390
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 3501-02


Aibonito
Robles
Matón Abajo
Hacienda Kamila
Country Club
Pasto
Cuyón
Piedras
Algarrobo
Pasto Viejo
Calle Domingo Colón
Calle Santa Clara
Cayey
Aibonito
Coamo
Aibonito
Salinas
PR-14
PR-722
PR-730
PR-718
PR-717
PR-711
PR-1
PR-7722
7719
7723
722
730
718
717
716
721
7718
14
1
Legend
Start Point
End Point
Circuit
1:36,380
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 3501-03


Torre Alta
Palo Hincado
Montecielo
Res San Antonio
Barranquitas
Honduras
Helechal
Pulguillas
Coamo Arriba
Asomante
Llanos
Colinas de San Francisco
Aibonito
Hacienda Kamila Country Club
PR-720
PR-156
PR-719
PR-723
PR-555
PR-14
PR-725
PR-726
PR-724
PR-718
Calle Los Garzas
Calle Pulguilla
Calle Antonio Rodriguez
Calle Domingo Colon
Aibonito
Coamo
Legend
Start Point
End Point
Circuit
1:43,120
0
0.35
0.7
1.4
Miles
N
LUMA
Circuit 3502-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Caguas Short Term Group 10

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Caguas Short Term Group 10
Project Type:	Restoration to Codes/Standards
Region:	Caguas
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Caguas Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Caguas Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
BARRANQUITAS II	9602-03	[redacted]		8.32
EL ABANICO PDS	9605-01			8.32
EL ABANICO PDS	9605-02			8.32
CAYEY T.C.	3401-03			8.32
JAJOME	3403-01			4.16
CAYEY RURAL	3405-02			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.91M**
Estimated Budget for Procurement & Construction:	**$29.05M**
Estimated Overall Budget for the Project:	**$31.96M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

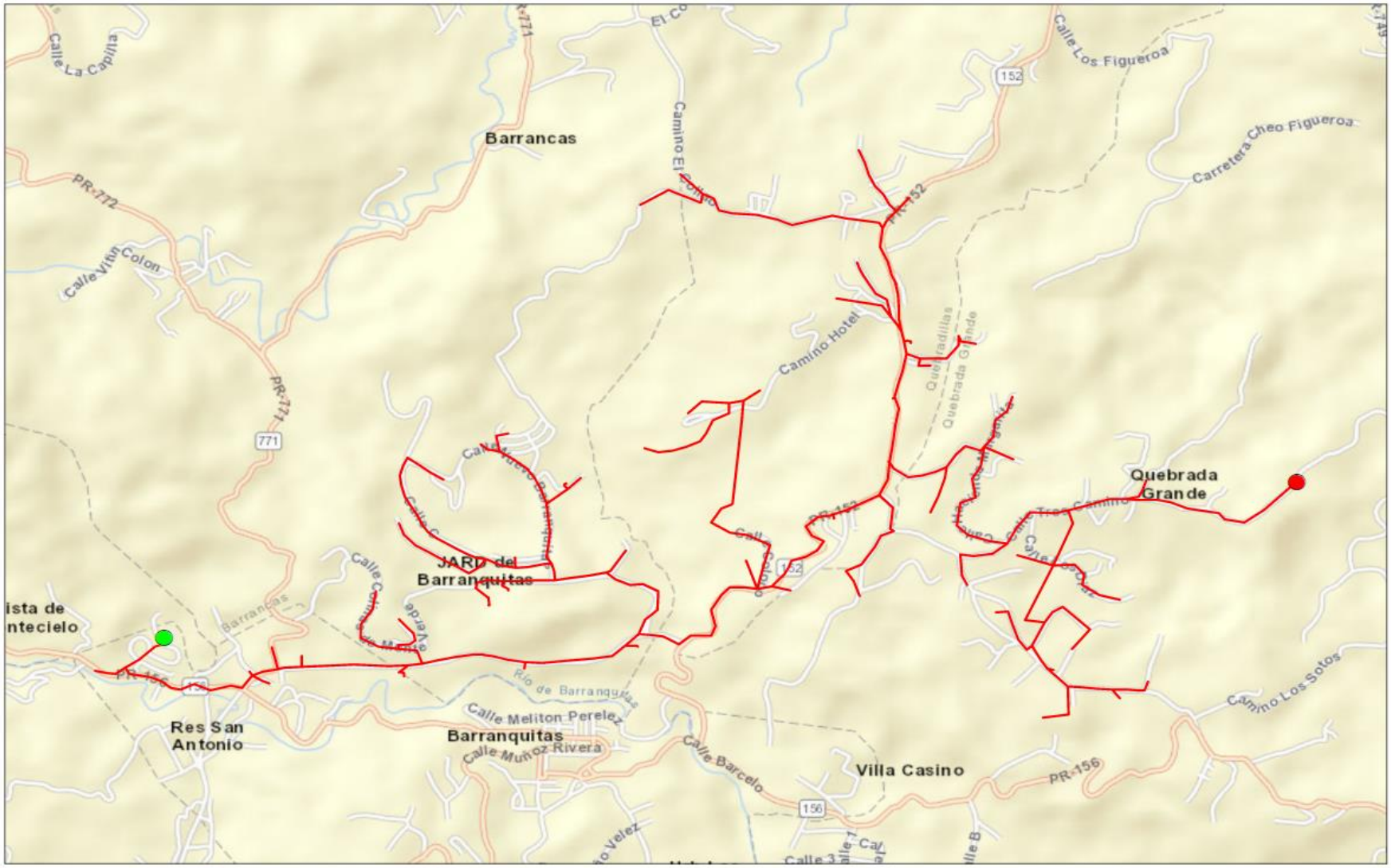
Note: If available, detailed engineering cost estimates will be included as an attachment.

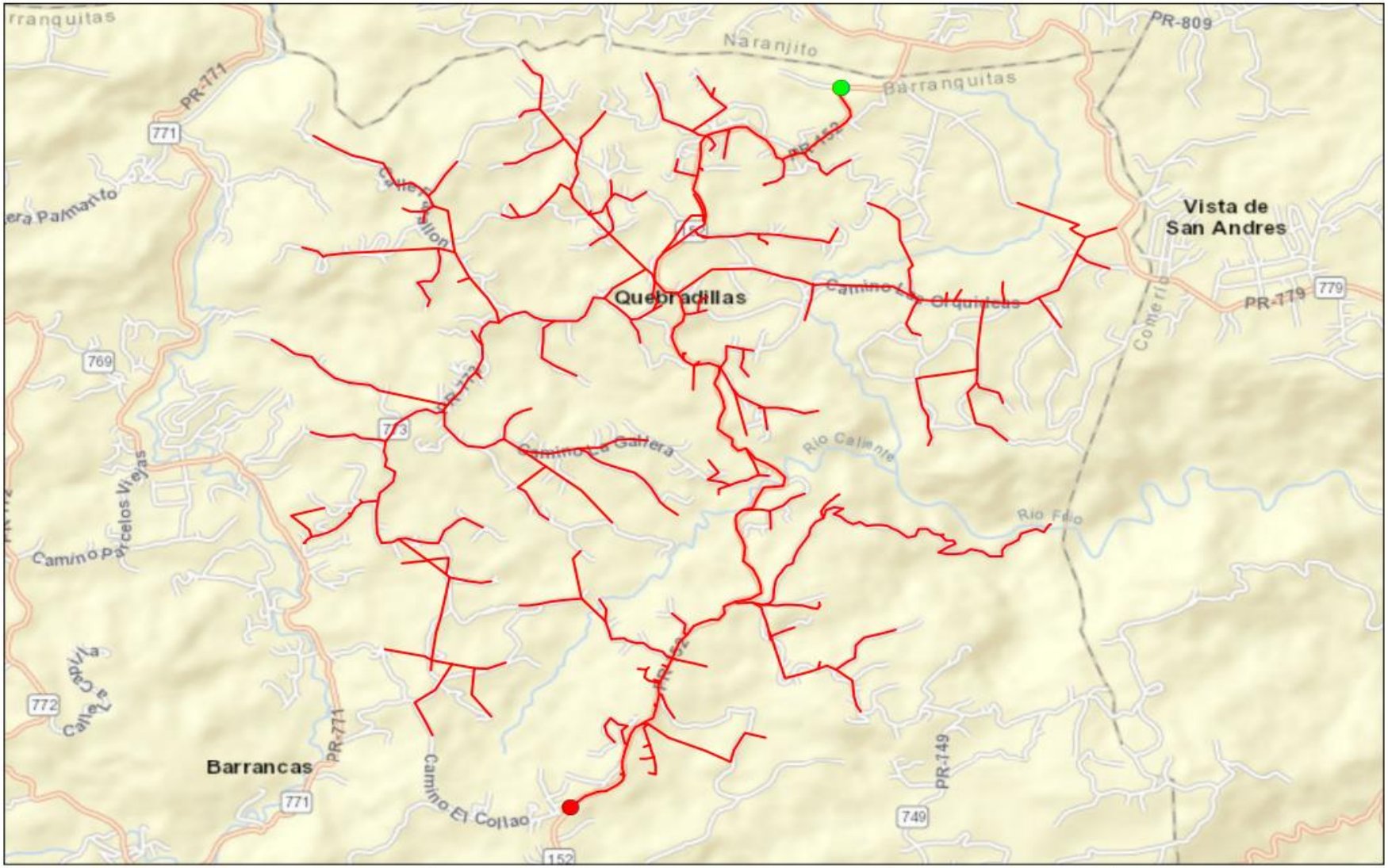
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Caguas Short Term Group 10 Location Maps	Location Maps and Site Picture


Barrancas
Calle La Capilla
PR-772
Calle Vista Colon
PR-771
771
Camino El Comino
PR-152
152
Calle Los Figueroa
Carretera Cheo Figueroa
Camino Hotel
Quebrada Grande
Quebrada Grande
JARD del Barranquitas
Barranquitas
Calle Meliton Perelez
Calle Muñoz Rivera
Res San Antonio
Villa Casino
Calle Barcelo
156
PR-156
Camino Los Sotos
Legend
Start Point
End Point
Circuit
1:16,780
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 9602-03



Legend

- Start Point
- End Point
- Circuit

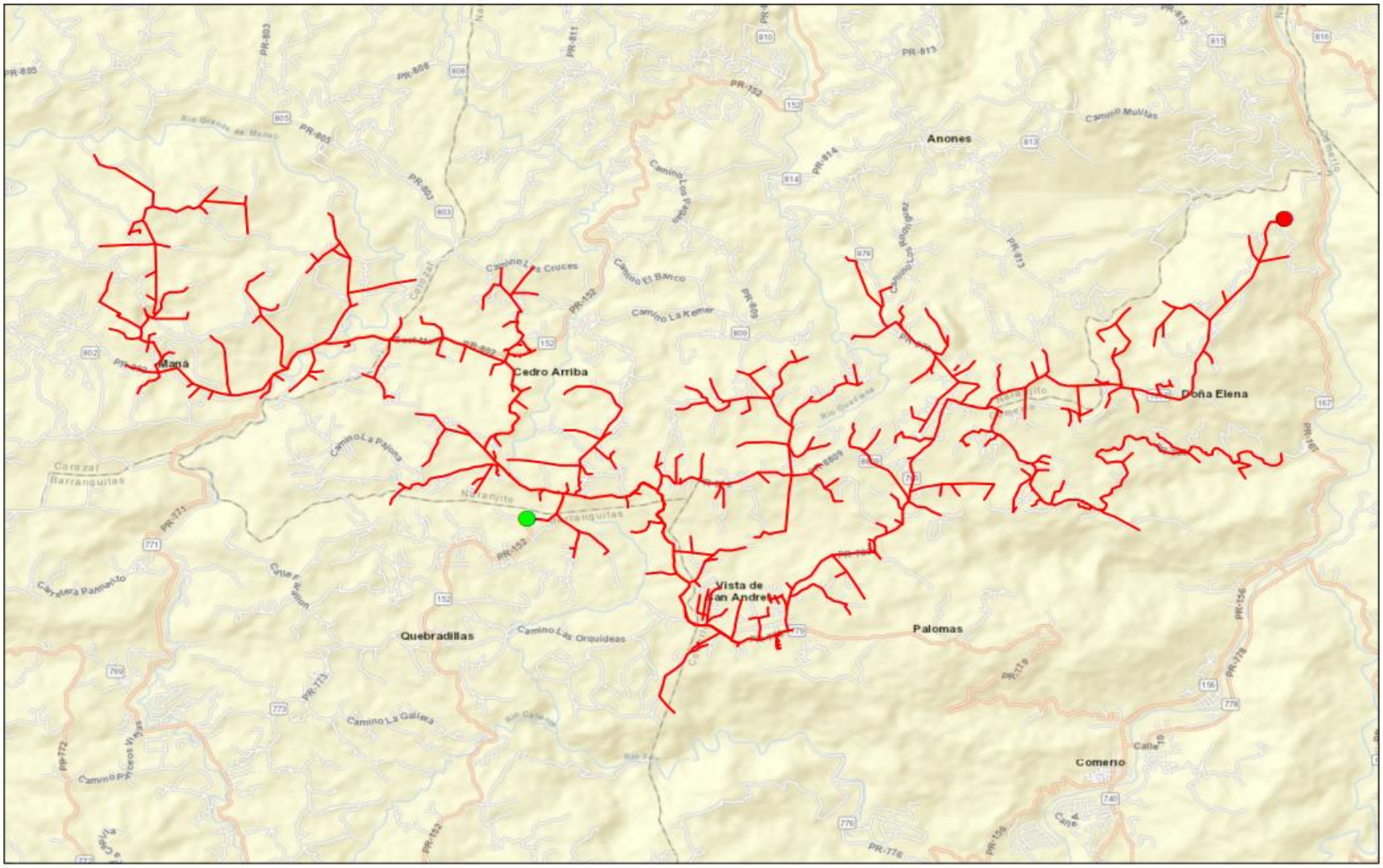
1:27,580

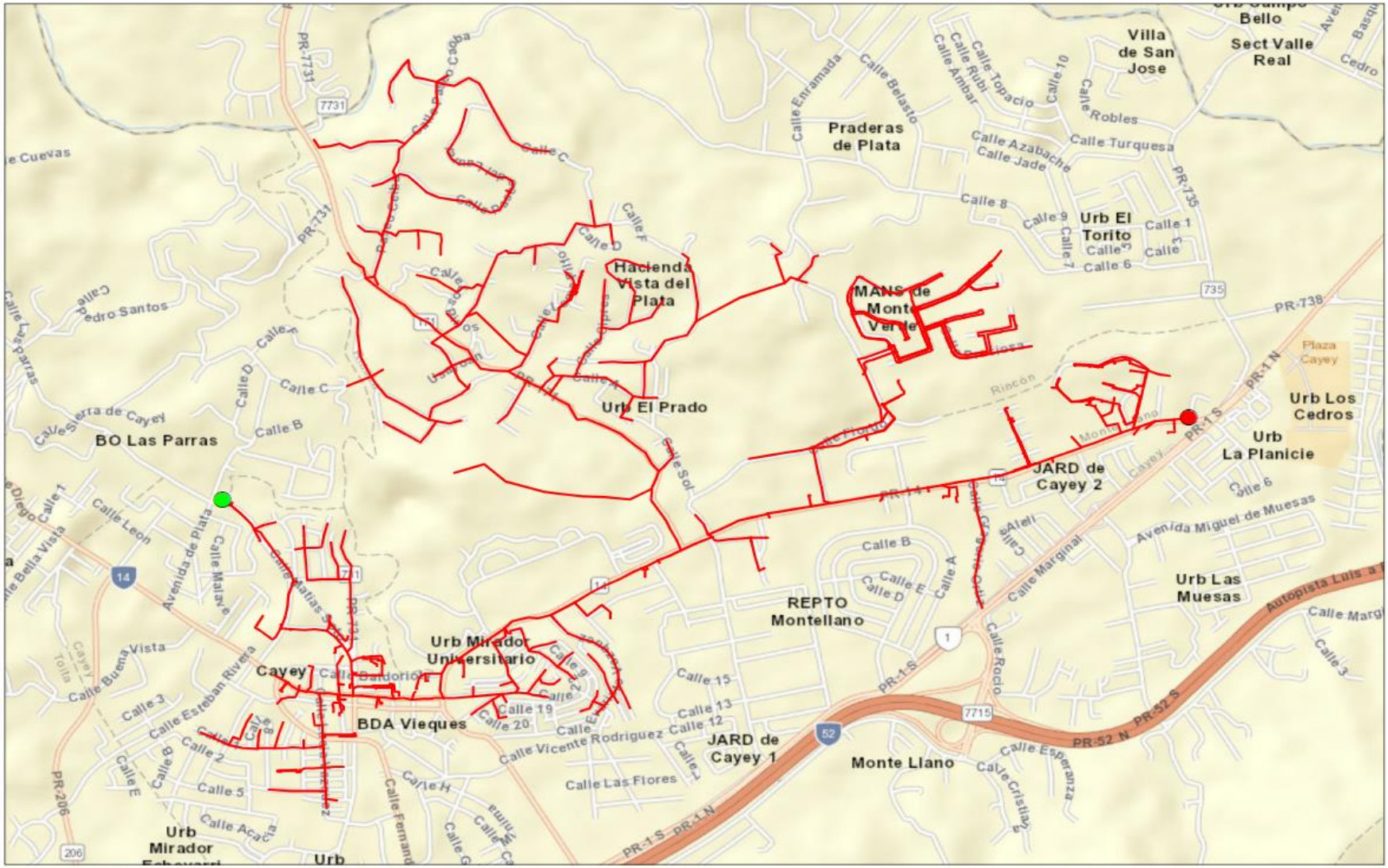
0 0.225 0.45 0.9 Miles

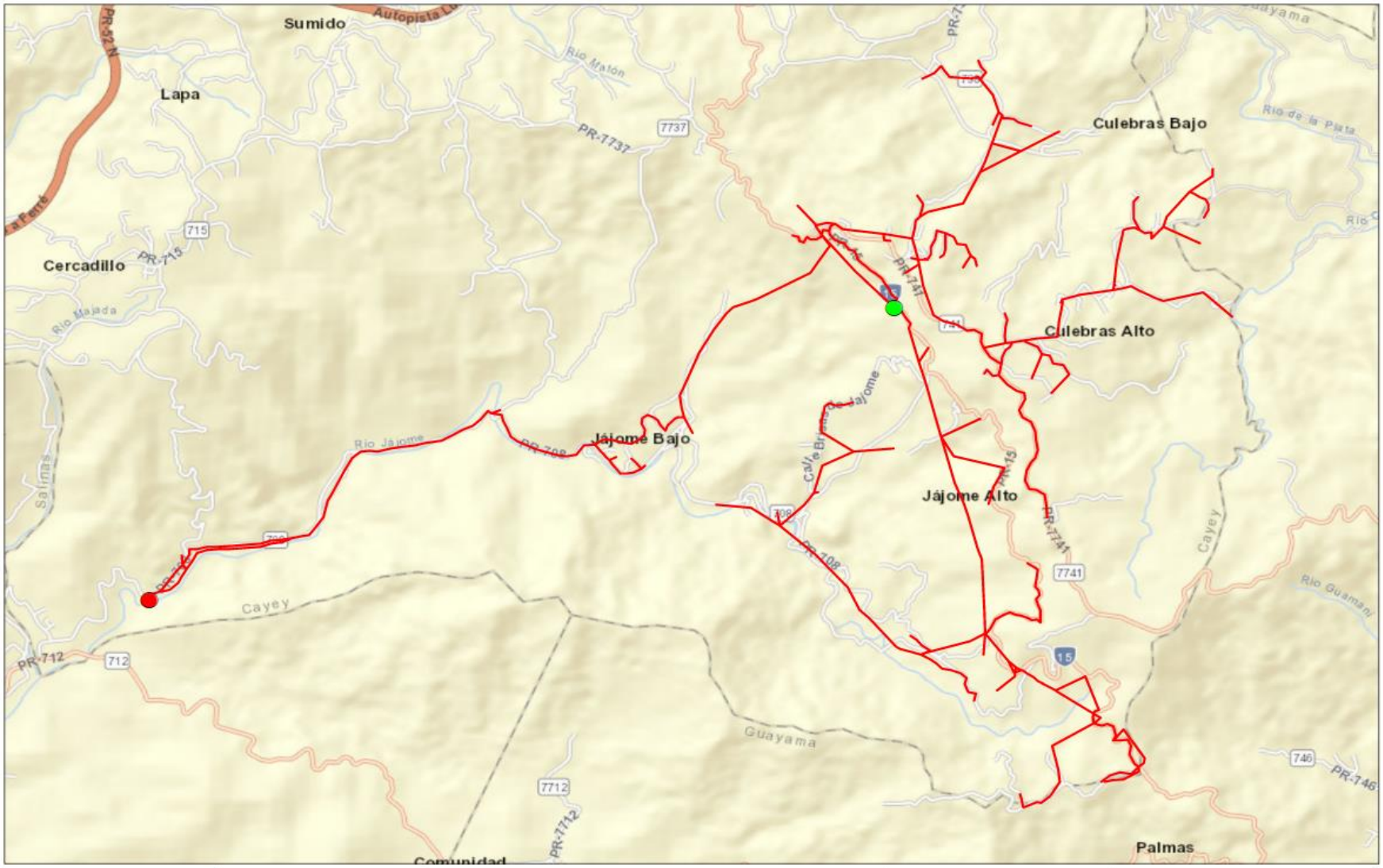
N

LUMA

Circuit 9605-01


Anones
Cedro Arriba
Doña Elena
Vista de San Andres
Palomas
Quebradillas
Comerio
Corozal
Barranquitas
Naranjito
Camino La Paloma
Camino Las Cruces
Camino El Banco
Camino La Kemer
Camino Las Orquideas
Camino La Galera
Carretera Palmarito
Camino Mulitas
PR-152
PR-811
PR-813
PR-814
PR-803
PR-805
PR-808
PR-809
PR-771
PR-773
PR-776
PR-778
Legend
Start Point
End Point
Circuit
1:49,650
0
0.4
0.8
1.6
Miles
N
LUMA
Circuit 9605-02


Villa de San Jose
Sect Valle Real
Praderas de Plata
Urb El Torito
Hacienda Vista del Plata
MANS de Monte Verde
Urb El Prado
BO Las Parras
JARD de Cayey 2
Urb Los Cedros
Urb La Planicie
Urb Las Muesas
REPTO Montellano
Urb Mirador Universitario
Cayey
BDA Vieques
JARD de Cayey 1
Monte Llano
Urb Mirador
Plaza Cayey
PR-1 S
PR-1 N
PR-52 S
PR-52 N
PR-731
PR-735
PR-738
PR-206
Calle Marginal
Avenida Miguel de Muesas
Autopista Luis a
Legend
Start Point
End Point
Circuit
1:17,990
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 3401-03



Legend

- Start Point
- End Point
- Circuit

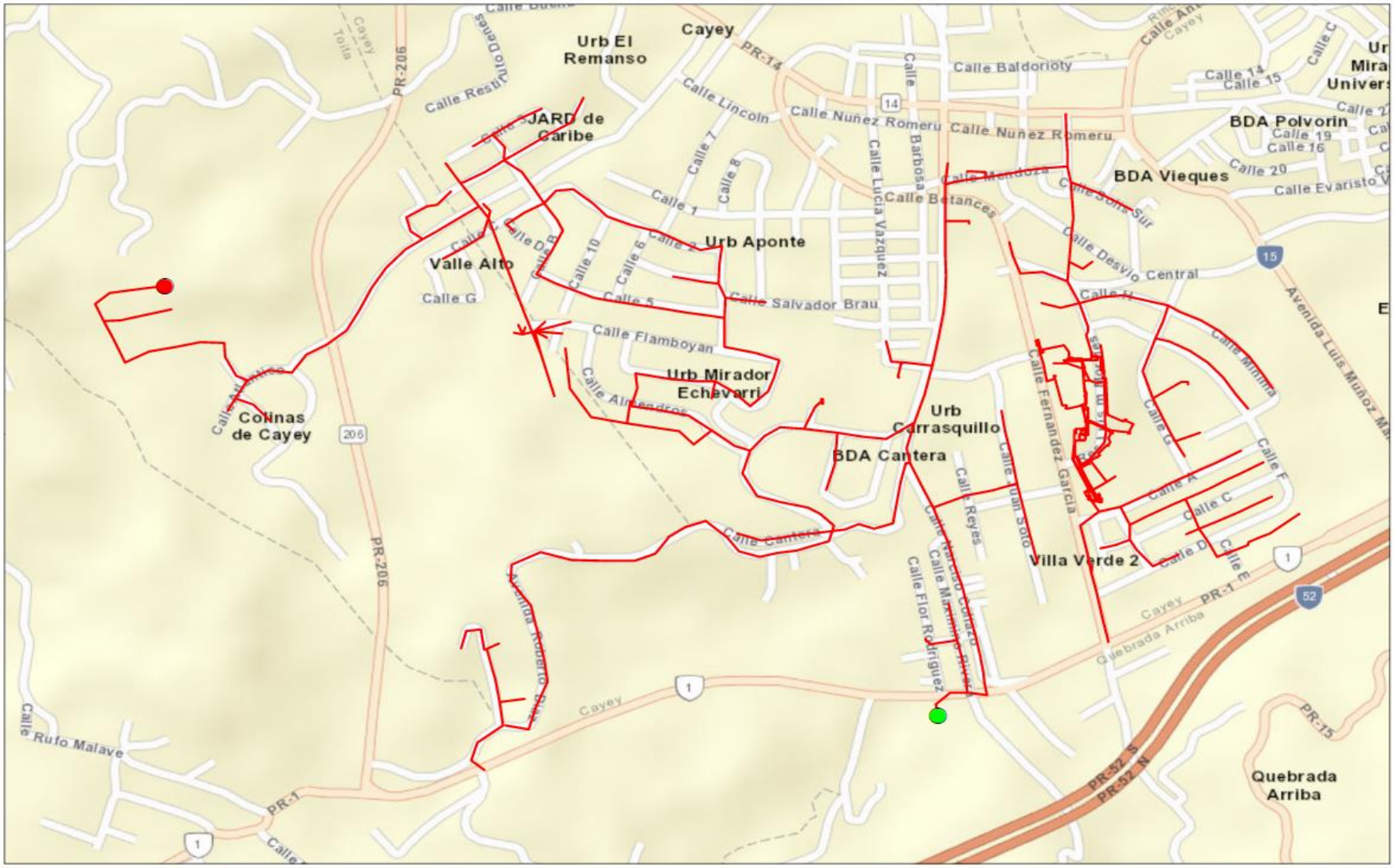
1:35,460

0 0.275 0.55 1.1 Miles

N

LUMA

Circuit 3403-01


Urb El Remanso
Cayey
JARD de Caribe
Urb Aponte
Valle Alto
Urb Mirador Echevarri
Urb Carrasquillo
BDA Cantera
BDA Vieques
BDA Polvorin
Villa Verde 2
Quebrada Arriba
Colinas de Cayey
Calle Lincoln
Calle Nuñez Romeru
Calle Baldorioty
Calle Salvador Brau
Calle Flamboyan
Calle Cantera
Calle Betances
Calle Mendoza
Calle Desvio Central
Avenida Luis Muñoz Marín
Avenida Roberto Sánchez
Calle Rufo Malave
PR-206
PR-14
PR-1
PR-15
PR-52
Legend
Start Point
End Point
Circuit
1:8,610
0 0.05 0.1 0.2
Miles
N
LUMA
Circuit 3405-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Caguas Short Term Group 11

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Caguas Short Term Group 11
Project Type:	Restoration to Codes/Standards
Region:	Caguas
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Caguas Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Caguas Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
COMSAT	3406-02	[redacted]		8.32
COMSAT	3406-03			8.32
CIDRA	3601-01			8.32
CIDRA	3601-03			8.32
LAS CRUCES	3602-01			8.32
LAS CRUCES	3602-02			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.91M**
Estimated Budget for Procurement & Construction:	**$29.13M**
Estimated Overall Budget for the Project:	**$32.04M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

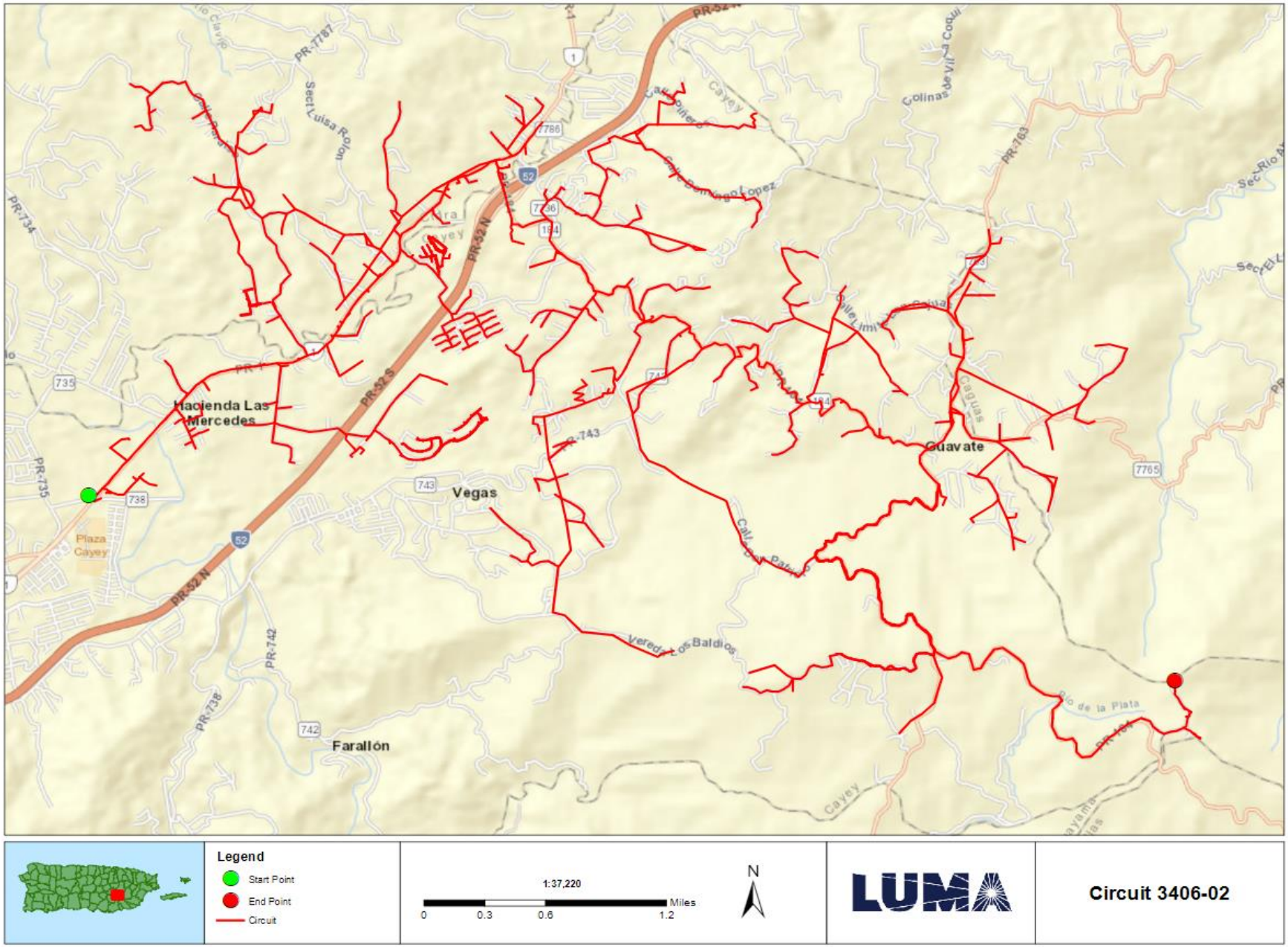
Note: If available, detailed engineering cost estimates will be included as an attachment.

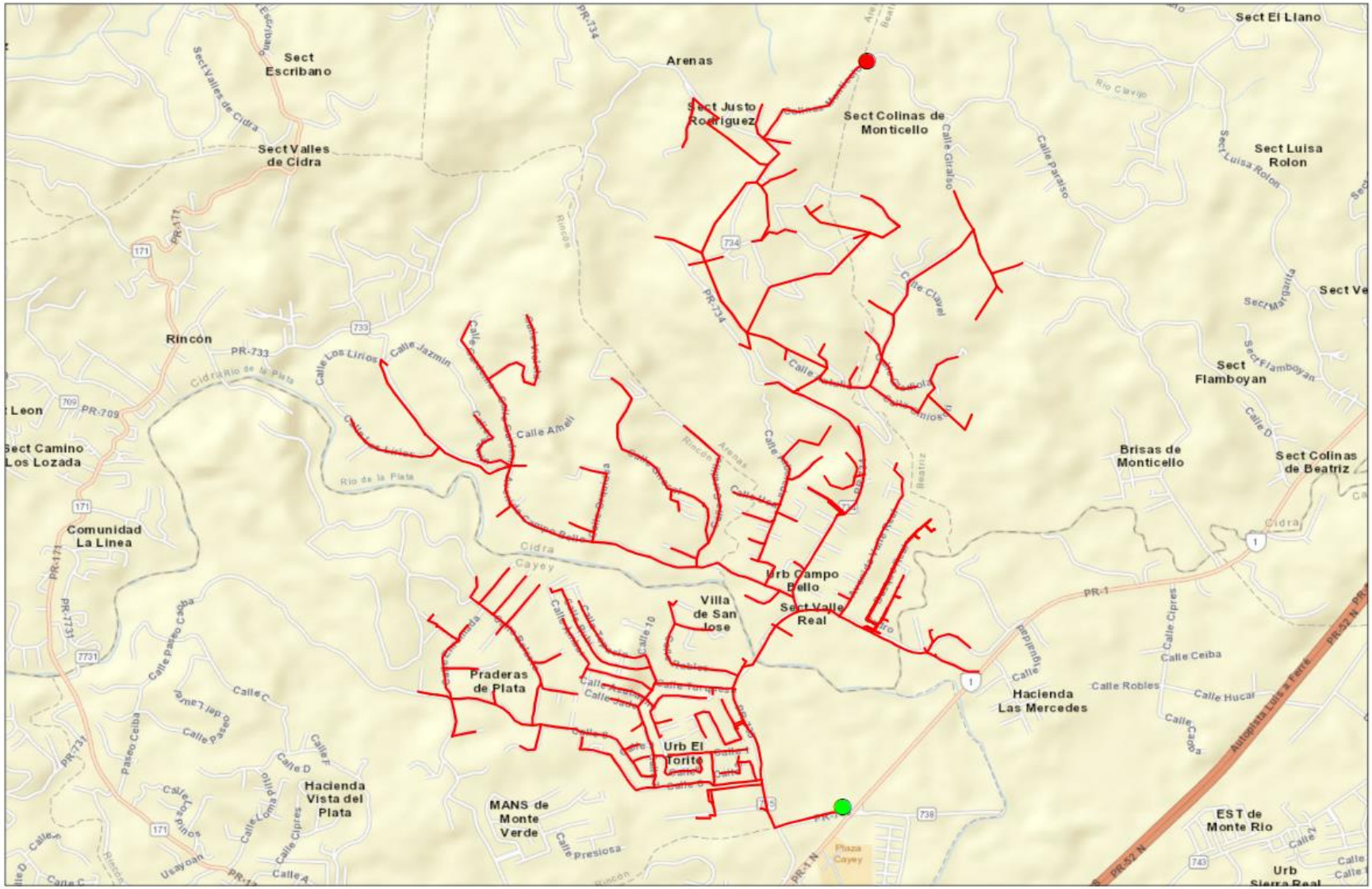
Environmental & Historic Preservation Requirements

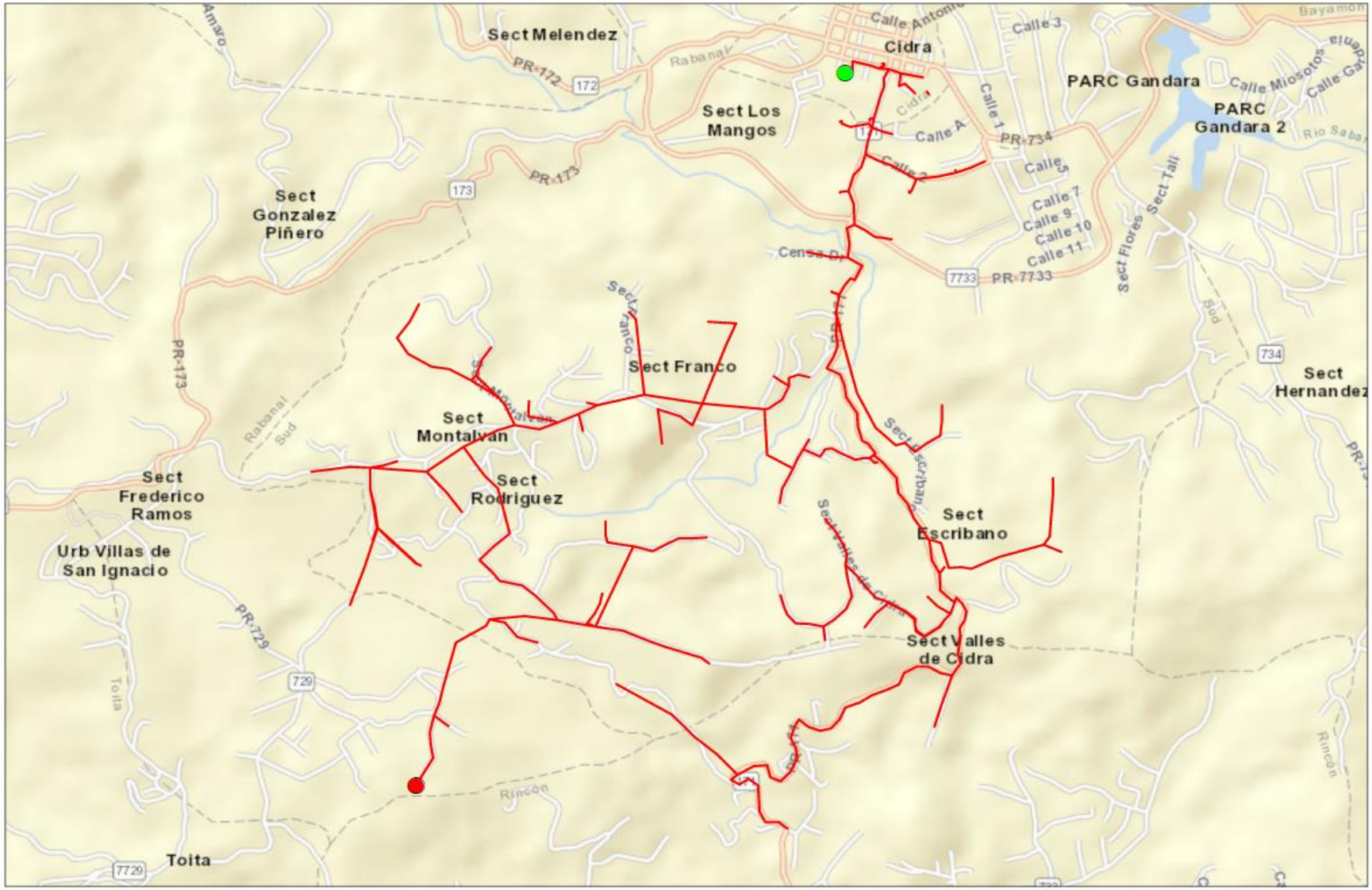
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

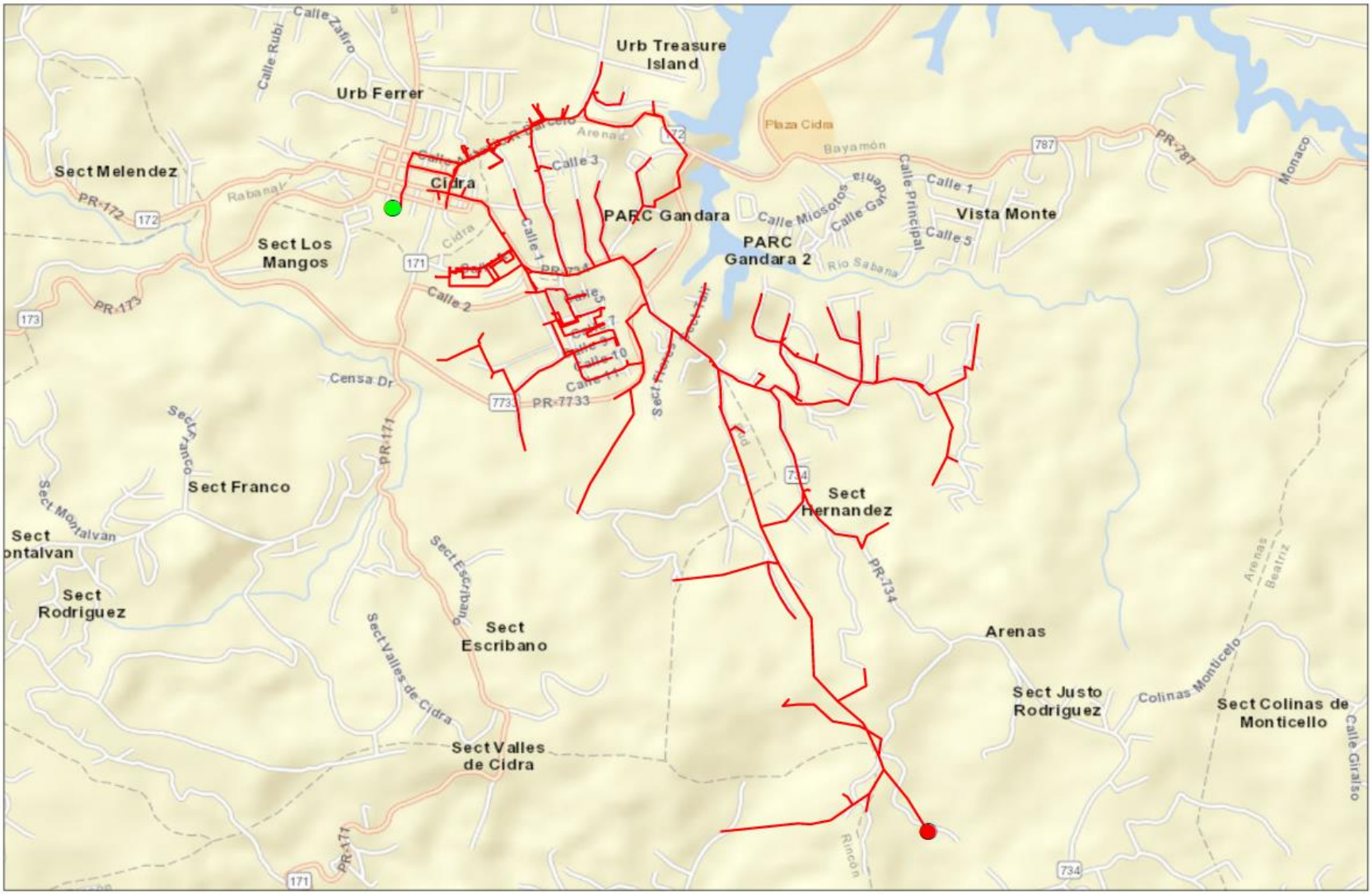
Attachments

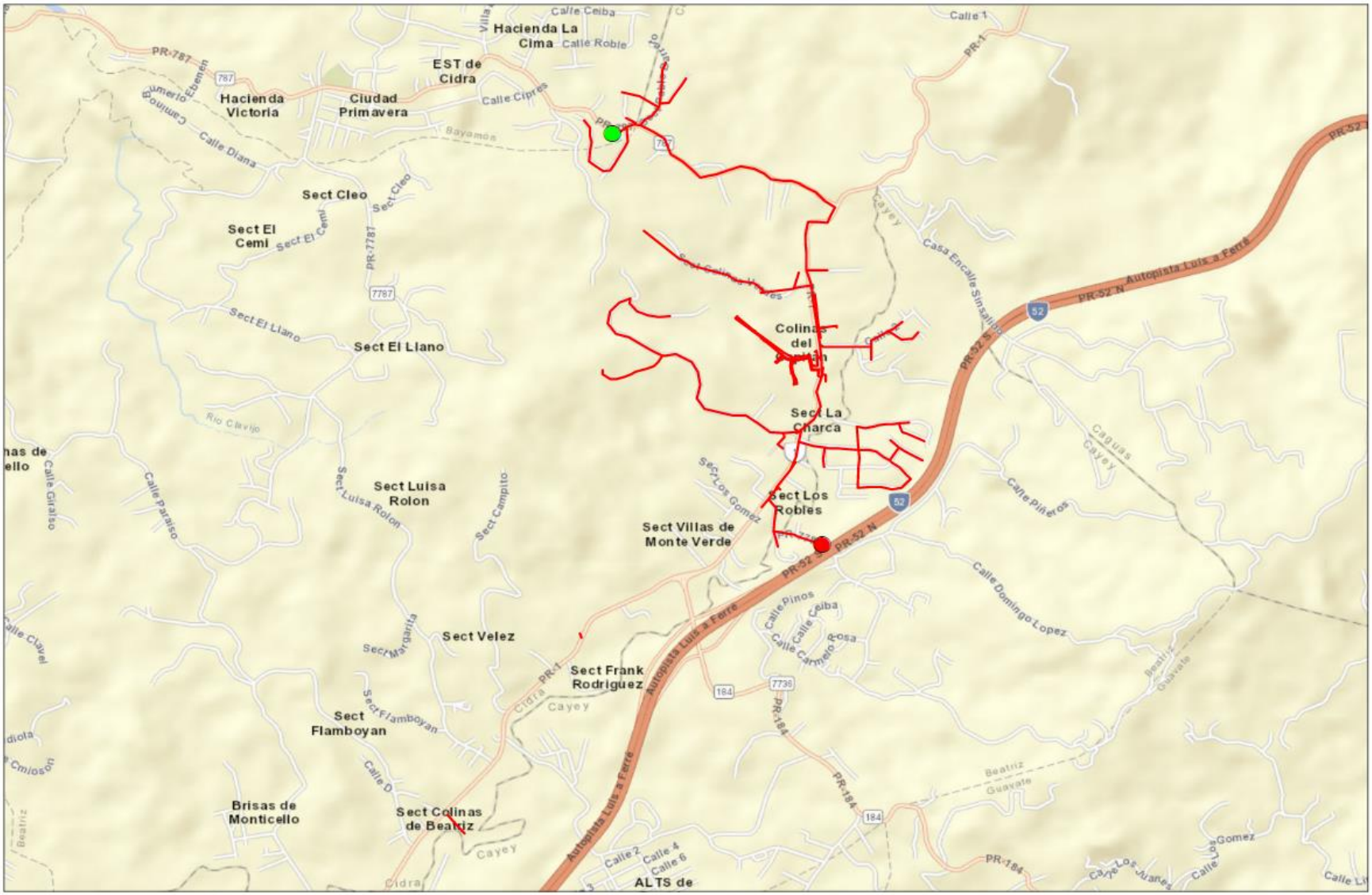
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Caguas Short Term Group 10 Location Maps	Location Maps and Site Picture

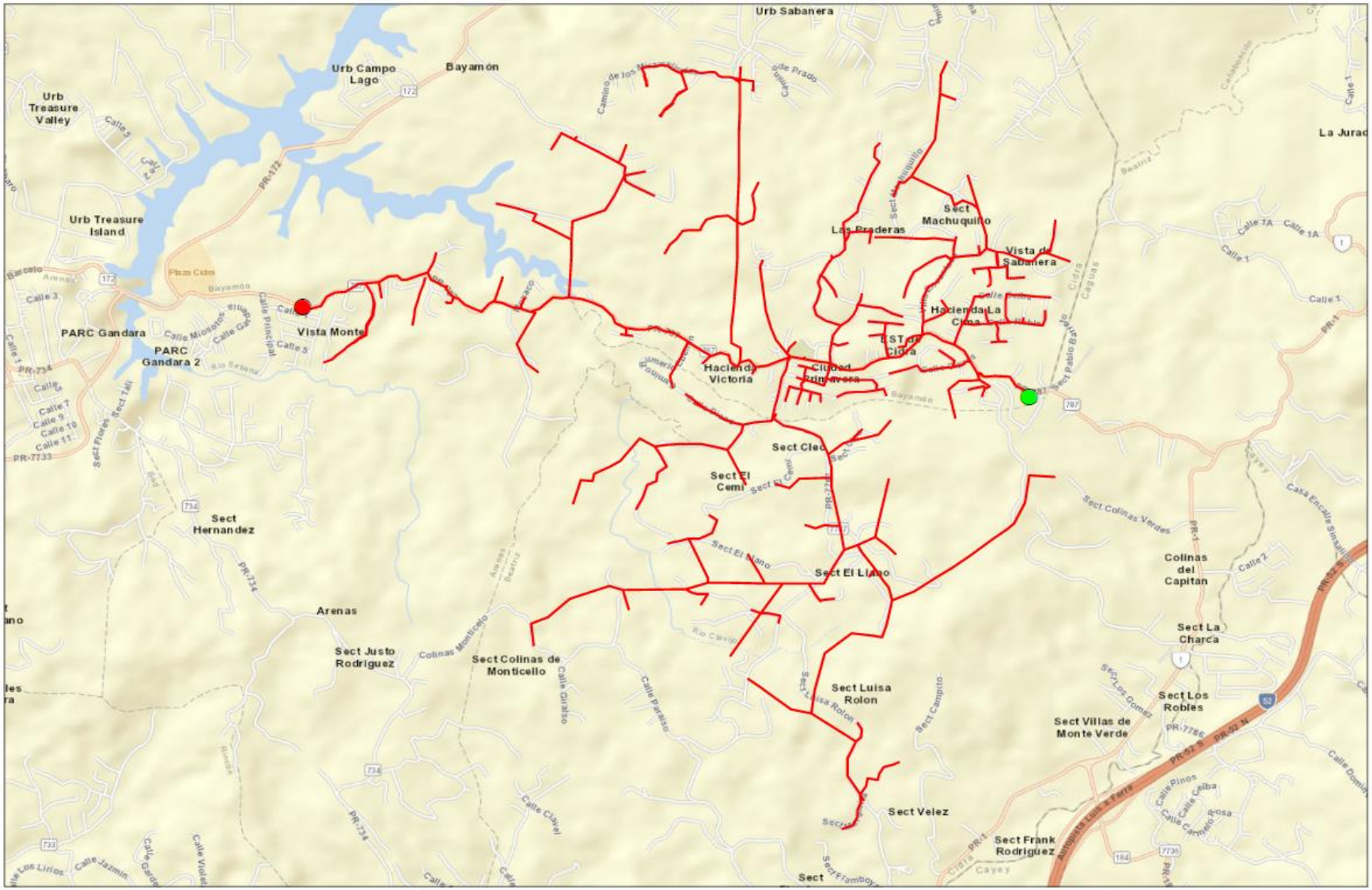

Hacienda Las Mercedes
Vegas
Guavate
Farallón
Plaza Cayey
PR-52 N
PR-52 S
PR-735
PR-734
PR-7787
PR-763
PR-743
PR-742
PR-738
Sect Luisa Rojas
Vereda los Baldios
Río de la Plata
Cayey
Caguas
Legend
Start Point
End Point
Circuit
1:37,220
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 3406-02


Sect Escribano
Arenas
Sect El Llano
Sect Justo Rodriguez
Sect Colinas de Monticello
Sect Valles de Cidra
Sect Luisa Rolon
Rincón
PR-733
Sect Flamboyan
Sect Camino Los Lozada
Brisas de Monticello
Sect Colinas de Beatriz
Comunidad La Linea
Urb Campo Bello
Villa de San Jose
Sect Valle Real
Praderas de Plata
Hacienda Las Mercedes
Urb El Torito
Hacienda Vista del Plata
MANS de Monte Verde
EST de Monte Rio
Urb Sierra Real
Calle Ahell
Calle Los Lirios
Calle Jazmin
Calle Ciruel
Calle Paraiso
Calle Giraldo
Calle Cipres
Calle Ceiba
Calle Robles
Calle Hucar
Calle Palma
Calle presiosa
Rio de la Plata
Rio Clavijo
Cidra
Cayey
Legend
Start Point
End Point
Circuit
1:23,060
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 3406-03


Sect Melendez
Cidra
PARC Gandara
PARC Gandara 2
Sect Los Mangos
Sect Gonzalez Piñero
Sect Franco
Sect Montalvan
Sect Rodriguez
Sect Escribano
Sect Valles de Cidra
Sect Frederico Ramos
Urb Villas de San Ignacio
Sect Hernandez
Toita
PR-172
PR-173
PR-175
PR-729
PR-734
PR-7733
Calle 1
Calle 3
Calle 5
Calle 7
Calle 9
Calle 10
Calle 11
Calle A
Rabanal
Rabanal Sud
Rincón
Legend
Start Point
End Point
Circuit
1:16,730
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 3601-01


Urb Treasure Island
Urb Ferrer
Calle Rubi
Calle Zafiro
Sect Melendez
Cidra
PARC Gandara
PARC Gandara 2
Vista Monte
Sect Los Mangos
Plaza Cidra
Bayamón
Río Sabana
Monaco
Calle 1
Calle 2
Calle 3
Calle 5
Calle 7
Calle 9
Calle 10
Calle 11
Calle Principal
Calle Miosotis
Calle Gardenia
Censa Dr
PR-172
PR-171
PR-173
PR-7733
PR-7734
PR-787
PR-134
Sect Franco
Sect Montalvan
Sect Rodriguez
Sect Escribano
Sect Valles de Cidra
Sect Hernandez
Arenas
Sect Justo Rodriguez
Colinas Monticello
Sect Colinas de Monticello
Calle Giralso
Arenas Beatriz
Rincon
Legend
Start Point
End Point
Circuit
1:17,660
0 0.125 0.25 0.5 Miles
N
LUMA
Circuit 3601-03


Hacienda La Cima
Calle Ceiba
Calle Roble
Calle 1
EST de Cidra
Hacienda Victoria
Ciudad Primavera
Calle Cipres
PR-787
Calle Diana
Bayamon
Sect Cleo
Sect El Cemi
PR-7787
Sect El Llano
Rio Cibuco
Sect Luisa Rolon
Sect Campito
Calle Paraiso
Calle Giralso
Sect Velez
Sect Margarita
Sect Flamboyan
Calle D
Brisas de Monticello
Sect Colinas de Beatriz
Cayey
Cidra
PR-1
Sect Frank Rodriguez
Autopista Luis a Ferre
Sect Los Gomez
Sect Villas de Monte Verde
Sect Los Robles
Sect La Charca
Colinas del Cibuco
Casa Encalle Sinsalida
PR-52 N
PR-52 S
Caguas
Calle Pinos
Calle Domingo Lopez
Calle Ceiba
Calle Carmelo Rosa
Beatriz
Guayate
7736
184
PR-184
Calle 2
Calle 4
Calle 6
ALTS de
Legend
Start Point
End Point
Circuit
1:21,870
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 3602-01


Urb Sabanera
Urb Campo Lago
Bayamon
Urb Treasure Valley
Urb Treasure Island
PARC Gandara
PARC Gandara 2
Vista Monte
Hacienda Victoria
Ciudad Primavera
Las Praderas
Sect Machuquino
Vista de Sabanera
Hacienda La Cima
EST de Cidra
Sect Cleo
Sect El Cemi
Sect El Llano
Sect Hernandez
Arenas
Sect Justo Rodriguez
Sect Colinas de Monticello
Sect Luisa Rolon
Sect Velez
Sect Frank Rodriguez
Sect Colinas Verdes
Colinas del Capitan
Sect La Charca
Sect Los Robles
Sect Villas de Monte Verde
Legend
Start Point
End Point
Circuit
1:26,350
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 3602-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Caguas Short Term Group 12

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Caguas Short Term Group 12
Project Type:	Restoration to Codes/Standards
Region:	Caguas
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Caguas Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Caguas Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CAGUAX	3009-01	[redacted]		8.32
VILLAS DE CASTRO	3013-03			8.32
RIO CAÑAS	3014-01			4.16
SABANERA II	3604-06			8.32
SABANERA II	3604-07			8.32
OROCOVIS	9902-03			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.84M**
Estimated Budget for Procurement & Construction:	**$28.38M**
Estimated Overall Budget for the Project:	**$31.22M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

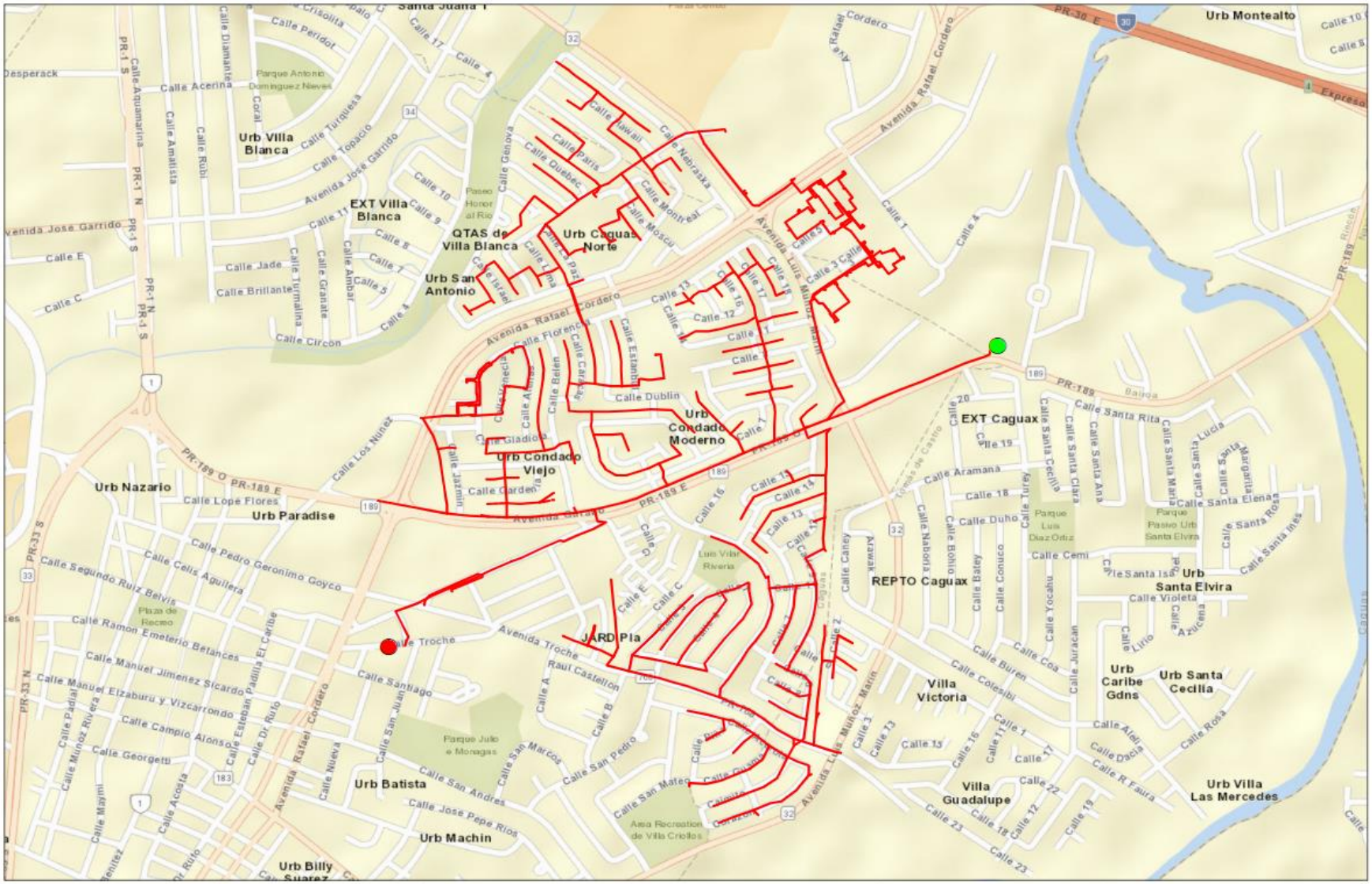
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Caguas Short Term Group 12 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

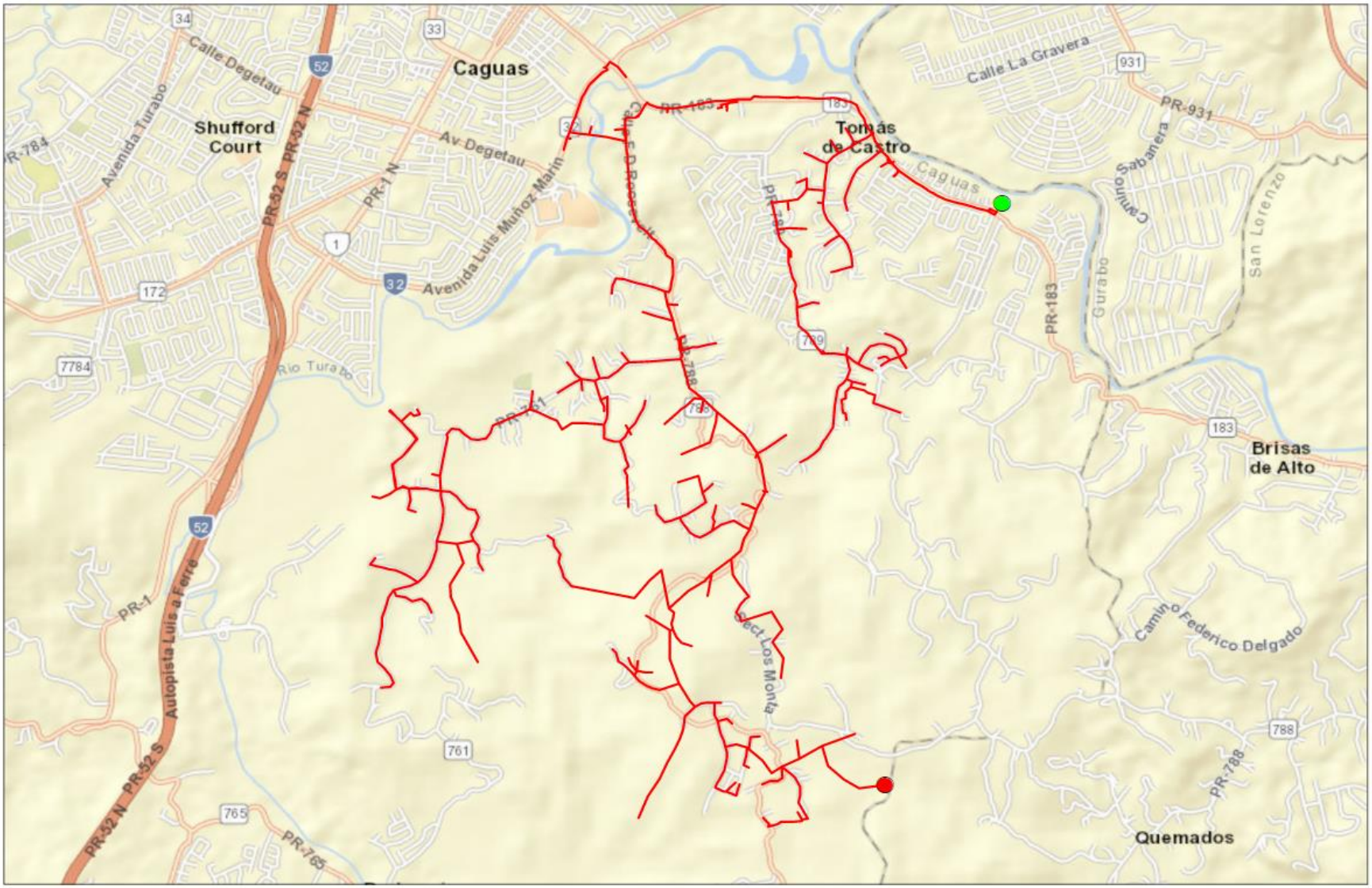
1:11,760

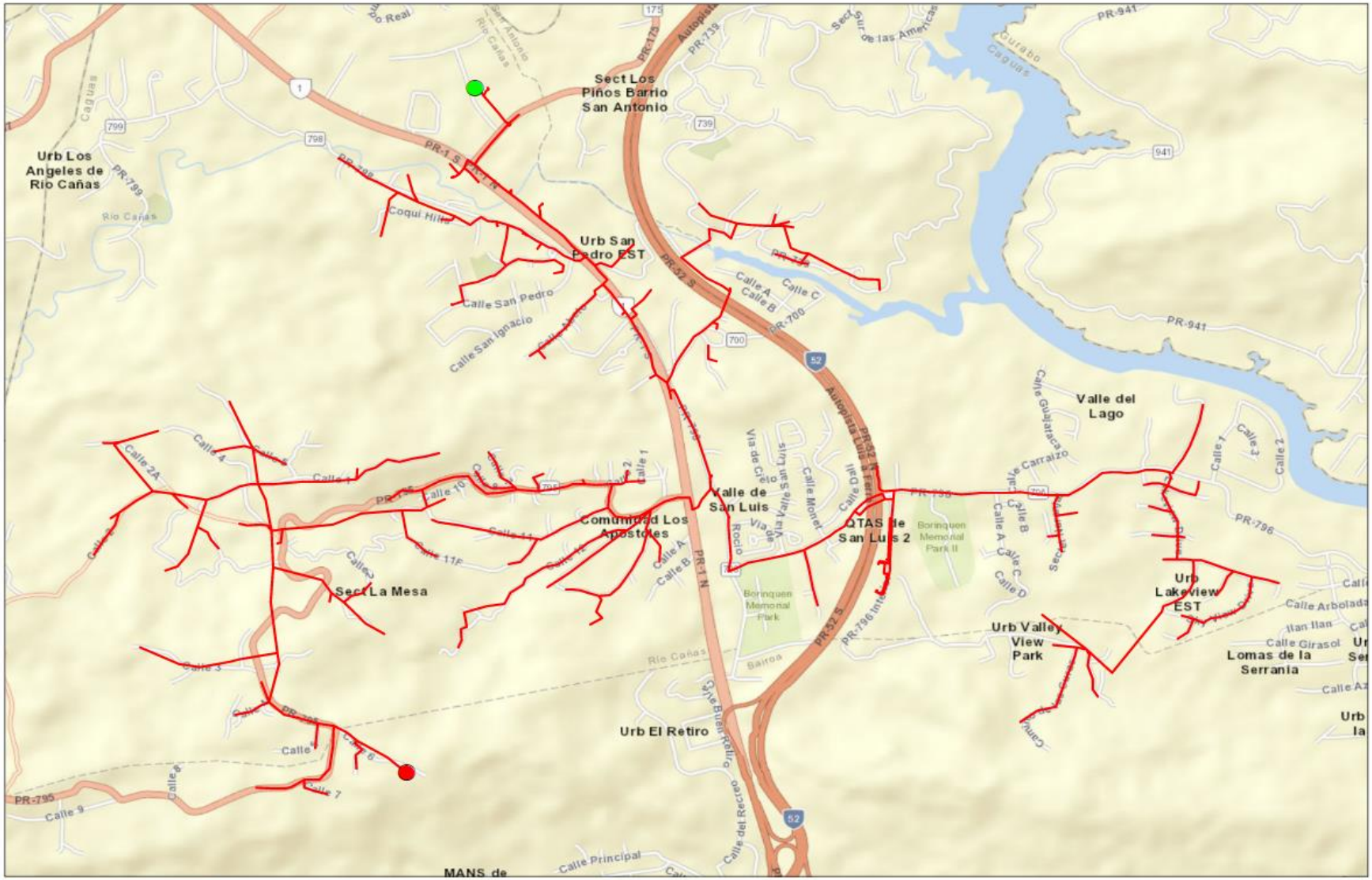
0 0.075 0.15 0.3 Miles

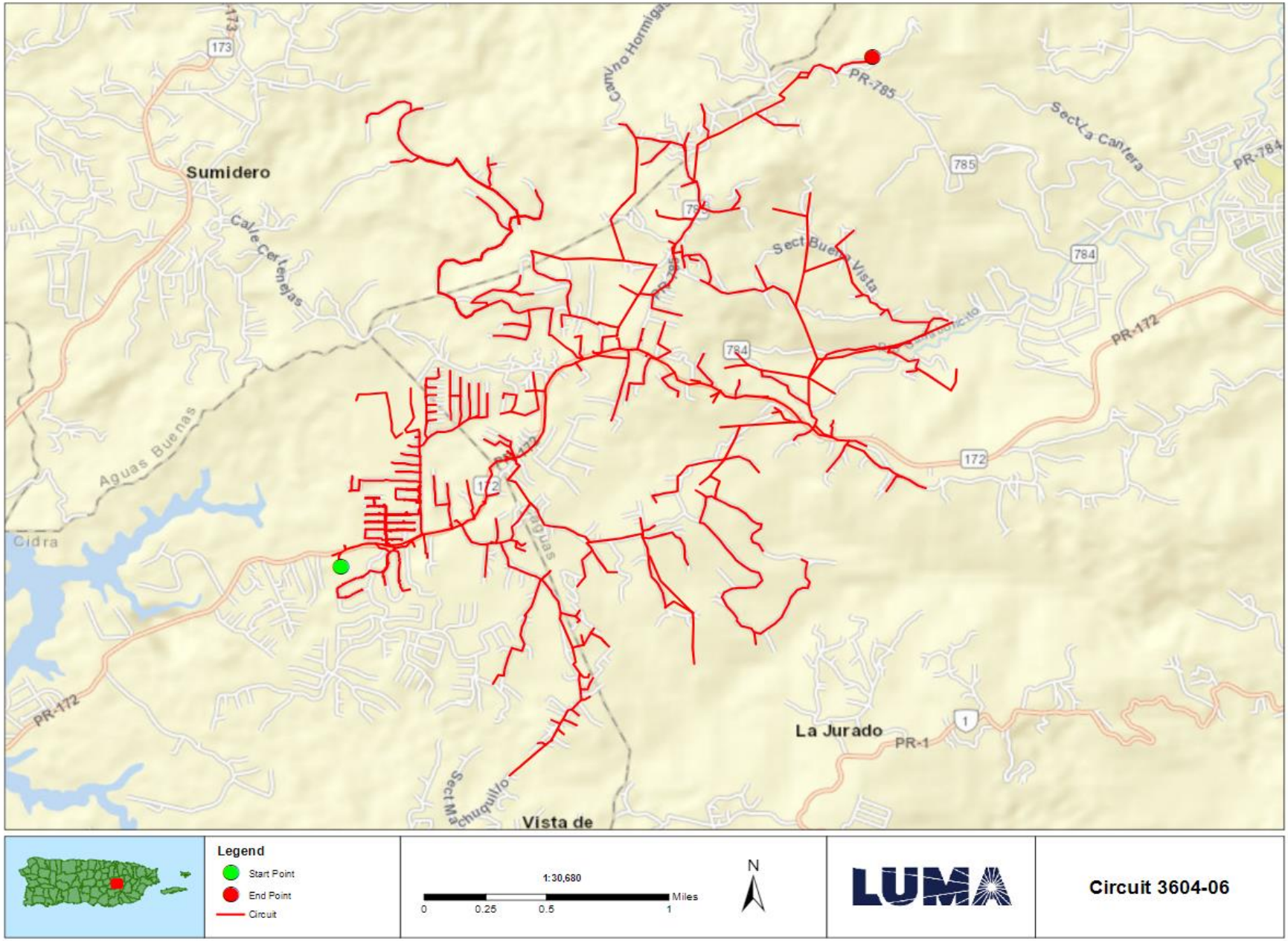
N

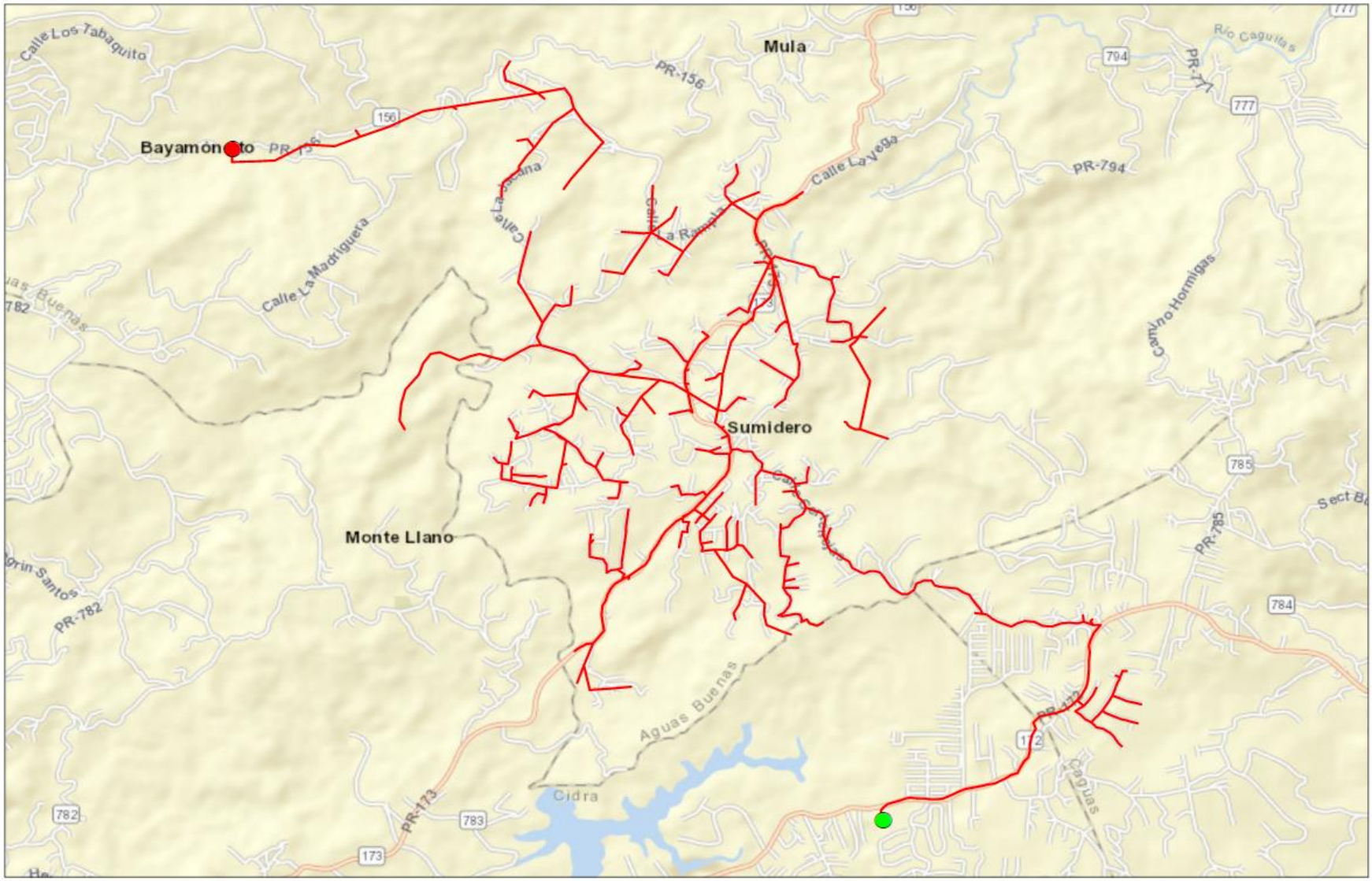
LUMA

Circuit 3009-01


Caguas
Shufford Court
Tomás de Castro
Brisas de Alto
Quemados
Calle Degetau
Avenida Turabo
Av. Degetau
Avenida Luis Muñoz Marín
Calle La Gravera
PR-931
Camino Sabanera
San Lorenzo
Río Turabo
PR-183
PR-1
PR-52 S
PR-52 N
Autopista Luis a Ferré
Camino Federico Delgado
PR-788
PR-765
Sect. Los Monta
Legend
Start Point
End Point
Circuit
1:30,860
0
0.25
0.5
1
Miles
N
LUMA
Circuit 3013-03


Sect Los Piños Barrio San Antonio
Urb Los Angeles de Rio Cañas
Urb San Pedro EST
Valle del Lago
Valle de San Luis
Comunidad Los Apostoles
QTAS de San Luis 2
Sect La Mesa
Urb Lakeview EST
Urb Valley View Park
Lomas de la Serrania
Urb El Retiro
Legend
Start Point
End Point
Circuit
1:21,640
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 3014-01


Sumidero
Calle Cerezas
Aguas Buenas
Cidra
PR-172
Camino Hormigas
PR-785
Sect La Cantera
PR-784
Sect Buena Vista
PR-172
La Jurado
PR-1
Sect Machuquillo
Vista de
173
785
784
172
1
Legend
Start Point
End Point
Circuit
1:30,680
0
0.25
0.5
1
Miles
N
LUMA
Circuit 3604-06



Legend

- Start Point
- End Point
- Circuit

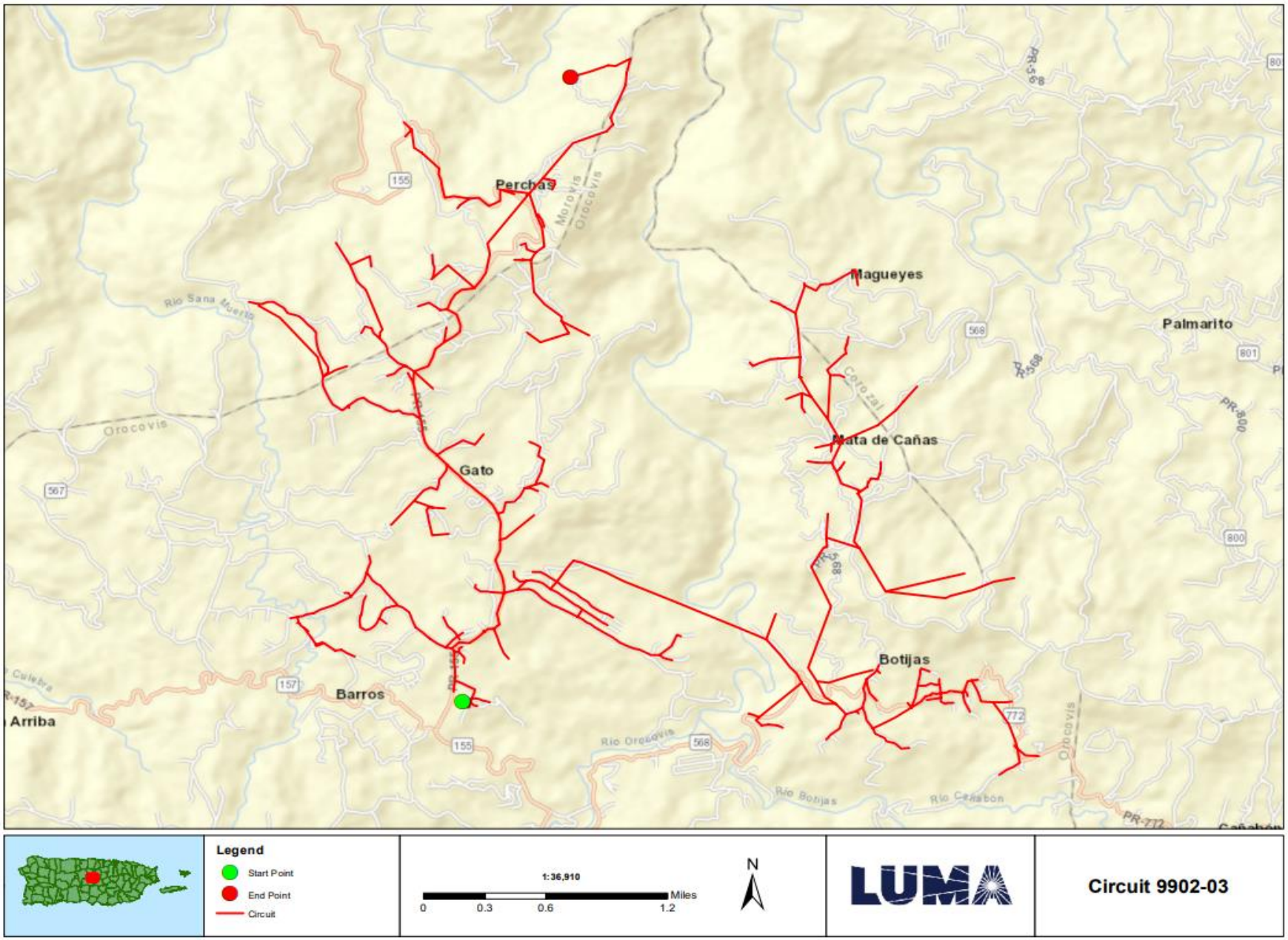
1:32,480

0 0.25 0.5 1 Miles

N

LUMA

Circuit 3604-07


Perchas
Magueyes
Palmarito
Mata de Cañas
Gato
Botijas
Barros
Arriba
Orocovis
Rio Sana Muerto
Rio Orocovis
Rio Botijas
Rio Cañabon
Legend
Start Point
End Point
Circuit
1:36,910
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 9902-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 3

Revision: 0

Date: 06JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 3
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
ARECIBO HOSP. DISTR. 13KV	8015-09	[redacted]	[redacted]	13.2
ARECIBO DISTR. HOSPITAL	8001-01	[redacted]	[redacted]	4.16
CAMBALACHE	8004-02	[redacted]	[redacted]	4.16
CAMBALACHE	8004-03	[redacted]	[redacted]	4.16
CAMBALACHE	8004-04	[redacted]	[redacted]	4.16
DOS BOCAS	8005-01	[redacted]	[redacted]	4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$3.15M**
Estimated Budget for Procurement & Construction:	**$31.47M**
Estimated Overall Budget for the Project:	**$34.62M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

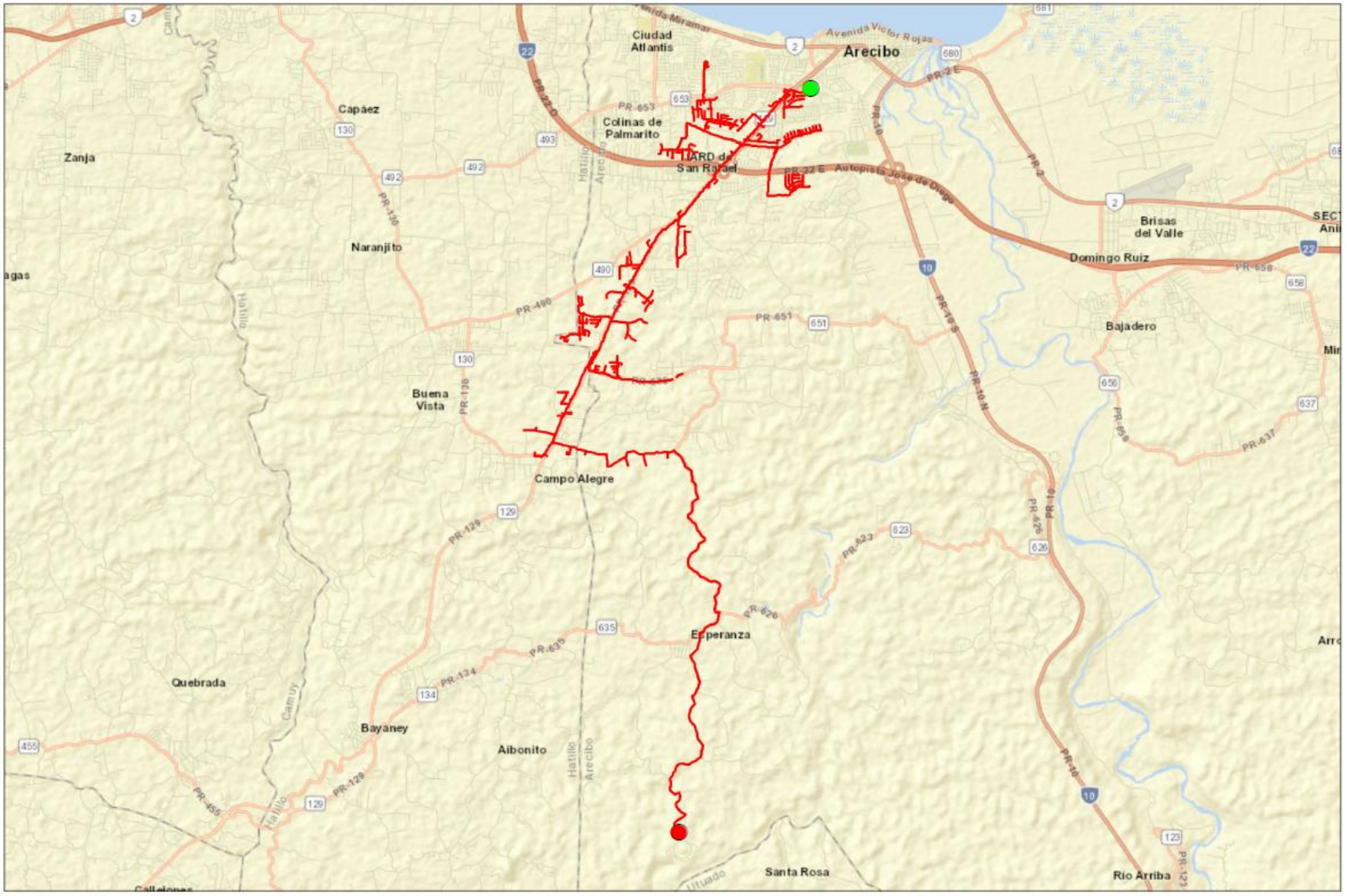
Note: If available, detailed engineering cost estimates will be included as an attachment.

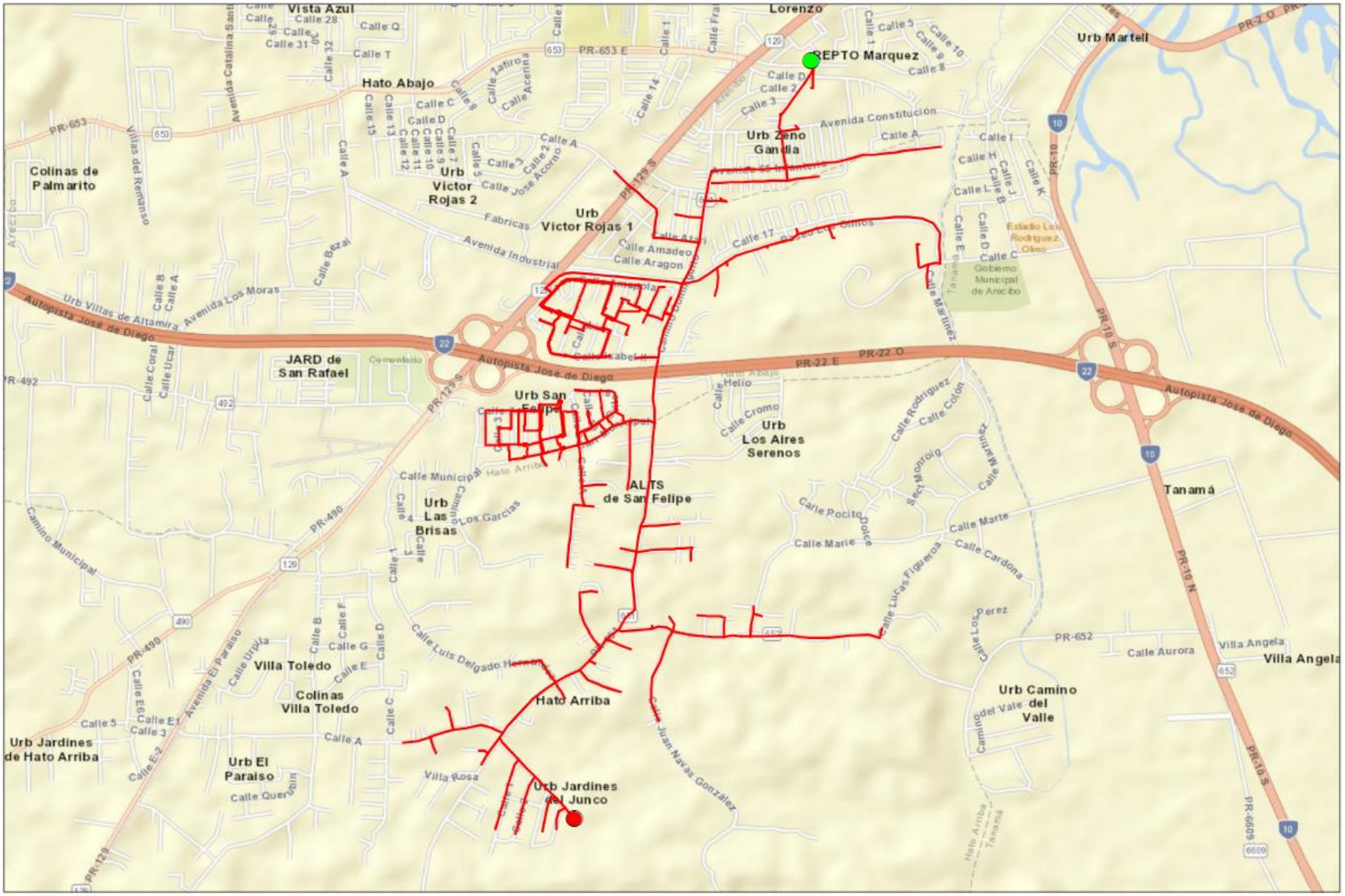
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 3 Location Maps	Location Maps and Site Picture


Arecibo
Ciudad Atlantis
Avenida Miramar
Avenida Victor Rojas
Capáez
Zanja
Naranjito
Colinas de Palmarito
JARD de San Rafael
Autopista Luis A. Ferré
Brisas del Valle
Domingo Ruiz
Bajadero
Buena Vista
Campo Alegre
Esperanza
Quebrada
Bayaney
Aibonito
Santa Rosa
Río Arriba
Hatillo
Camuy
Arecibo
PR-2
PR-22
PR-10
PR-129
PR-130
PR-134
PR-455
PR-490
PR-651
PR-653
PR-658
PR-637
PR-626
PR-623
PR-625
PR-629
PR-492
PR-493
PR-656
PR-681
PR-680
PR-123
Legend
Start Point
End Point
Circuit
1:83,840
0 0.5 1 2
Miles
N
LUMA
Circuit 8015-09


Vista Azul
Hato Abajo
Lorenzo
REPTO Marquez
Urb Martell
Urb Zeno Gandia
Avenida Constitución
Colinas de Palmarito
Urb Victor Rojas 2
Urb Victor Rojas 1
Avenida Industrial
Fabricas
Calle Amadeo
Calle Aragon
Urb Villas de Altamira
Avenida Los Moras
Autopista José de Diego
PR-22 E
PR-22 O
JARD de San Rafael
Cementerio
Urb San Felipe
Urb Los Aires Serenos
ALTS de San Felipe
Tanamá
Urb Las Brisas
Calle Municipal
Hato Arriba
Camino Municipal
PR-490
PR-129 S
PR-653 E
PR-653
PR-492
Villa Toledo
Colinas Villa Toledo
Urb Jardines de Hato Arriba
Urb El Paraiso
Villa Rosa
Urb Jardines del Junco
Urb Camino del Valle
Villa Angela
Calle Aurora
PR-652
PR-10 N
PR-10 S
Gobierno Municipal de Arecibo
Estadio Luis Rodriguez Olmo
Legend
Start Point
End Point
Circuit
1:22,500
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 8001-01

Legend

- Start Point
- End Point
- Circuit

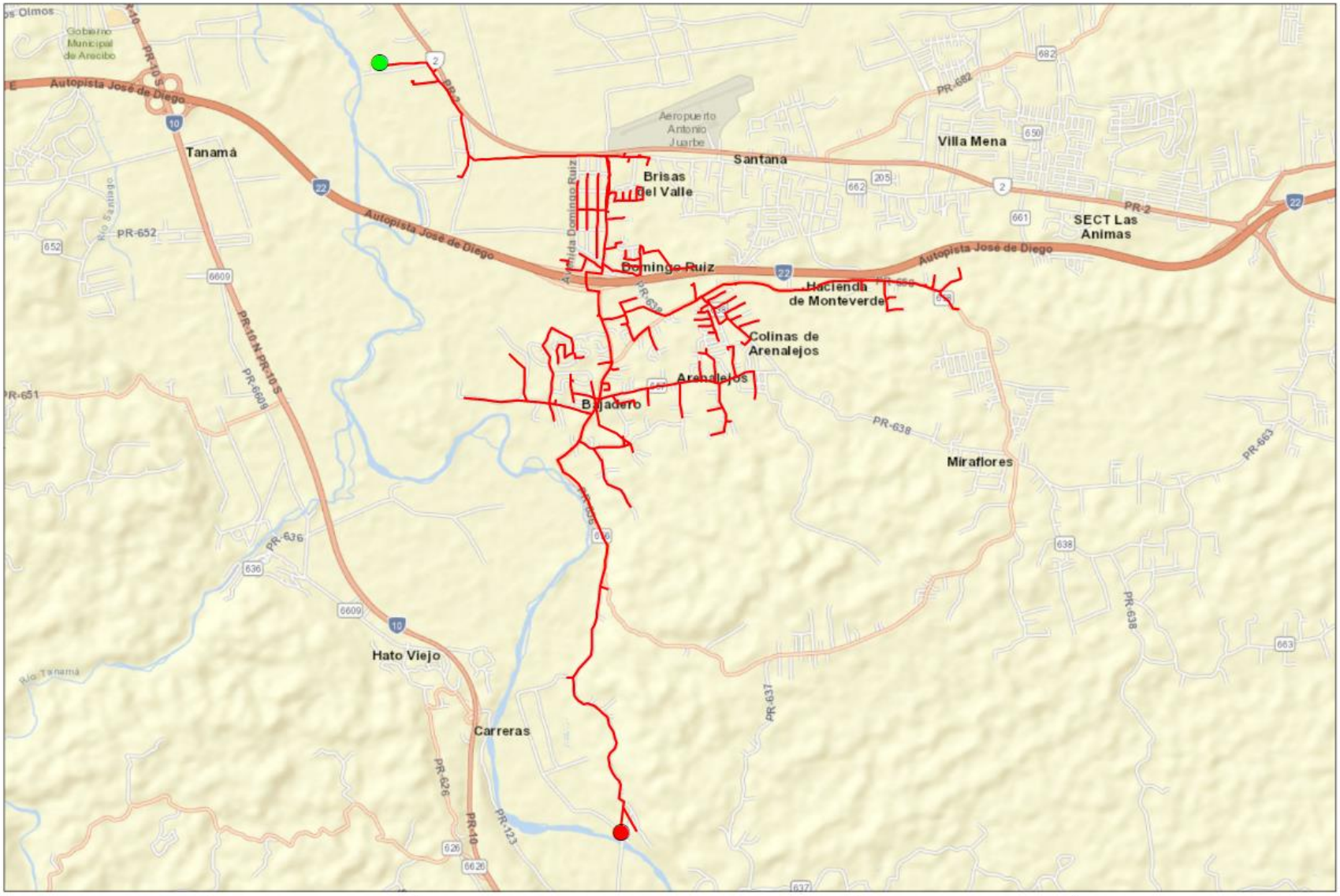
1:55,350

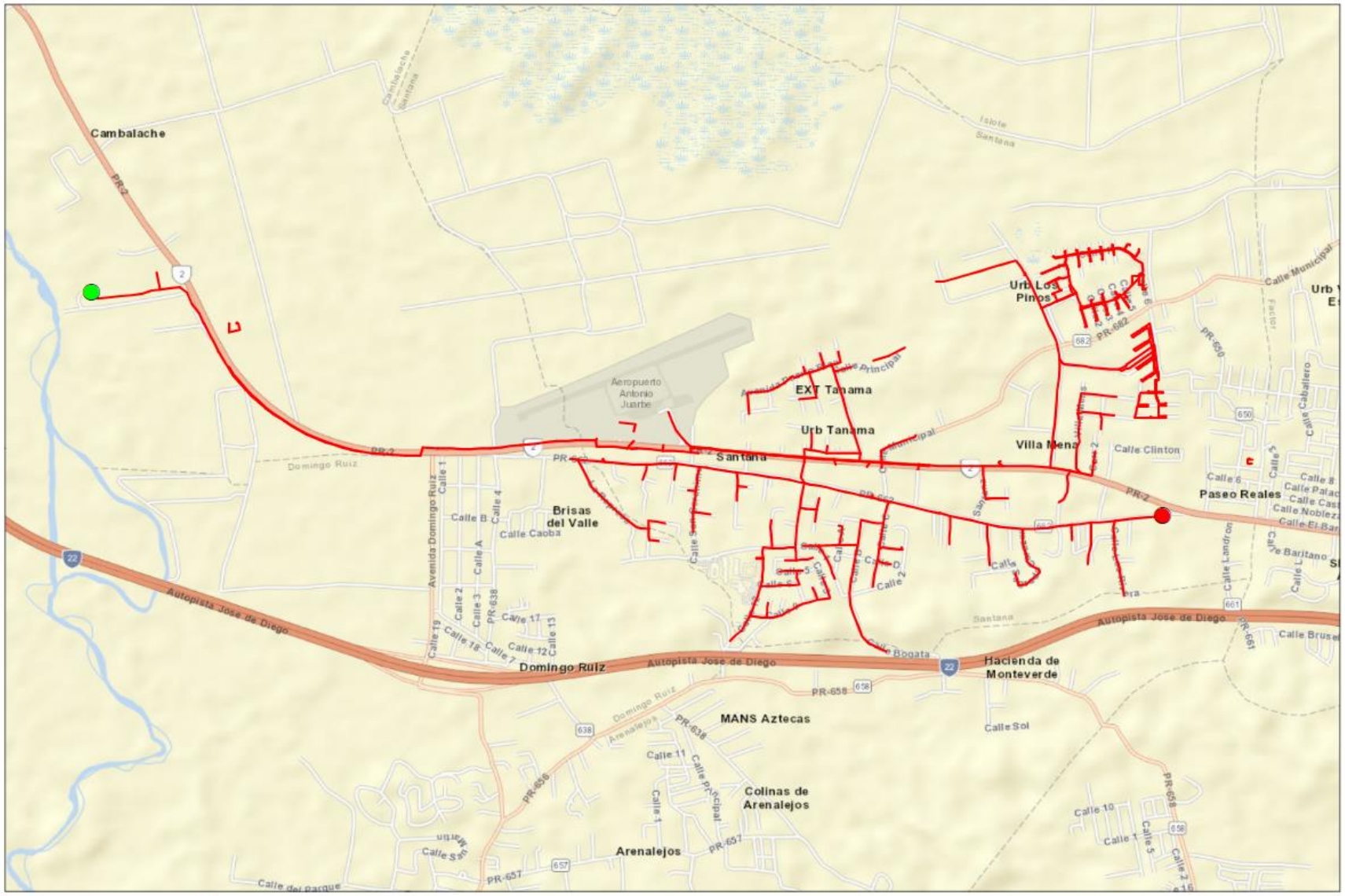
0 0.45 0.9 1.8 Miles

N

LUMA

Circuit 8004-02


Autopista José de Diego
Tanamá
Santana
Villa Mena
Brisas
Del Valle
Domingo Ruiz
Hacienda
de Monteverde
Colinas de
Arenalejos
Arenalejos
Bajadero
SECT Las
Animas
Miraflores
Hato Viejo
Carreras
PR-652
PR-651
PR-636
PR-638
PR-637
PR-626
PR-123
PR-682
PR-663
Río Tanamá
Río Santiago
Legend
Start Point
End Point
Circuit
1:42,140
0
0.35
0.7
1.4
Miles
N
LUMA
Circuit 8004-03



Legend

- Start Point
- End Point
- Circuit

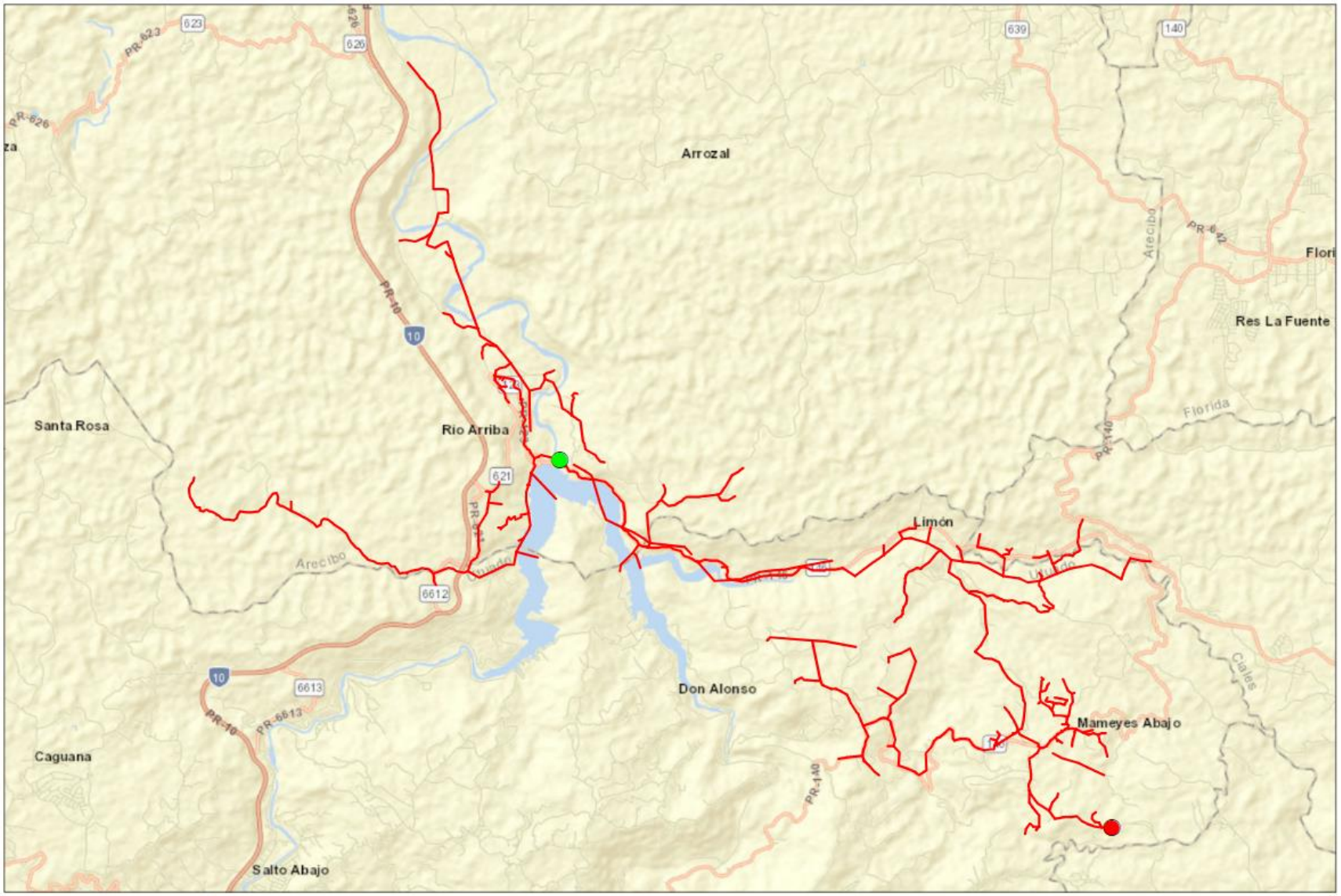
1:23,910

0 0.175 0.35 0.7 Miles

N

LUMA

Circuit 8004-04



Legend

- Start Point
- End Point
- Circuit

1:71,360

0 0.5 1 2 Miles

N

LUMA

Circuit 8005-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 4

Revision: 0

Date: 09JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	09JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 4
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
MIRADOR AZUL	8007-01	[redacted]		7.2
MIRADOR AZUL	8007-03			7.2
DOMINGUITO	8010-02			4.16
DOMINGUITO	8010-03			7.2
FACTOR 1	8011-01			4.16
SAN DANIEL	8013-02			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.86M**
Estimated Budget for Procurement & Construction:	**$28.58M**
Estimated Overall Budget for the Project:	**$31.44M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

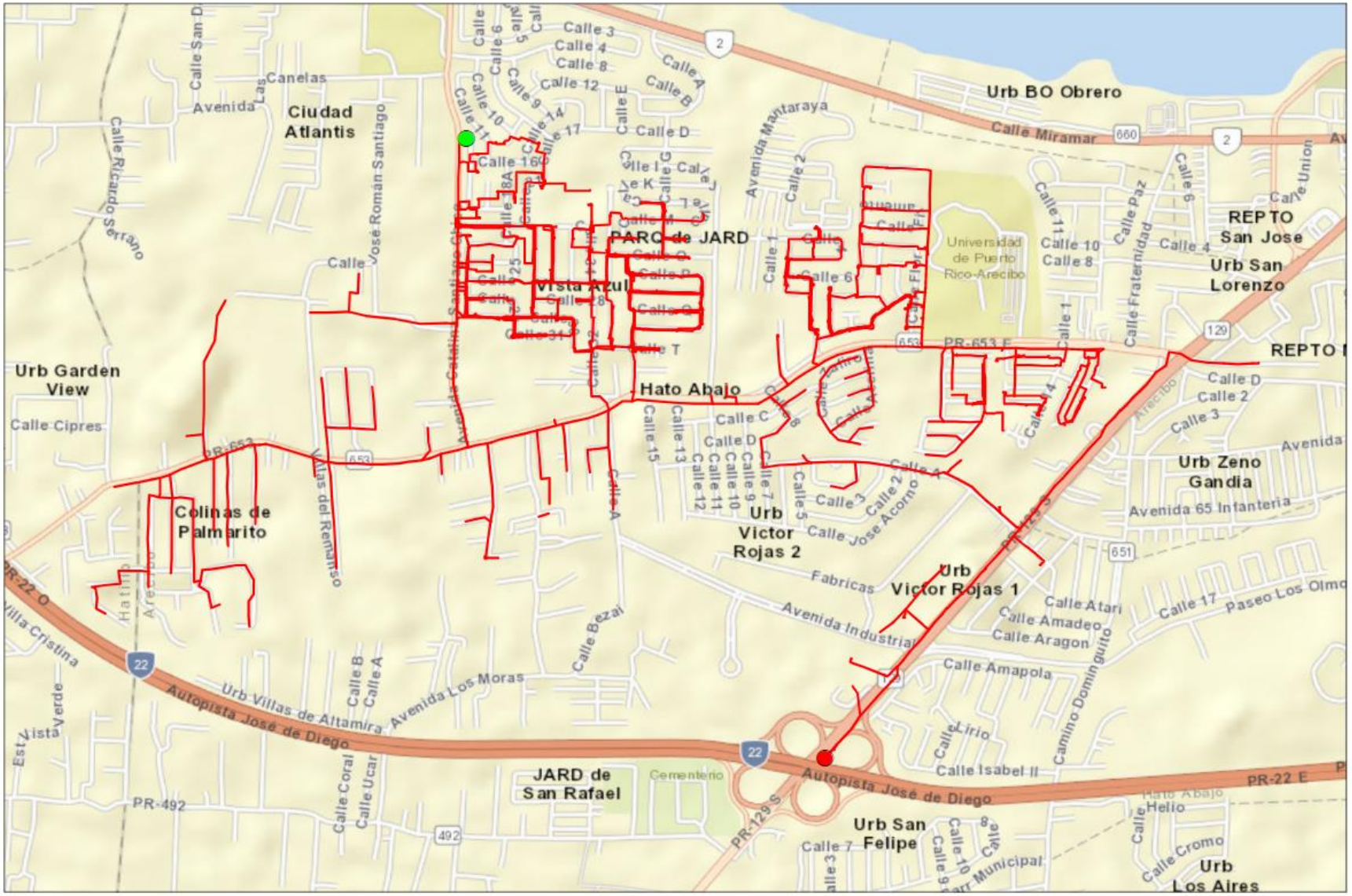
Note: If available, detailed engineering cost estimates will be included as an attachment.

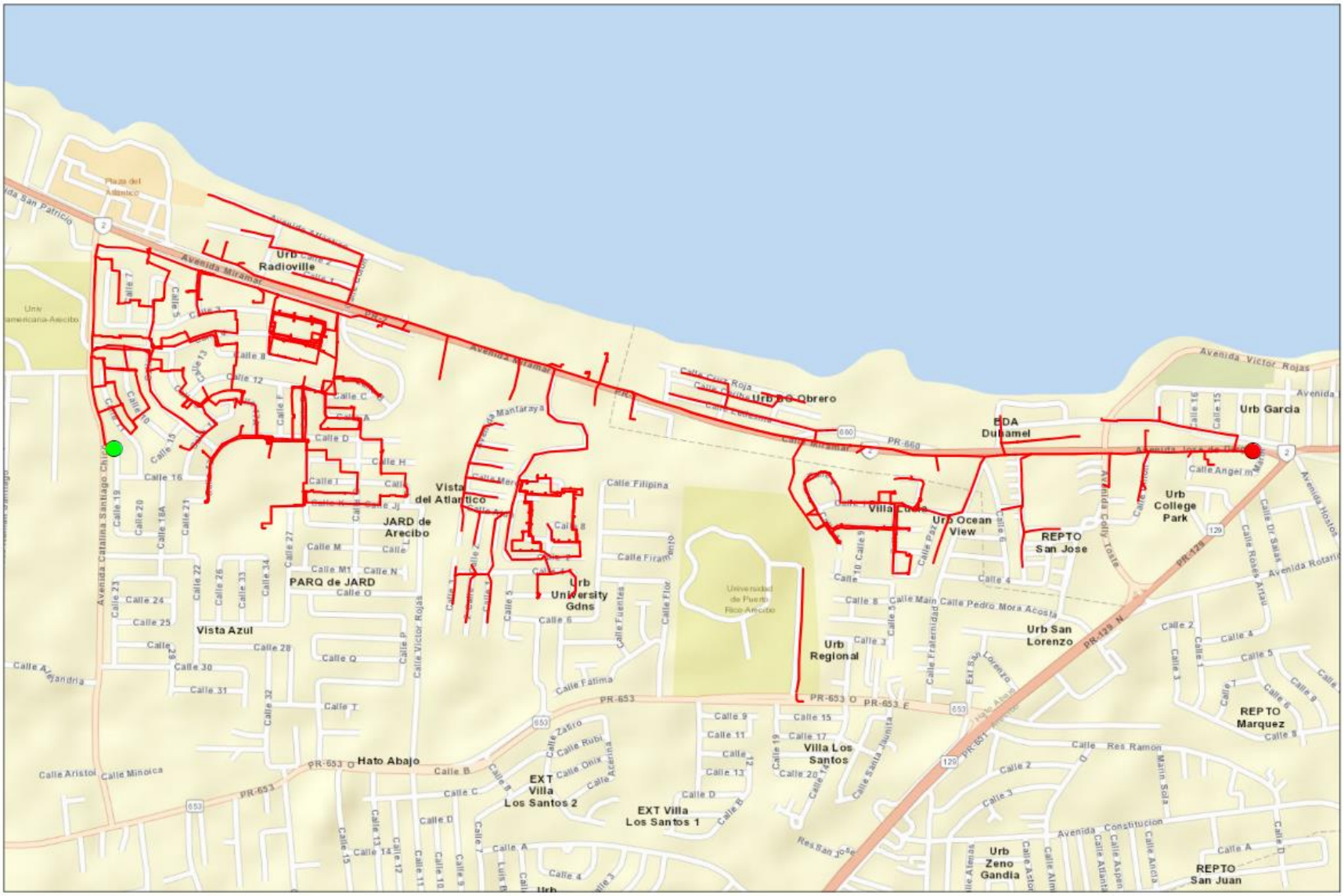
Environmental & Historic Preservation Requirements

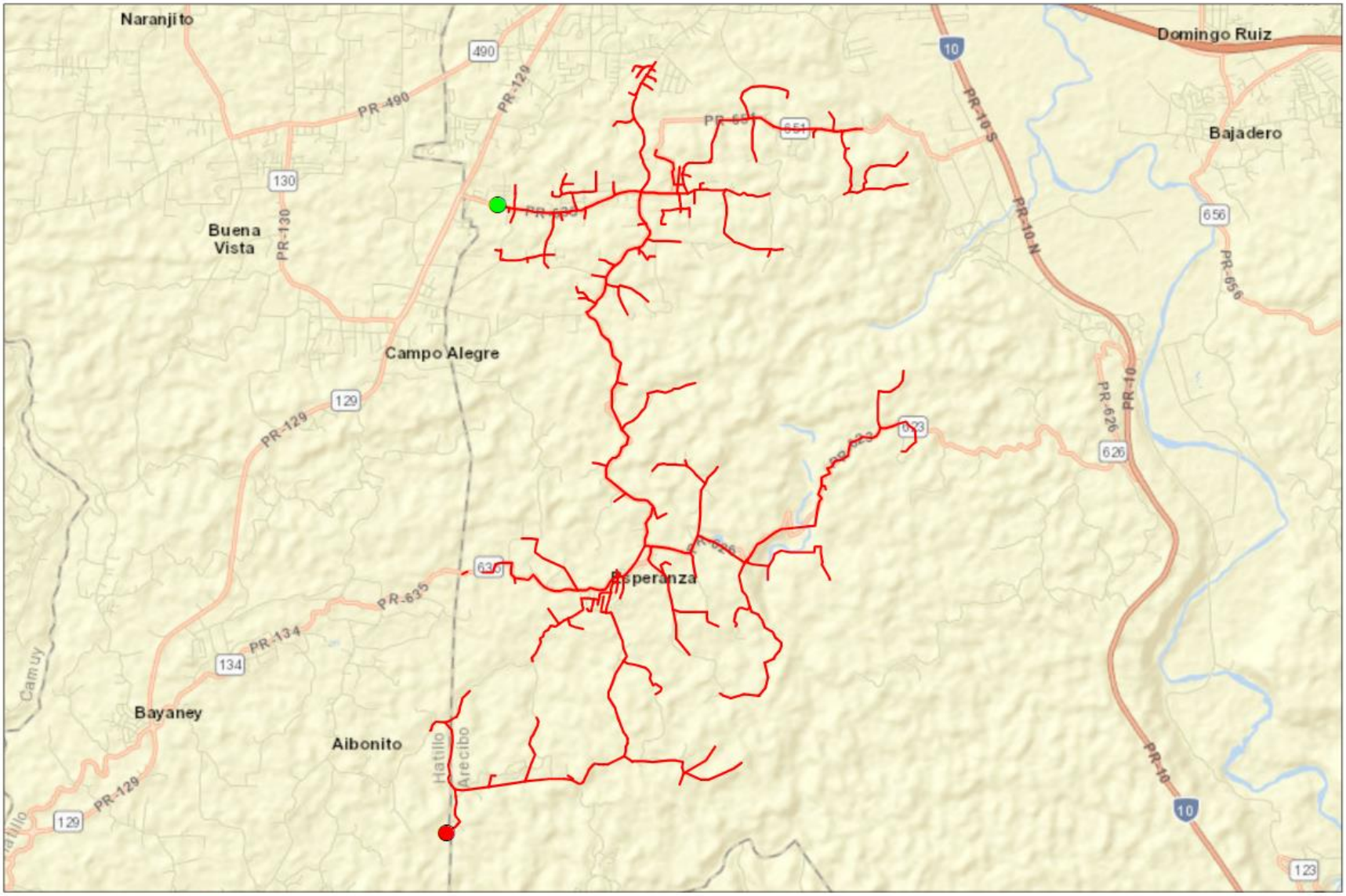
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

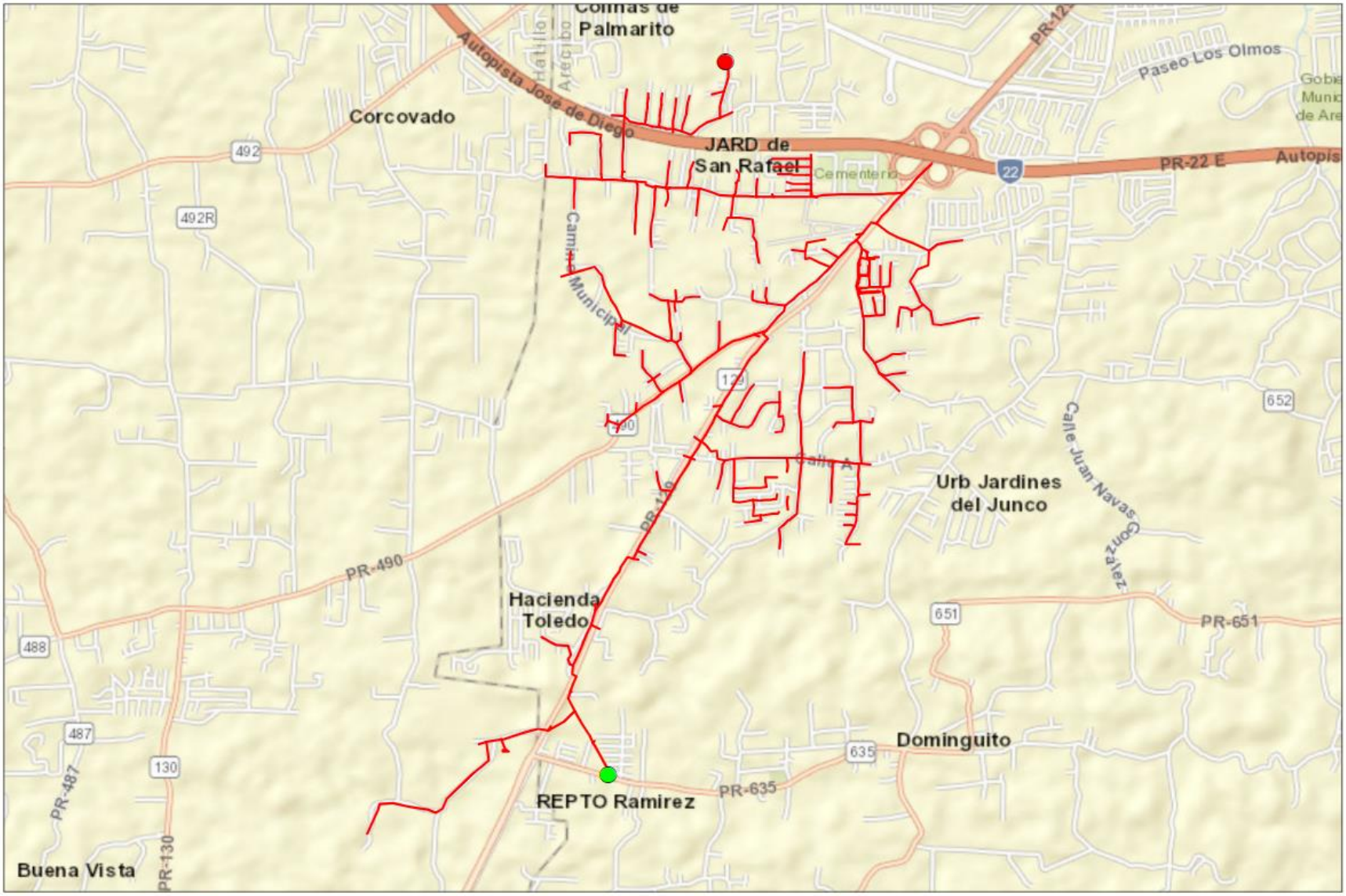
Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 4 Location Maps	Location Maps and Site Picture

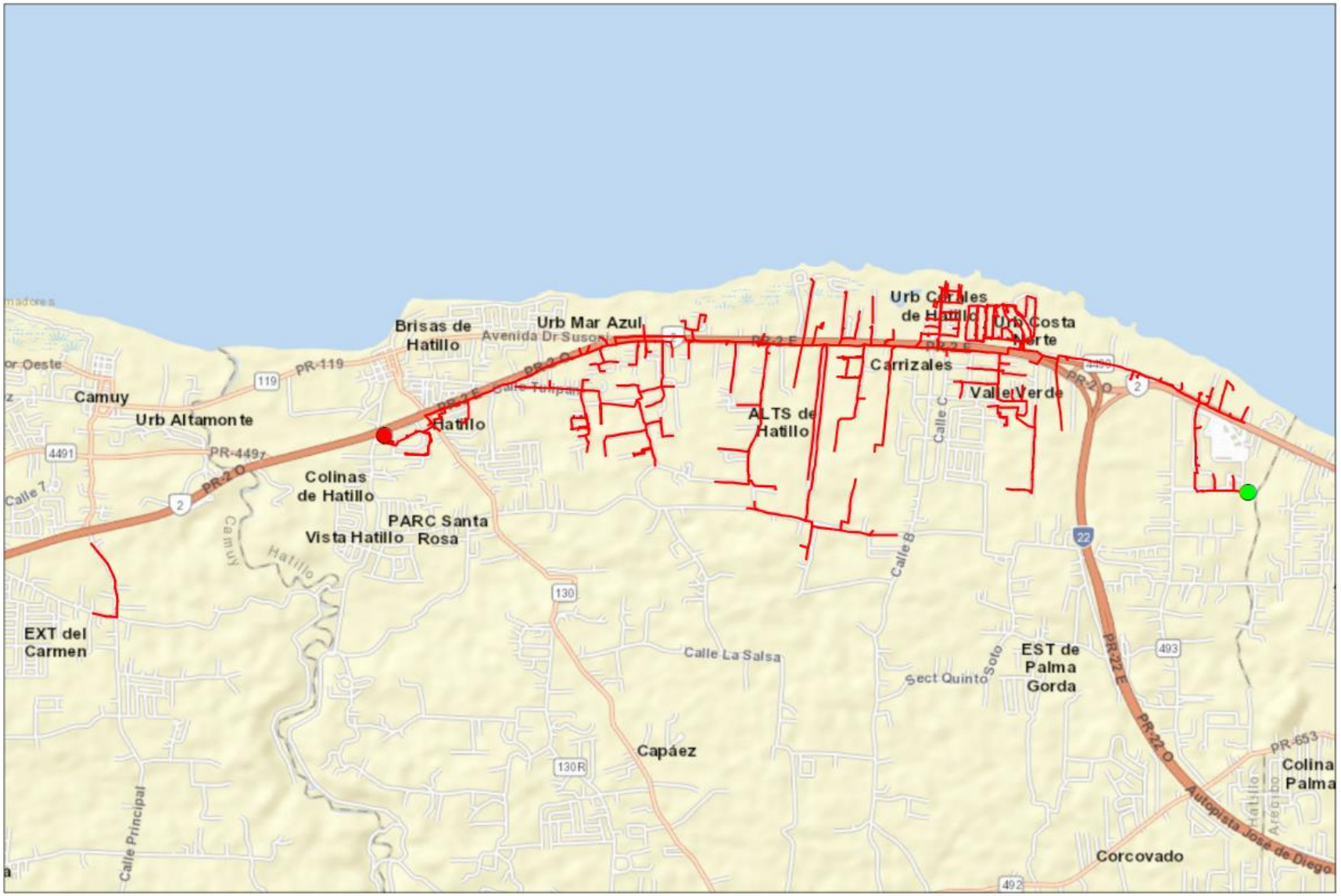

Ciudad Atlantis
Urb BO Obrero
Calle Miramar
PARC de JARD
Vista Azul
Hato Abajo
Urb Garden View
Calle Cipres
Colinas de Palmarito
Villas del Remanso
Urb Victor Rojas 2
Urb Victor Rojas 1
Avenida Industrial
Fabricas
Calle Jose Acorno
Avenida Montaraya
Universidad de Puerto Rico-Arecibo
REPTO San Jose
Urb San Lorenzo
REPTO
PR-653 E
Urb Zeno Gandia
Avenida 65 Infanteria
Calle Atari
Calle Amadeo
Calle Aragon
Calle Amapola
Calle Lirio
Calle Isabel II
Camino Dominguito
Calle 17
Paseo Los Olmo
Urb Villas de Altamira
Avenida Los Moras
Autopista José de Diego
PR-22 O
PR-22 E
JARD de San Rafael
Cementerio
Urb San Felipe
Urb Los Aires
PR-492
PR-129 S
Calle Bezal
Calle Coral
Calle Ucar
Calle Paz
Calle Fraternidad
Calle Union
Calle Ricardo Serrano
Avenida Las Canelas
Calle San D
Calle Vose Roman Santiago
Avenida Catalino Santiago Gloria
Calle Helio
Calle Cromo
Legend
Start Point
End Point
Circuit
1:16,140
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 8007-01


Urb Radioville
Avenida Miramar
Vista del Atlantico
JARD de Arecibo
PARQ de JARD
Vista Azul
Urb University Gdns
Hato Abajo
EXT Villa Los Santos 2
EXT Villa Los Santos 1
Urb Regional
Villa Los Santos
Urb Ocean View
Urb Obrero
BDA Duhamel
Urb College Park
REPTO San Jose
Urb San Lorenzo
REPTO Marquez
Urb Garcia
Urb Zeno Gandia
REPTO San Juan
PR-653
PR-660
PR-129
Legend
Start Point
End Point
Circuit
1:13,080
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 8007-03


Naranjito
Domingo Ruiz
Bajadero
Buena Vista
Campo Alegre
Esperanza
Bayaney
Aibonito
Camuy
Hatillo
Arecibo
PR-490
PR-129
PR-130
PR-10
PR-10 S
PR-10 N
PR-626
PR-656
PR-635
PR-134
490
130
129
134
635
626
656
10
123
Legend
Start Point
End Point
Circuit
1:58,170
0
0.475
0.95
1.9
Miles
N
LUMA
Circuit 8010-02


Colinas de Palmarito
Autopista José de Diego
Corcovado
JARD de San Rafael
Cementerio
PR-22 E
Paseo Los Olmos
Camino Municipal
Urb Jardines del Junco
Calle Juan Navas Gonzalez
Hacienda Toledo
PR-490
PR-651
Dominguito
PR-635
REPTO Ramirez
Buena Vista
PR-487
PR-130
492
492R
488
487
130
652
651
635
22
Legend
Start Point
End Point
Circuit
1:28,270
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 8010-03


Villa Mena
Santana
Brisas del Valle
Domingo Ruiz
Hacienda de Monteverde
Colinas de Arenalejos
Arenalejos
Bajadero
Miradores
Sabana Hoyos
Hato Viejo
Carreras
Arrozal
Autopista Jose de Diego
PR-2
PR-22
PR-638
PR-658
PR-656
PR-663
PR-639
PR-664
PR-626
PR-10
PR-123
PR-638
PR-715
Legend
Start Point
End Point
Circuit
1:43,480
0
0.35
0.7
1.4
Miles
N
LUMA
Circuit 8011-01


Brisas de Hatillo
Urb Mar Azul
Avenida Dr Susoni
Urb Costa Norte
Carrizales
Valle Verde
ALTS de Hatillo
Camuy
Urb Altamonte
PR-119
PR-449
PR-2 O
PR-2 E
Colinas de Hatillo
PARC Santa Rosa
Vista Hatillo
Calle 7
Calle Tulipan
Calle C
Calle B
Camuy
Hatillo
EXT del Carmen
Calle La Salsa
Sect Quinto Soto
EST de Palma Gorda
PR-22 E
PR-22 O
PR-653
Colina Palma
Autopista Jose de Diego
Capáez
Calle Principal
Corcovado
Legend
Start Point
End Point
Circuit
1:34,100
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 8013-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 5

Revision: 0

Date: 09JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	09JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 5
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
FACTOR 13 KV	8014-08	[redacted]		4.16
CAMUY	7601-03			4.16
CAMUY	7601-04			4.16
CAMUY PROVISIONAL	7602-06			4.16
HATILLO	7701-01			4.16
HATILLO	7701-03			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.15M**
Estimated Budget for Procurement & Construction:	**$21.51M**
Estimated Overall Budget for the Project:	**$23.66M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

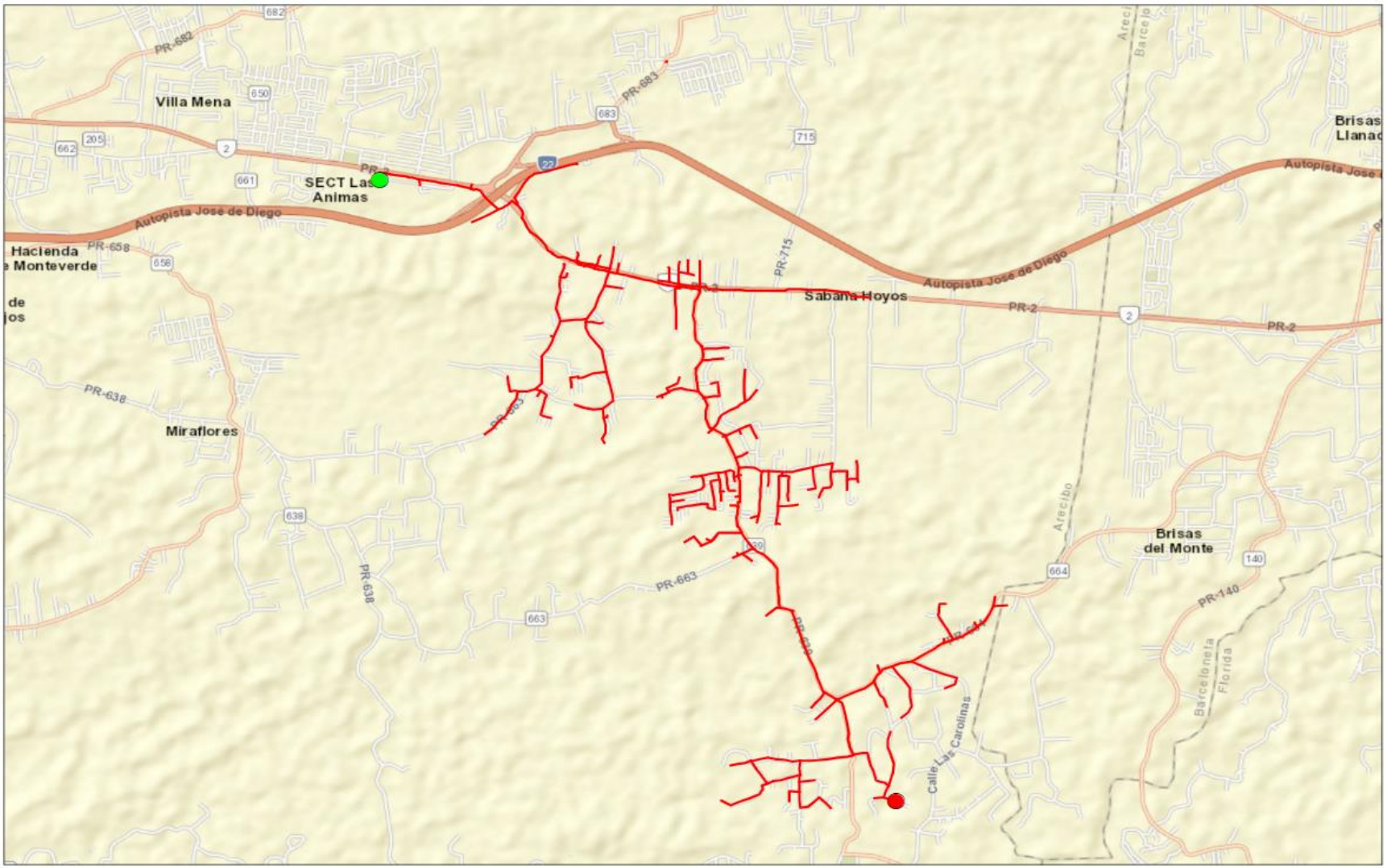
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 5 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

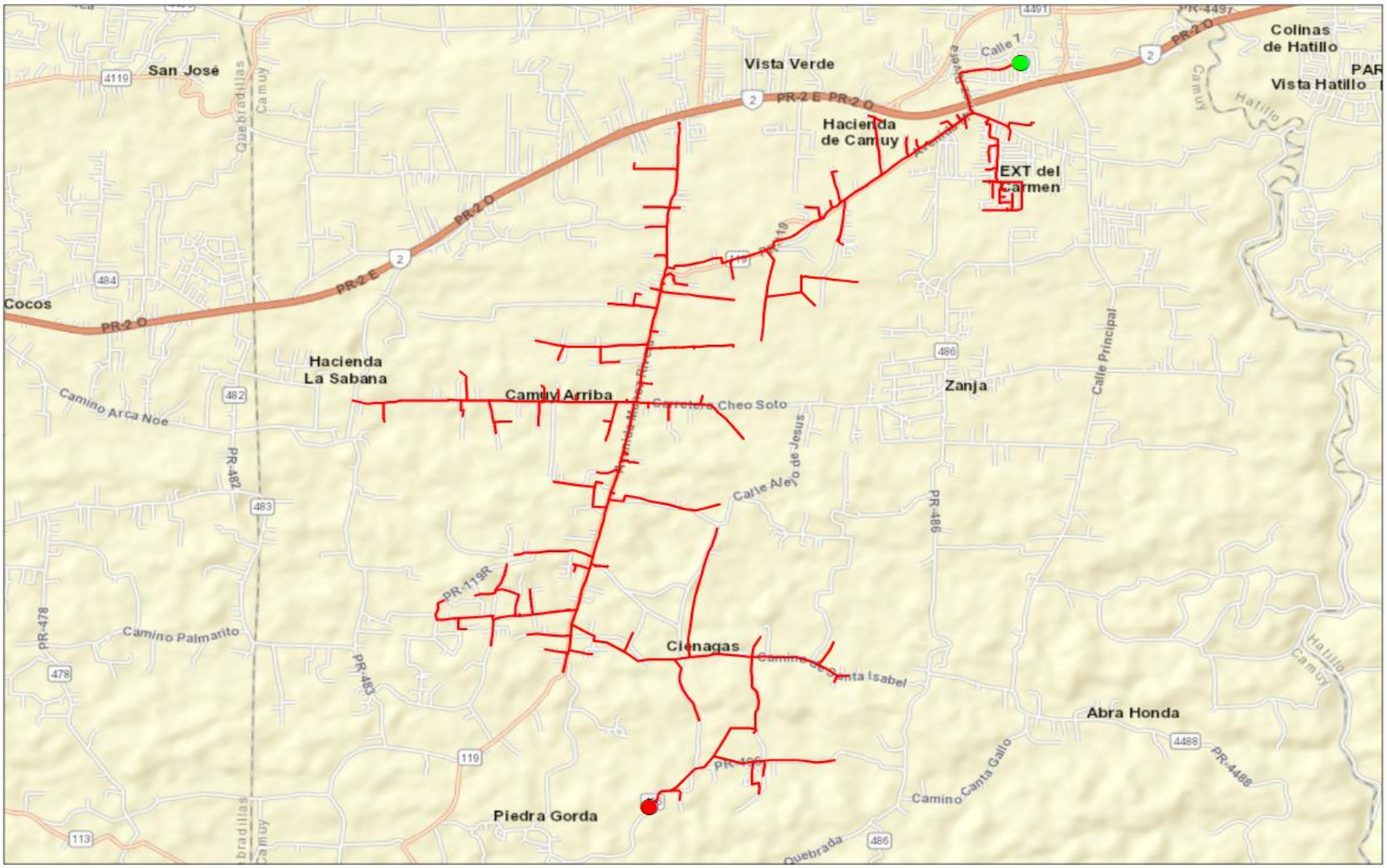
1:39,740

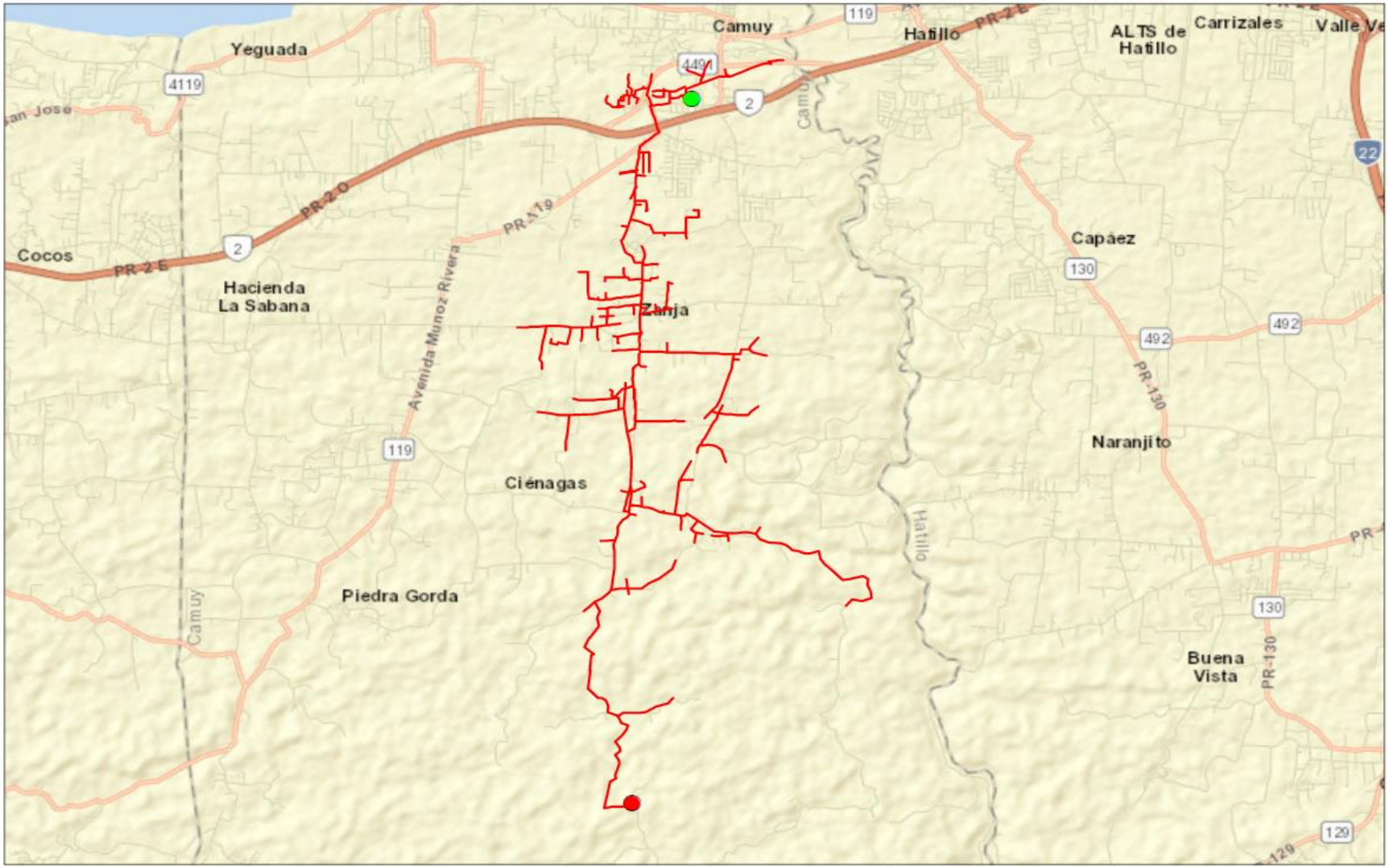
0 0.325 0.65 1.3 Miles

N

LUMA

Circuit 8014-08


San José
Vista Verde
Colinas de Hatillo
Hacienda de Camuy
EXT del Carmen
Cocos
Hacienda La Sabana
Camuy Arriba
Zanja
Calle Principal
Carretera Cheo Soto
Calle Alejo de Jesus
Camino Arca Noe
Camino Palmarito
Cienagas
Camino de Santa Isabel
Abra Honda
Camino Canta Gallo
Piedra Gorda
Quebrada
PR-2 E
PR-2 O
PR-119
PR-119R
PR-482
PR-483
PR-486
PR-478
PR-4488
Legend
Start Point
End Point
Circuit
1:36,570
0 0.3 0.6 1.2 Miles
N
LUMA
Circuit 7601-03



Legend

- Start Point
- End Point
- Circuit

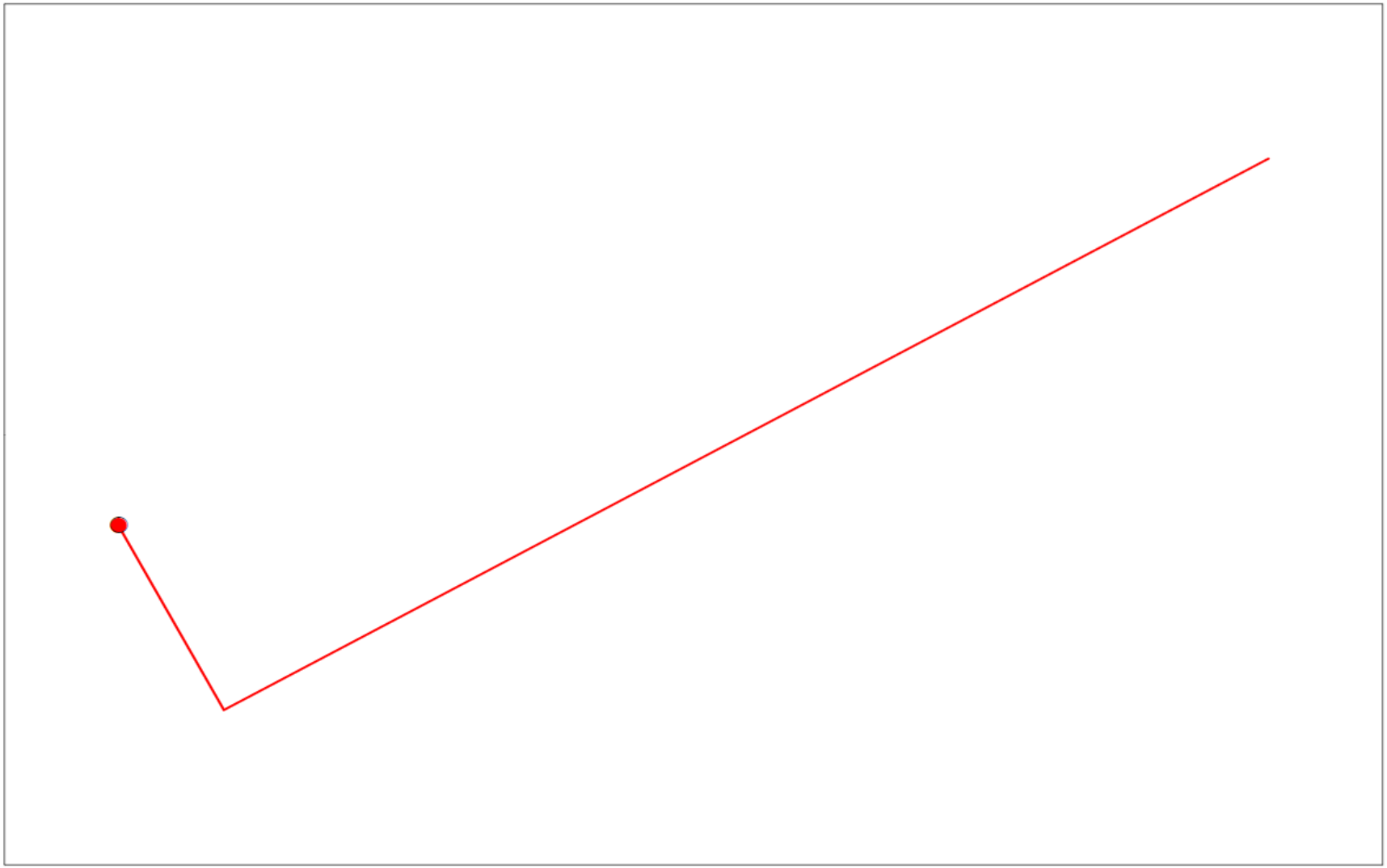
1:55,120

0 0.45 0.9 1.8 Miles

N

LUMA

Circuit 7601-04



Legend

- Start Point
- End Point
- Circuit

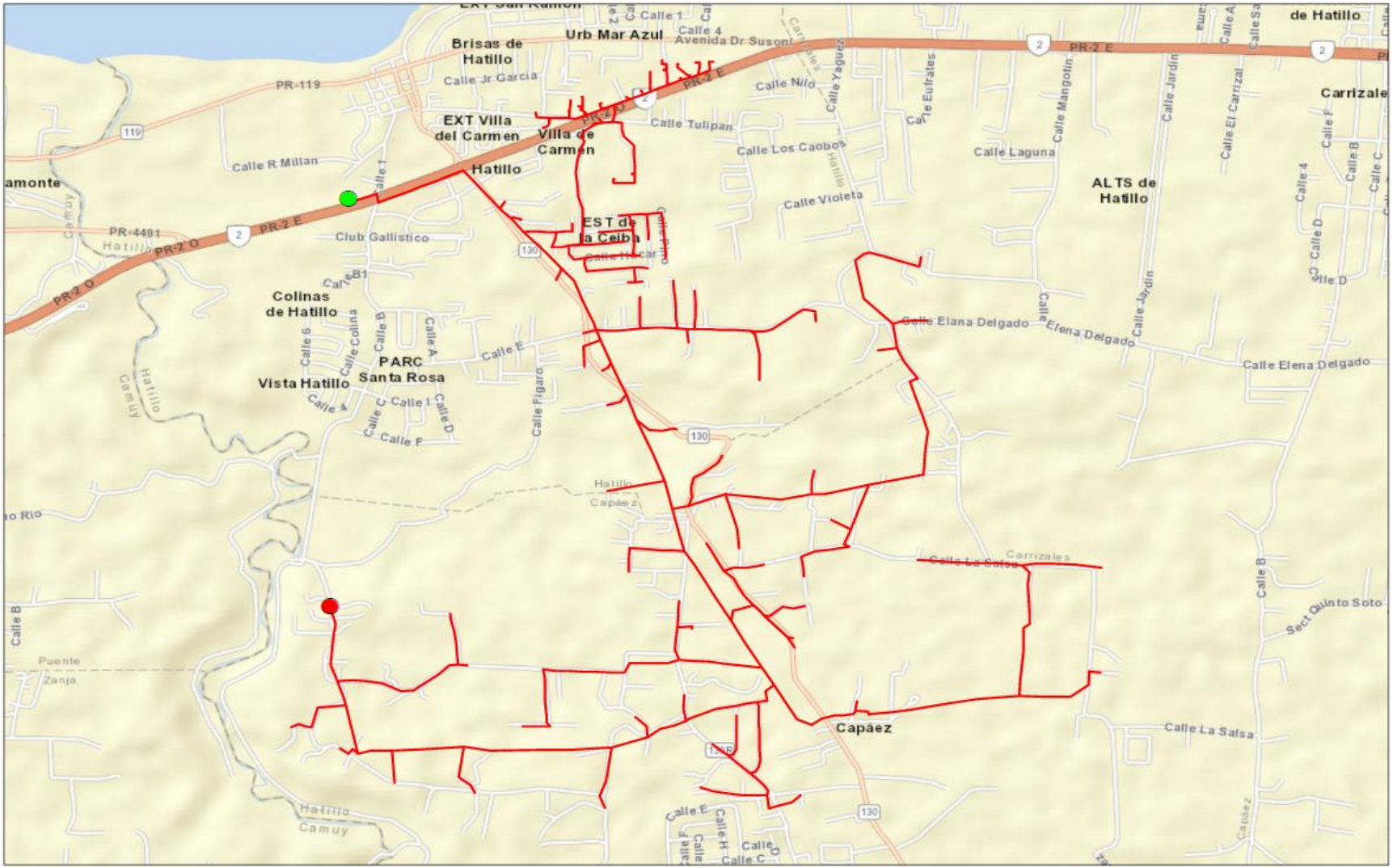
1:20

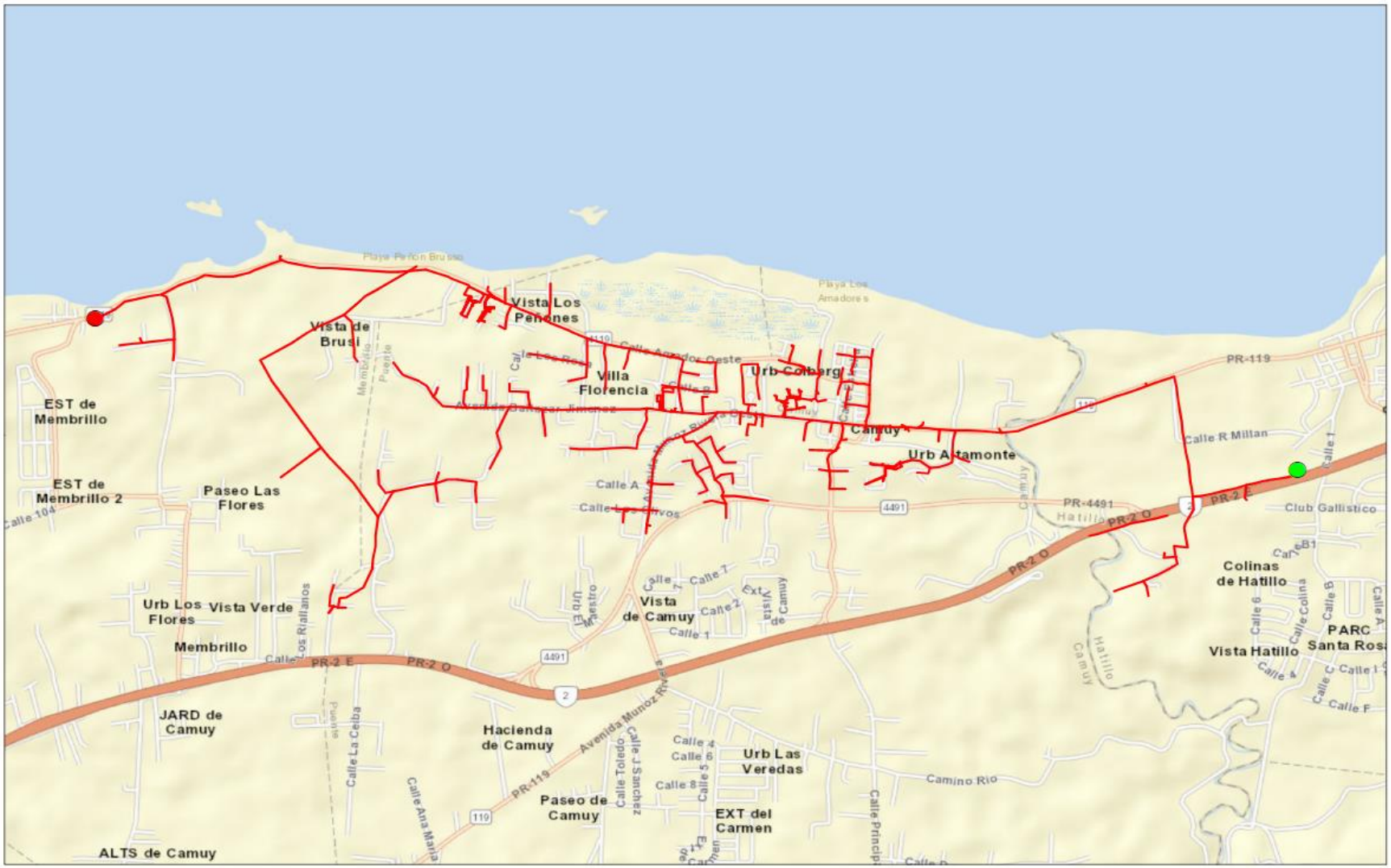
0 0.00015 0.0003 0.0006 Miles

N

LUMA

Circuit 7602-06


Brisas de Hatillo
Urb Mar Azul
Avenida Dr Susoni
Calle 1
Calle 4
Calle Jr Garcia
PR-119
EXT Villa del Carmen
Villa de Carmen
Hatillo
PR-2 E
PR-2 O
Calle Nilo
Calle Tulipan
Calle Los Caobos
Calle Violeta
Calle Laguna
ALTS de Hatillo
de Hatillo
Carrizale
Calle R Millan
Club Gallistico
PR-4491
EST de la Ceiba
Colinas de Hatillo
PARC Santa Rosa
Vista Hatillo
Calle Elena Delgado
Calle Figaro
Calle Jardin
Calle La Salsa
Capáez
Carrizales
Sect Quinto Soto
Puente
Zanja
Hatillo Camuy
Legend
Start Point
End Point
Circuit
1:20,060
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 7701-01


Vista Los Peñones
Vista de Brusi
Villa Florencia
Urb Colbarg
Camuy
Urb Altamonte
EST de Membrillo
EST de Membrillo 2
Paseo Las Flores
Urb Los Flores
Vista Verde
Membrillo
Vista de Camuy
Colinas de Hatillo
Vista Hatillo
PARC Santa Ros
JARD de Camuy
Hacienda de Camuy
Urb Las Veredas
Paseo de Camuy
EXT del Carmen
ALTS de Camuy
Club Gallistico
PR-119
PR-2 E
PR-2 O
PR-4491
Calle R Millan
Avenida Munoz Rivera
Camino Rio
Legend
Start Point
End Point
Circuit
1:20,450
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 7701-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 6

Revision: 0

Date: 09JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	09JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 6
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
PAJUIL	7702-02	[redacted]		4.16
PAJUIL	7702-03			4.16
SAN DANIEL	8013-01			4.16
QUEBRADILLAS	7402-01			4.16
QUEBRADILLAS	7402-05			4.16
GUAJATACA	7403-02			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.75M**
Estimated Budget for Procurement & Construction:	**$27.49M**
Estimated Overall Budget for the Project:	**$30.24M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

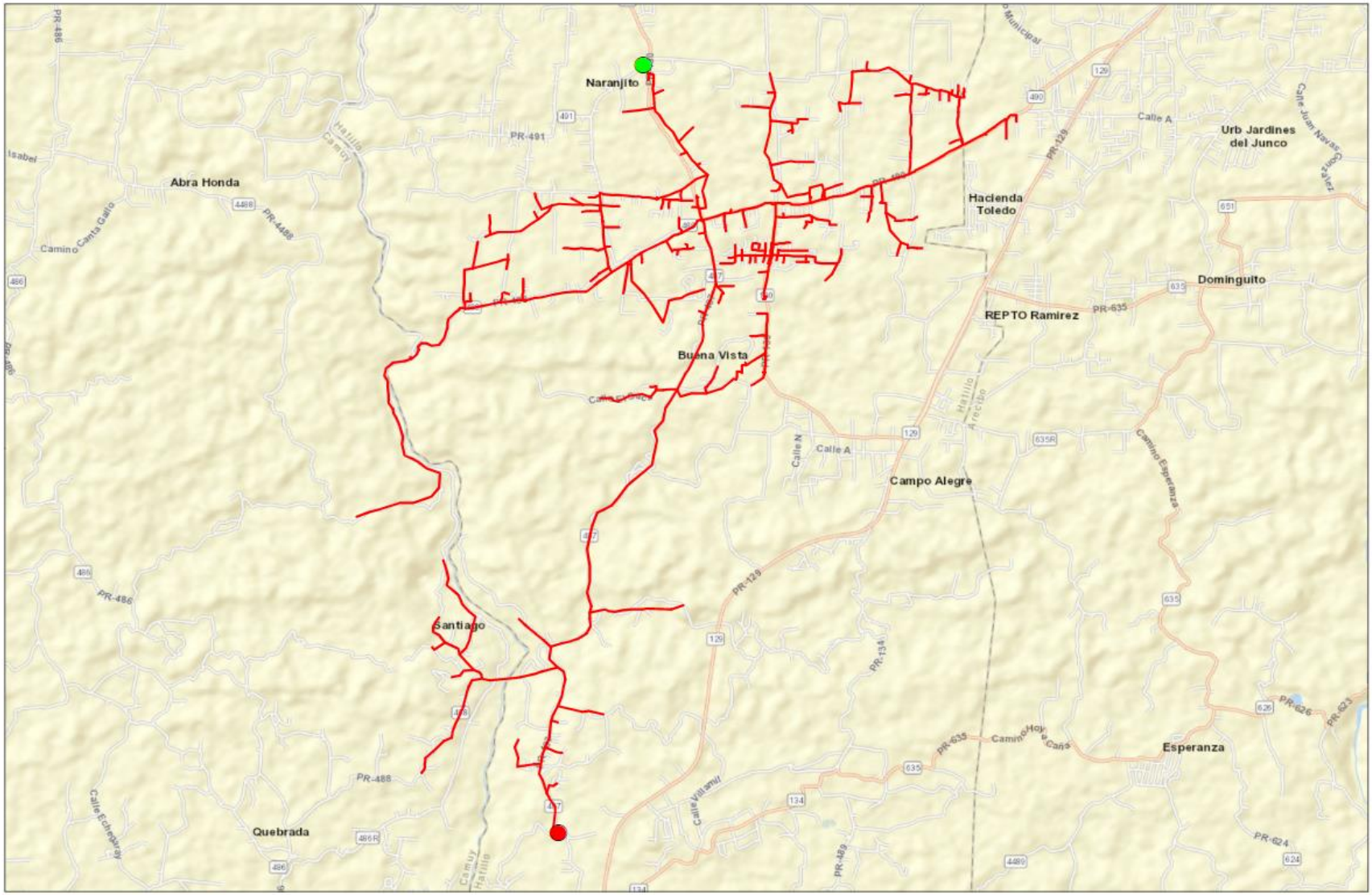
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 6 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

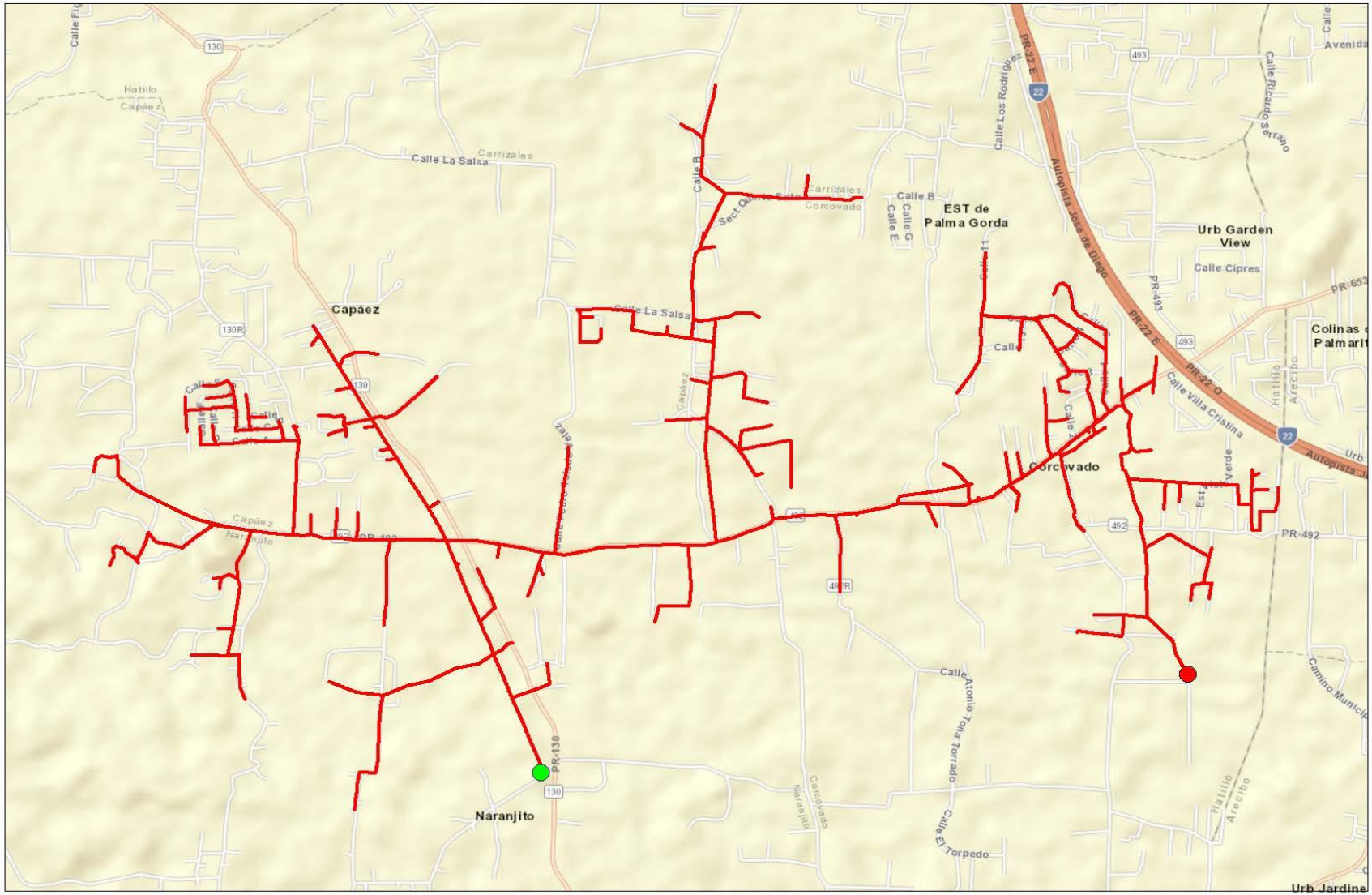
1:48,710

0 0.4 0.8 1.6 Miles

N

LUMA

Circuit 7702-02



Legend

- Start Point
- End Point
- Circuit

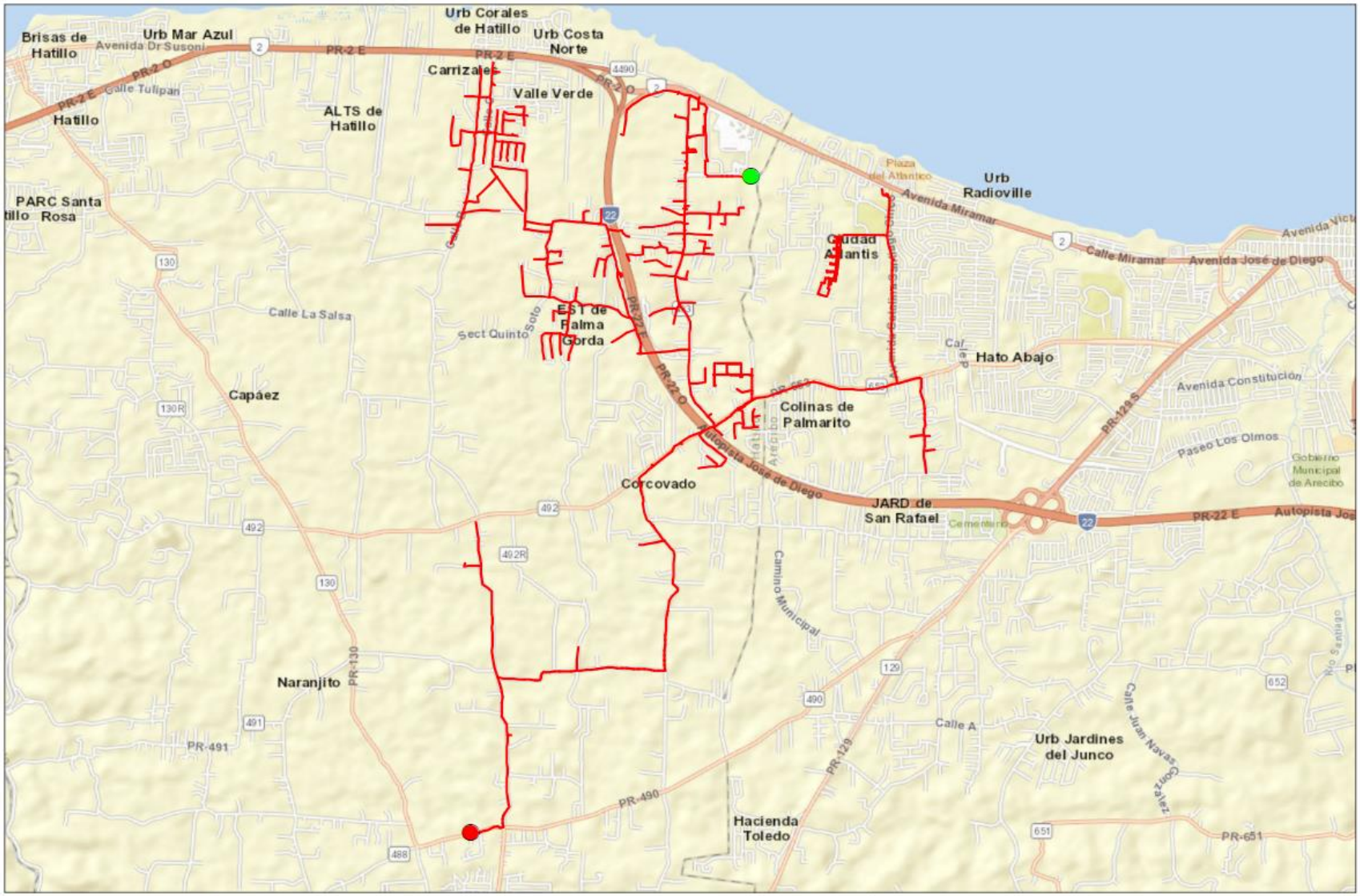
1:22,980

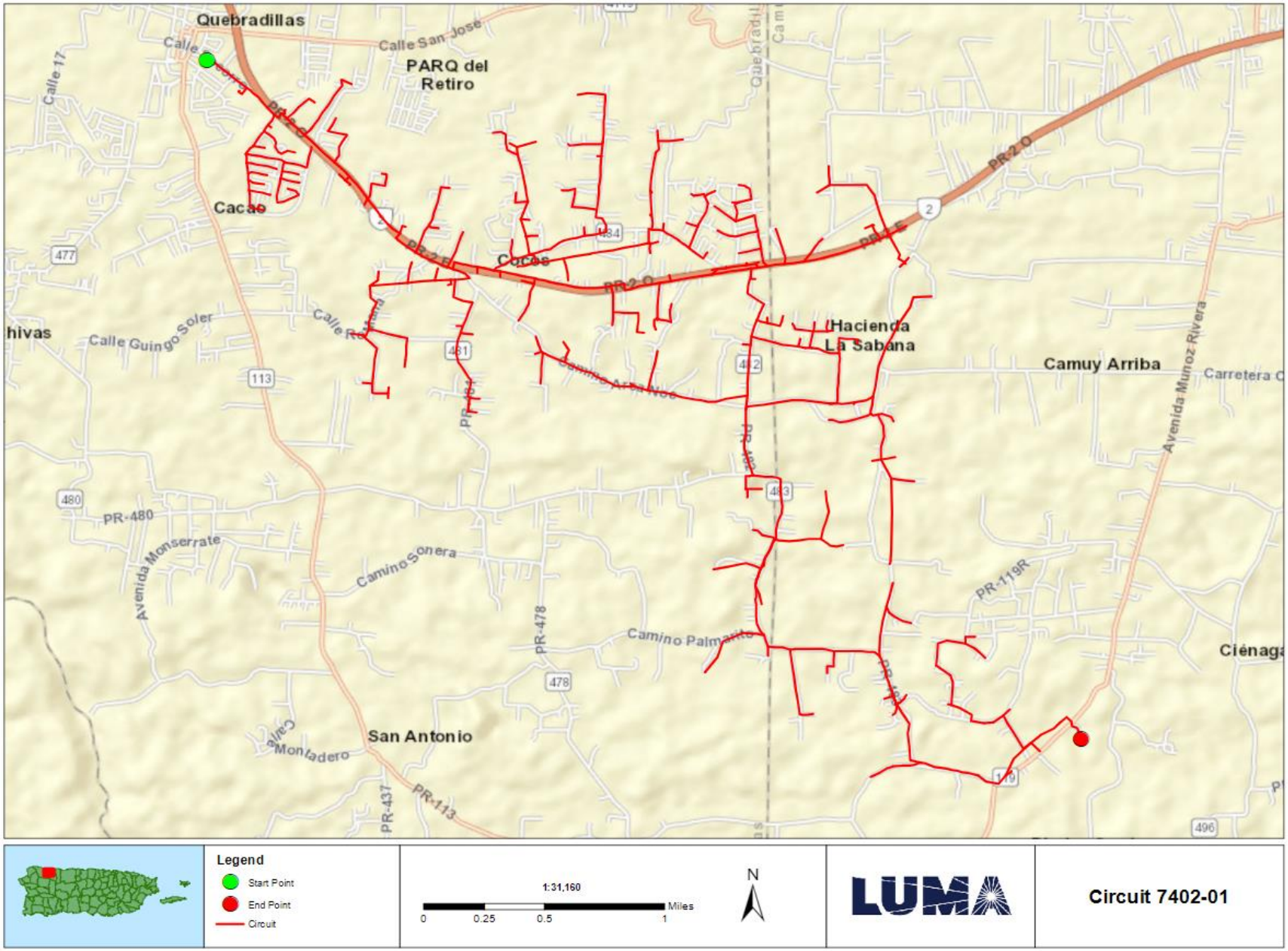
0 0.175 0.35 0.7 Miles

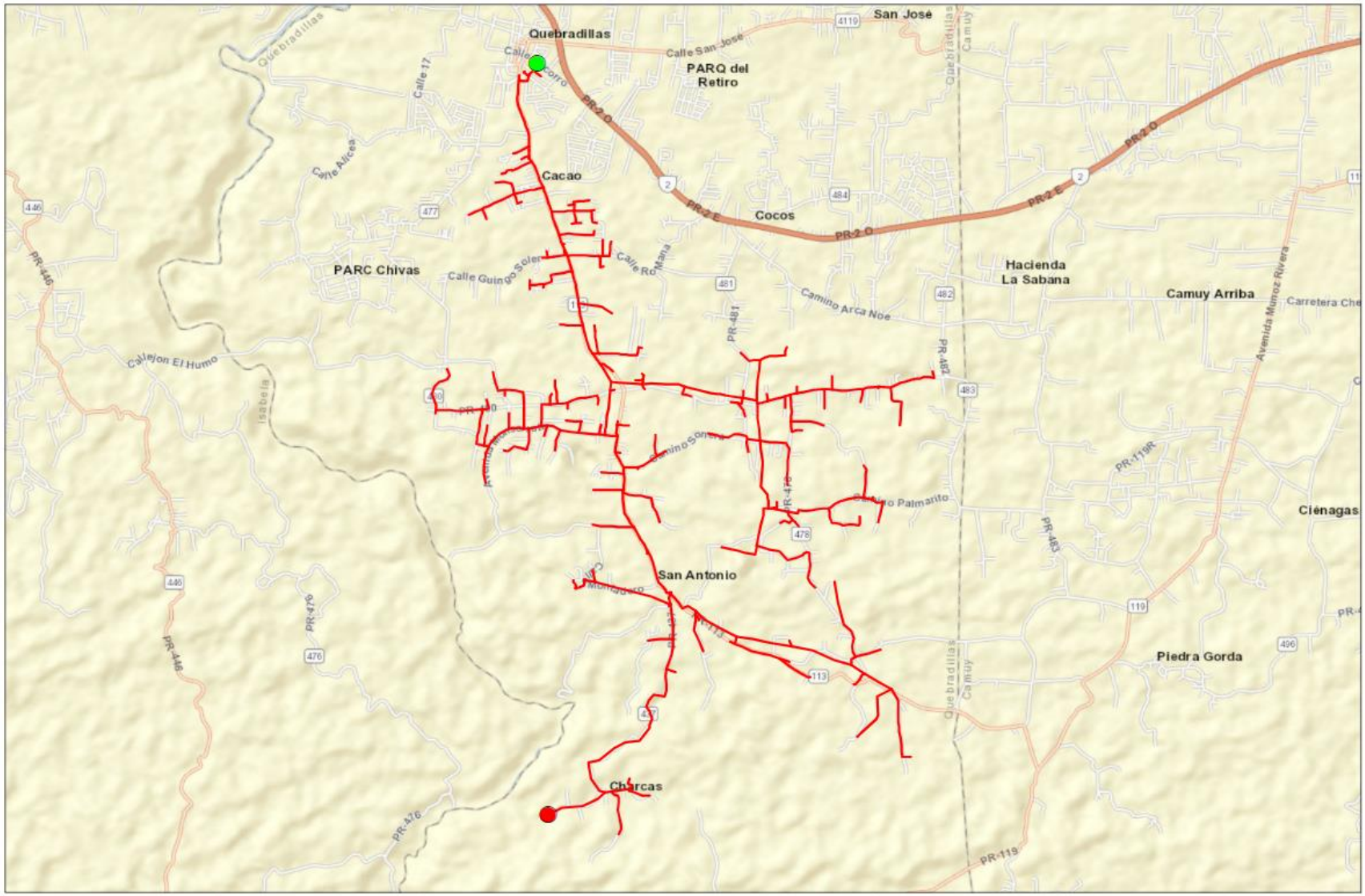
N

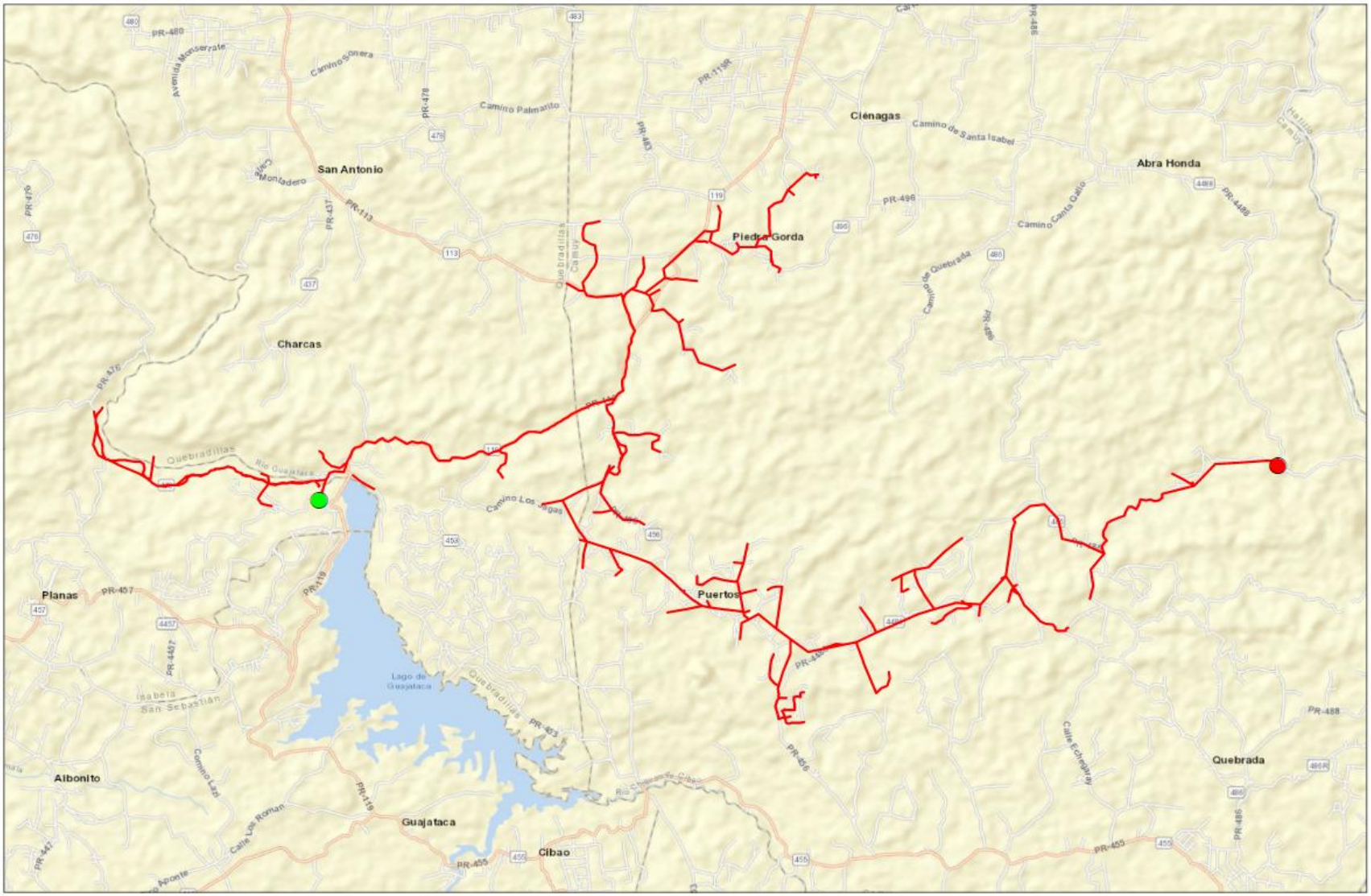
LUMA

Circuit 7702-03


Urb Corales de Hatillo
Urb Costa Norte
Brisas de Hatillo
Urb Mar Azul
Avenida Dr Susoni
Carrizales
Valle Verde
Calle Tulipan
Hatillo
ALTS de Hatillo
PARC Santa Rosa
Urb Radioville
Plaza del Atlantico
Avenida Miramar
Ciudad Atlantis
Calle Miramar
Avenida José de Diego
Avenida Vicky
Calle La Salsa
Sect Quinto Soto
EST de Palma Gorda
Hato Abajo
Avenida Constitución
Capáez
Colinas de Palmarito
Paseo Los Olmos
Gobierno Municipal de Arecibo
Autopista José de Diego
Corcovado
JARD de San Rafael
Cementerio
PR-22 E
Camino Municipal
Naranjito
PR-130
PR-491
PR-490
PR-128
Calle A
Urb Jardines del Junco
Hacienda Toledo
PR-651
Legend
Start Point
End Point
Circuit
1:40,480
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 8013-01


Quebradillas
Calle San Jose
PARQ del Retiro
Cacao
Cacao
Hacienda La Sabana
Camuy Arriba
Avenida Munoz Rivera
Calle Guingo Soler
Avenida Monserrate
Camino Sonera
Camino Palmarito
San Antonio
Calle Montadero
PR-2 O
PR-480
PR-478
PR-119R
PR-437
PR-113
Legend
Start Point
End Point
Circuit
1:31,160
0
0.25
0.5
1
Miles
N
LUMA
Circuit 7402-01


Quebradillas
San Jose
PARQ del Retiro
Cacao
Cocos
PARC Chivas
Hacienda La Sabana
Camuy Arriba
Cienagas
San Antonio
Piedra Gorda
Charcas
Callejon El Humo
Camino Arca Noe
Camino Palmarito
Calle Guingo Soler
Calle Alicea
Calle 17
Isabela
Avenida Munoz Rivera
PR-2 O
PR-2 E
PR-446
PR-481
PR-482
PR-483
PR-478
PR-476
PR-119R
PR-119
Legend
Start Point
End Point
Circuit
1:43,880
0
0.35
0.7
1.4
Miles
N
LUMA
Circuit 7402-05


Cienagas
Abra Honda
San Antonio
Piedra Gorda
Charcas
Puertos
Planas
Lago de Guajataca
Quebradillas
Albonito
Guajataca
Cibao
Quebrada
Legend
Start Point
End Point
Circuit
1:53,030
Miles
0
0.425
0.85
1.7
N
LUMA
Circuit 7403-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 7

Revision: 0

Date: 09JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	09JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 7
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
ADJUNTAS PUEBLO	8202-01	[redacted]		8.32
ADJUNTAS PUEBLO	8202-02			8.32
ADJUNTAS PUEBLO	8202-03			8.32
YAHUECAS	8203-01			4.16
JAYUYA	8301-01			4.16
GUAJATACA	7403-03			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.75M**
Estimated Budget for Procurement & Construction:	**$27.50M**
Estimated Overall Budget for the Project:	**$30.25M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

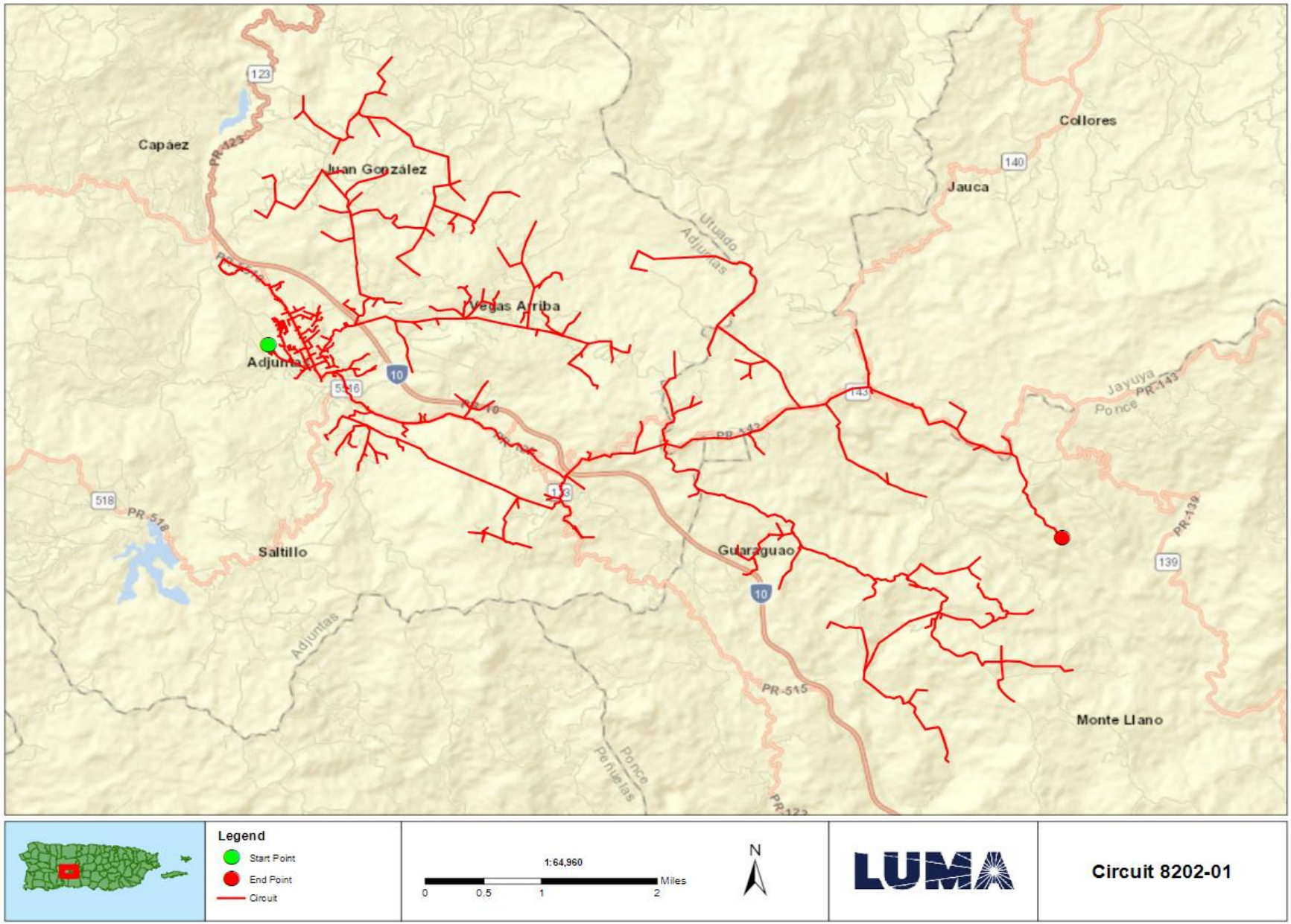
Note: If available, detailed engineering cost estimates will be included as an attachment.

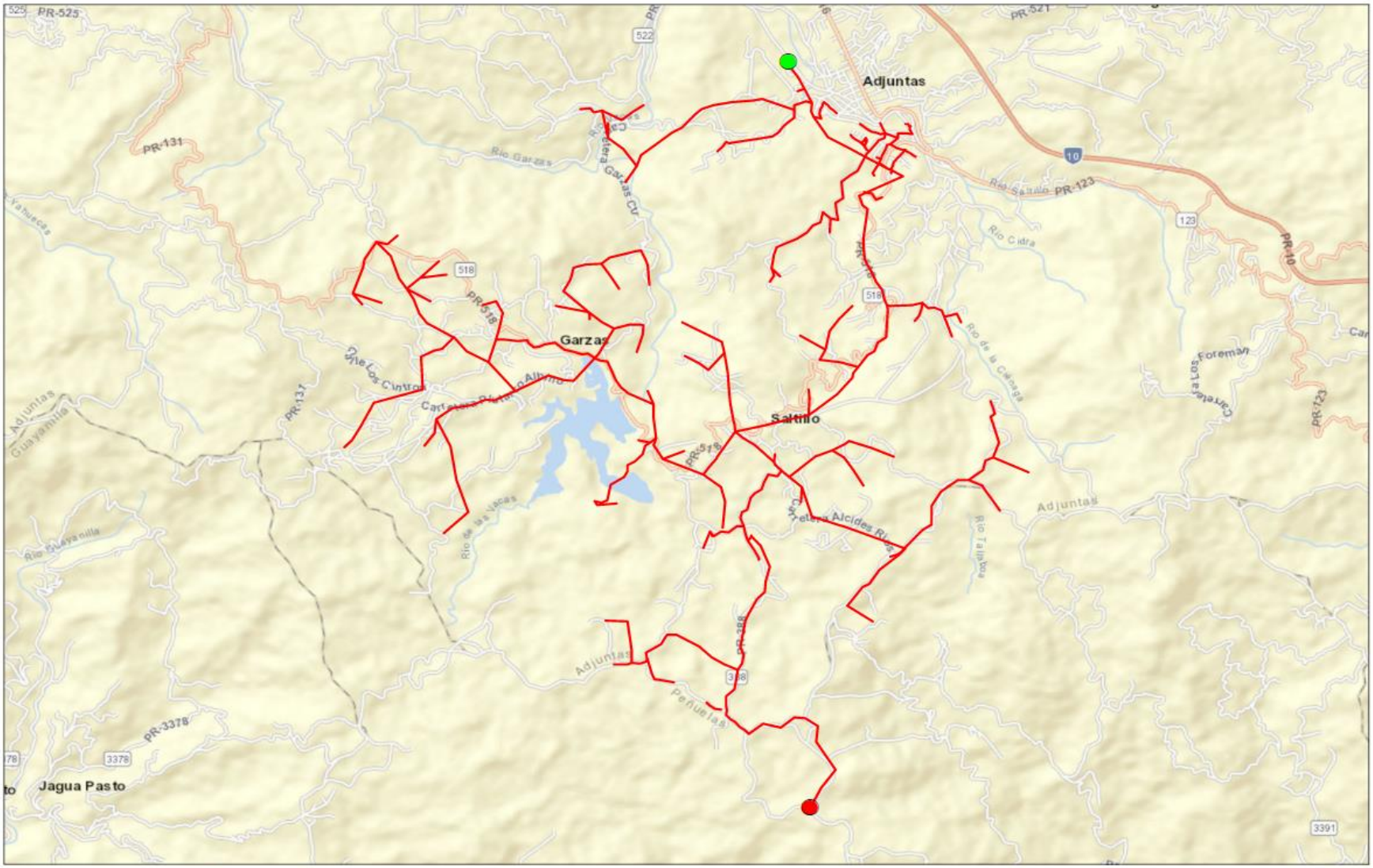
Environmental & Historic Preservation Requirements

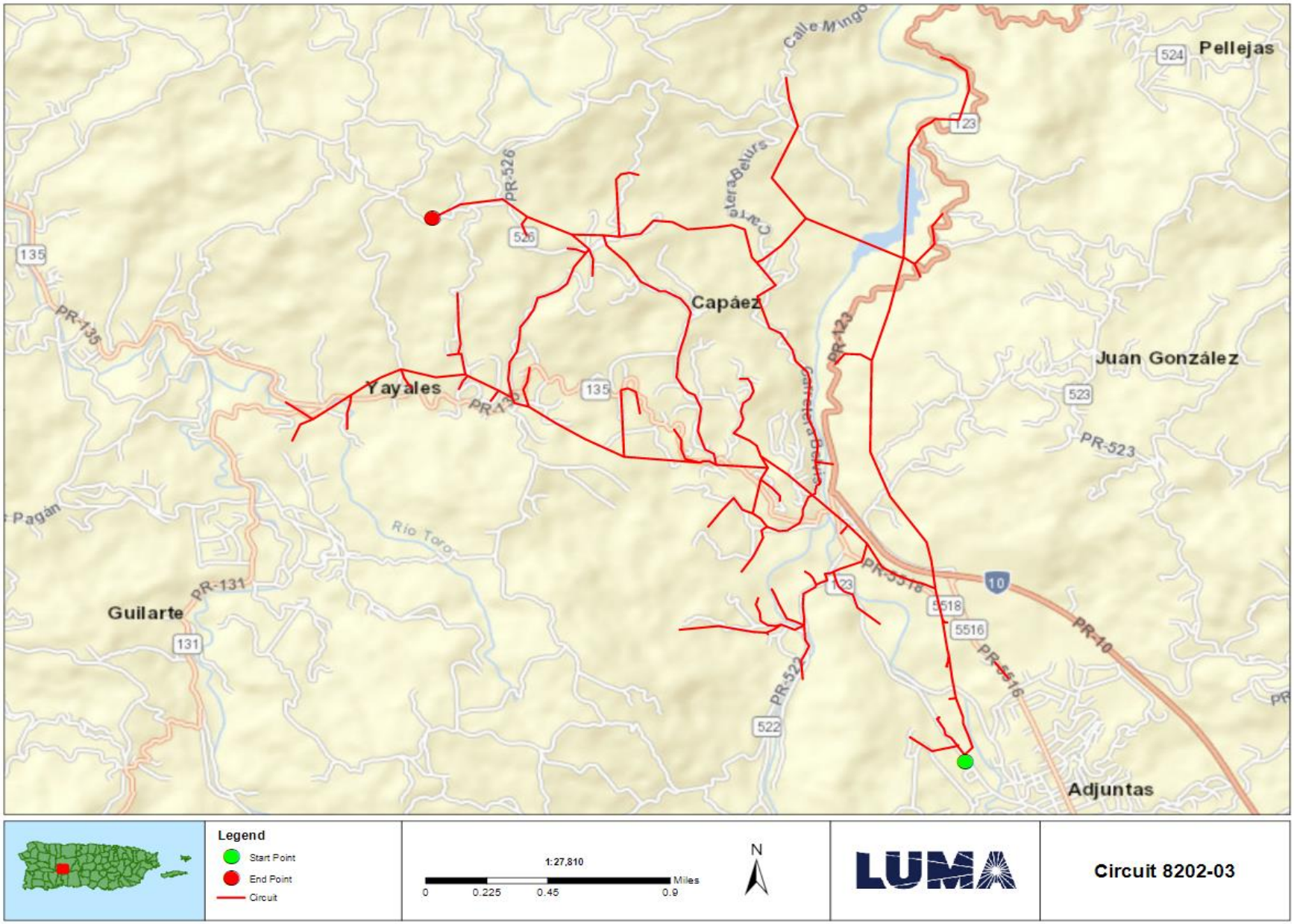
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

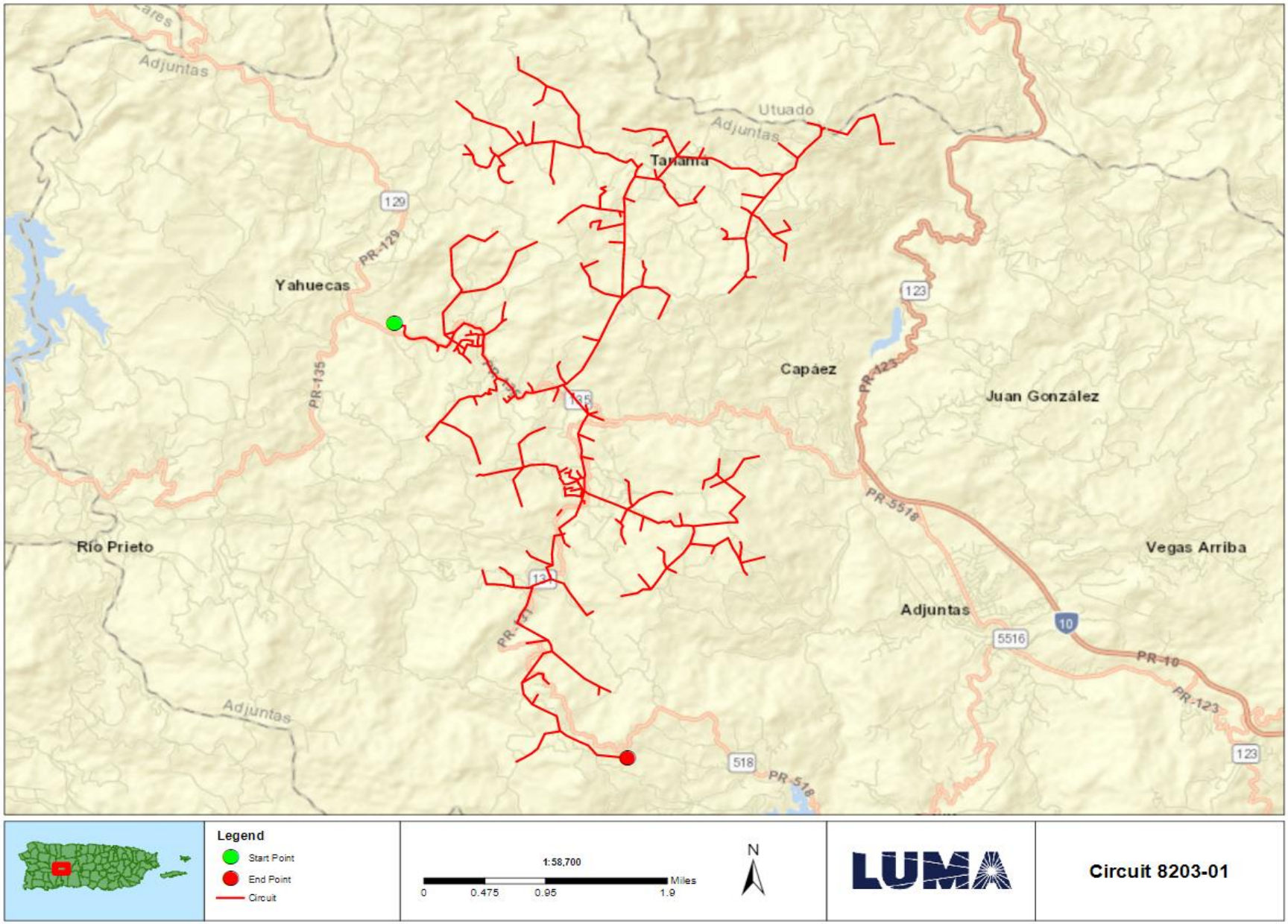
Attachments

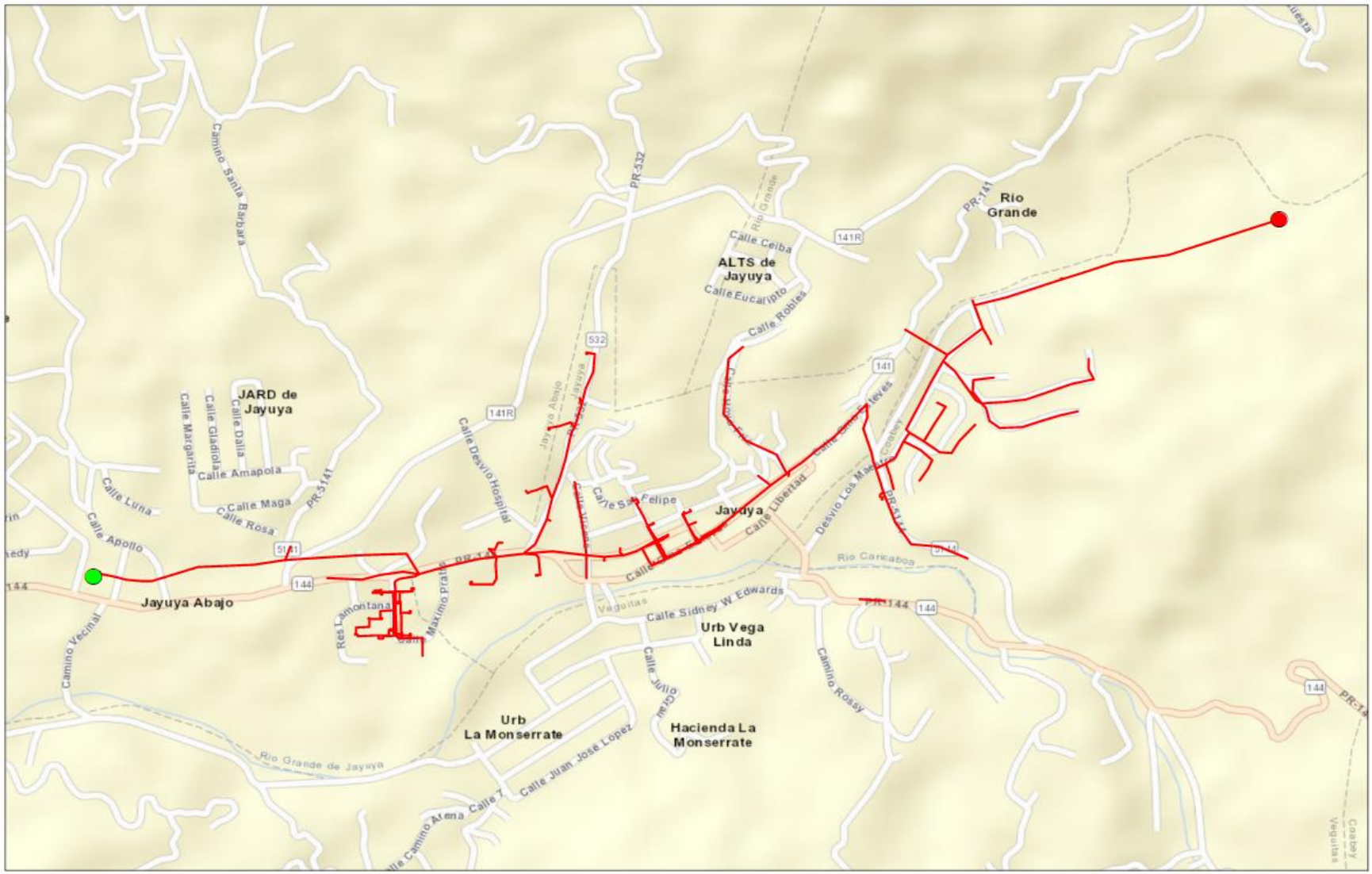
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 7 Location Maps	Location Maps and Site Picture

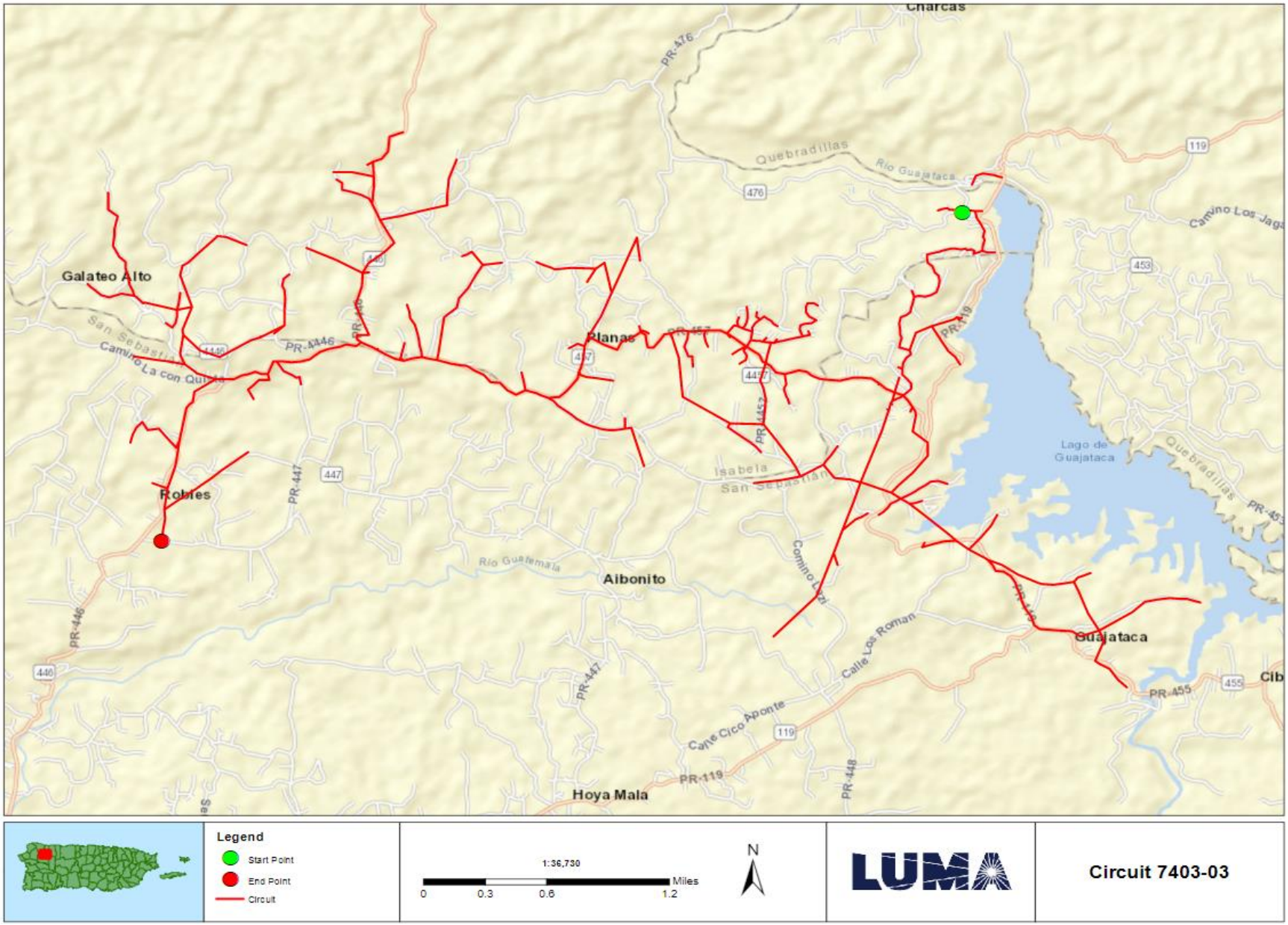

Capáez
Juan González
Vegas Arriba
Adjuntas
Saltillo
Guaraguao
Jauca
Collores
Monte Llano
Jayuya
Ponce
PR-123
PR-10
PR-143
PR-518
PR-515
PR-139
PR-122
Adjuntas
Ponce
Peñuelas
Utuado
Adjuntas
123
10
5516
143
518
140
139
Legend
Start Point
End Point
Circuit
1:64,960
0
0.5
1
2
Miles
N
LUMA
Circuit 8202-01


Adjuntas
Garzas
Saltillo
Jagua Pasto
PR-525
PR-131
PR-518
PR-123
PR-10
PR-521
PR-3378
PR-388
Río Garzas
Río Cidra
Río de la Cañaga
Río Tallaboa
Río Guayanilla
Río de las Vacas
Peñuelas
Foreman
Adjuntas
Guayanilla
Legend
Start Point
End Point
Circuit
1:40,440
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 8202-02


Pellejas
Capáez
Juan González
Yayales
Guilarte
Adjuntas
Río Toro
PR-526
PR-135
PR-123
PR-523
PR-131
PR-5518
PR-10
PR-5516
PR-522
Legend
Start Point
End Point
Circuit
1:27,810
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 8202-03


Adjuntas
Utuado
Adjuntas
Tanama
129
PR-129
Yahuecas
123
Capáez
PR-123
Juan González
135
PR-135
PR-5518
Río Prieto
Vegas Arriba
Adjuntas
5516
10
PR-10
PR-123
123
Adjuntas
518
PR-518
Legend
Start Point
End Point
Circuit
1:58,700
0
0.475
0.95
1.9
Miles
N
LUMA
Circuit 8203-01


Jayuya Abajo
JARD de Jayuya
ALTS de Jayuya
Jayuya
Rio Grande
Urb La Monserrate
Hacienda La Monserrate
Urb Vega Linda
Camino Santa Barbara
Calle Luna
Calle Apolo
Calle Margarita
Calle Gladiola
Calle Dalia
Calle Amapola
Calle Maga
Calle Rosa
PR-3141
Calle Desvio Hospital
Jayuya Abajo
PR-532
Calle Ceiba
Calle Eucalipto
Calle Robles
Calle San Felipe
Calle Libertad
Desvio Los Maestros
PR-144
Rio Caricaboa
Calle Sidney W Edwards
Vegüitas
Camino Vecinal
Res Lamontana
Maximo Prats
Calle Julio
Camino Rosay
Rio Grande de Jayuya
Calle Juan Jose Lopez
Calle 7
Camino Arena
141R
532
141
5141
144
Legend
Start Point
End Point
Circuit
1:10,820
0
0.075
0.15
0.3
Miles
N
LUMA
Circuit 8301-01


Charcas
PR-476
Quebradillas
Río Guajataca
476
119
Camino Los Jaga
453
Galateo Alto
San Sebastián
Camino La con Quina
PR-4446
446
PR-446
Planas
PR-457
447
PR-447
PR-119
Robles
Isabela
San Sebastián
Lago de
Guajataca
Quebradillas
PR-453
Río Guatemala
Aibonito
Camino La 21
PR-455
Guajataca
Calle Los Roman
Calle Cico Aponte
PR-448
Hoya Mala
455
Cib
Legend
Start Point
End Point
Circuit
1:36,730
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 7403-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 8

Revision: 0

Date: 10JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 8
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
JAYUYA II	8302-04	[redacted]		4.16
UTUADO PUEBLO	8101-01			4.16
UTUADO PUEBLO	8101-04			4.16
UTUADO PUEBLO	8101-05			4.16
SAN JOSE	8104-02			4.16
SAN JOSE	8104-05			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.51M**
Estimated Budget for Procurement & Construction:	**$25.06M**
Estimated Overall Budget for the Project:	**$27.57M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

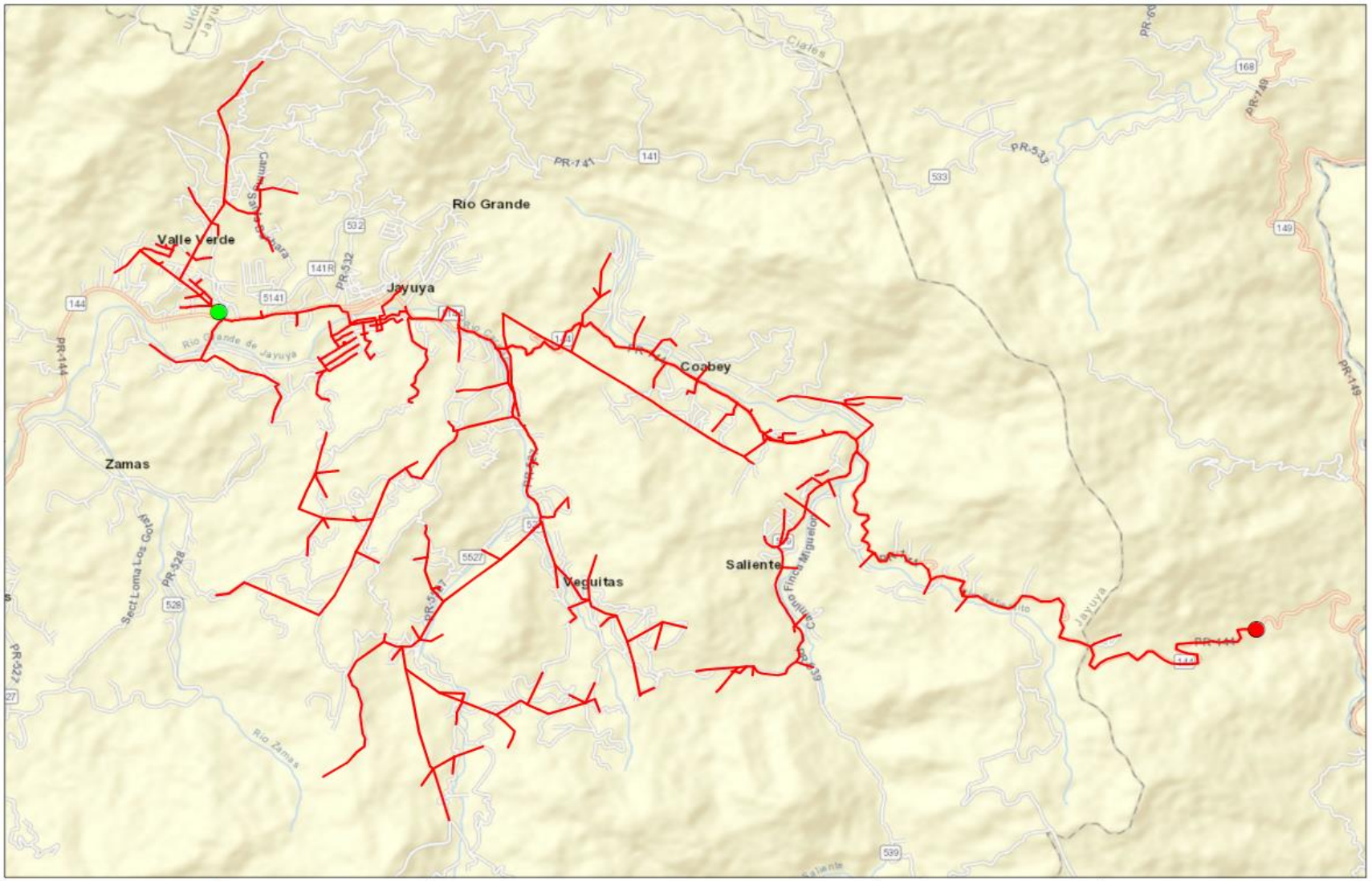
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 8 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

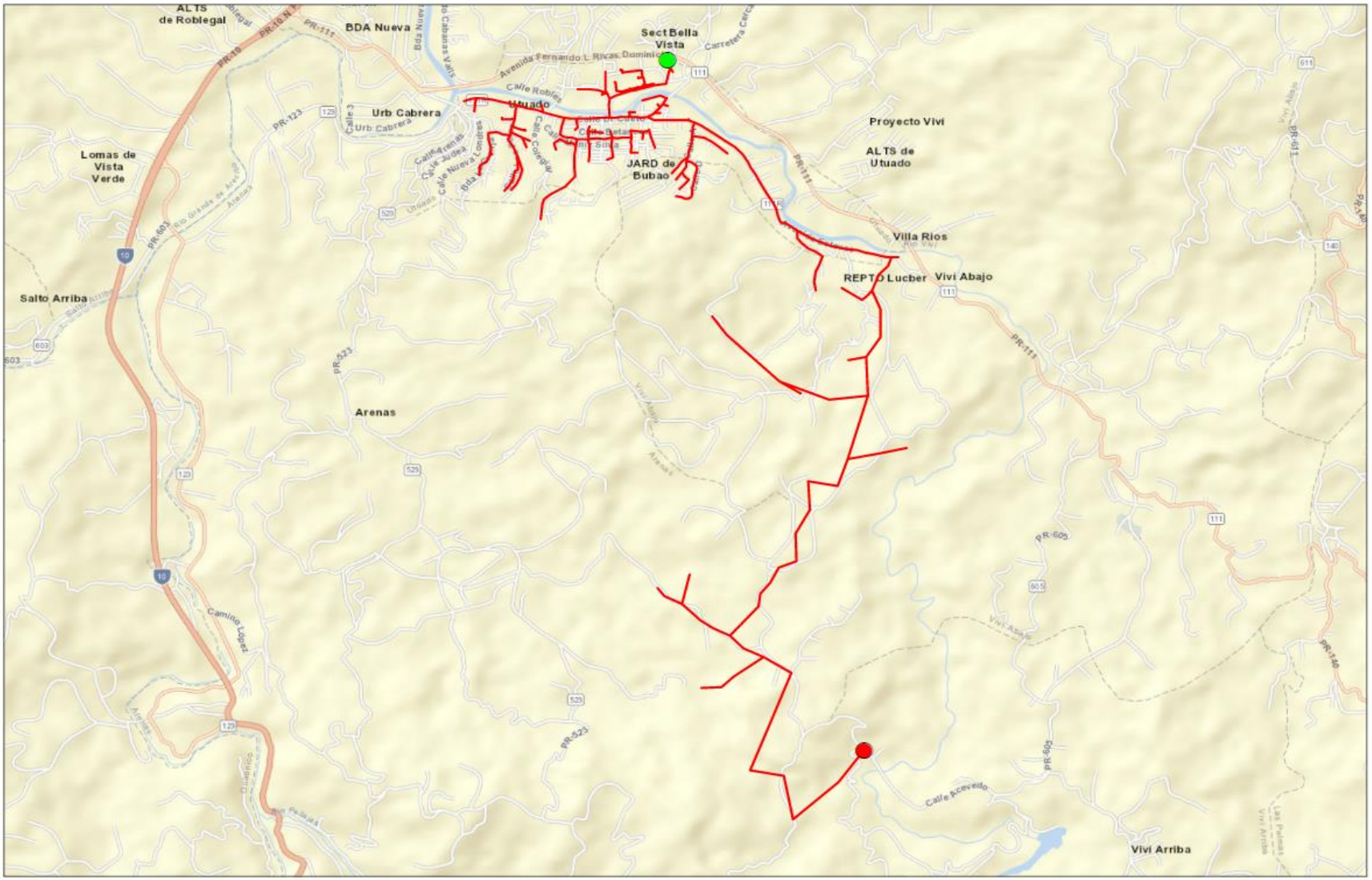
1:41,370

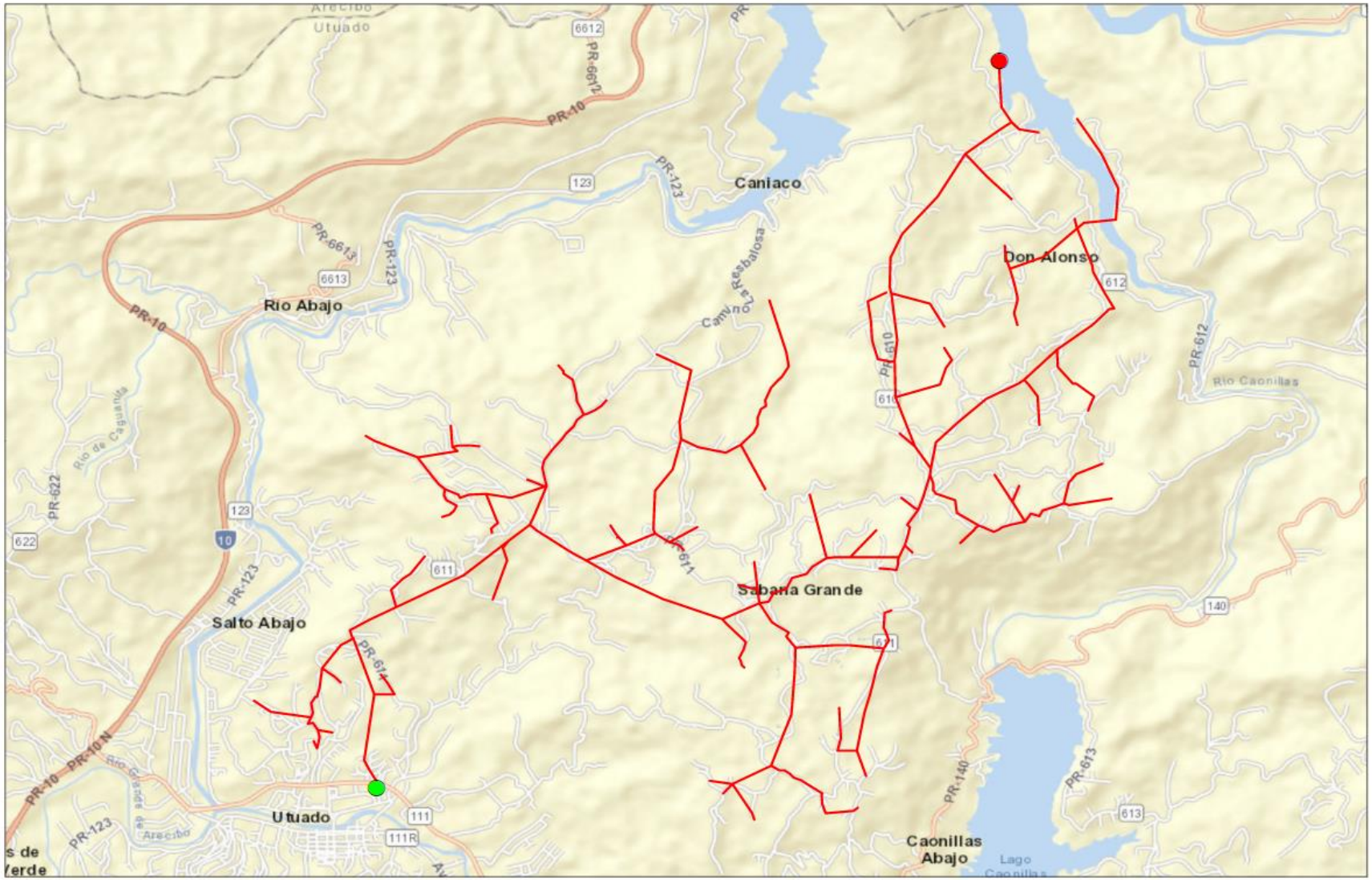
0 0.325 0.65 1.3 Miles

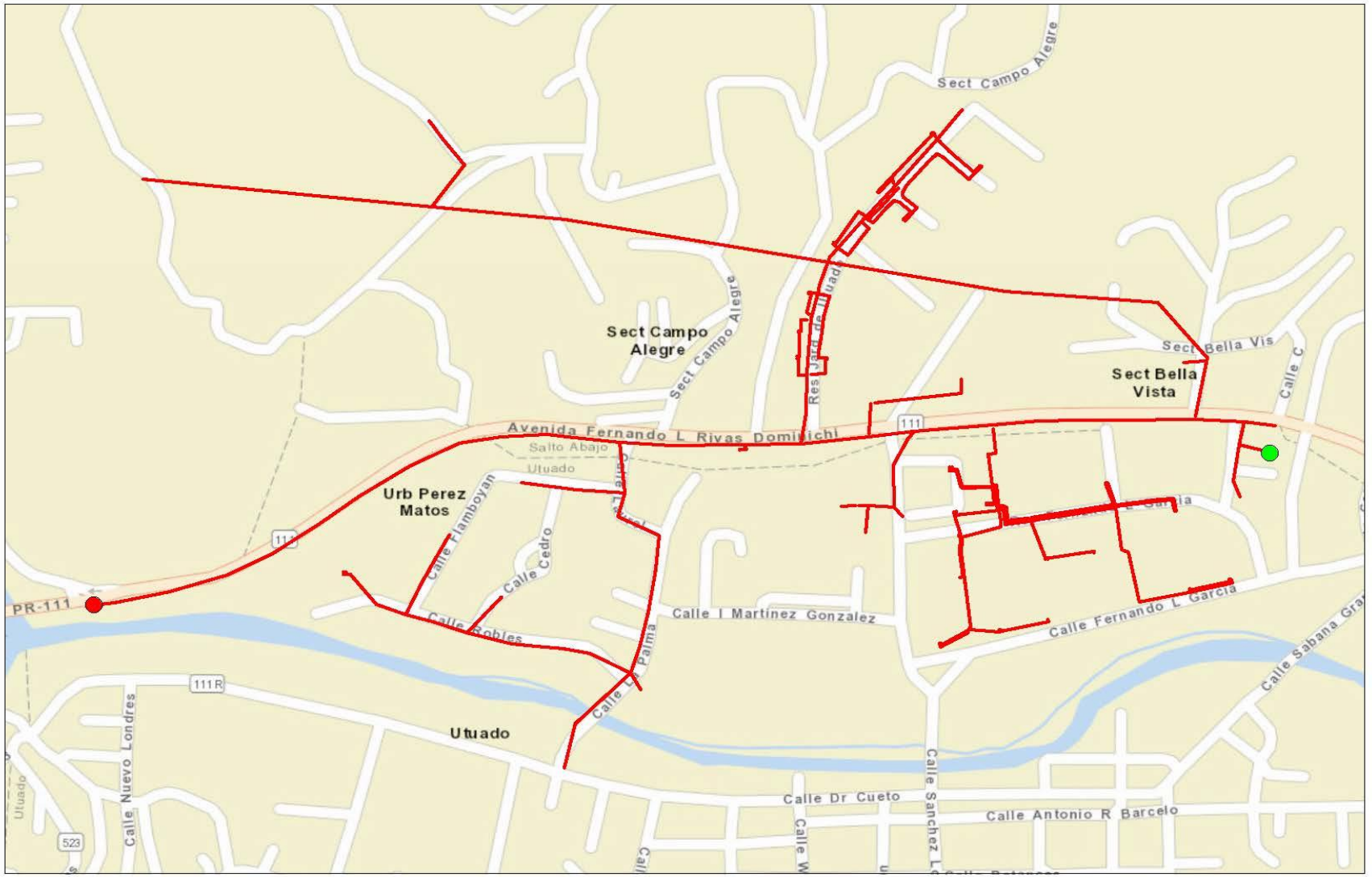
N

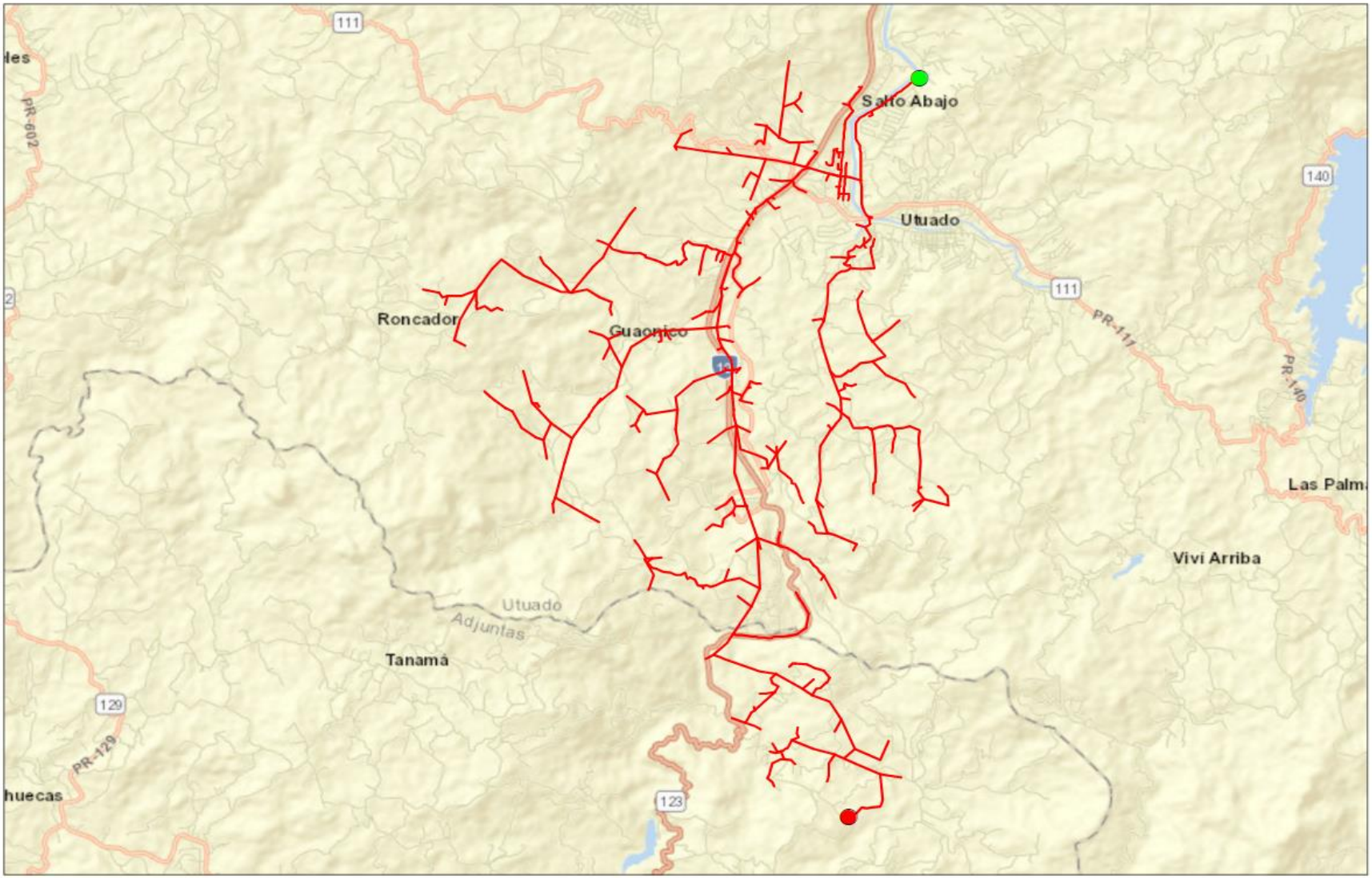
LUMA

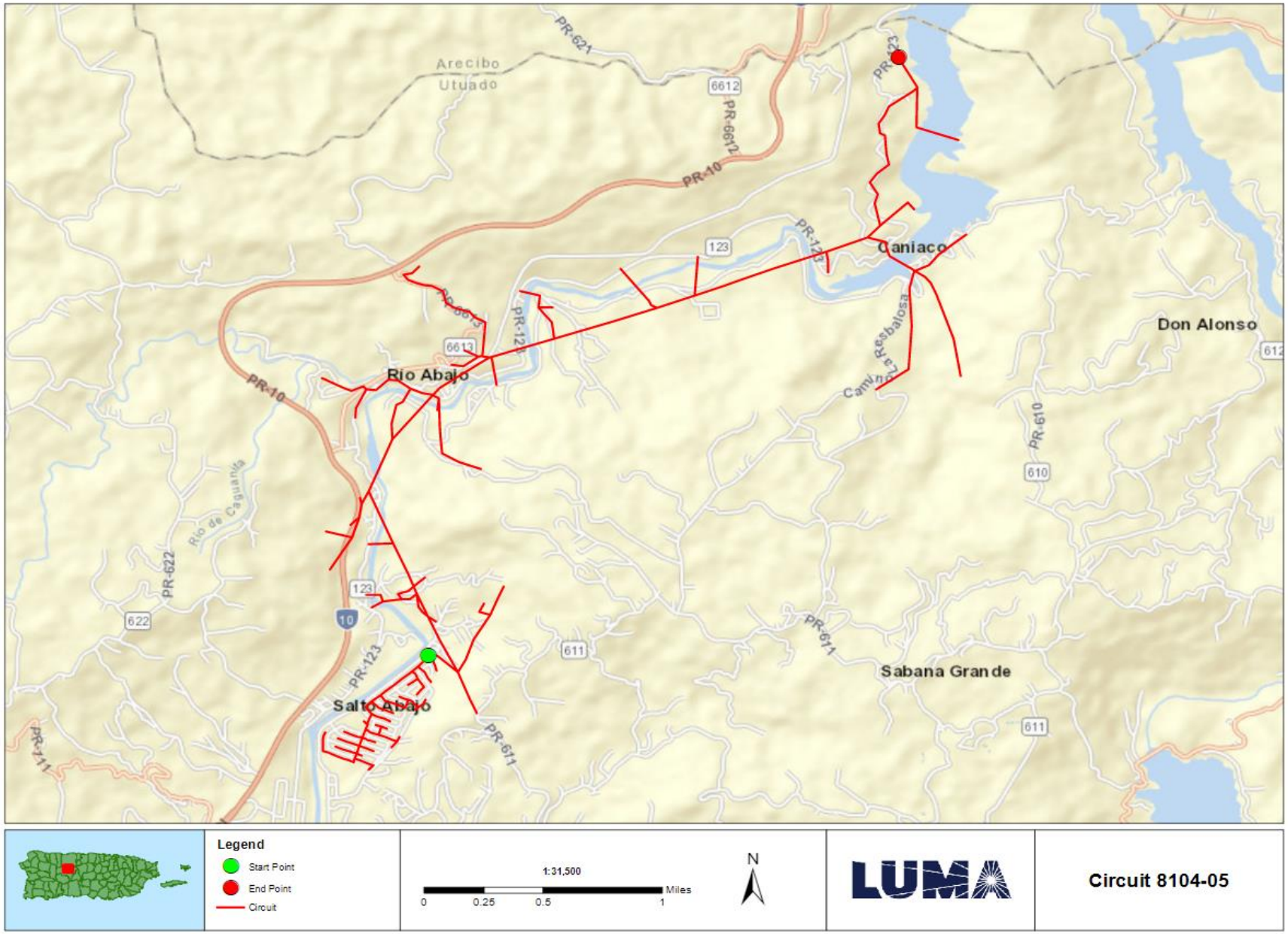
Circuit 8302-04


ALTS de Roblegal
BDA Nueva
Sect Bella Vista
Urb Cabrera
Utuado
JARD de Bubao
Proyecto Vivi
ALTS de Utuado
Lomas de Vista Verde
Villa Rios
REPTO Lucber
Vivi Abajo
Salto Arriba
Arenas
Vivi Arriba
Legend
Start Point
End Point
Circuit
1:26,410
0 0.2 0.4 0.8 Miles
N
LUMA
Circuit 8101-01


Utuado
Caniaco
Don Alonso
Rio Abajo
Salto Abajo
Sabana Grande
Utuado
Caonillas Abajo
Lago Caonillas
Rio Caonillas
PR-10
PR-123
PR-6613
PR-6612
PR-622
PR-610
PR-611
PR-612
PR-613
PR-614
PR-140
Camino Resbalosa
Legend
Start Point
End Point
Circuit
1:34,970
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 8101-04


Sect Campo Alegre
Sect Campo Alegre
Sect Campo Alegre
Sect Bella Vis
Sect Bella Vista
Avenida Fernando L Rivas Dominicchi
Salto Abajo
Utuado
Urb Perez Matos
Calle Flamboyan
Calle Cedro
Calle Robles
Calle L Palma
Calle I Martinez Gonzalez
Calle Fernando L Garcia
Calle Sabana Gra
PR-111
111
111R
523
Utuado
Calle Nuevo Londres
Calle Dr Cueto
Calle Antonio R Barcelo
Calle Sanchez
Legend
Start Point
End Point
Circuit
1:4,440
0
0.035
0.07
0.14
Miles
N
LUMA
Circuit 8101-05


Salto Abajo
Utuado
Roncador
Guaonico
Utuado
Adjuntas
Tanamá
Vivi Arriba
Las Palm
111
140
129
123
PR-602
PR-111
PR-140
PR-129
Legend
Start Point
End Point
Circuit
1:58,120
0
0.475
0.95
1.9
Miles
N
LUMA
Circuit 8104-02


Arecibo
Utuado
PR-621
6612
PR-6612
PR-10
PR-123
123
Caniaco
Don Alonso
6613
Rio Abajo
PR-10
PR-622
Rio de Cagnanda
622
123
10
PR-123
Salto Abajo
611
PR-611
Sabana Grande
PR-610
610
PR-111
Legend
Start Point
End Point
Circuit
1:31,500
0
0.25
0.5
1
Miles
N
LUMA
Circuit 8104-05

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 9

Revision: 0

Date: 10JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 9
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CRUCE DAVILA	8501-01	[redacted]		4.16
BARCELONETA PUEBLO	8504-03			4.16
CIALES	8701-04			8.32
FLORIDA	8602-01			4.16
FLORIDA	8602-03			4.16
MANATÍ PUEBLO	8405-01			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$3.27M**
Estimated Budget for Procurement & Construction:	**$32.66M**
Estimated Overall Budget for the Project:	**$35.93M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

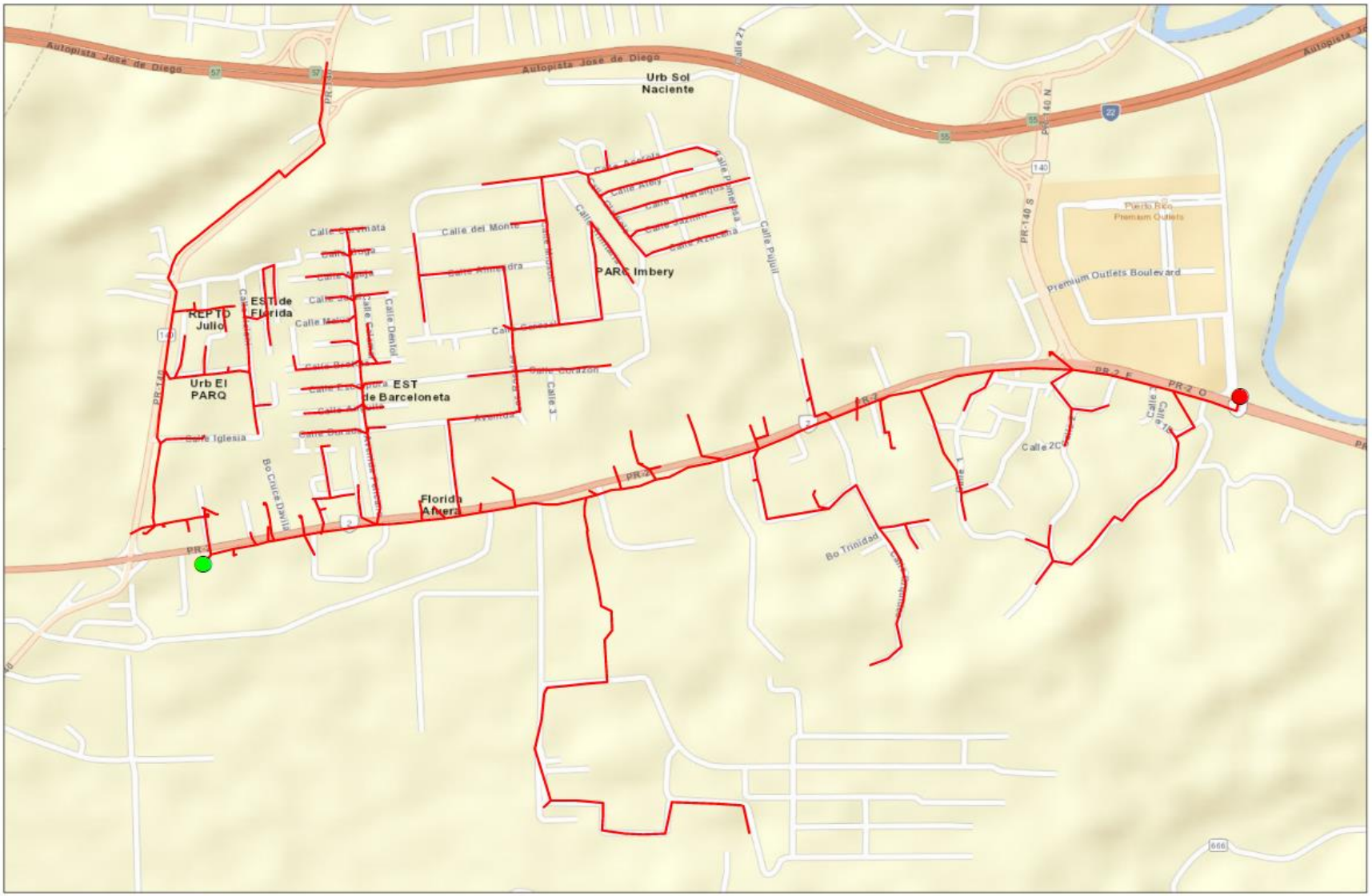
Note: If available, detailed engineering cost estimates will be included as an attachment.

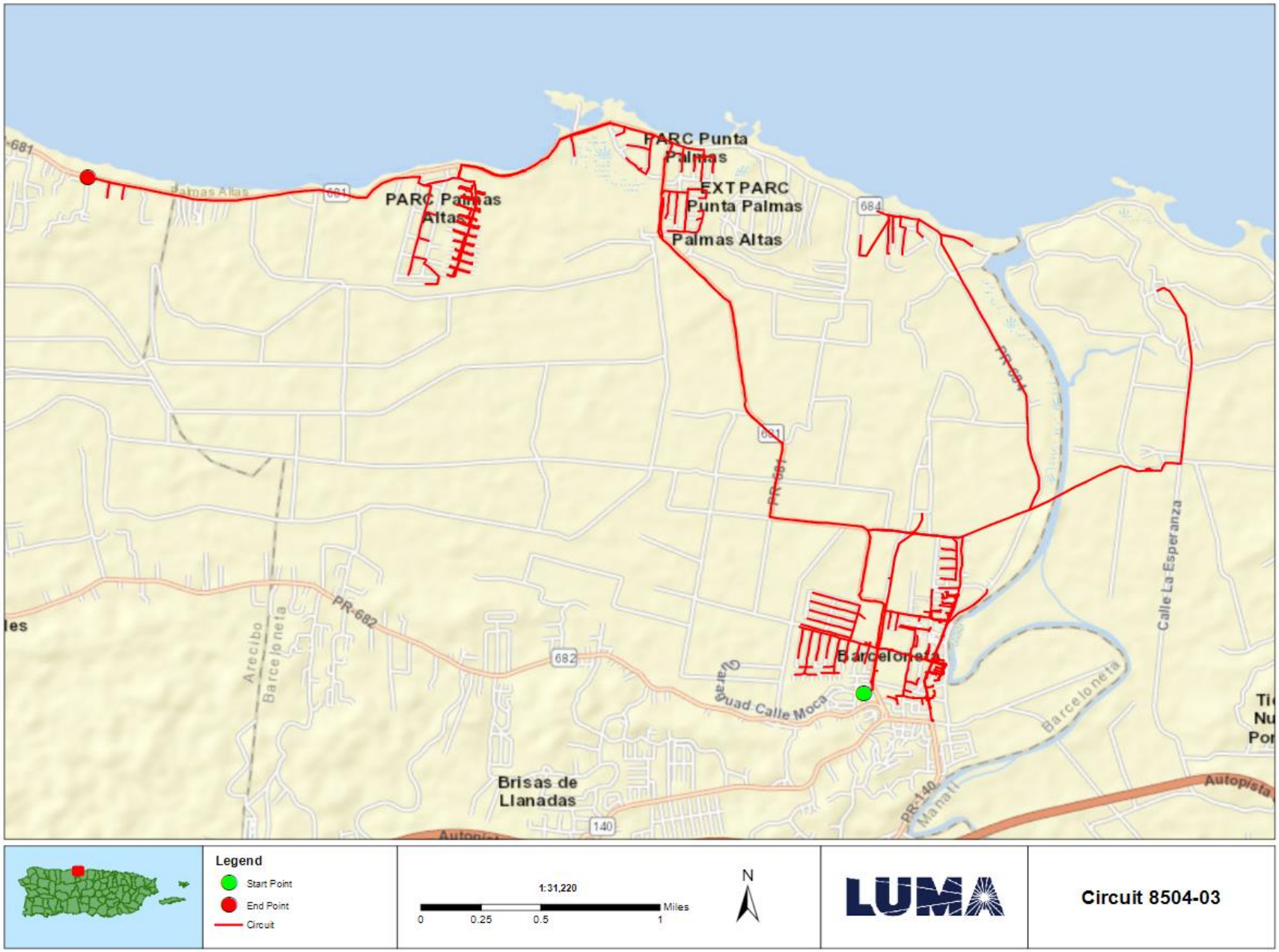
Environmental & Historic Preservation Requirements

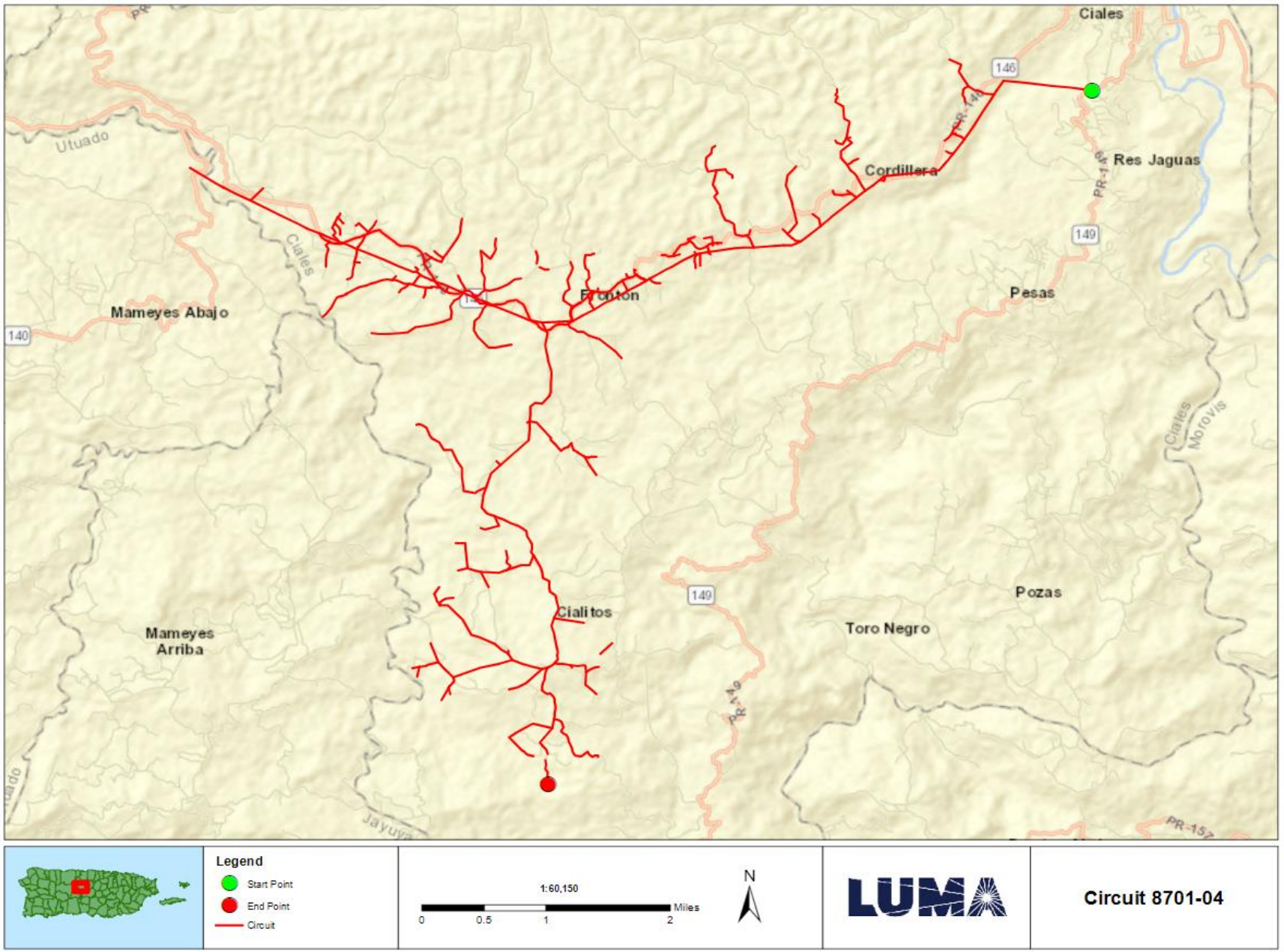
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

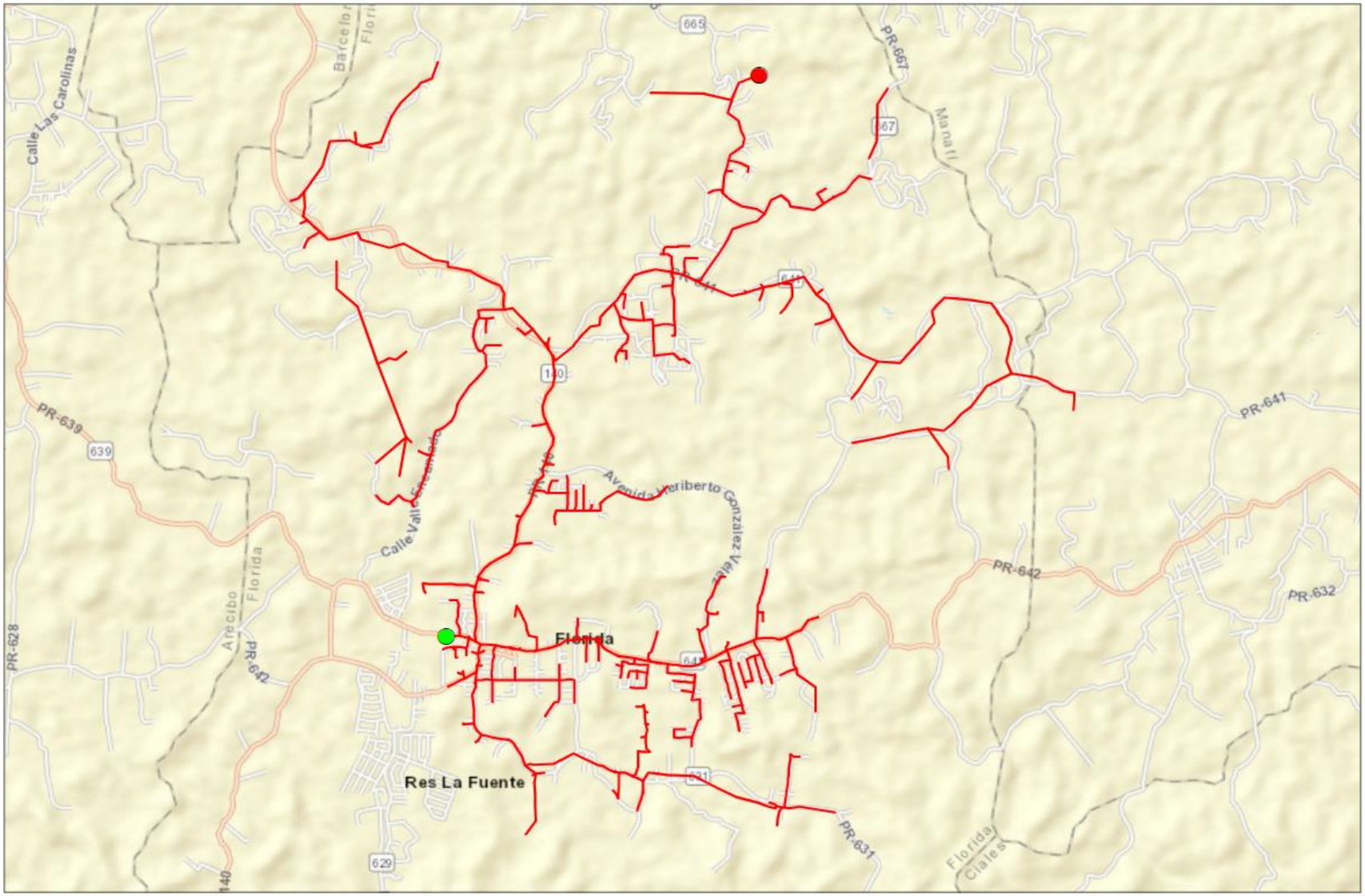
Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 9 Location Maps	Location Maps and Site Picture


Autopista Jose de Diego
Urb Sol Naciente
PARC Imbery
EST de Florida
REPTO Julio
Urb El PARQ
EST de Barceloneta
Florida Afuera
Bo Cruce Davila
Bo Trinidad
Premium Outlets Boulevard
Puerto Rico Premium Outlets
Calle Iglesia
Calle del Monte
Calle Pulguit
Calle 2C
PR-2
PR-140 S
PR-140 N
Legend
Start Point
End Point
Circuit
1:12,640
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 8501-01


PARC Punta Palmas
EXT PARC Punta Palmas
PARC Palmas Altas
Palmas Altas
Palmas Altas
681
684
PR-681
PR-682
682
Arecibo Barceloneta
Barceloneta
Quad Calle Moca
Calle La Esperanza
Brisas de Llanadas
140
PR-140
Manati
Autopista
Legend
Start Point
End Point
Circuit
1:31,220
0
0.25
0.5
1
Miles
N
LUMA
Circuit 8504-03


Ciales
Utuado
Cordillera
Res Jaguas
Mameyes Abajo
Frontón
Pesas
Cialitos
Mameyes Arriba
Toro Negro
Pozas
Morovis
Jayuya
146
149
140
PR-149
PR-157
Legend
Start Point
End Point
Circuit
1:60,150
Miles
0
0.5
1
2
N
LUMA
Circuit 8701-04



Legend

- Start Point
- End Point
- Circuit

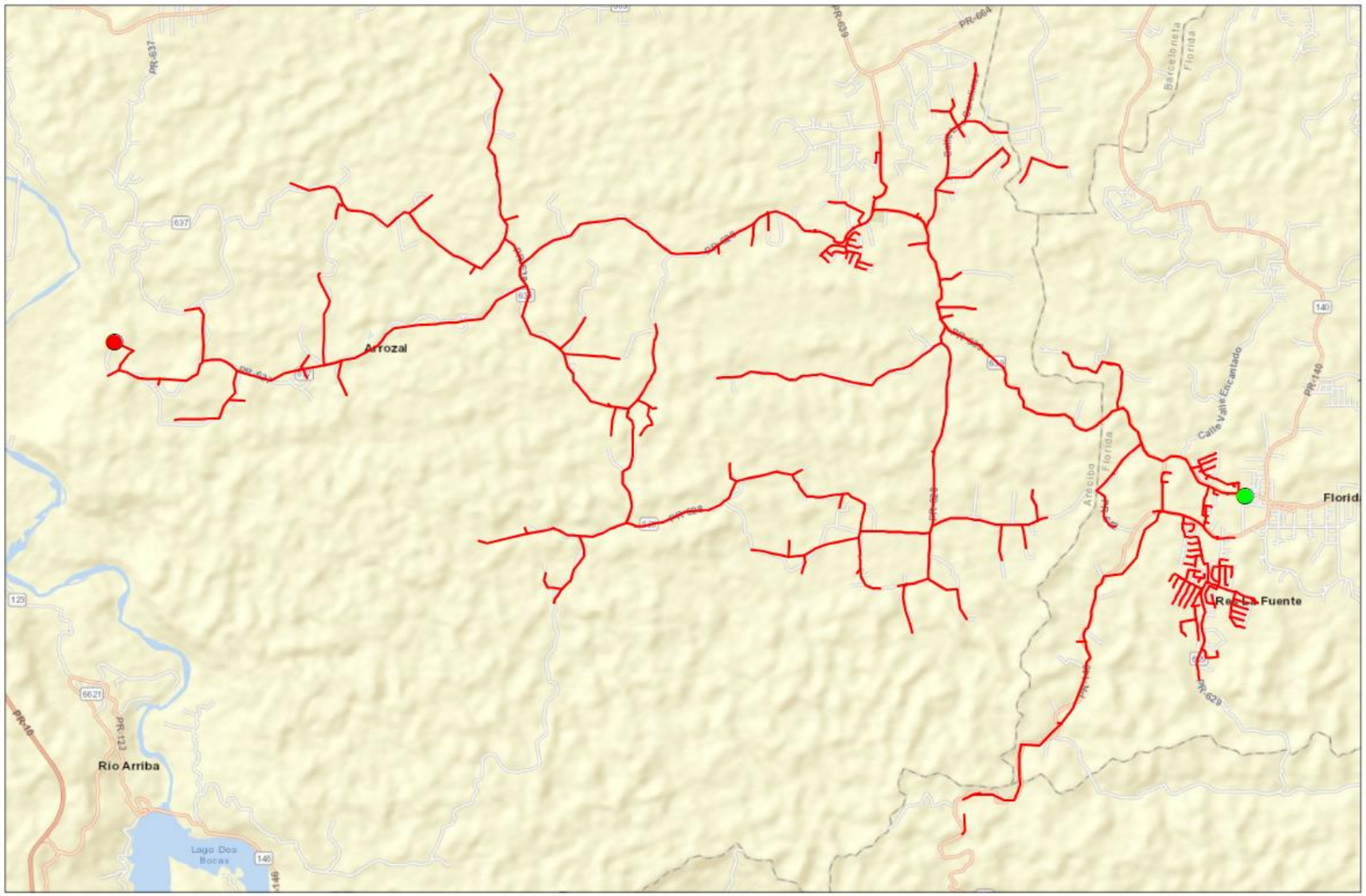
1:34,020

0 0.275 0.55 1.1 Miles

N

LUMA

Circuit 8602-01



Legend

- Start Point
- End Point
- Circuit

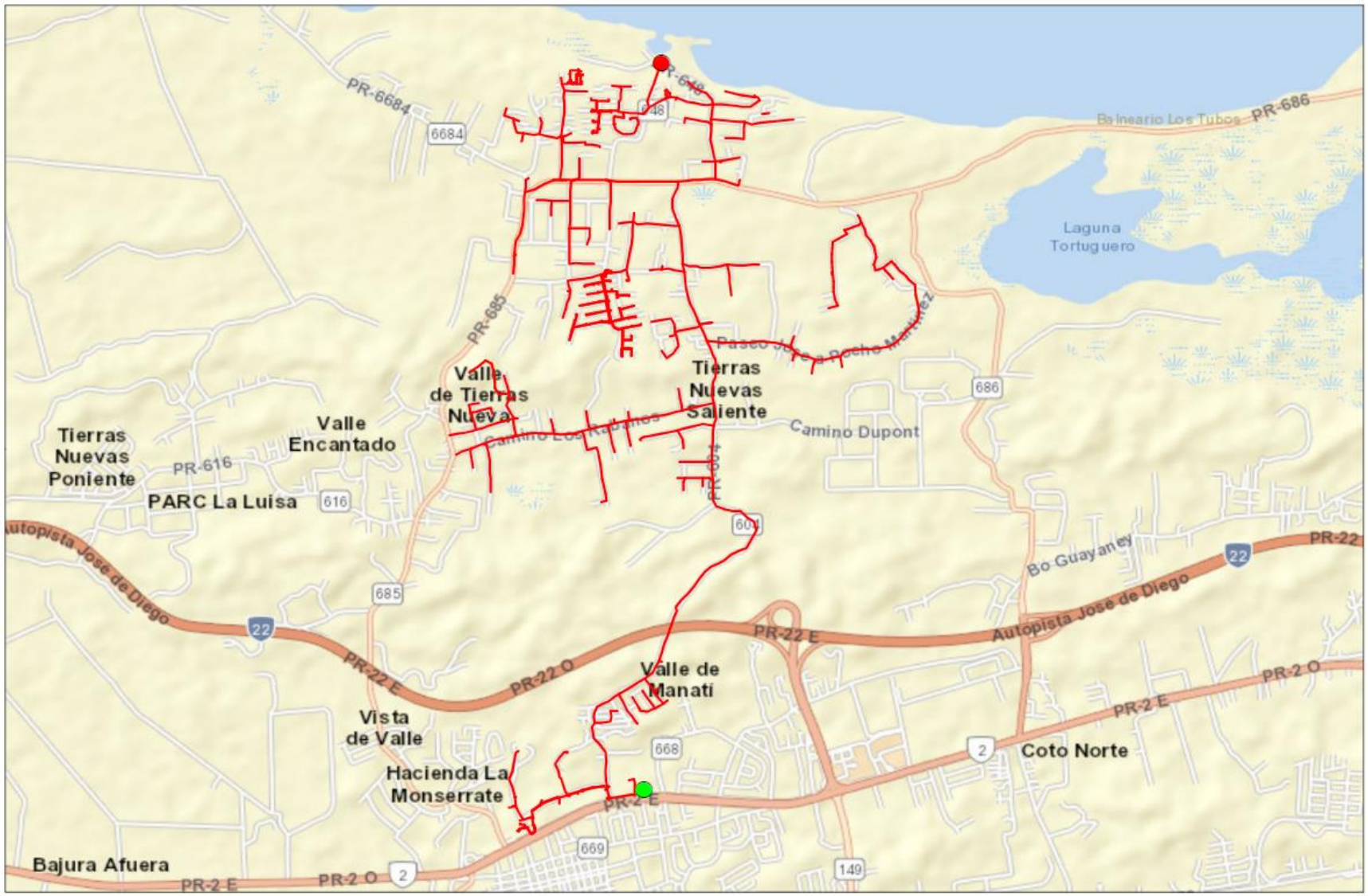
1:47,280

0 0.375 0.75 1.5 Miles

N

LUMA

Circuit 8602-03


PR-6684
6684
PR-686
Balneario Los Tubos
Laguna
Tortuguero
PR-685
Valle
de Tierras
Nueva
Tierras
Nuevas
Saliente
Paseo de la Roche Martínez
686
Camino Dupont
Tierras
Nuevas
Poniente
PR-616
PARC La Luisa
616
Valle
Encantado
Camino Los Rabanos
PR-604
604
685
Autopista Jose de Diego
22
PR-22 E
PR-22 O
Bo Guayaney
Valle de
Manati
Vista
de Valle
668
Hacienda La
Monserrate
PR-2 E
PR-2 O
2
Coto Norte
669
149
Bajura Afuera
Legend
Start Point
End Point
Circuit
1:28,440
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 8405-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 10

Revision: 0

Date: 10JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 10
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
MANATÍ PUEBLO	8405-03	[redacted]		13.2
MANATÍ 13.2 KV	8404-02			13.2
MOROVIS	8801-01			8.32
MOROVIS	8801-02			8.32
MOROVIS	8801-03			8.32
MOROVIS	8801-04			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.76M**
Estimated Budget for Procurement & Construction:	**$27.60M**
Estimated Overall Budget for the Project:	**$30.36M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

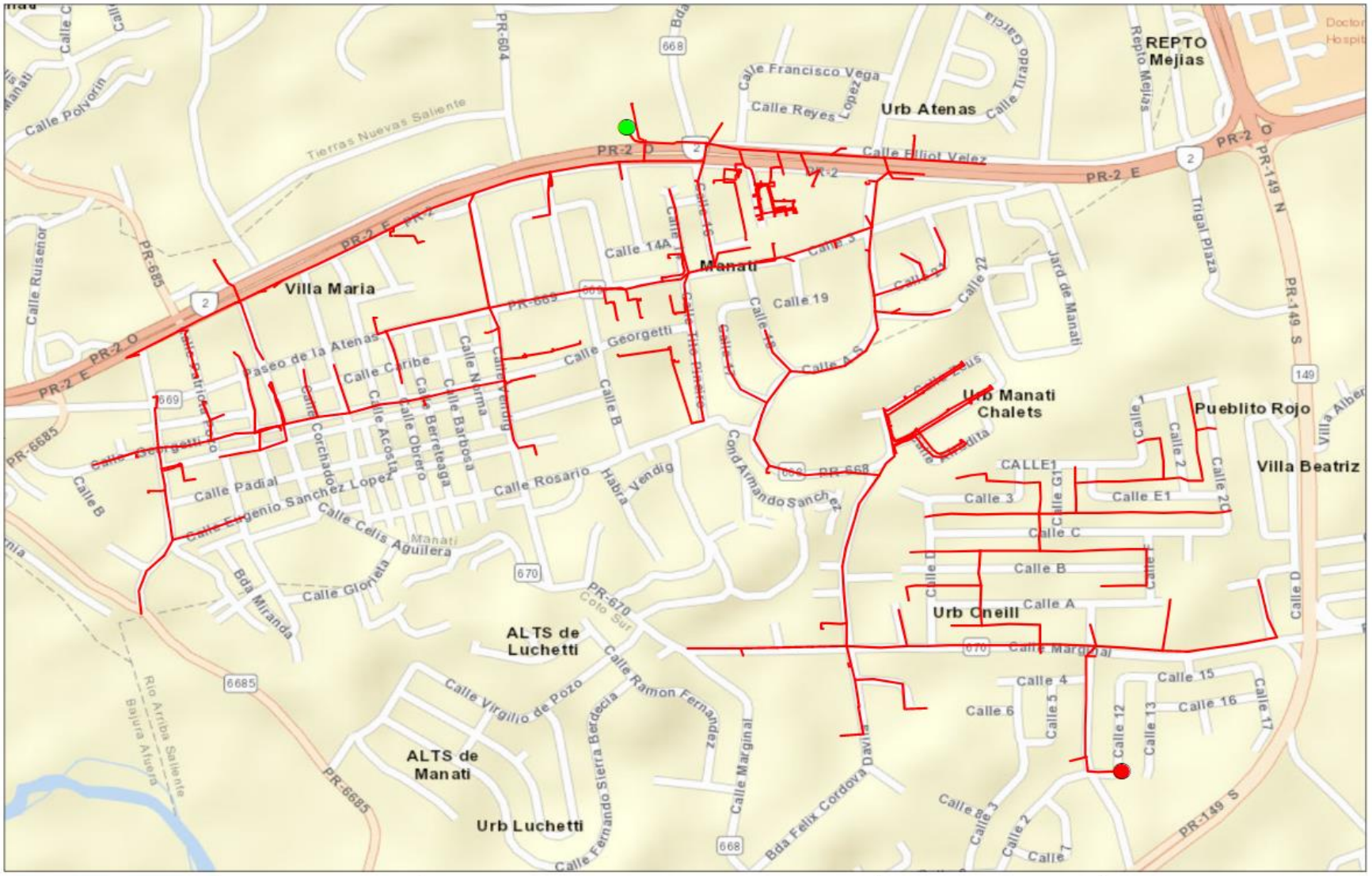
Note: If available, detailed engineering cost estimates will be included as an attachment.

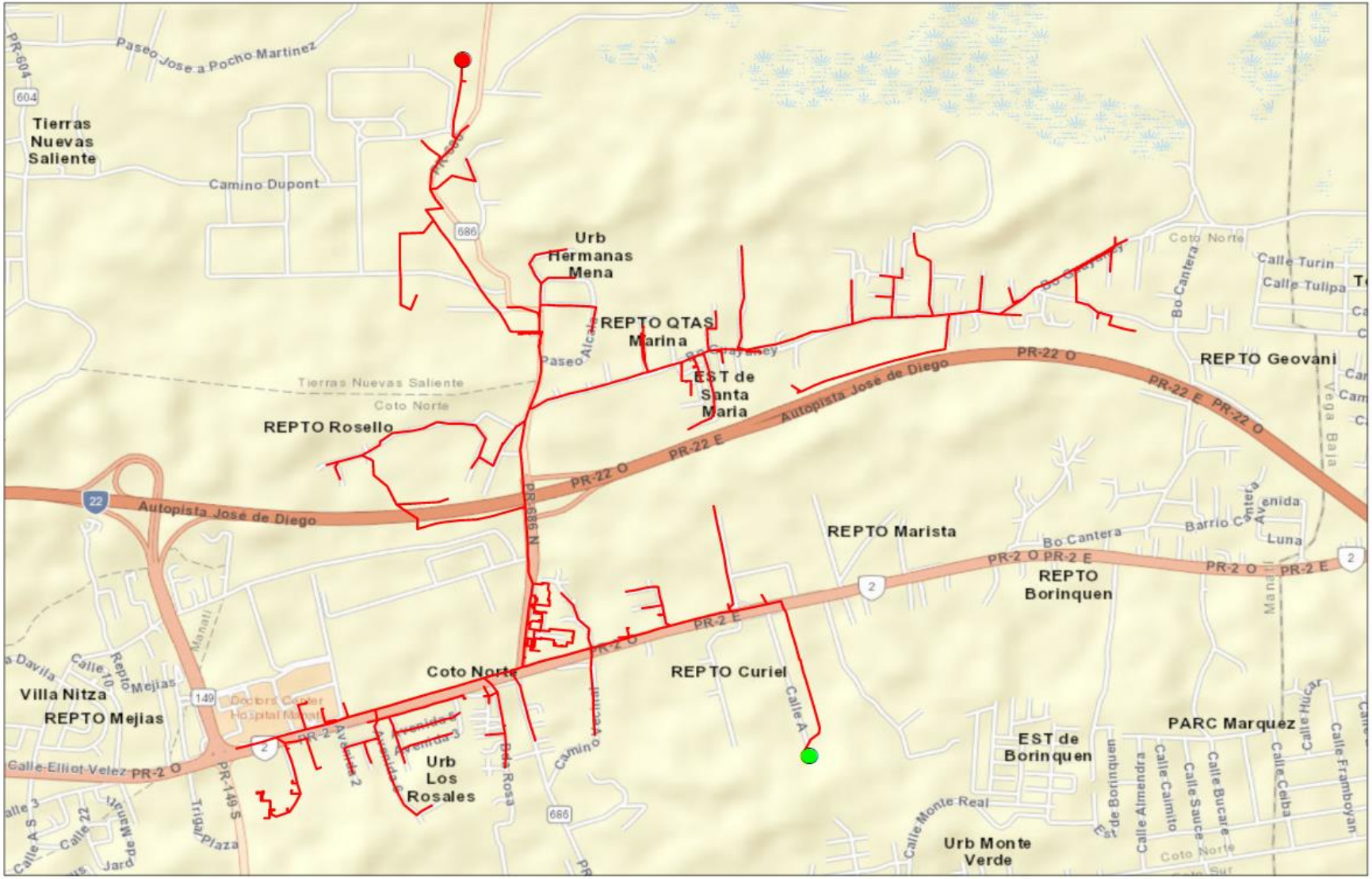
Environmental & Historic Preservation Requirements

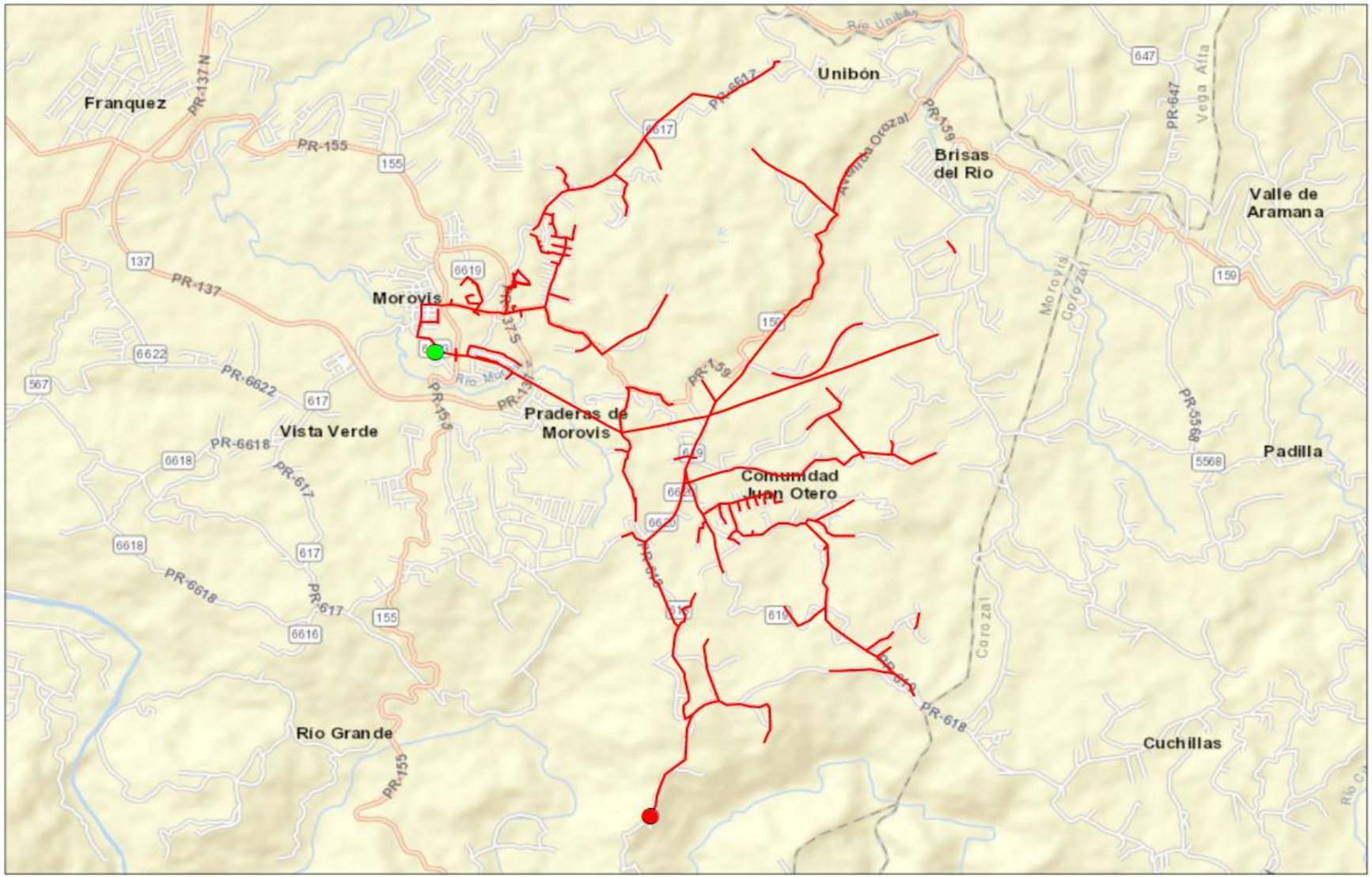
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

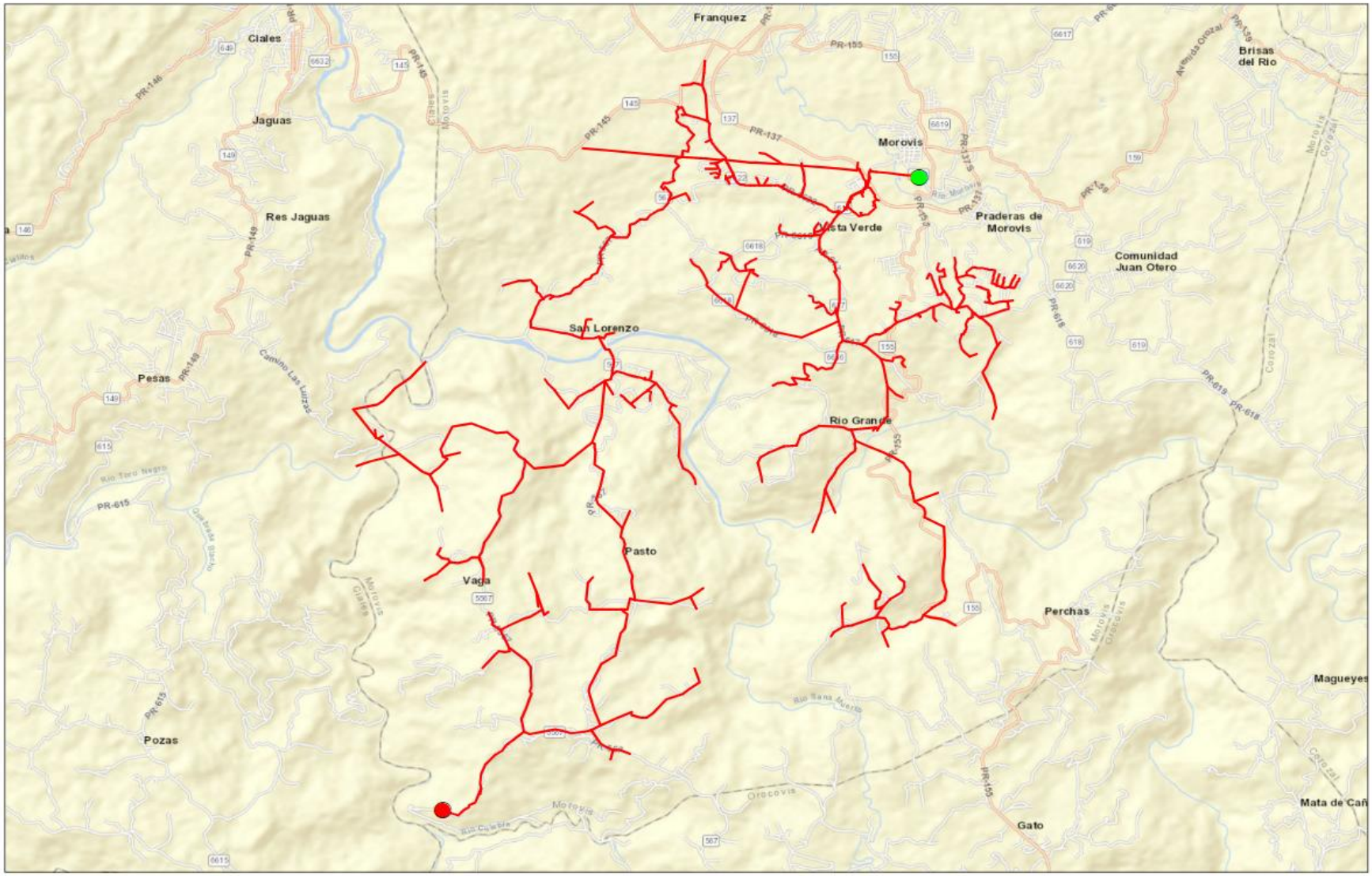
Attachments

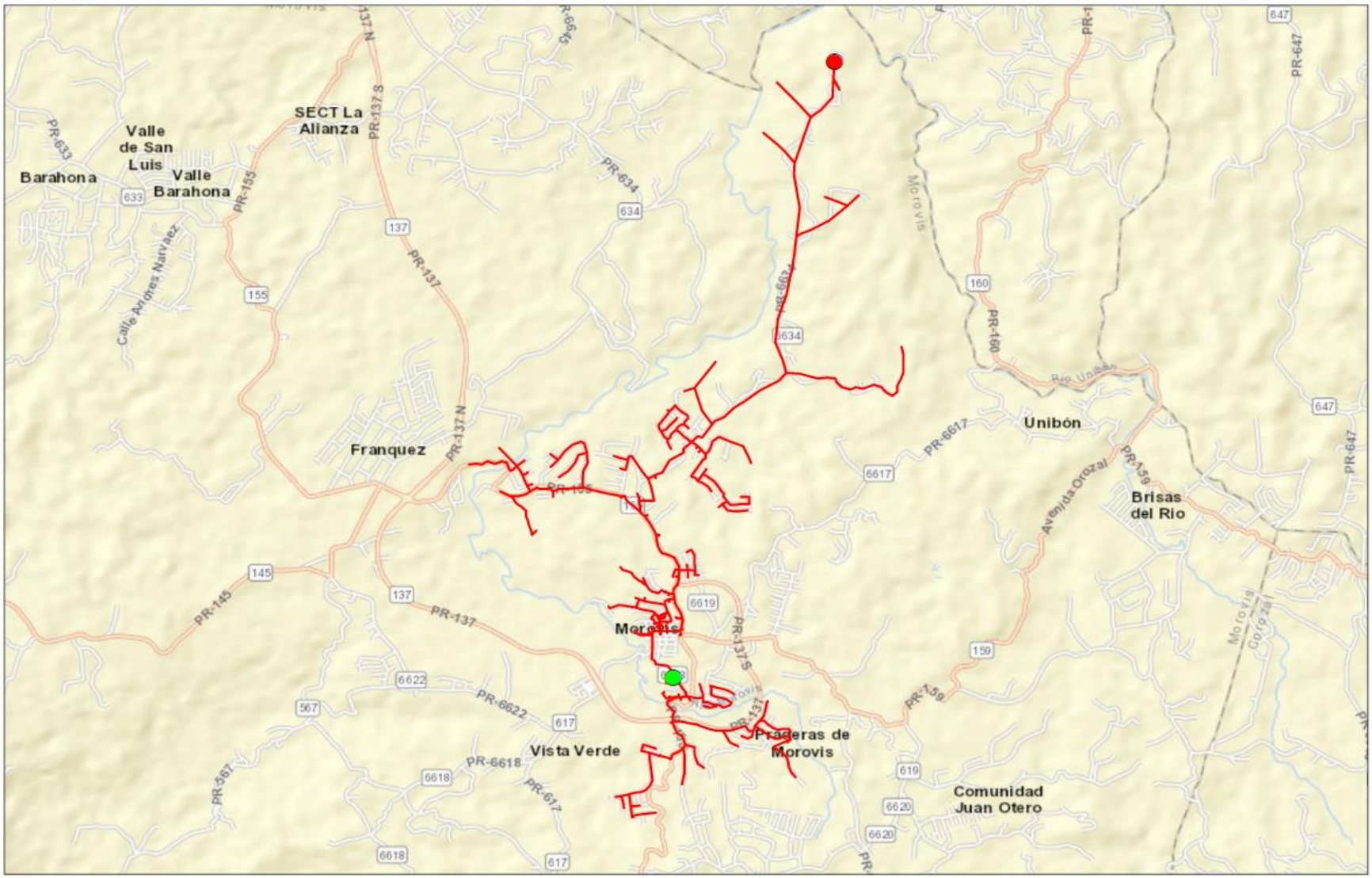
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 10 Location Maps	Location Maps and Site Picture

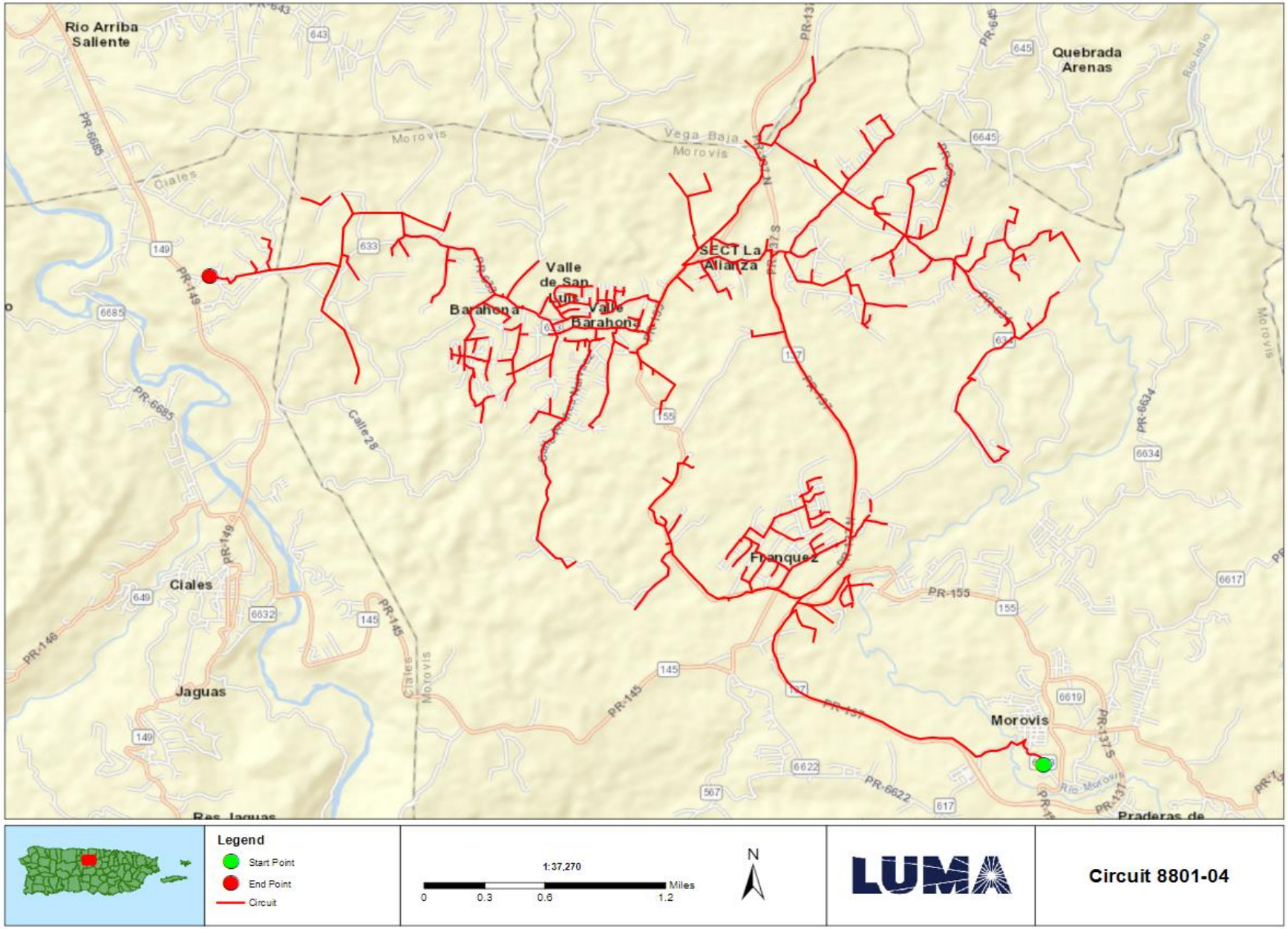

REPTO Mejias
Urb Atenas
Villa Maria
Manati
Urb Manati Chalets
Pueblito Rojo
Villa Beatriz
Urb Cneill
ALTS de Luchetti
ALTS de Manati
Urb Luchetti
Calle Francisco Vega
Calle Reyes Lopez
Calle Elliot Velez
Calle Georgetti
Calle Padial
Calle Rosario
Calle Celis Aguilera
Calle Virgilio de Pozo
Calle Ramon Fernandez
Calle Marginal
Bda Felix Cordova Davila
Calle Fernando Sierra Berdecia
Paseo de la Atenas
Calle Caribe
Calle Acosta
Calle Obrero
Calle Barbosa
Calle Norma
Calle Eugenio Sanchez Lopez
Calle Gloriela
Bda Miranda
Cond Armando Sanchez
Calle Margarital
Tierras Nuevas Saliente
Rio Arriba Saliente Bajura Afuera
PR-2 O
PR-2 E
PR-504
PR-685
PR-6685
PR-668
PR-670
PR-149 N
PR-149 S
Legend
Start Point
End Point
Circuit
1:8,680
0 0.05 0.1 0.2 Miles
N
LUMA
Circuit 8405-03


Paseo Jose a Pocho Martinez
PR-604
604
Tierras Nuevas Saliente
Camino Dupont
686
Urb Hermanas Mena
REPTO QTAS Marina
Paseo Alcalá
Bo Cotorrayey
EST de Santa Maria
Tierras Nuevas Saliente
Coto Norte
REPTO Rosello
PR-22 O
PR-22 E
Autopista Jose de Diego
22
PR-686 N
REPTO Marista
Bo Cantera
Coto Norte
Calle Turin
Calle Tulipa
REPTO Geovani
Vega Baja
Barrio Cantera
Avenida Luna
PR-2 O
PR-2 E
REPTO Borinquen
2
Manati
Calle 10
Repto Mejias
Villa Nitza
REPTO Mejias
149
Doctors Center Hospital Manati
Coto Norte
REPTO Curiel
Calle A
Calle Elliot Velez
PR-149 S
Avenida 2
Avenida 3
Urb Los Rosales
Bda Rosa
Camino Vecinal
686
EST de Borinquen
PARC Marquez
Calle Almendra
Calle Caimito
Calle Sauce
Calle Bucare
Calle Ceiba
Calle Framboyan
Calle Monte Real
Urb Monte Verde
Coto Norte
Legend
Start Point
End Point
Circuit
1:17,580
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 8404-02


Franquez
PR-137 N
PR-155
155
137
PR-137
6619
Morovis
6622
PR-6622
567
617
Vista Verde
PR-6618
6618
PR-617
Río Grande
PR-155
6616
Unibón
PR-6617
6617
Avenida Orozal
PR-159
Brisas del Río
Praderas de Morovis
Comunidad Juan Otero
619
Río Unibón
647
PR-647
Vega Alta
Valle de Aramana
159
Morovis
Corozal
PR-5589
5568
Padilla
PR-618
Cuchillas
Legend
Start Point
End Point
Circuit
1:33,160
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 8801-01


Franquez
Ciales
Jaguas
Res Jaguas
Morovis
Brisas del Rio
Praderas de Morovis
Vista Verde
Comunidad Juan Otero
San Lorenzo
Pesas
Rio Grande
Pasto
Vaga
Perchas
Magueyes
Pozas
Gato
Mata de Caña
PR-146
PR-145
PR-137
PR-155
PR-149
PR-615
PR-618
PR-619
PR-159
Legend
Start Point
End Point
Circuit
1:51,750
0
0.425
0.85
1.7
Miles
N
LUMA
Circuit 8801-02


SECT La Alianza
Valle de San Luis
Valle Barahona
Barahona
Franquez
Morovis
Unibón
Brisas del Rio
Prageras de Morovis
Vista Verde
Comunidad Juan Otero
PR-137
PR-137 N
PR-137 S
PR-155
PR-634
PR-6617
PR-6622
PR-6618
PR-145
PR-567
PR-617
PR-159
PR-160
PR-647
Avenida Orozal
Río Unibón
Calle Andres Narvaez
Legend
Start Point
End Point
Circuit
1:36,150
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 8801-03


Río Arriba Saliente
Quebrada Arenas
Vega Baja
Morovis
Ciales
Valle de San Luis
Barahona
Valle Barahona
SECT La Alianza
Franquez
Morovis
Jaguas
Ciales
Calle 28
PR-6685
PR-149
PR-145
PR-155
PR-137
PR-6622
PR-6634
643
645
6645
633
6685
149
155
145
137
6634
649
6632
6617
6619
6622
567
617
Legend
Start Point
End Point
Circuit
1:37,270
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 8801-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 11

Revision: 0

Date: 10JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 11
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
VEGA ALTA 13KV	9105-08	[redacted]		13.2
BREÑAS	9201-02			8.32
VEGA ALTA 8KV	9101-01			8.32
VEGA ALTA 8KV	9101-03			8.32
VEGA ALTA 8KV	9101-04			8.32
SANTA ANA	9103-01			8.32
VEGA BAJA 2	9003-06			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$3.30M**
Estimated Budget for Procurement & Construction:	**$33.04M**
Estimated Overall Budget for the Project:	**$36.34M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

Note: If available, detailed engineering cost estimates will be included as an attachment.

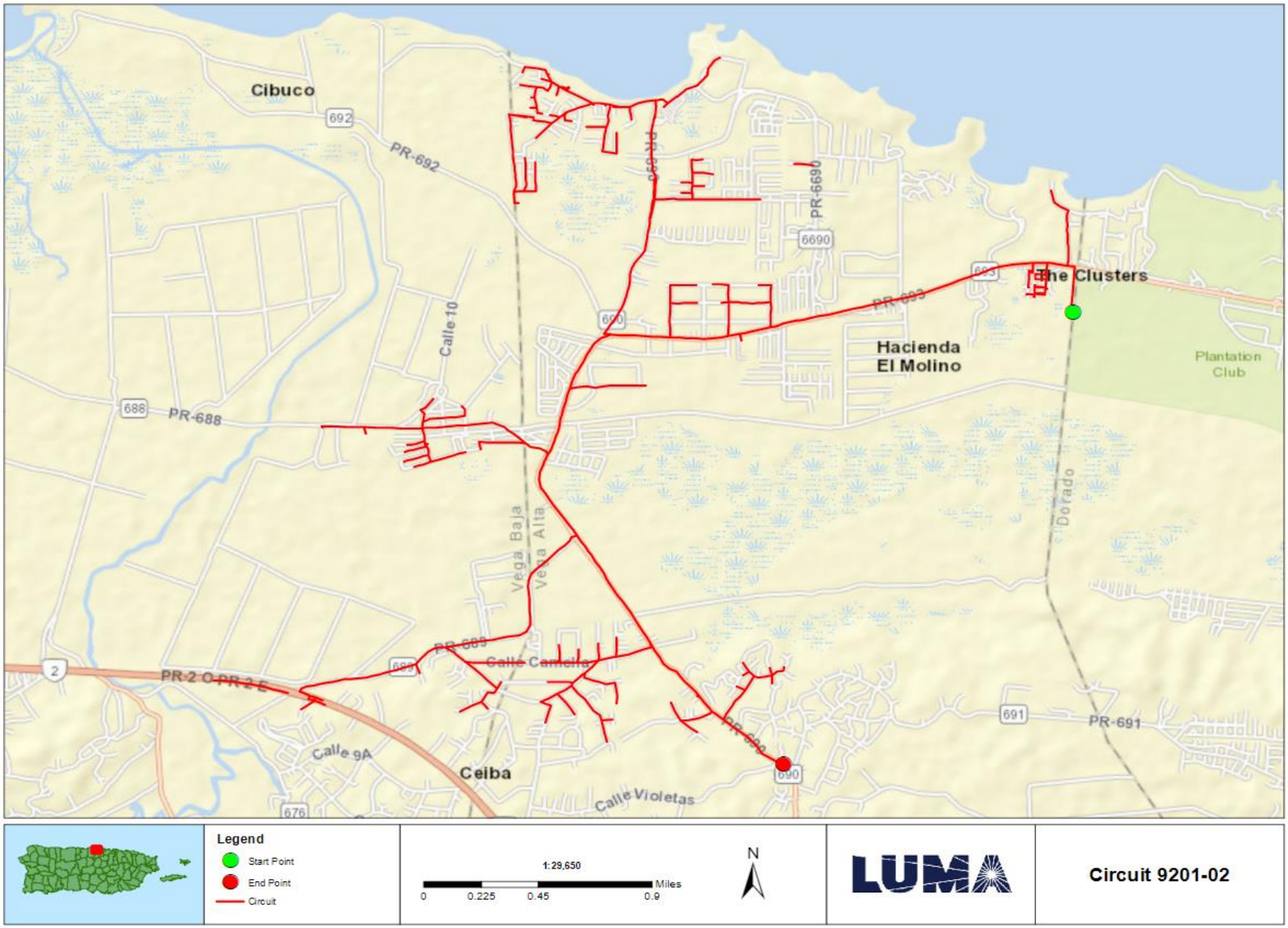
Environmental & Historic Preservation Requirements

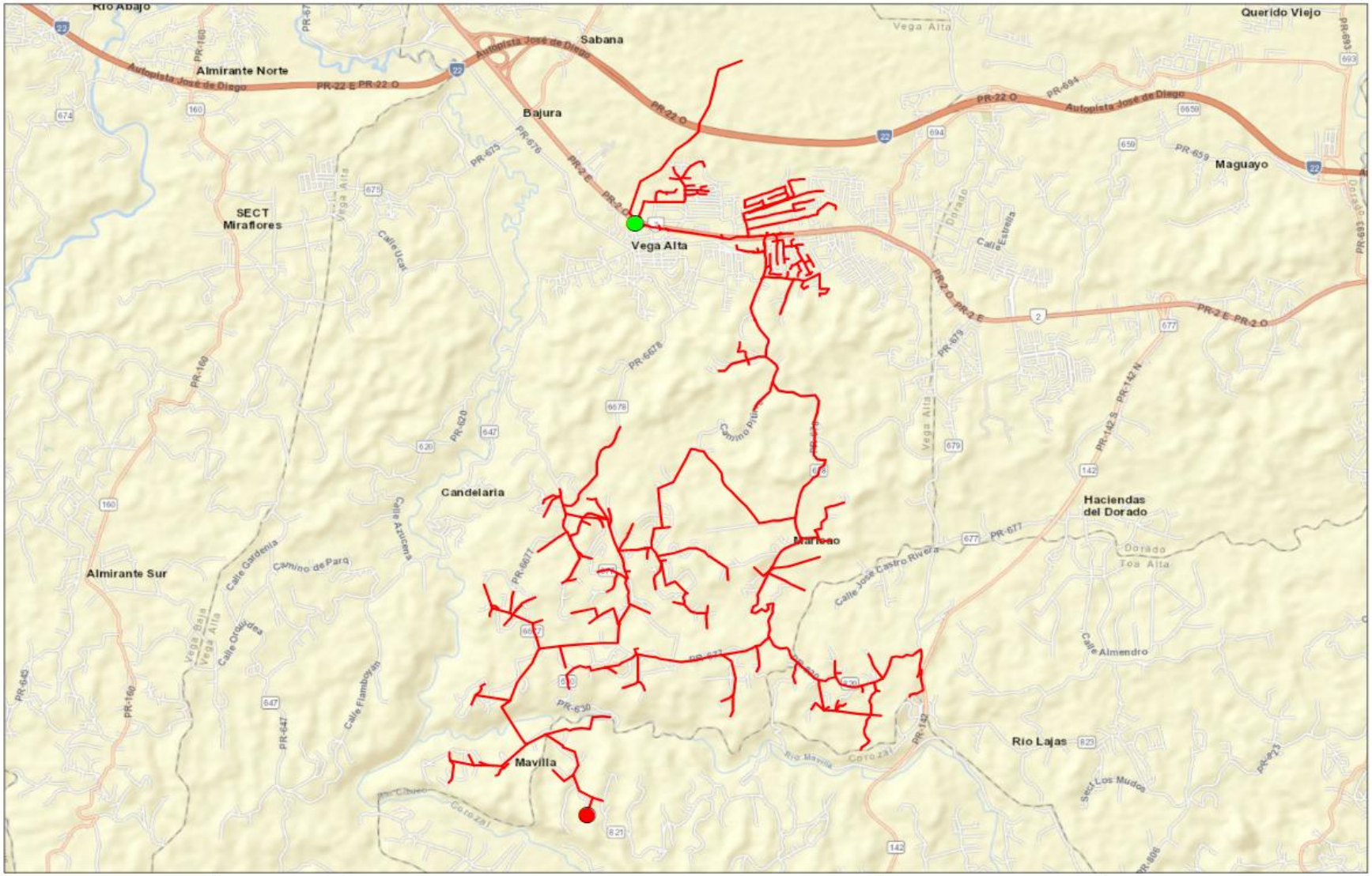
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 11 Location Maps	Location Maps and Site Picture


Ponderosa
Calle 5
Calle 4
Calle 3
Calle 2
Calle 1
Calle 13
Calle 105
CALLE102
EXT
La Inmaculada
Calle 101
Calle Calandria
Bajura
Espinosa
PR-2 O
PR-2 E
2
Calle Estacion
Calle Jacinto Seilo
Calle Jaime Acosta
Calle Teodomiro Ramirez
Calle Muñoz Rivera
Calle Gabriel Hernandez
Calle Georgetti
Calle Colon
Calle Unión
Calle Libertad
Calle Giboyeaux
Espinosa
Vega Alta
Calle 16
Calle 15
Calle 9
Calle 8
ega Alta
Legend
Start Point
End Point
Circuit
1:3,920
0
0.0325
0.065
0.13
Miles
N
LUMA
Circuit 9105-08


Cibuco
692
PR-692
PR-6690
6690
The Clusters
PR-693
Hacienda
El Molino
Plantation
Club
Calle 10
688
PR-688
Vega Baja
Vega Alta
Dorado
PR-683
Calle Camelia
2
PR-2 O PR-2 E
Calle 9A
Ceiba
Calle Violetas
691
PR-691
676
Legend
Start Point
End Point
Circuit
1:29,650
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 9201-02



Legend

- Start Point
- End Point
- Circuit

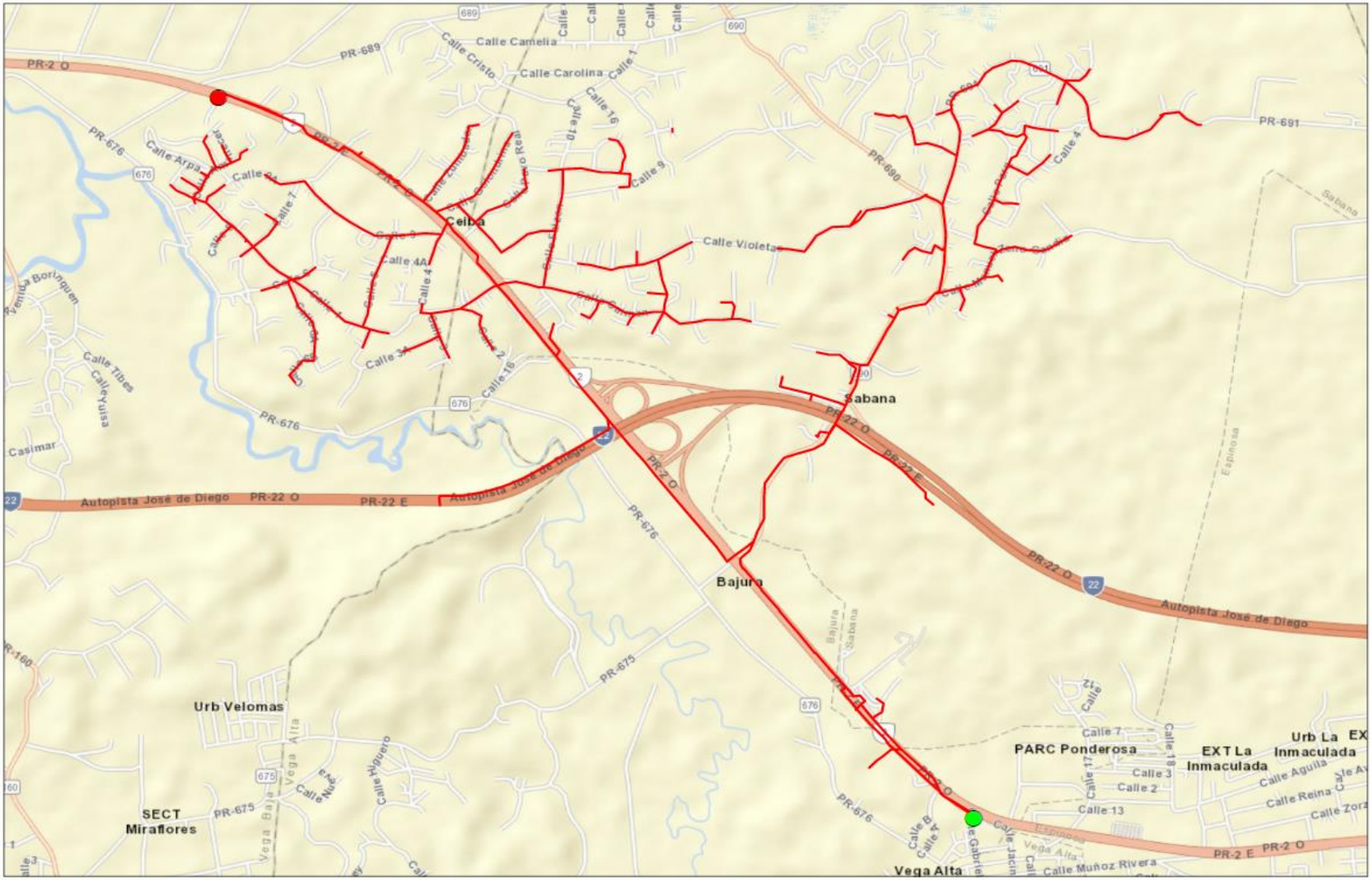
1:48,690

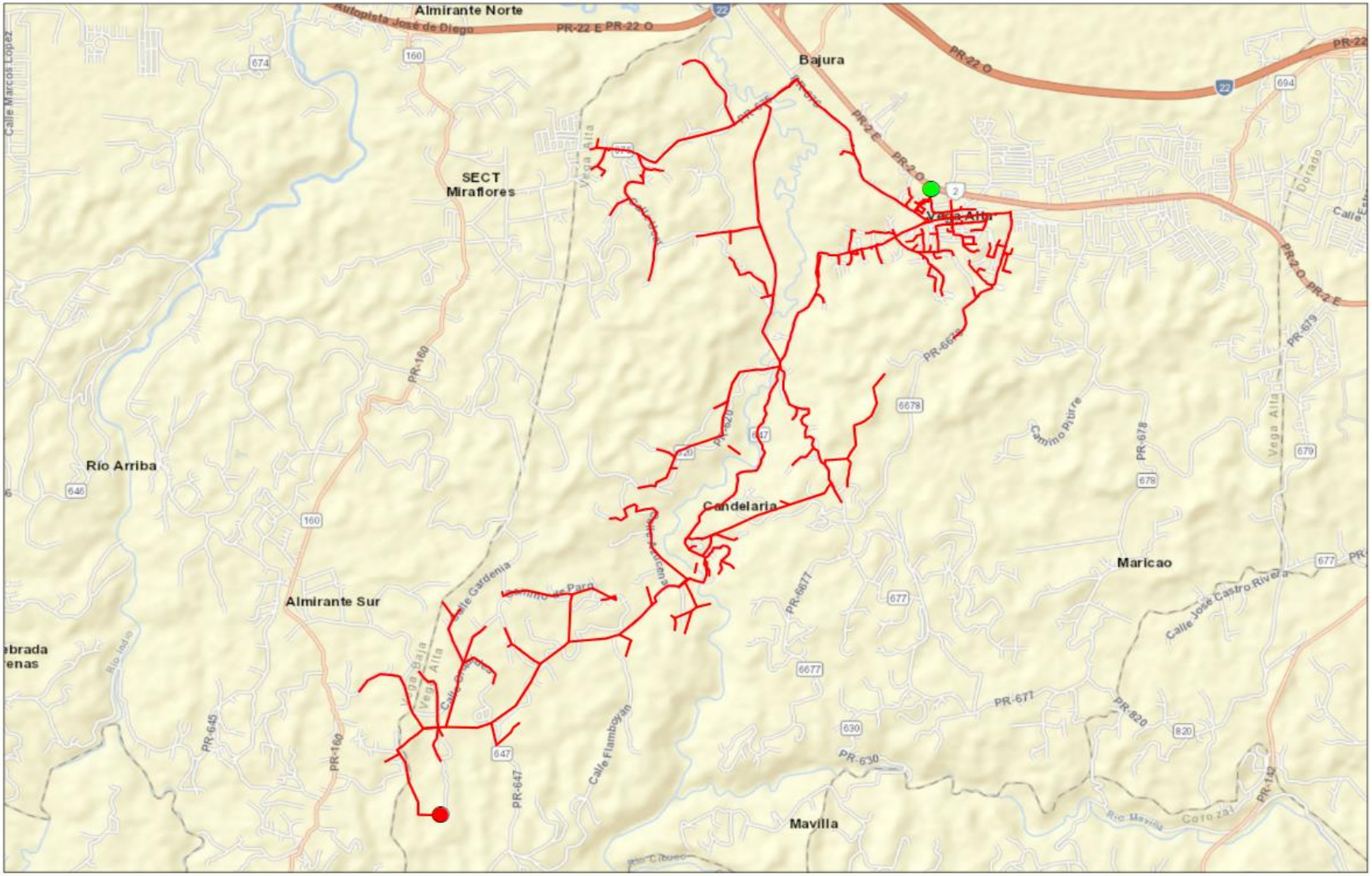
0 0.4 0.8 1.6 Miles

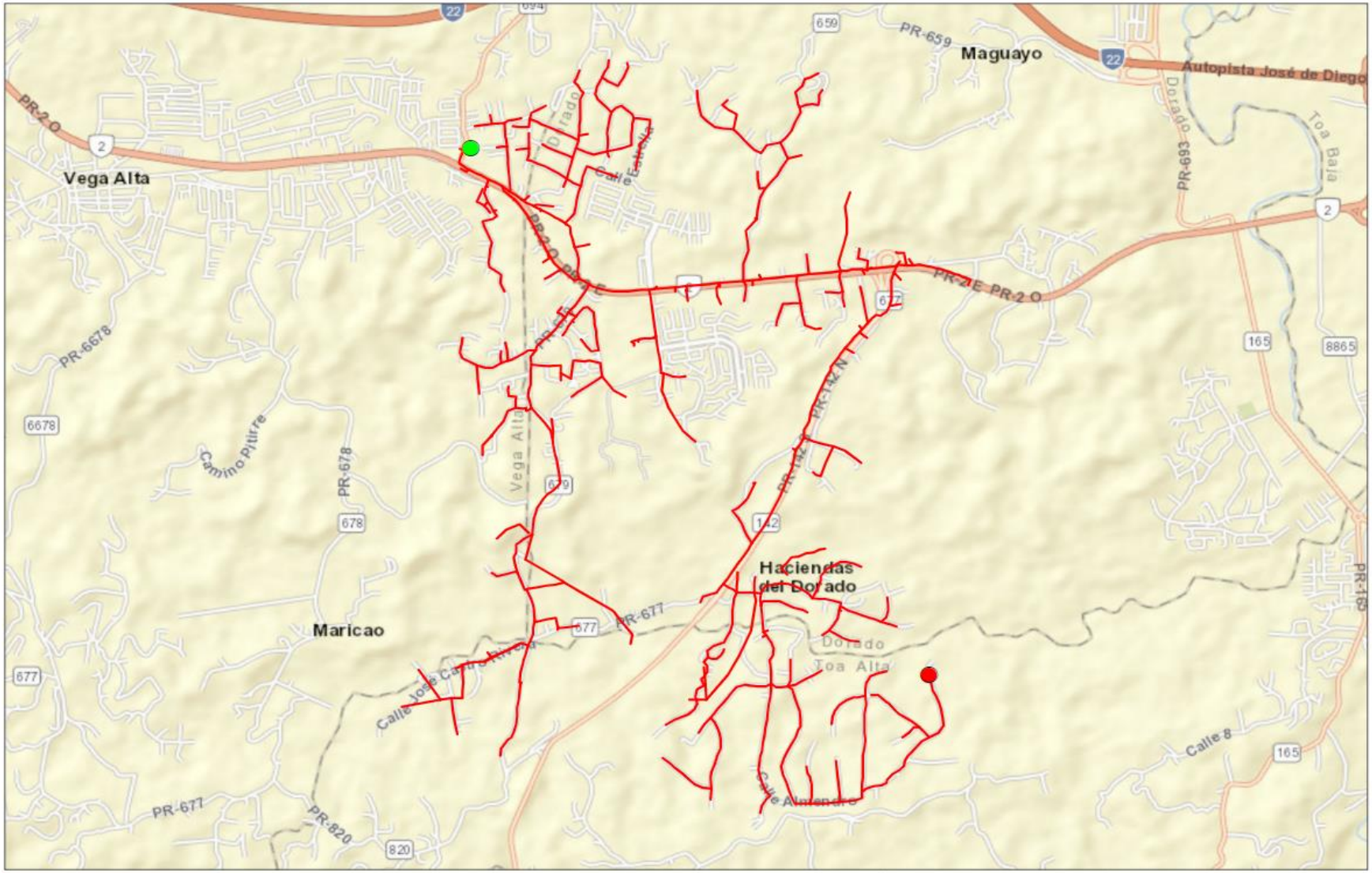
N

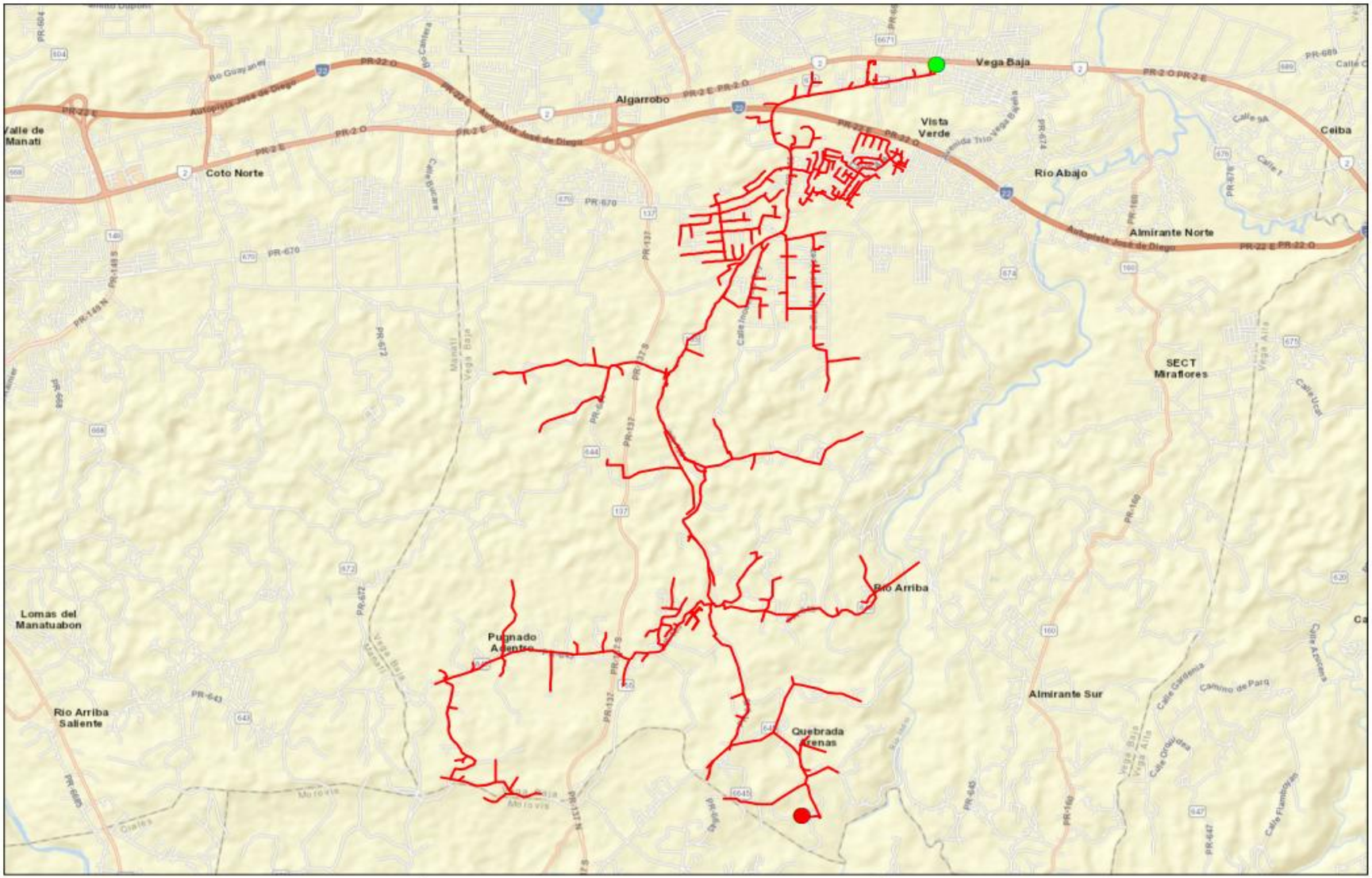
LUMA

Circuit 9101-01


Calle Camelia
Calle Cristo
Calle Carolina
PR-689
PR-690
PR-691
PR-676
PR-2 O
Ceiba
Calle Violeta
Sabana
Autopista José de Diego
PR-22 O
PR-22 E
Bajura
PR-675
Urb Velomas
SECT
Miraflores
PARC Ponderosa
EXT La
Inmaculada
Urb La
Inmaculada
Vega Alta
Calle Muñoz Rivera
Legend
Start Point
End Point
Circuit
1:21,170
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 9101-03


Almirante Norte
Autopista José de Diego
PR-22 E PR-22 O
Bajura
PR-22 O
SECT
Miraflores
Vega Alta
PR-2 E
PR-2 O
Río Arriba
PR-160
Candelaria
Almirante Sur
Maricao
Mavilla
PR-677
PR-678
PR-679
PR-647
PR-645
PR-630
PR-820
Legend
Start Point
End Point
Circuit
1:41,400
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 9101-04


Vega Alta
Maguayo
Autopista José de Diego
Haciendas del Dorado
Maricao
Dorado
Toa Alta
Toa Baja
PR-2 O
PR-659
PR-693
PR-6678
PR-678
PR-677
PR-820
PR-2 E PR-2 O
PR-142 N
Camino Pitirre
Calle 8
Legend
Start Point
End Point
Circuit
1:31,670
0
0.25
0.5
1
Miles
N
LUMA
Circuit 9103-01


Vega Baja
Algarrobo
Vista Verde
Ceiba
Rio Abajo
Almirante Norte
Coto Norte
Valle de Manati
SECT Miraflores
Rio Arriba
Lomas del Manatuabon
Pugnado Adentro
Rio Arriba Saliente
Almirante Sur
Quebrada Arenas
Legend
Start Point
End Point
Circuit
1:53,220
0
0.425
0.85
1.7
Miles
N
LUMA
Circuit 9003-06

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Arecibo Short Term Group 12

Revision: 0

Date: 10JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issue for Use

Contents

Overview

Project Name:	Distribution Feeders - Arecibo Short Term Group 12
Project Type:	Restoration to Codes/Standards
Region:	Arecibo
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Arecibo Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Arecibo Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
VEGA ALTA 13KV	9105-06	[redacted]		13.2
VEGA BAJA TC 13KV	9004-10			13.2
VEGA BAJA 1	9001-01			8.32
SAN DEMETRIO	9002-01			8.32
SAN DEMETRIO	9002-03			7.2
VEGA BAJA 2	9003-05			8.32
VEGA BAJA TC 13KV	9004-08			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.64M**
Estimated Budget for Procurement & Construction:	**$26.40M**
Estimated Overall Budget for the Project:	**$29.04M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

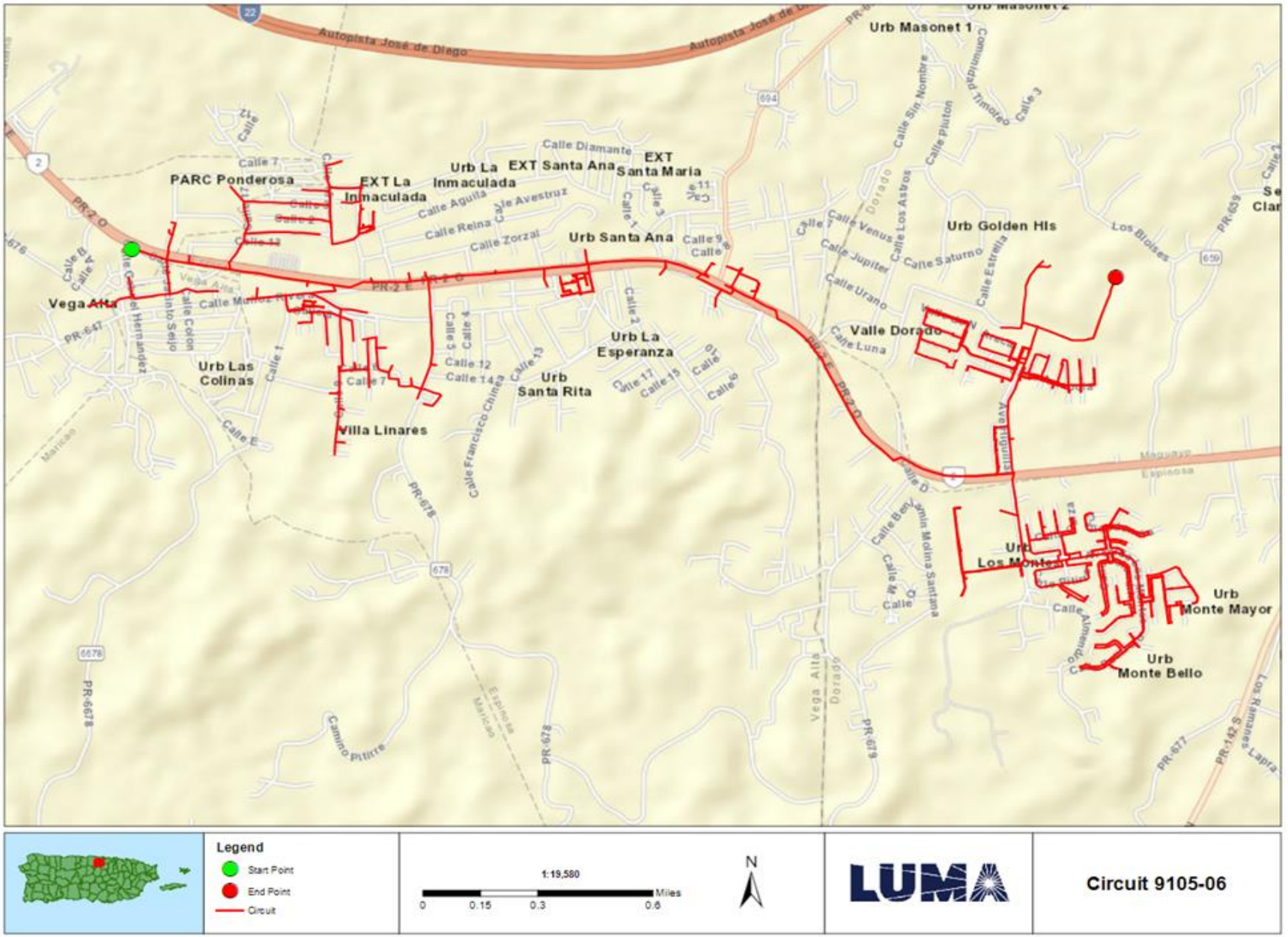
Note: If available, detailed engineering cost estimates will be included as an attachment.

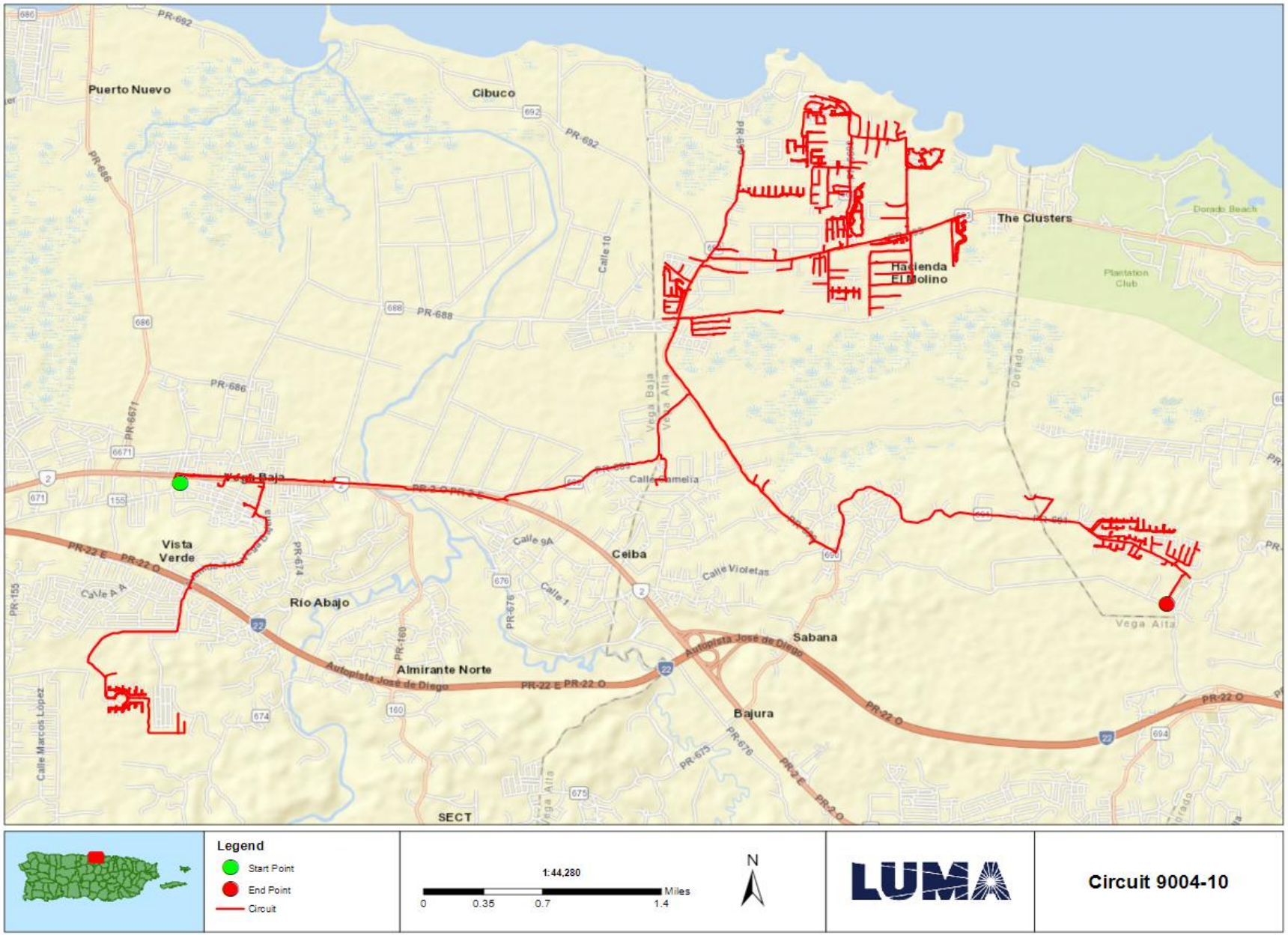
Environmental & Historic Preservation Requirements

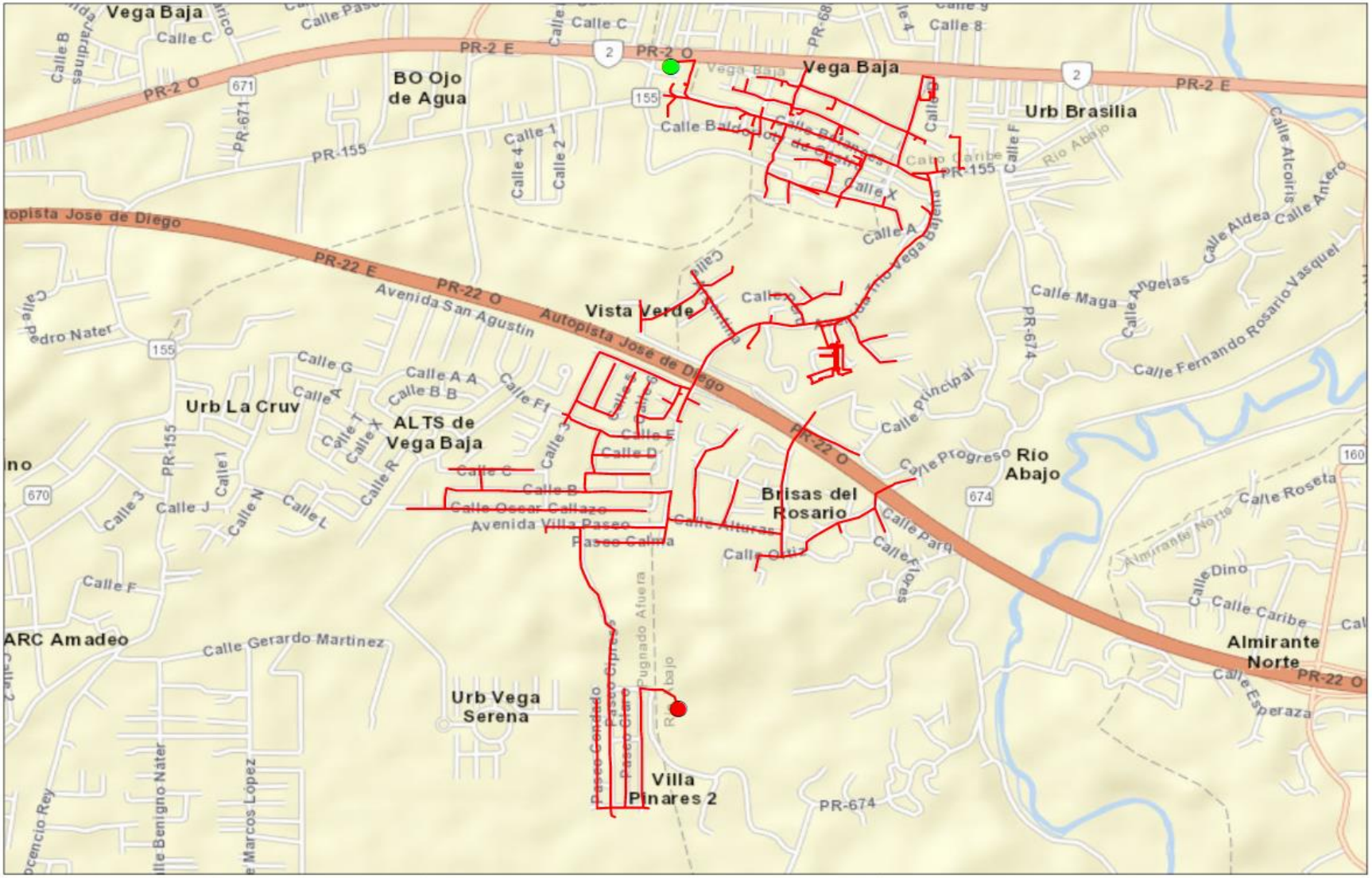
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

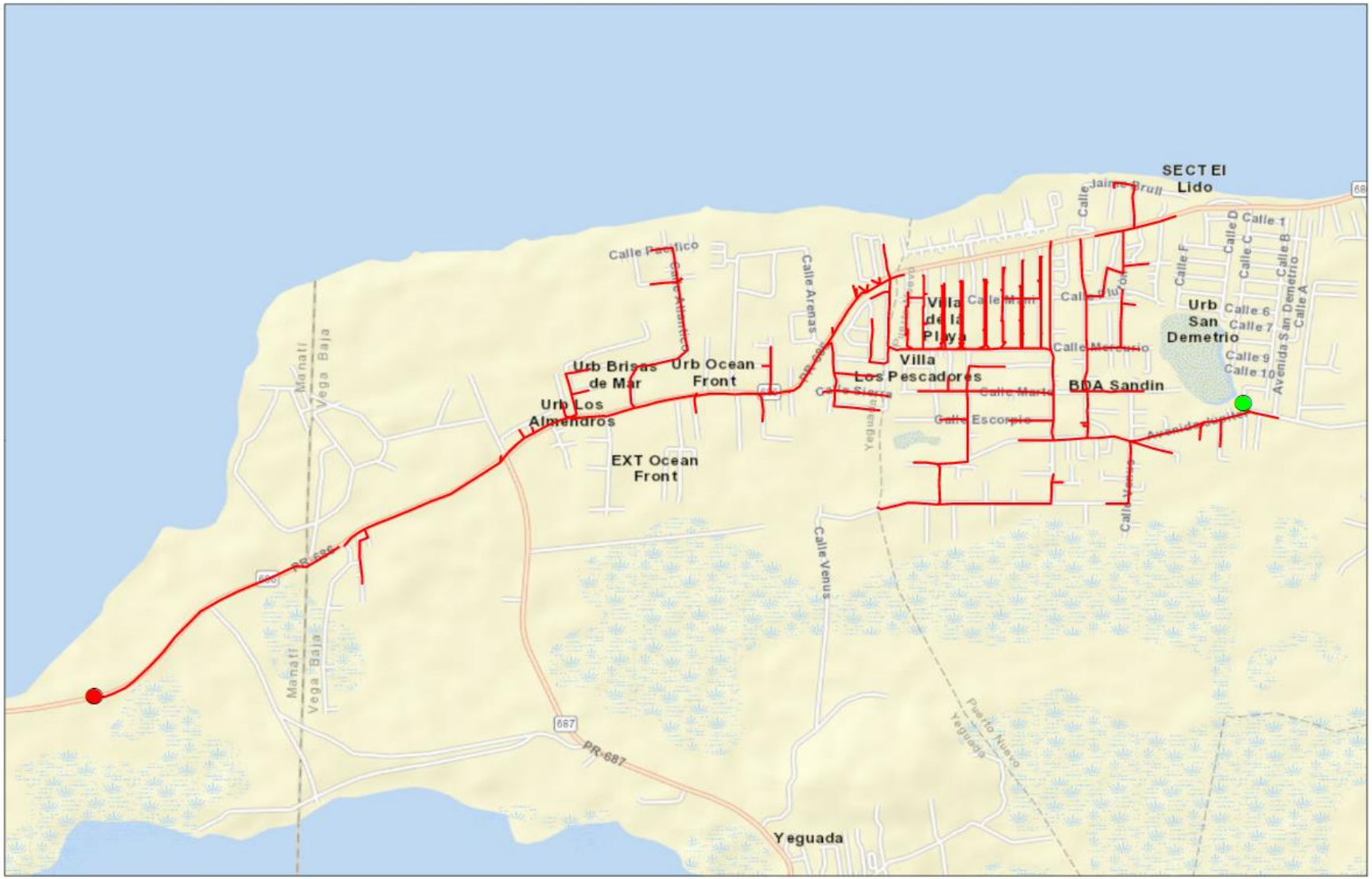
Attachments

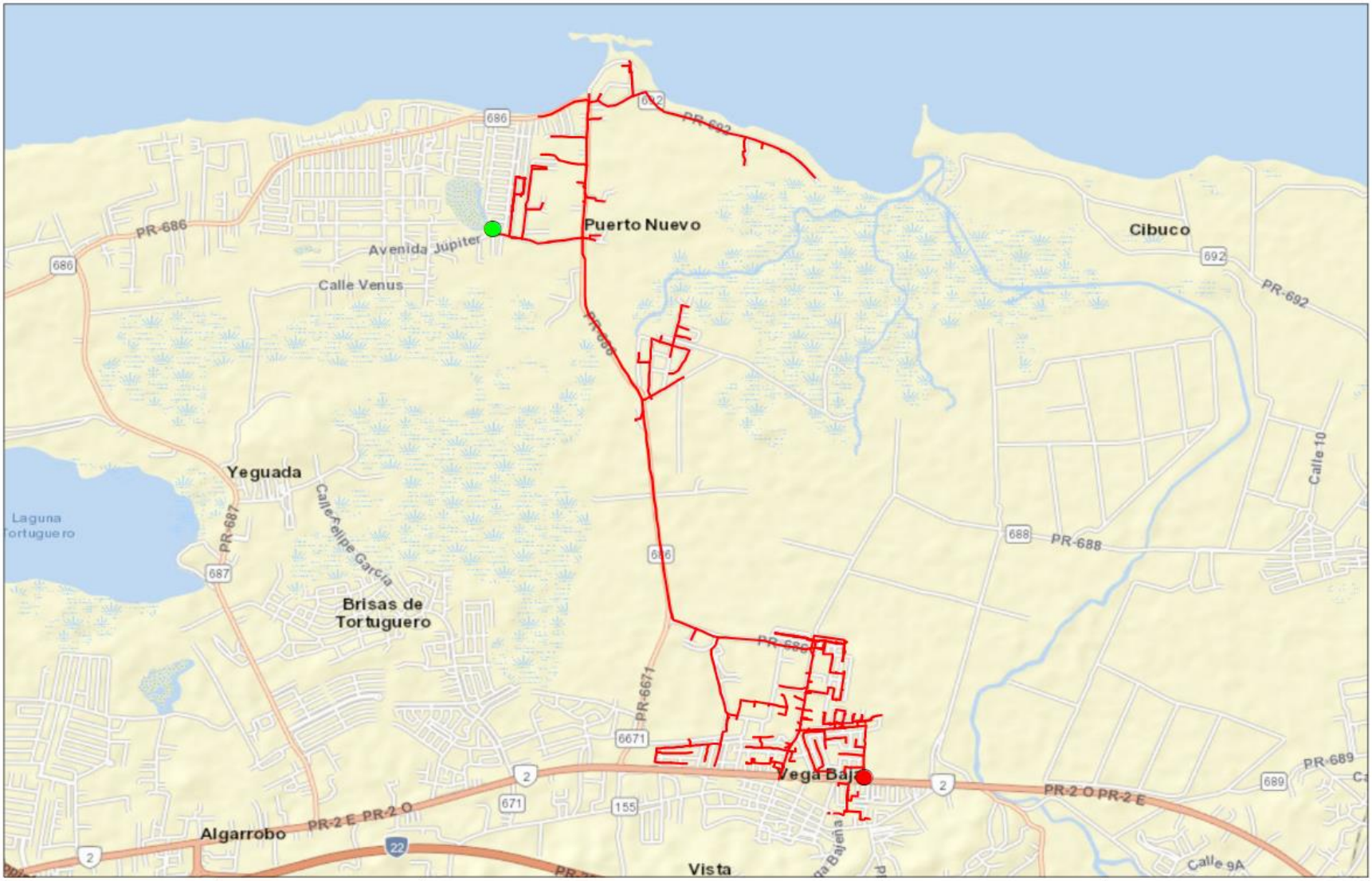
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Arecibo Short Term Group 12 Location Maps	Location Maps and Site Picture

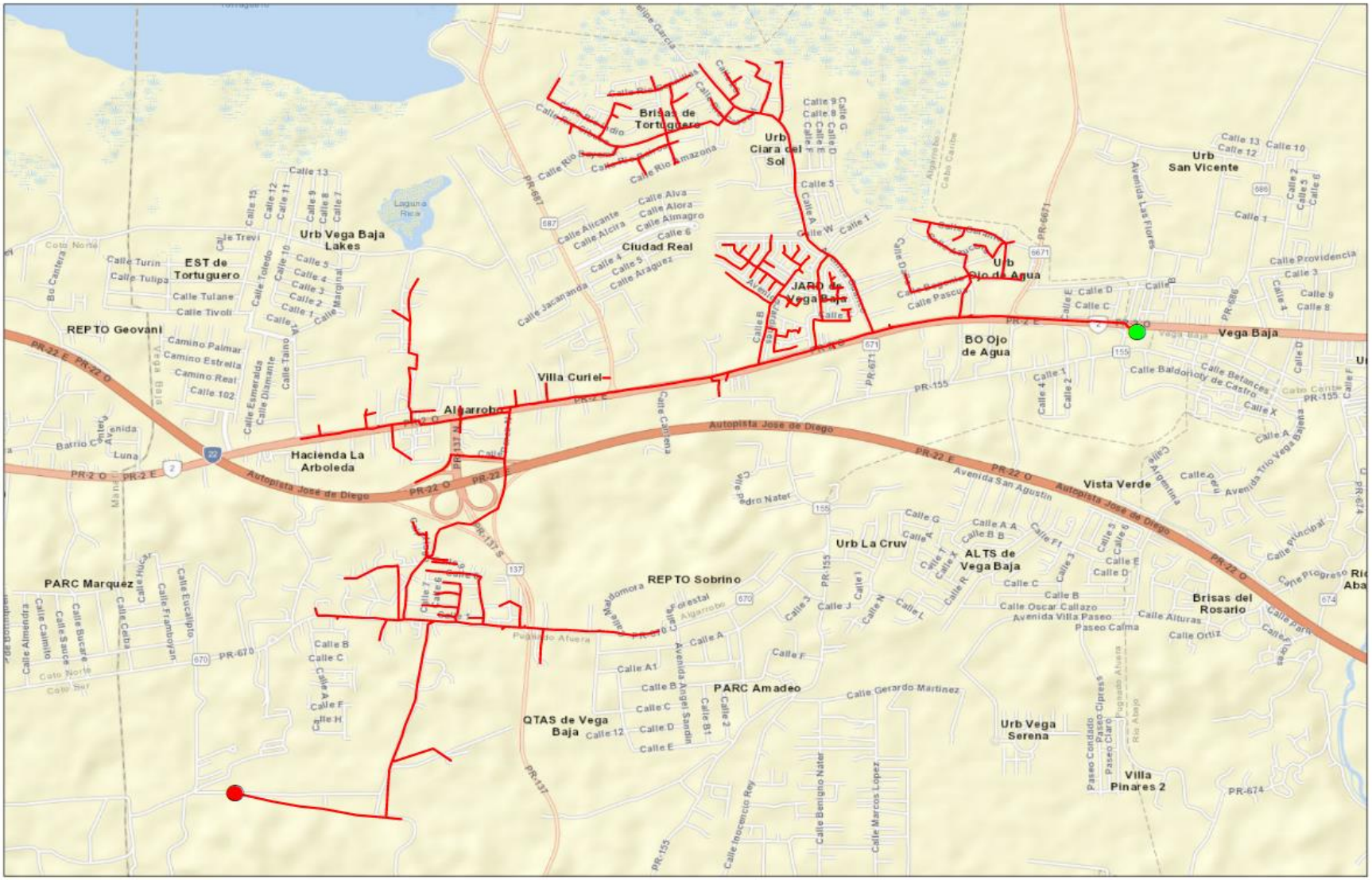

Autopista José de Diego
Urb Masonet 1
PARC Ponderosa
EXT La Inmaculada
Urb La Inmaculada
EXT Santa Ana
EXT Santa Maria
Urb Santa Ana
Urb Golden Hls
Vega Alta
Urb Las Colinas
Villa Linares
Urb Santa Rita
Urb La Esperanza
Valle Dorado
Urb Monte Mayor
Urb Monte Bello
Legend
Start Point
End Point
Circuit
1:19,580
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 9105-06

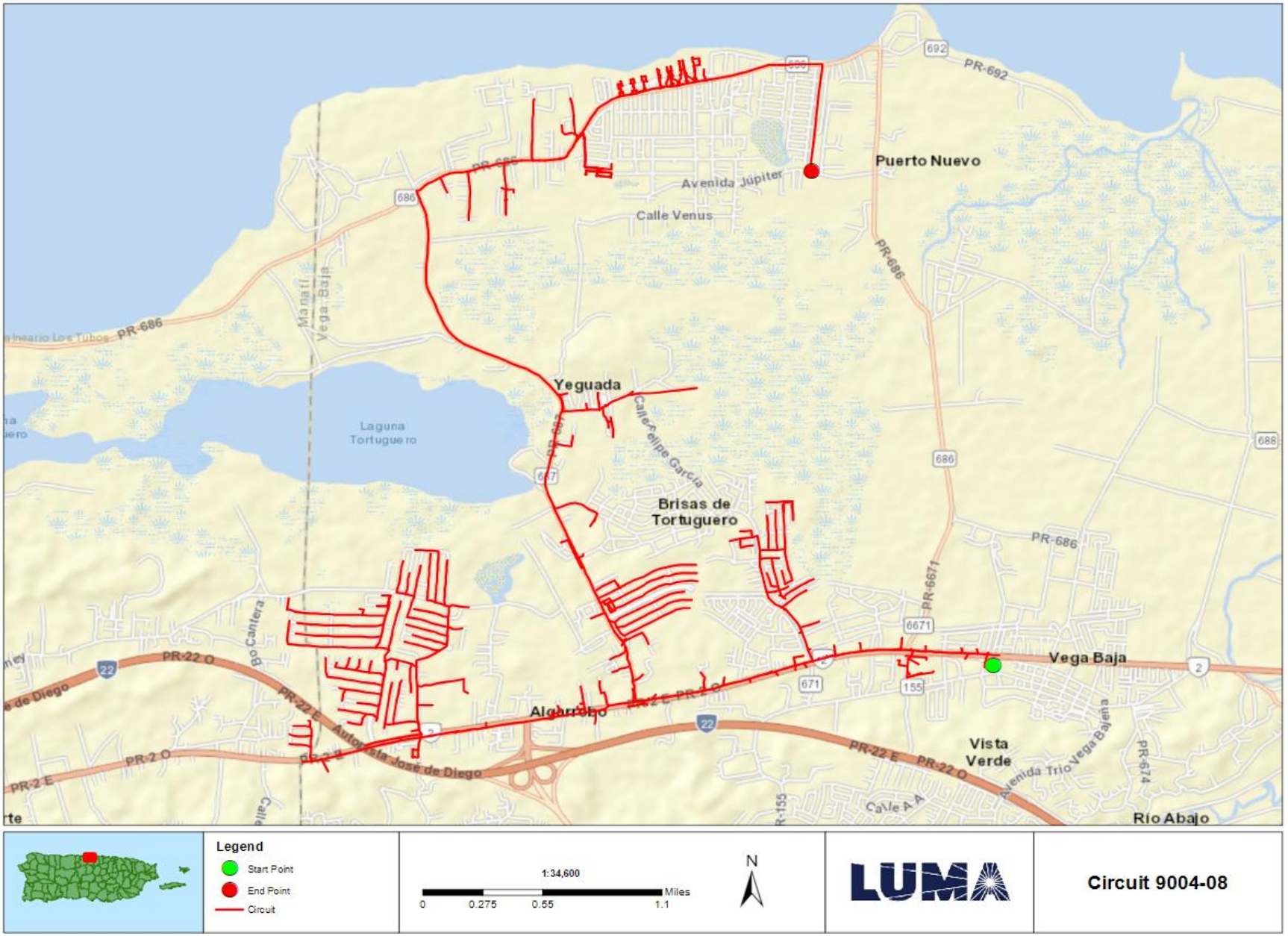

Puerto Nuevo
Cibuco
The Clusters
Hacienda El Molino
Vega Baja
Vista Verde
Río Abajo
Almirante Norte
Ceiba
Sabana
Bajura
Vega Alta
SECT
Legend
Start Point
End Point
Circuit
1:44,280
0
0.35
0.7
1.4
Miles
N
LUMA
Circuit 9004-10


Vega Baja
BO Ojo de Agua
Vega Baja
Urb Brasilia
Vista Verde
Urb La Cruv
ALTS de Vega Baja
Brisas del Rosario
Rio Abajo
Almirante Norte
ARC Amadeo
Urb Vega Serena
Villa Pinares 2
PR-2 E
PR-2 O
PR-22 E
PR-22 O
PR-155
PR-671
PR-674
Autopista Jose de Diego
Avenida San Agustin
Avenida Villa Paseo
Calle Gerardo Martinez
Calle Principal
Calle Progreso
Calle Caribe
Calle Dino
Calle Roseta
Calle Esperaza
Calle Fernando Rosario Vasquez
Calle Maga
Calle Angelas
Calle Aldea
Calle Antero
Calle Alcoiris
Legend
Start Point
End Point
Circuit
1:15,620
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 9001-01


SECT El Lido
Urb San Demetrio
Villa de la Playa
Villa Los Pescadores
BDA Sandin
Urb Brisas de Mar
Urb Ocean Front
Urb Los Almendros
EXT Ocean Front
Calle Pacifico
Calle Arenas
Calle Venus
Calle Mercurio
Calle Escorpio
Avenida San Demetrio
Manati
Vega Baja
PR-686
PR-687
687
Yeguada
Puerto Nuevo
Yeguada
Legend
Start Point
End Point
Circuit
1:18,800
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 9002-01


Puerto Nuevo
Cibuco
Avenida Júpiter
Calle Venus
Yeguada
Laguna Tortuguero
Brisas de Tortuguero
Vega Baja
Algarrobo
Vista
PR-686
PR-692
PR-687
PR-688
PR-6671
PR-2 E
PR-2 O
686
692
687
688
6671
671
155
2
22
Calle 10
Calle 9A
Legend
Start Point
End Point
Circuit
1:33,240
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 9002-03


Brisas de Tortuguero
Urb Ciara del Sol
Urb San Vicente
Urb Vega Baja Lakes
EST de Tortuguero
Ciudad Real
JARD de Vega Baja
Urb Ojo de Agua
REPTO Geovani
Villa Curiel
BO Ojo de Agua
Vega Baja
Algarrobo
Hacienda La Arboleda
Autopista Jose de Diego
Vista Verde
Urb La Cruv
ALTS de Vega Baja
REPTO Sobrino
PARC Marquez
Brisas del Rosario
PARC Amadeo
QTAS de Vega Baja
Urb Vega Serena
Villa Pinares 2
Legend
Start Point
End Point
Circuit
1:25,210
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 9003-05


Puerto Nuevo
Avenida Júpiter
Calle Venus
Yeguada
Laguna Tortuguero
Brisas de Tortuguero
Algarrobo
Vega Baja
Vista Verde
Río Abajo
PR-686
PR-692
PR-22 E
PR-22 O
PR-2 E
PR-2 O
Autopista José de Diego
Avenida Trio Vega Bajena
Calle A A
Legend
Start Point
End Point
Circuit
1:34,600
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 9004-08

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 11

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 11
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CABO ROJO	6703-03			7.2
ACACIAS 4.16 kV	6801-01			4.16
ACACIAS 4.16 kV	6801-02			4.16
ACACIAS 4.16 kV	6801-03			4.16
ACACIAS 13.2 kV	6802-01			13.2
ACACIAS 4.16 kV	6802-02			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.34M**
Estimated Budget for Procurement & Construction:	**$23.43M**
Estimated Overall Budget for the Project:	**$25.77M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

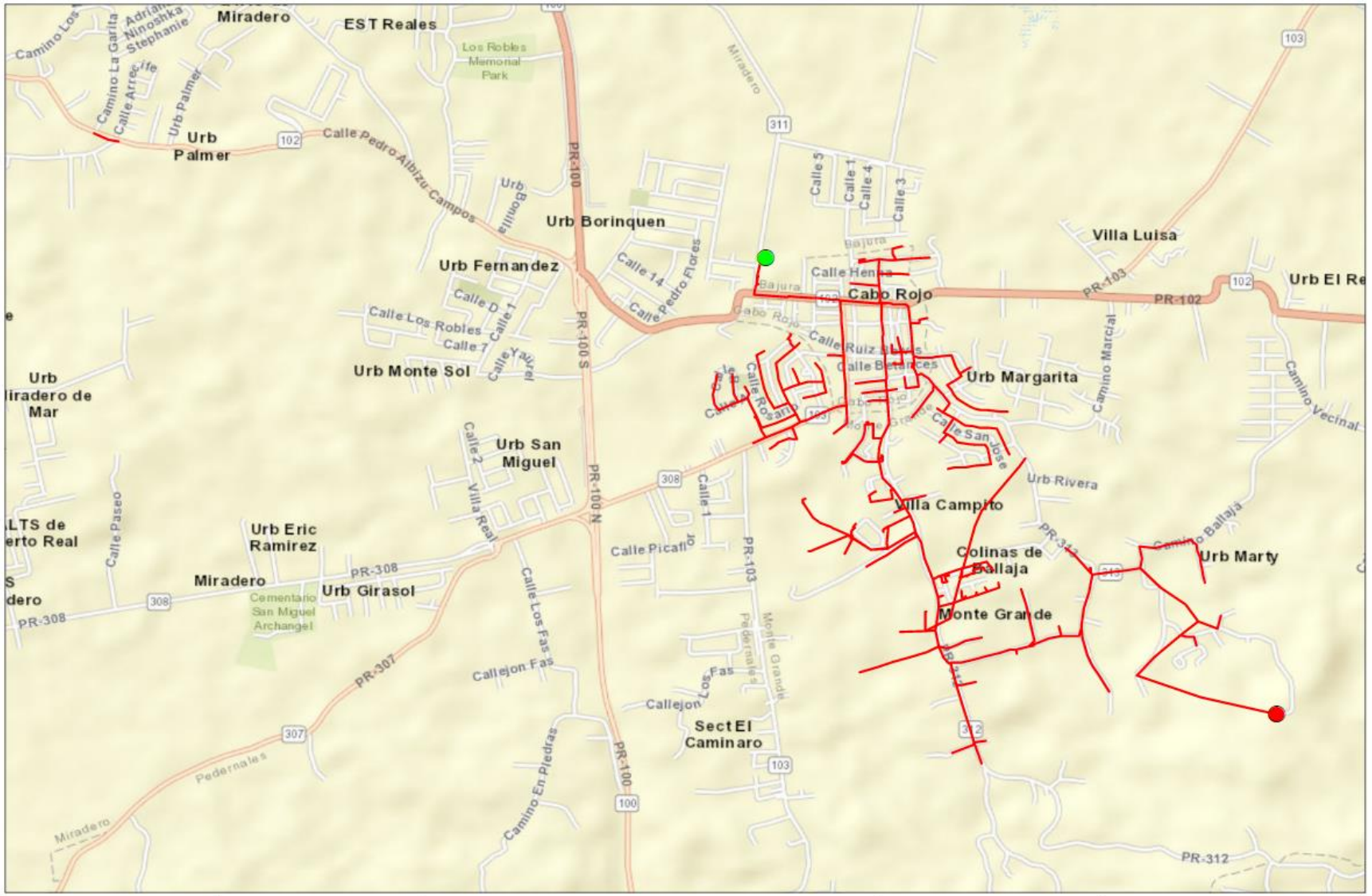
Note: If available, detailed engineering cost estimates will be included as an attachment.

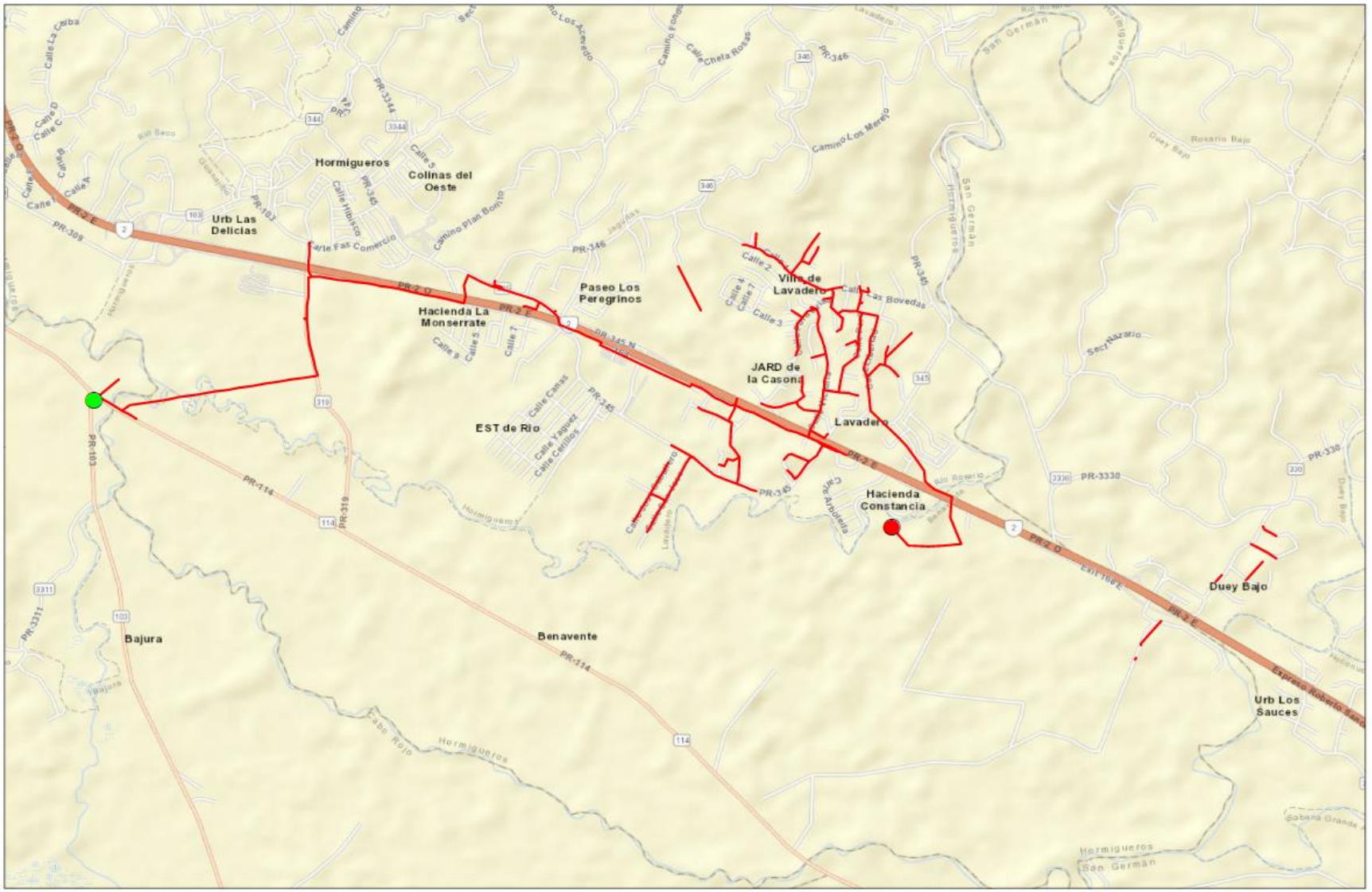
Environmental & Historic Preservation Requirements

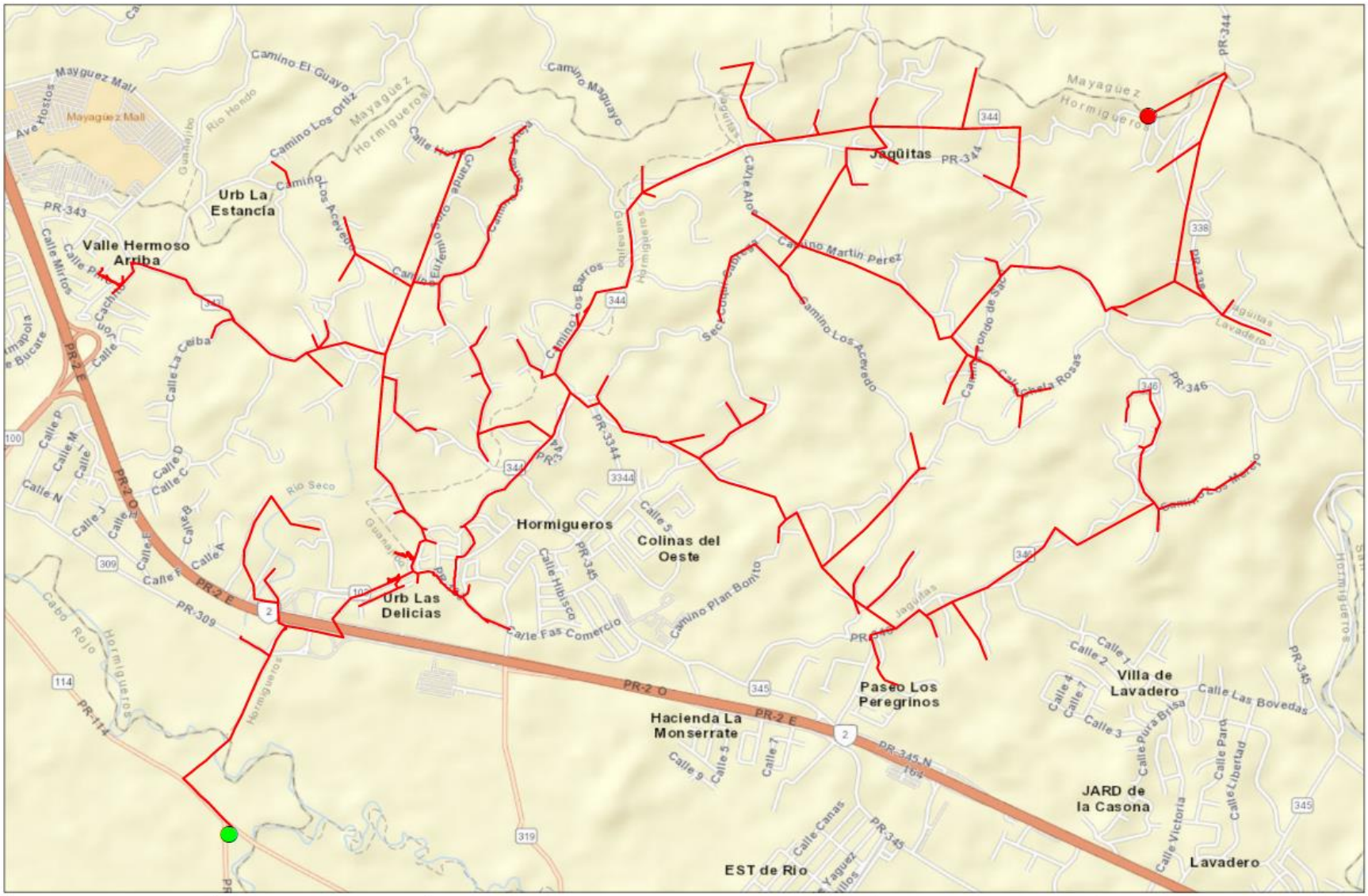
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

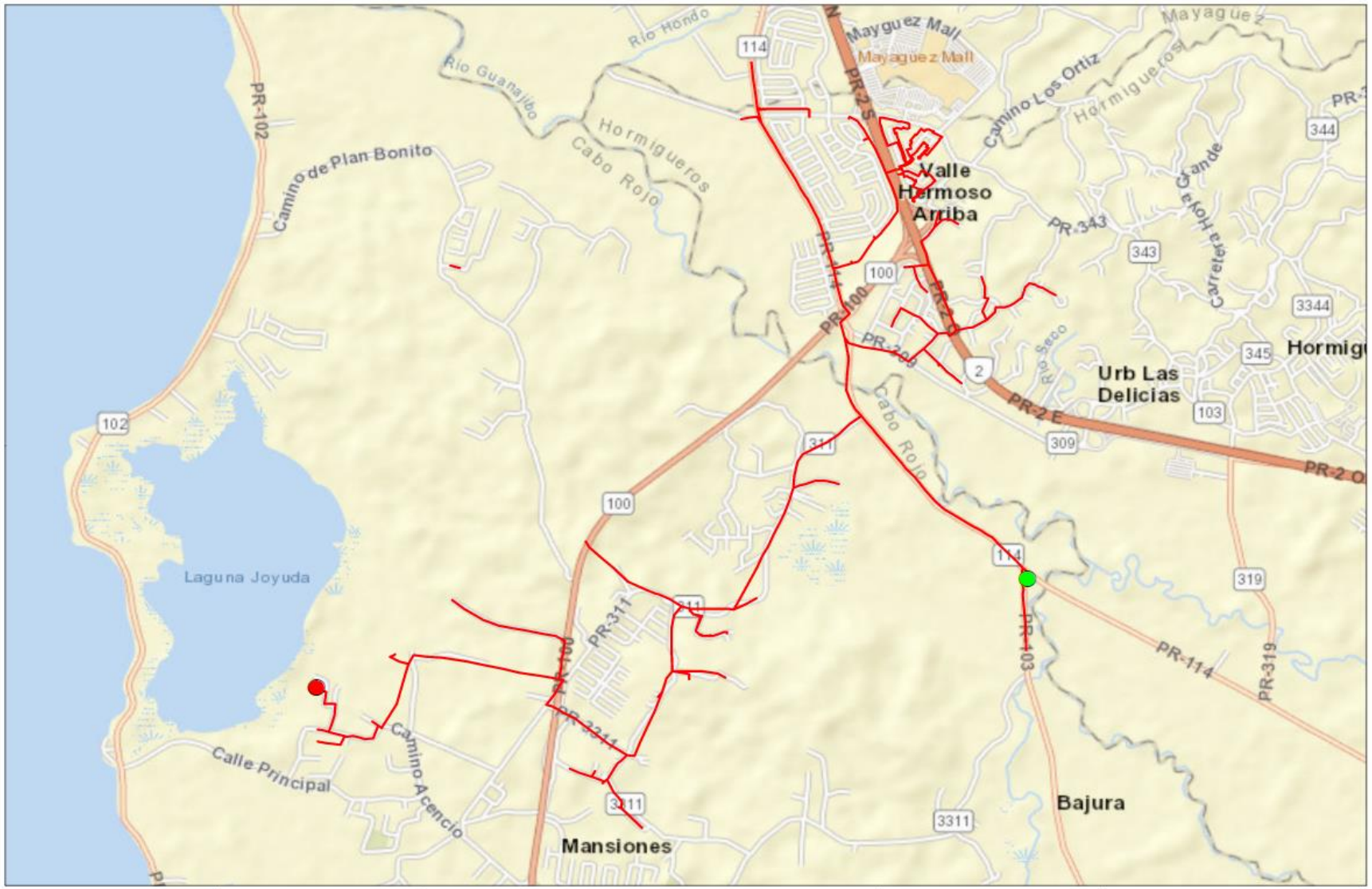
Attachments

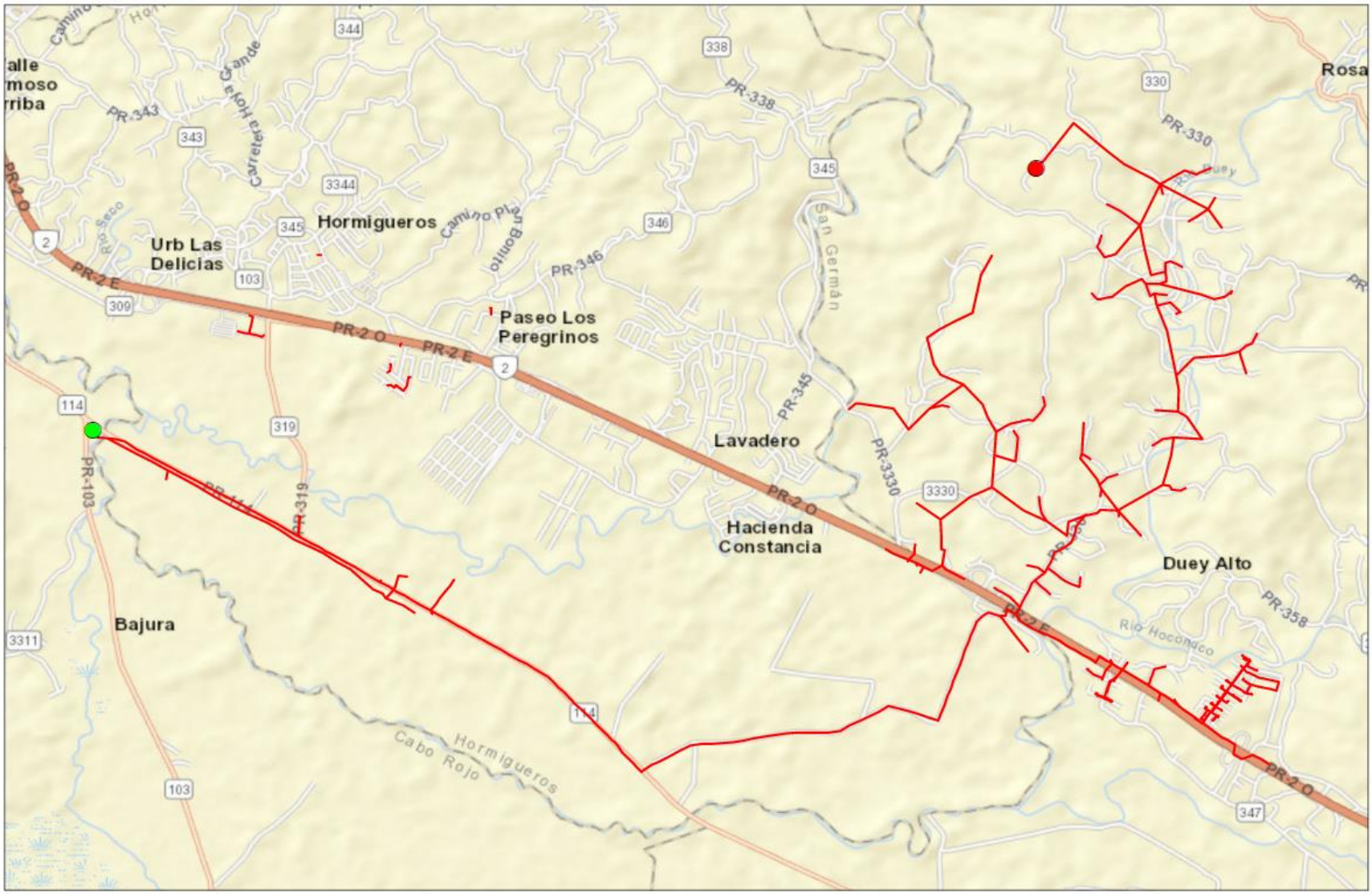
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 11 Location Maps	Location Maps and Site Picture

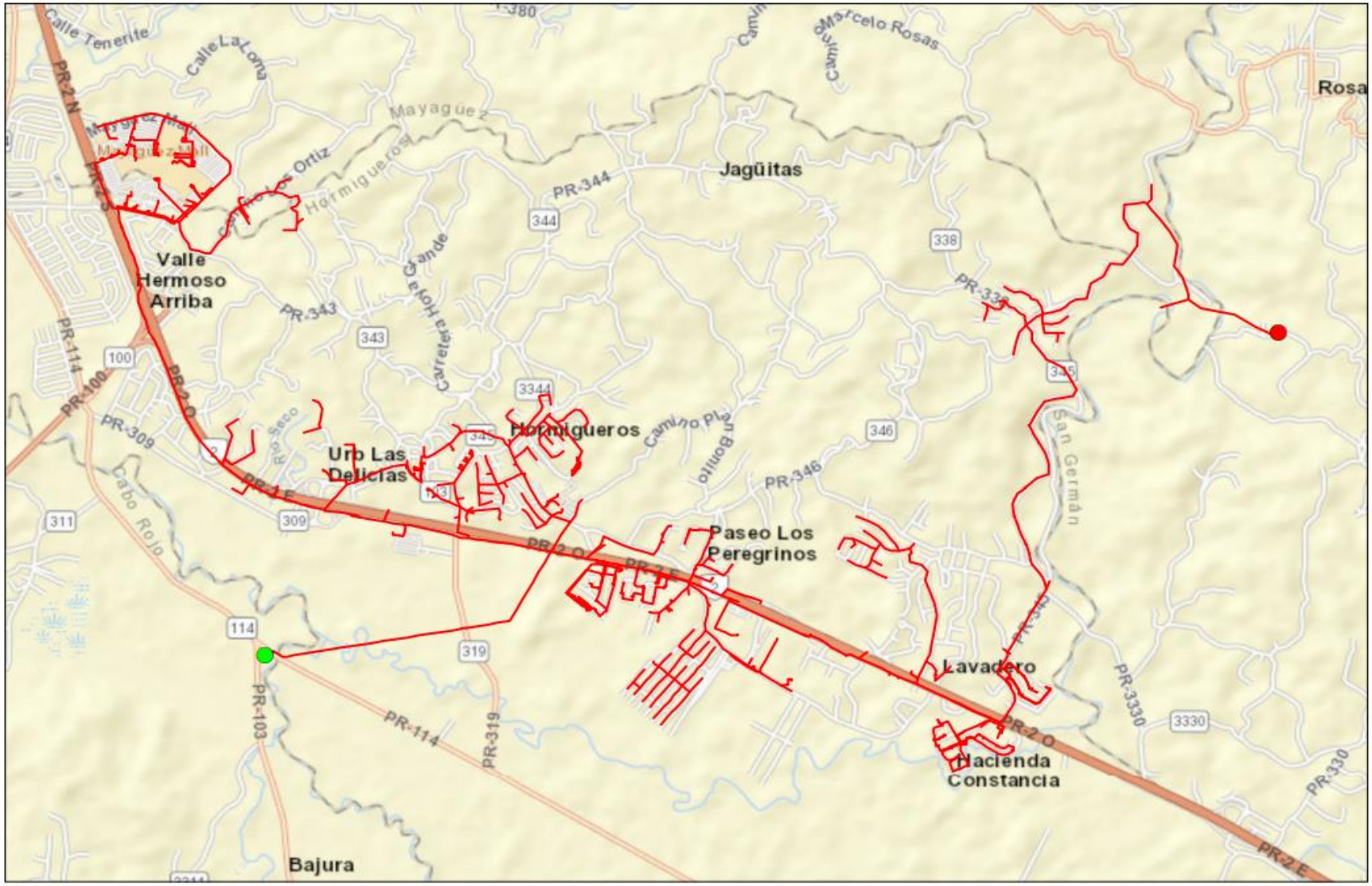

Miradero
EST Reales
Los Robles Memorial Park
Urb Palmer
Calle Pedro Albizu Campos
Urb Borinquen
Urb Fernandez
Urb Monte Sol
Urb Miradero de Mar
Urb San Miguel
Urb Eric Ramirez
Urb Girasol
Cementario San Miguel Archangel
Villa Luisa
Cabo Rojo
Urb Margarita
Urb Rivera
Villa Campito
Colinas de Ballaja
Monte Grande
Urb Marty
Sect El Caminaro
PR-100
PR-100 S
PR-100 N
PR-102
PR-103
PR-308
PR-307
PR-312
Legend
Start Point
End Point
Circuit
1:18,300
1 of 1
N
LUMA
Circuit 6703-03


Hormigueros
Colinas del Oeste
Urb Las Delicias
Paseo Los Peregrinos
Hacienda La Monserrate
Villa de Lavadero
JARD de la Casona
Lavadero
EST de Rio
Hacienda Constancia
Duey Bajo
Bajura
Benavente
Urb Los Sauces
Legend
Start Point
End Point
Circuit
1:26,230
1 of 1
N
LUMA
Circuit 6801-01


Mayaguez Mall
Camino El Guayo
Camino Los Ortiz
Camino Maguayo
Urb La Estancia
Valle Hermoso Arriba
Jaqûitas
PR-344
PR-343
PR-2 E
PR-2 O
Camino Los Barros
Camino Martin Perez
Camino Los Acevedo
Hormigueros
Colinas del Oeste
Urb Las Delicias
Calle Hibisco
Calle Fas Comercio
Camino Plan Bonito
PR-345
PR-3344
PR-309
PR-114
Paseo Los Peregrinos
Hacienda La Monserrate
Villa de Lavadero
JARD de la Casona
EST de Rio
Lavadero
Rio Seco
Rio Hondo
Cabo Rojo
Legend
Start Point
End Point
Circuit
1:20,220
1
of 1
N
LUMA
Circuit 6801-02


Río Hondo
Río Guanajibo
Hormigueros
Cabo Rojo
Mayguez Mall
Mayaguez Mall
Camino Los Ortiz
Mayaguez
Valle Hermoso Arriba
Carretera Hoya Grande
Urb Las Delicias
Río Seco
Cabo Rojo
Camino de Plan Bonito
Laguna Joyuda
Calle Principal
Camino Acencio
Mansiones
Bajura
PR-102
PR-100
PR-2 S
PR-2 O
PR-2 E
PR-343
PR-114
PR-311
PR-103
PR-319
102
114
100
2
343
344
3344
345
103
309
311
319
3311
Legend
Start Point
End Point
Circuit
1:27,400
0
1
of 1
N
LUMA
Circuit 6801-03


Hormigueros
Urb Las Delicias
Paseo Los Peregrinos
Lavadero
Hacienda Constancia
Bajura
Duey Alto
Rosa
PR-2 O
PR-2 E
PR-346
PR-345
PR-3330
PR-319
PR-103
PR-330
PR-358
PR-338
PR-343
Río Hocomoco
Río Seco
Cabo Rojo
Legend
Start Point
End Point
Circuit
1:31,140
1 of 1
N
LUMA
Circuit 6802-01


Valle Hermoso Arriba
Hormigueros
Urb Las Delicias
Paseo Los Peregrinos
Jagüitas
Lavadero
Hacienda Constancia
Bajura
Mayagüez
Rosa
PR-2 N
PR-2 O
PR-2 E
PR-114
PR-100
PR-309
PR-343
PR-344
PR-346
PR-319
PR-103
PR-3330
PR-330
Legend
Start Point
End Point
Circuit
1:28,550
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 6802-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 12

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 12
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
MARICAO	6301-01	[redacted]		4.16
MARICAO	6301-02			4.16
ONCE DE AGOSTO	6001-03			4.16
CUATRO HERMANOS	6004-02			4.16
CENTRO MEDICO	6008-04			4.16
CERRO LAS MESAS	6010-02			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$1.73M**
Estimated Budget for Procurement & Construction:	**$17.31M**
Estimated Overall Budget for the Project:	**$19.04M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

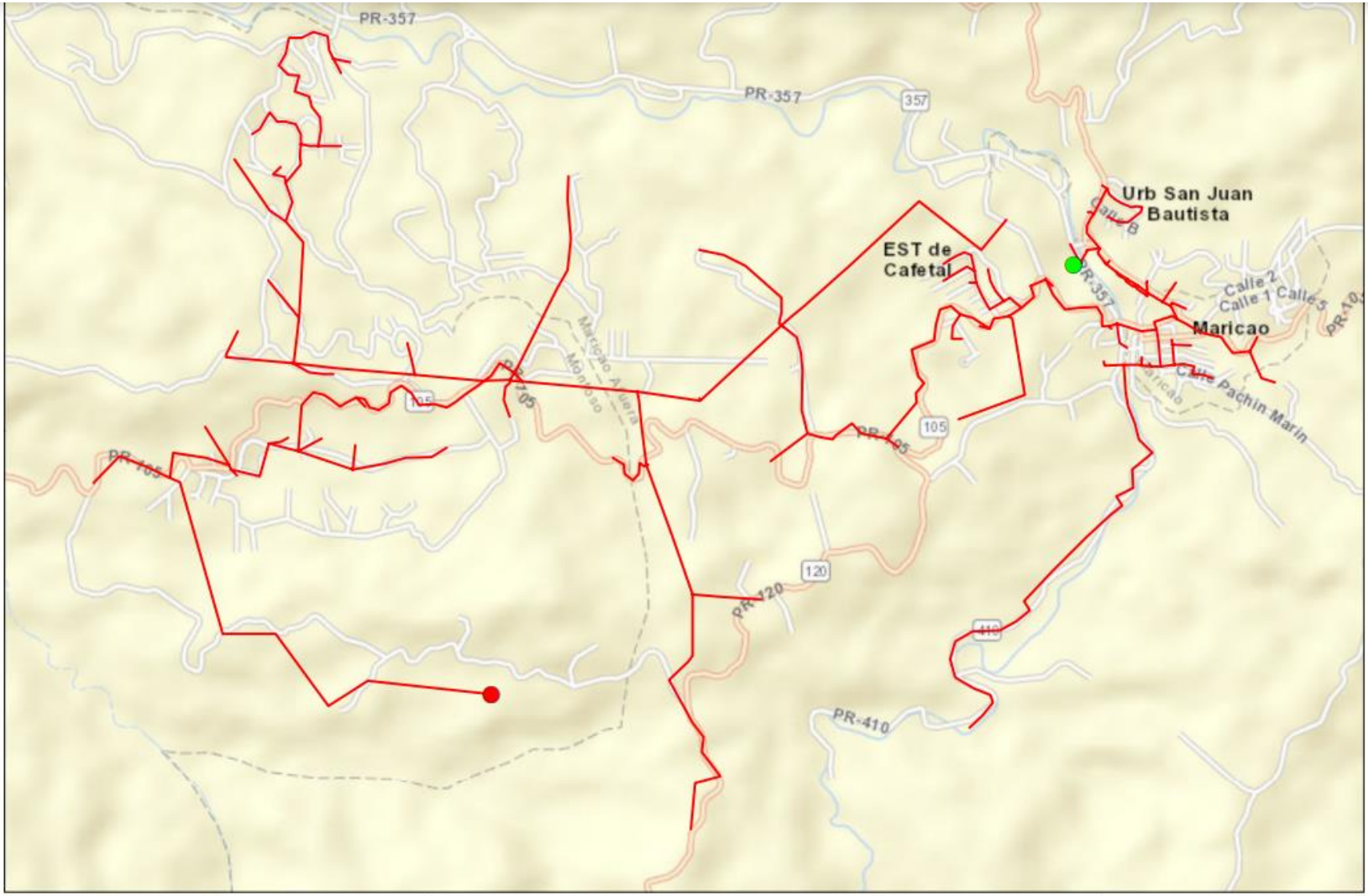
Note: If available, detailed engineering cost estimates will be included as an attachment.

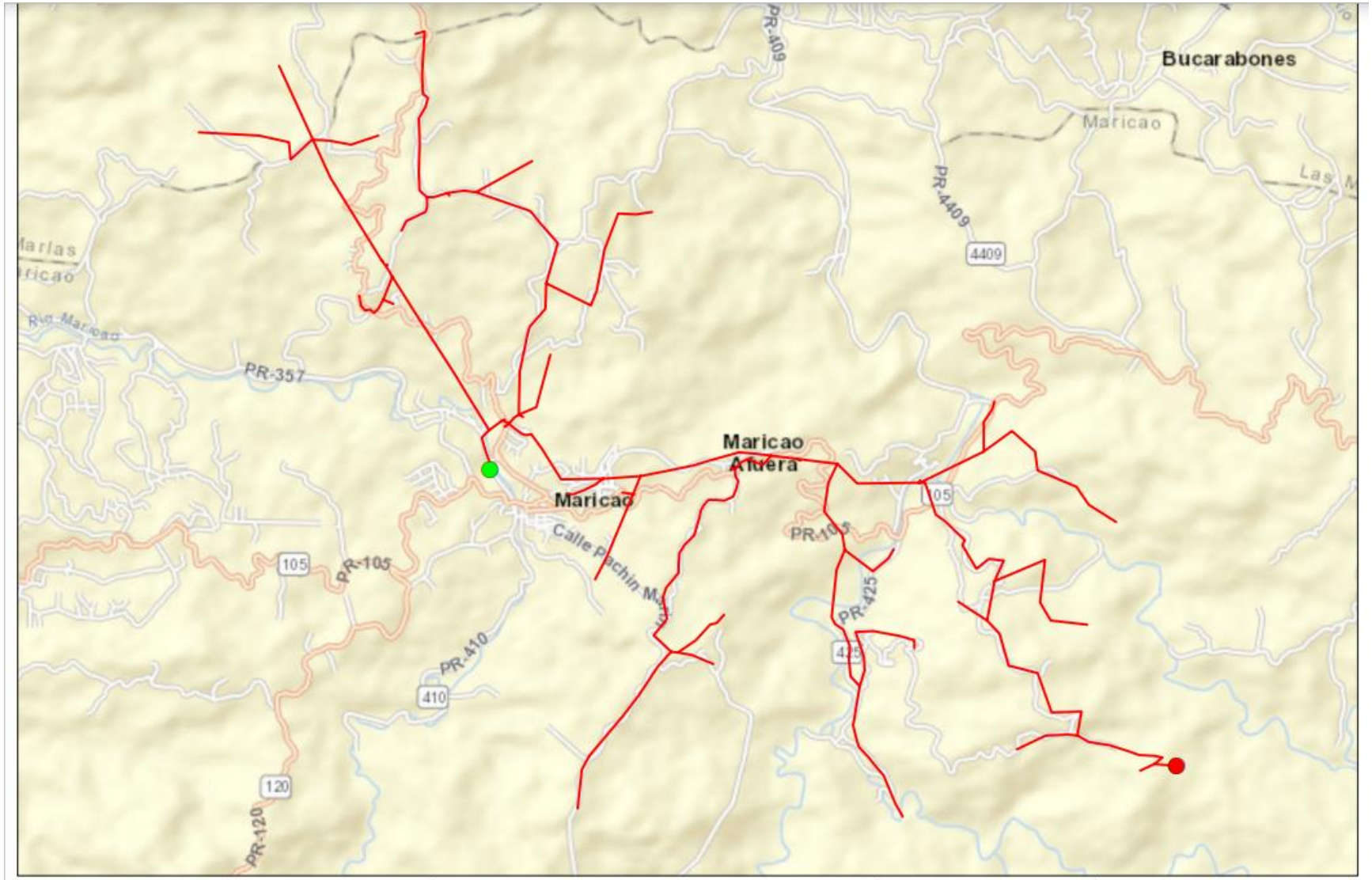
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

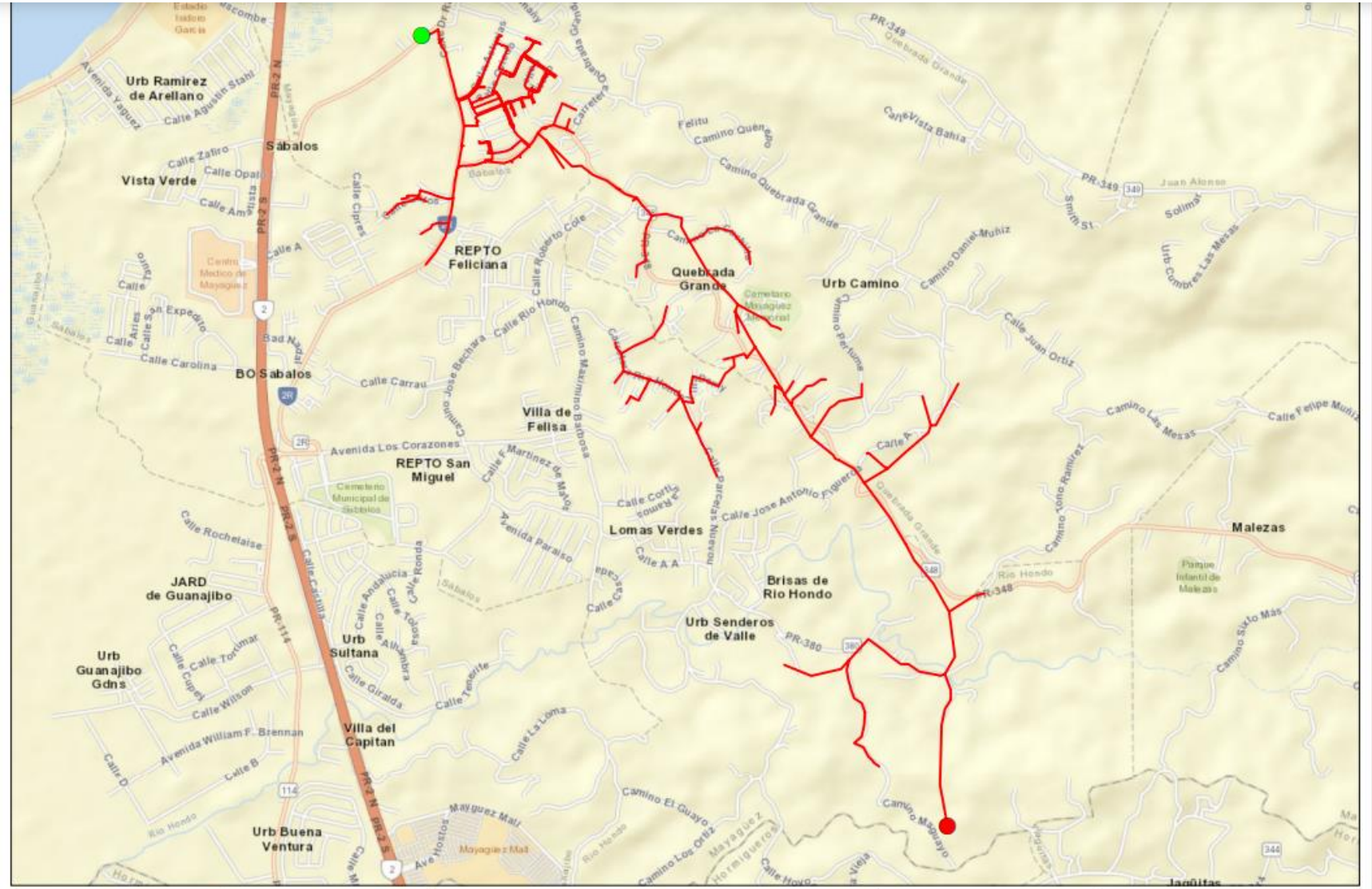
Attachments

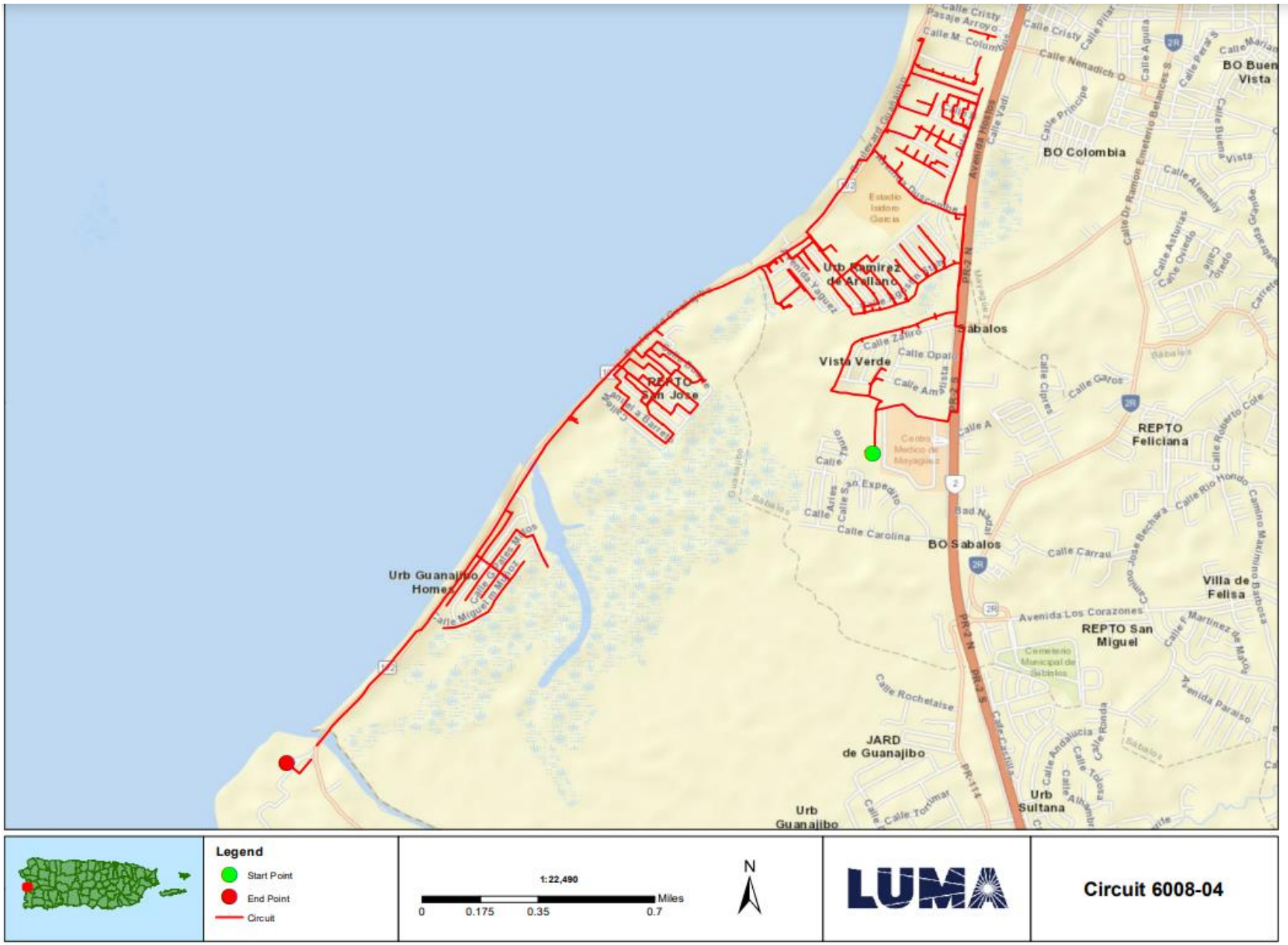
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 12 Location Maps	Location Maps and Site Picture

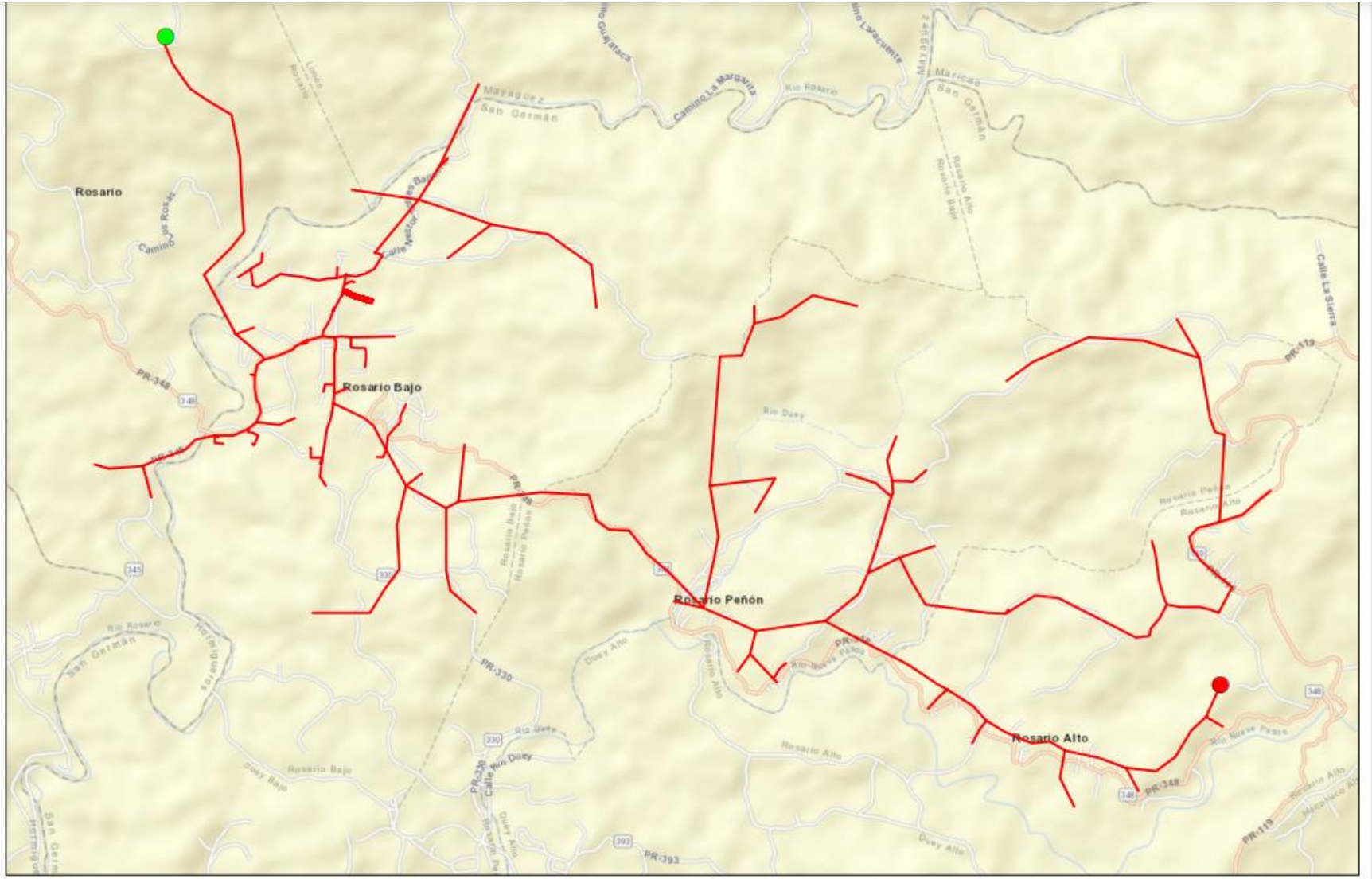

PR-357
PR-357
357
Urb San Juan Bautista
EST de Cafetal
PR-357
Calle 2
Calle 1
Calle 5
Maricao
Calle Pachin Marin
PR-105
105
PR-120
120
PR-410
Legend
Start Point
End Point
Circuit
1:15,280
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 6301-01


Bucarabones
Maricao
PR-4409
4409
PR-357
Maricao
Afuera
Maricao
Calle Pachin Marin
PR-105
105
PR-410
410
PR-425
425
120
PR-120
Legend
Start Point
End Point
Circuit
1:27,470
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 6301-02


Villa Angelica
Villa India
Parque Luis Muñoz Marin
BO Mineral
BO Buena Vista
Villa Sol
EST de San Benito
Calle Poachito Gonzalez
Avenida Luis Muñoz Marin
Calle Carbonell
Calle Cantera
Calle Broadway
Calle Primm
Calle Aguacate
Calle Coronado Forestier
PR-105
PR-349
Calle Mariano Abril
Calle Fortuner
Calle Kofresi
Calle Nenadich E
Calle Buena Vista
Calle Santa Maria
Calle Santa Teresa
Calle Manantiales
Calle San Fernando
Calle Gutierrez
Calle Salvador
Calle Luis Vilella
Calle Antonio Sanchez Nunez
Calle Oriente
Calle Licey
Calle Salud
Calle Solfront
Calle San Agustin
Carretera Quebrada Grande
Camino Ortiz
Camino Juan Lopez
Repto Mercado
Est San Benito
Camino Felitu
Camino Quenepo
Mayaguez Arriba
Quebrada Grande
Calle Vista Bahia
Calle Juan Mari Ramos
Calle Cauces
Calle Jaguey
Calle Romani
Legend
Start Point
End Point
Circuit
1:9,090
1
of 1
N
LUMA
Circuit 6001-03


Urb Ramirez de Arellano
Sábalos
Vista Verde
REPTO Feliciana
Quebrada Grande
Urb Camino
BO Sabalos
Villa de Felisa
REPTO San Miguel
Lomas Verdes
Brisas de Rio Hondo
Urb Senderos de Valle
Malezas
JARD de Guanajibo
Urb Guanajibo Gdns
Urb Sultana
Villa del Capitan
Urb Buena Ventura
Legend
Start Point
End Point
Circuit
1:22,790
0 0.175 0.35 0.7 Miles
N
LUMA
Circuit 6004-02


Legend
Start Point
End Point
Circuit
1:22,490
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 6008-04
BO Colombia
Sabalos
Vista Verde
REPTO Feliciana
BO Sabalos
REPTO San Miguel
Villa de Felisa
JARD de Guanajibo
Urb Sultana
Urb Guanajibo
Urb Guanajibo Homes
Urb Ramirez de Arellano
REPTO San Jose


Rosario
Rosario Bajo
Rosario Peñón
Rosario Alto
Mayaguez
San Germán
Maricao
Río Rosario
Río Duey
Río Nuevo Pasos
Duey Alto
Duey Bajo
Calle La Sierra
Calle Río Duey
PR-348
PR-330
PR-119
PR-393
Legend
Start Point
End Point
Circuit
1:24,570
Miles
0
0.2
0.4
0.8
N
LUMA
Circuit 6010-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 13

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 13
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
ALTURAS DE MAYAGÜEZ	6012-03	[redacted]	[redacted]	13.2
ALTURAS DE MAYAGÜEZ	6012-05	[redacted]	[redacted]	13.2
ONCE DE AGOSTO 13KV	6014-01	[redacted]	[redacted]	13.2
ONCE DE AGOSTO 13KV	6014-03	[redacted]	[redacted]	13.2
RINCÓN	7301-02	[redacted]	[redacted]	4.16
RINCÓN	7301-04	[redacted]	[redacted]	4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.35M**
Estimated Budget for Procurement & Construction:	**$23.53M**
Estimated Overall Budget for the Project:	**$25.88M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

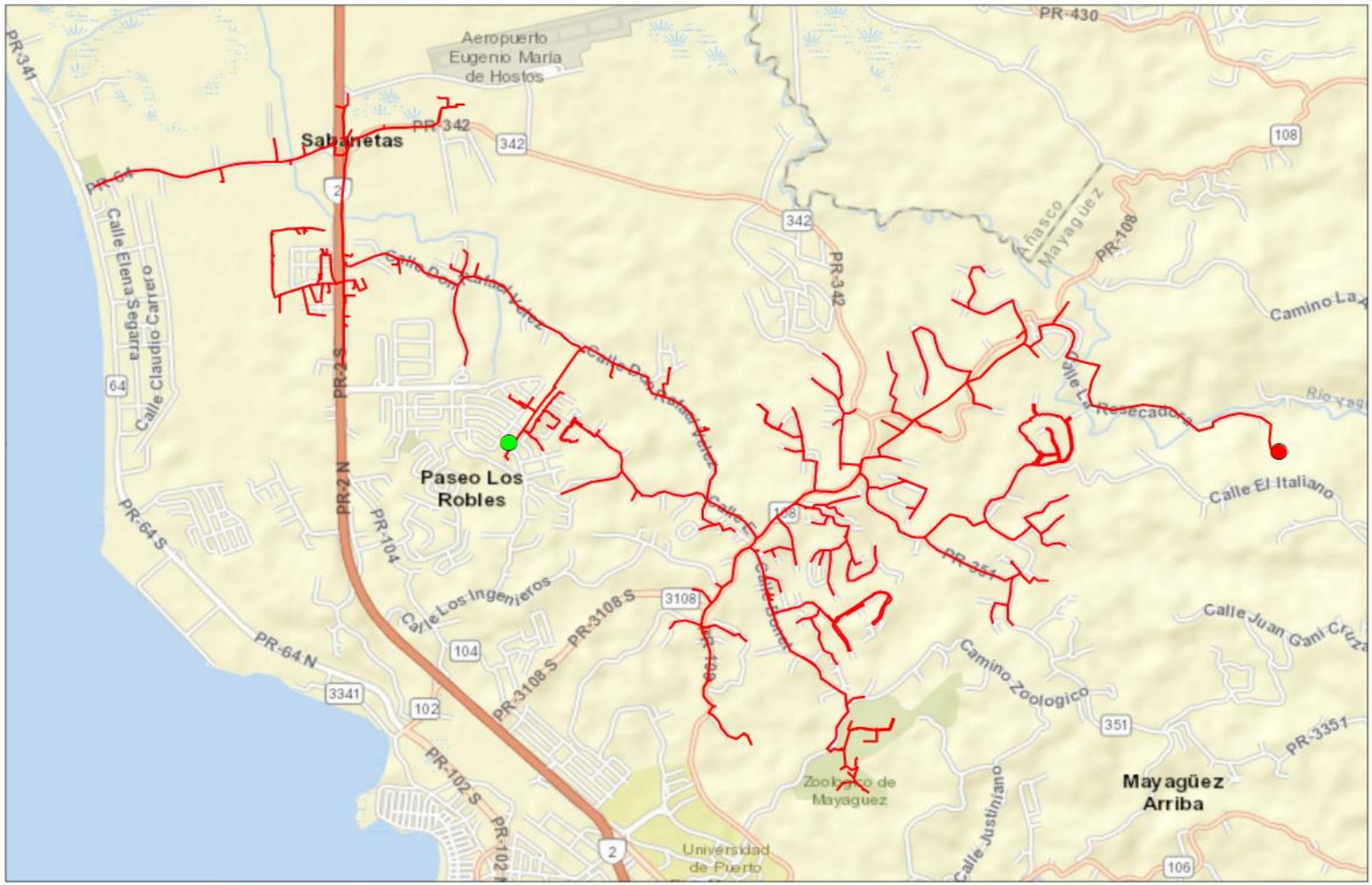
Note: If available, detailed engineering cost estimates will be included as an attachment.

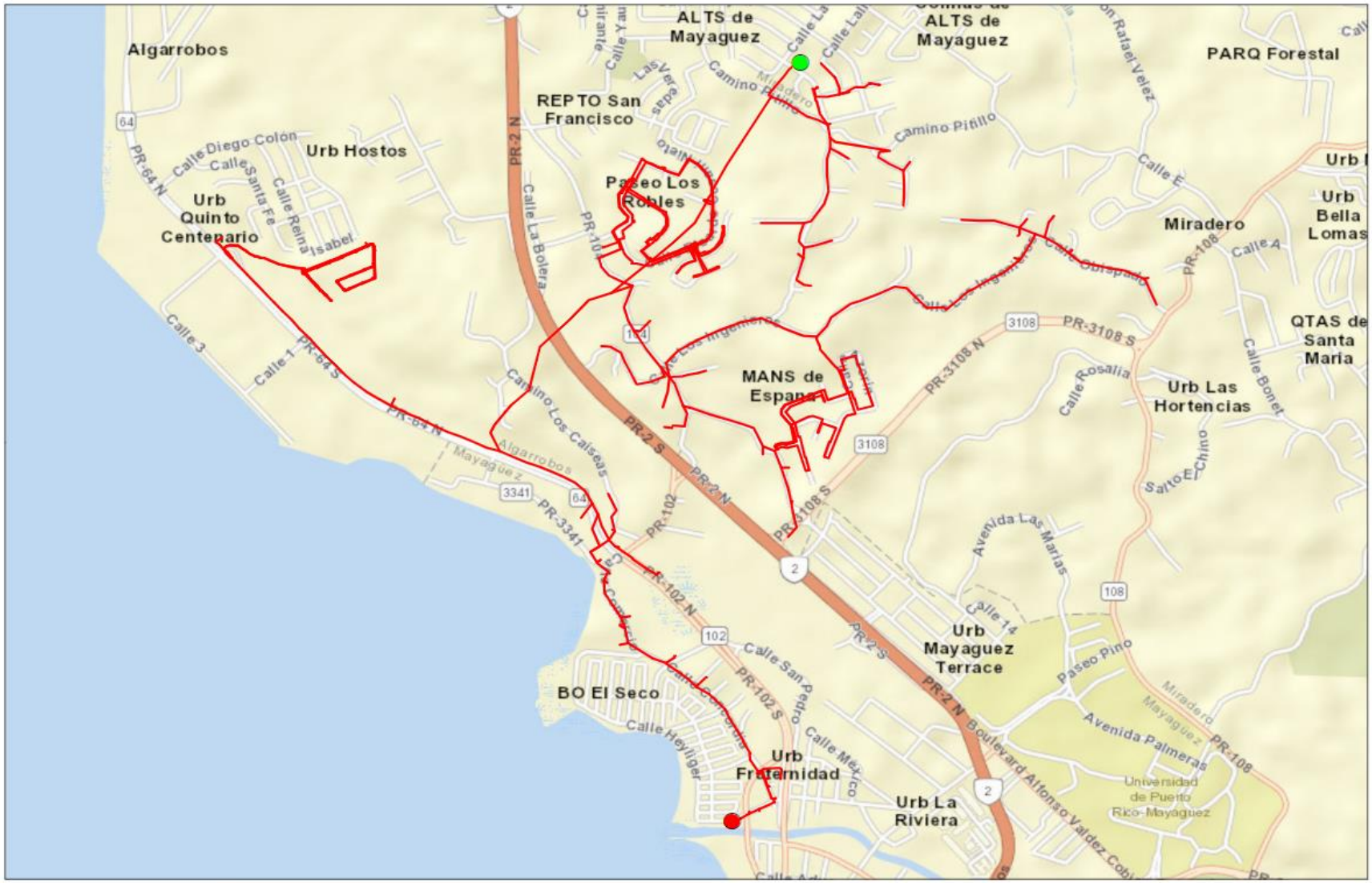
Environmental & Historic Preservation Requirements

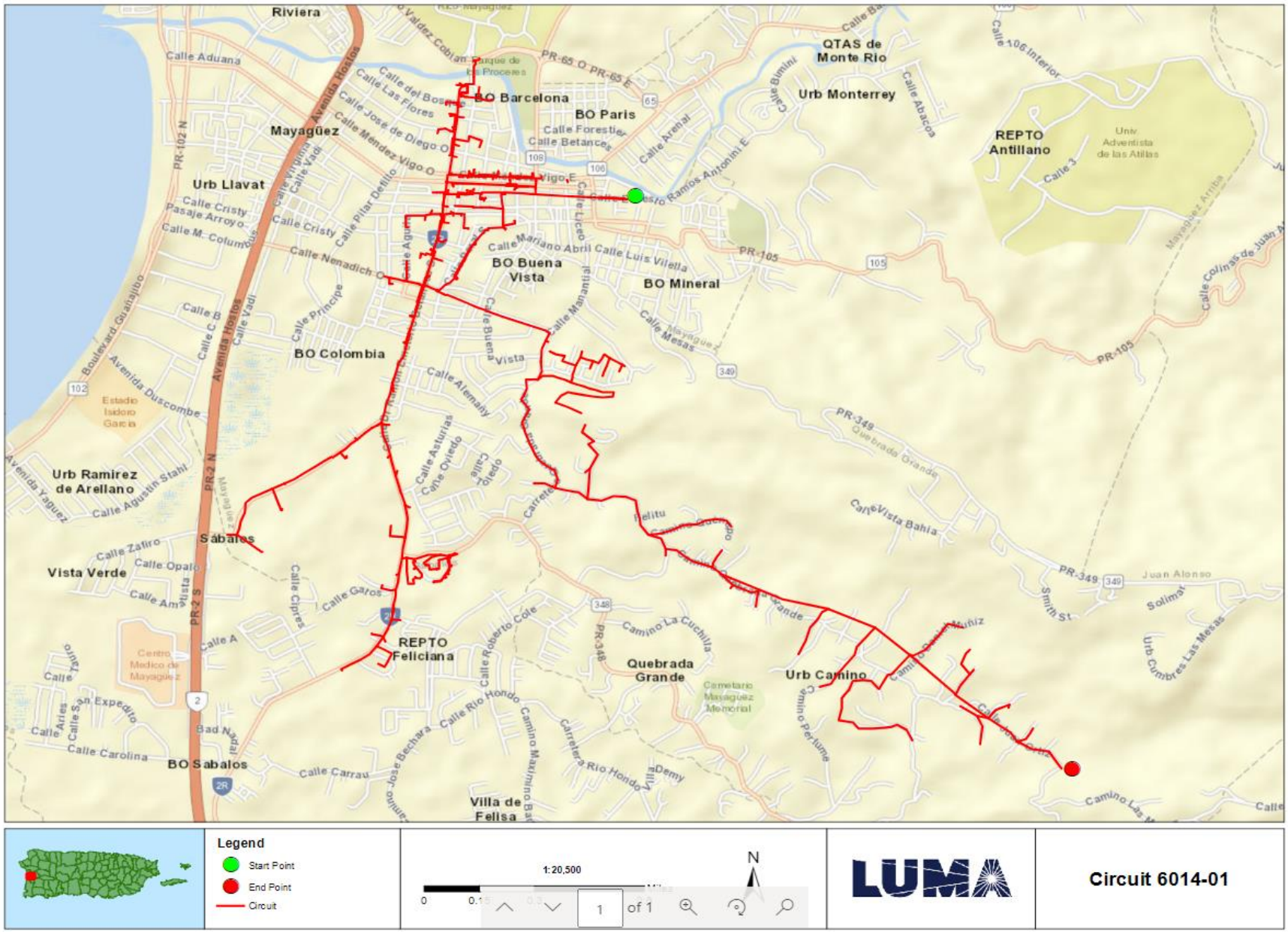
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

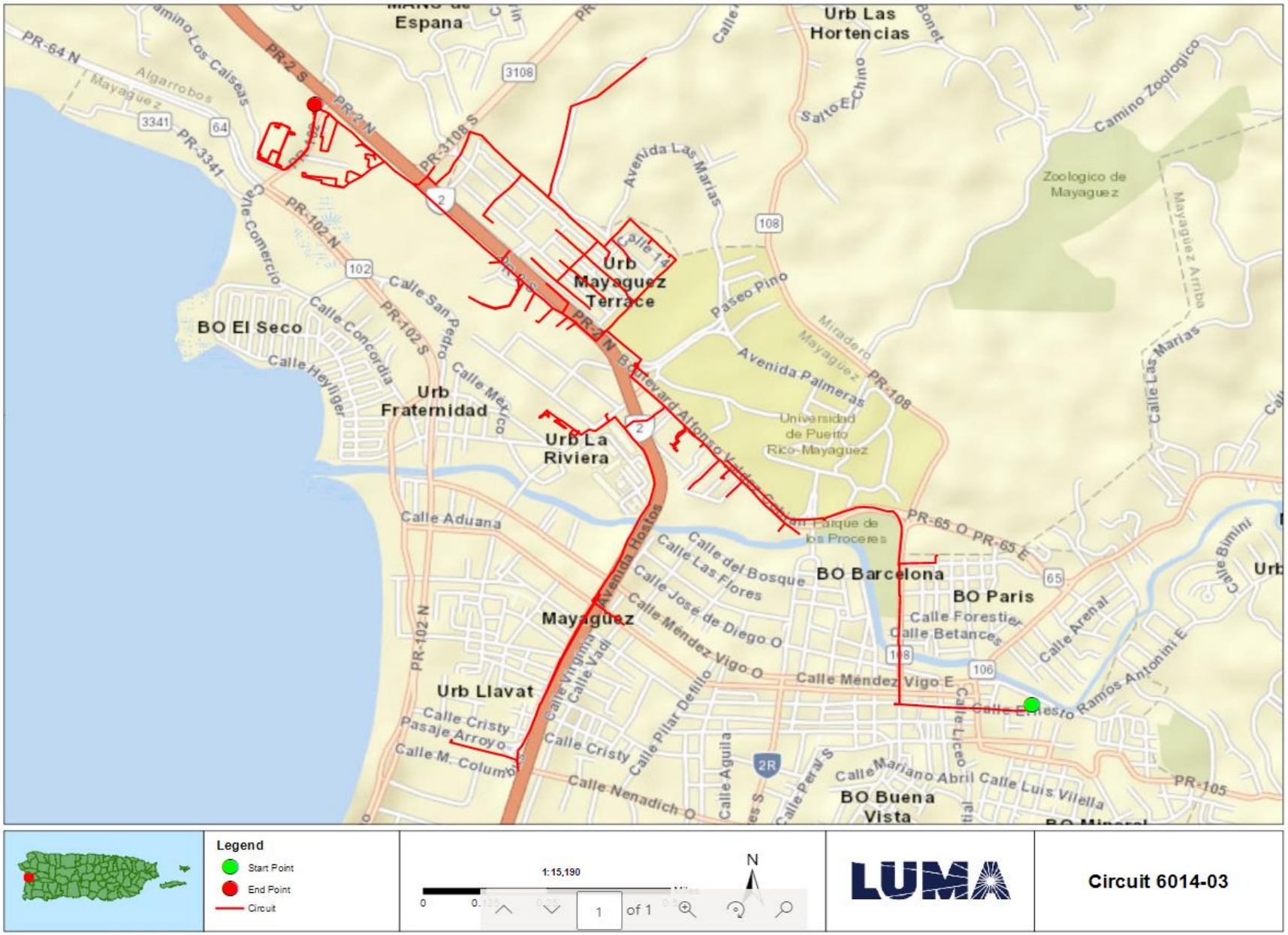
Attachments

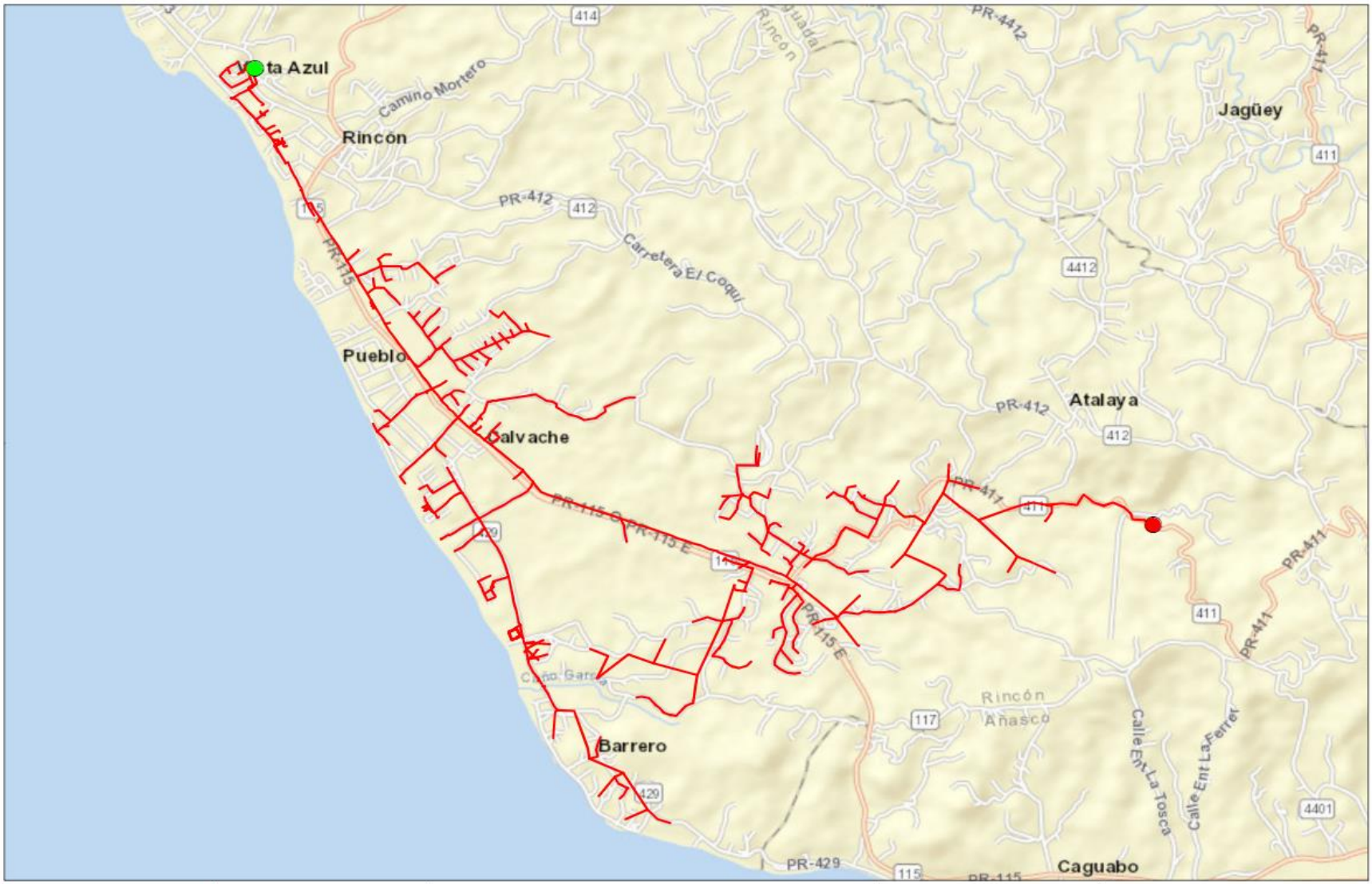
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 13 Location Maps	Location Maps and Site Picture


Aeropuerto
Eugenio María
de Hostos
PR-430
PR-341
Sabanetas
PR-342
342
108
PR-64
Calle Elena Segarra
Calle Claudio Carrero
64
PR-2 S
PR-2 N
Calle Don Rafael Vélez
Añasco
Mayagüez
PR-108
Camino La
Río Yag
Calle Los Resecadores
Paseo Los
Robles
PR-104
Calle El Italiano
PR-64 S
Calle Los Ingenieros
PR-3108 S
3108
104
PR-64 N
3341
102
Calle Juan Gani Cruz
Camino Zoologico
351
PR-3351
PR-102 S
Zoológico de
Mayagüez
Mayagüez
Arriba
Universidad
de Puerto
Calle Justiniano
106
Legend
Start Point
End Point
Circuit
1:28,580
0
1
of 1
N
LUMA
Circuit 6012-03


Algarrobos
ALTS de Mayaguez
ALTS de Mayaguez
PARQ Forestal
REPTO San Francisco
Urb Hostos
Urb Quinto Centenario
Paseo Los Robles
Miradero
Urb Bella Lomas
QTAS de Santa Maria
MANS de Espana
Urb Las Hortencias
Urb Mayaguez Terrace
BO El Seco
Urb Fraternidad
Urb La Riviera
Universidad de Puerto Rico-Mayaguez
Calle Diego Colón
Calle Santa Fe
Calle Reina Isabel
Calle La Bolera
Camino Pitillo
Calle E
Calle A
Calle Rosalia
Calle Bonet
Salto El Chino
Avenida Las Marias
Paseo Pino
Avenida Palmeras
Calle San Pedro
Calle Mexico
Calle Heyliger
Boulevard Alfonso Valdez Cobian
Camino Los Calseos
Calle 3
Calle 1
Calle 14
PR-64 N
PR-64 S
PR-2 N
PR-2 S
PR-102
PR-102 N
PR-102 S
PR-3108 N
PR-3108 S
PR-3341
PR-108
Legend
Start Point
End Point
Circuit
1:16,620
0
0.1
1
of 1
N
LUMA
Circuit 6012-05


Riviera
Calle Aduana
Mayagüez
Urb Llavat
Calle Cristy
Pasaje Arroyo
Calle M. Columbus
Boulevard Guanajibo
Avenida Hostos
PR-102 N
Calle Vadi
Calle Virginia
Calle Nenadich O
Calle Principe
Calle Pilar Delfilo
Calle Mendez Vigo O
Calle José de Diego O
Calle del Bosque
Calle Las Flores
BO Barcelona
BO Paris
Calle Forestier
Calle Betances
Vigo E
Calle Arenal
Calle Bumini
QTAS de Monte Rio
Urb Monterrey
Calle Abacoa
REPTO Antillano
Univ. Adventista de las Atilas
Calle 3
Calle 106 Interior
PR-65 O PR-65 E
Calle Mariano Abril
Calle Luis Vilella
BO Buena Vista
BO Mineral
Calle Manantial
Calle Buena Vista
Calle Mesas
PR-105
Calle Colinas de Juan A
BO Colombia
Calle Alemany
Calle Asturias
Calle Oviedo
Avenida Duscombe
Estadio Isidoro Garcia
Urb Ramirez de Arellano
Calle Agustin Stahl
Avenida Yagüez
Sábanas
Vista Verde
Calle Zafiro
Calle Opalo
Calle Garos
Calle Cipres
Calle A
Centro Medico de Mayagüez
REPTO Feliciana
Quebrada Grande
Camino La Cuchilla
Calle Roberto Cole
Calle Rio Hondo
Camino Maximino Ba
Carretera Rio Hondo
Urb Camino
Cementario Mayagüez Memorial
Vista Bahia
PR-349
Quebrada Grande
Juan Alonso
Solimar
Smith St
Urb Cumbres Las Mesas
Calle Aries
Calle Carolina
BO Sabalos
Calle Carrau
Villa de Felisa
Legend
Start Point
End Point
Circuit
1:20,500
1 of 1
LUMA
Circuit 6014-01


Urb Las Hortencias
Espana
PR-64 N
Algarrobos
Mayaguez
3341
PR-3341
64
PR-2 S
PR-2 N
3108
PR-3108 S
Salto El Chino
Camino Zoologico
Zoologico de Mayaguez
Avenida Las Marias
108
Calle 14
Urb Mayaguez Terrace
Paseo Pino
Mirador Mayaguez
PR-108
Avenida Palmeras
Universidad de Puerto Rico-Mayaguez
Mayaguez Arriba
Calle Las Marias
Calle Comercio
PR-102 N
102
Calle San Pedro
Calle Concordia
PR-102 S
BO El Seco
Calle Heyliger
Urb Fraternidad
Calle Mexico
Urb La Riviera
Boulevard Alfonso Valdes Cobian
Parque de los Proceres
PR-65 O PR-65 E
Calle Aduana
Avenida Hostos
Calle del Bosque
Calle Las Flores
BO Barcelona
BO Paris
65
Calle Forestier
Calle Betances
Calle Arenal
Calle Bimini
Calle José de Diego O
Calle Méndez Vigo O
Mayaguez
PR-102 N
Calle Méndez Vigo E
108
106
Calle Ernesto Ramos Antonini E
Urb Llavat
Calle Virginia
Calle Vadi
Calle Pilar Defillo
Calle Cristy
Pasaje Arroyo
Calle M. Columbus
Calle Cristy
Calle Nenadich O
Calle Aguila
2R
Calle Peral S
Calle Luceo
Calle Mariano Abril
Calle Luis Vilella
PR-105
BO Buena Vista
Legend
Start Point
End Point
Circuit
1:15,190
0
1
of 1
N
LUMA
Circuit 6014-03



Legend

- Start Point
- End Point
- Circuit

1:31,030

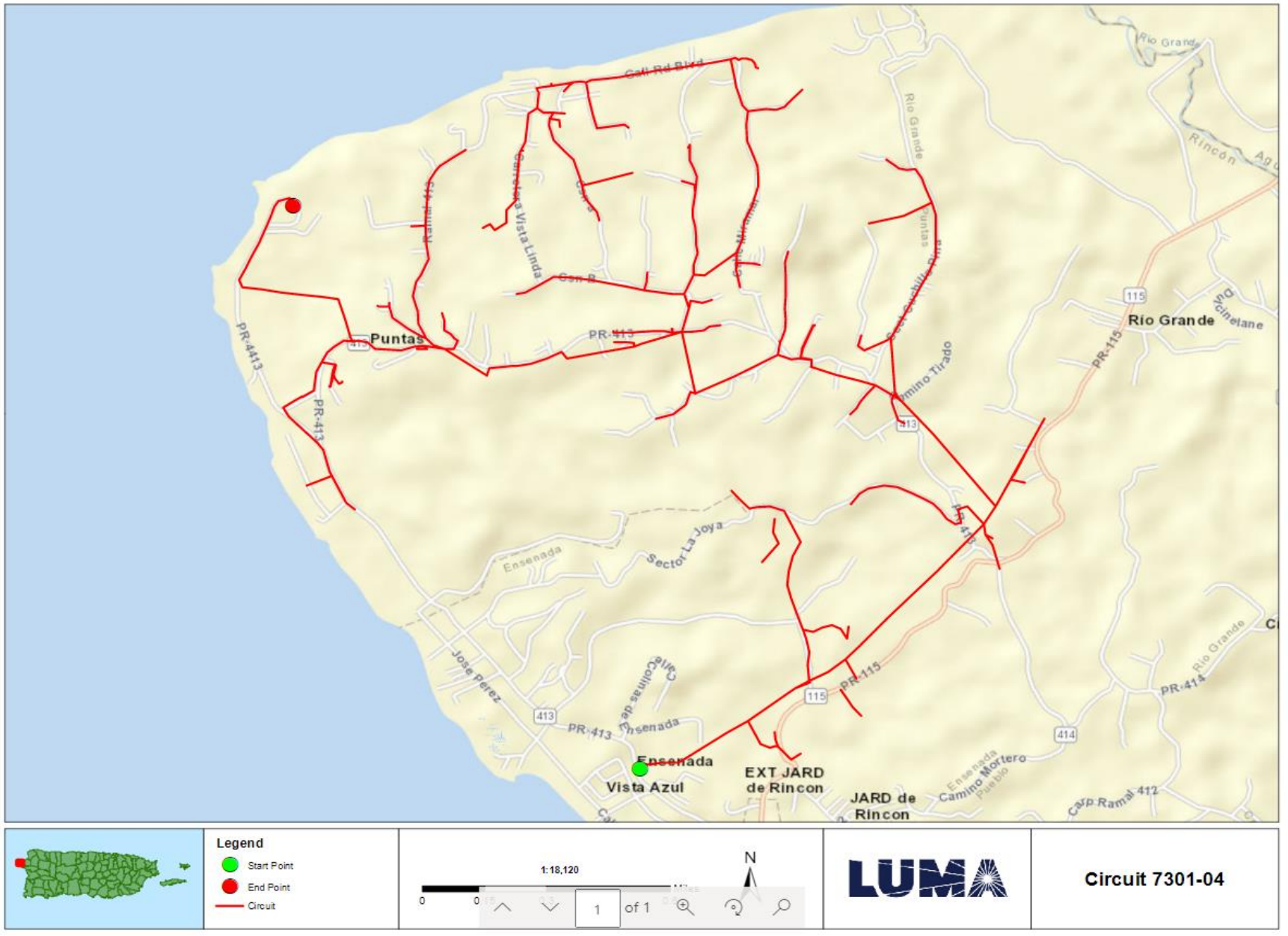
0

1 of 1

N

LUMA

Circuit 7301-02


Puntas
Río Grande
Ensenada
Vista Azul
EXT JARD de Rincon
JARD de Rincon
Sector La Joya
Camino Tirado
PR-413
PR-115
PR-414
Legend
Start Point
End Point
Circuit
1:18,120
1 of 1
N
LUMA
Circuit 7301-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 14

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 14
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
RINCON	7301-05	[redacted]		4.16
PUNTA DEL MAR	7302-01			13.2
SAN GERMAN	6401-02			4.16
SAN GERMAN	6401-04			4.16
SAN GERMAN INDUSTR.	6404-02			4.16
SAN GERMAN INDUSTR.	6404-03			4.16
SAN GERMAN TC 13kV	6406-04			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.35M**
Estimated Budget for Procurement & Construction:	**$23.53M**
Estimated Overall Budget for the Project:	**$25.88M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

Note: If available, detailed engineering cost estimates will be included as an attachment.

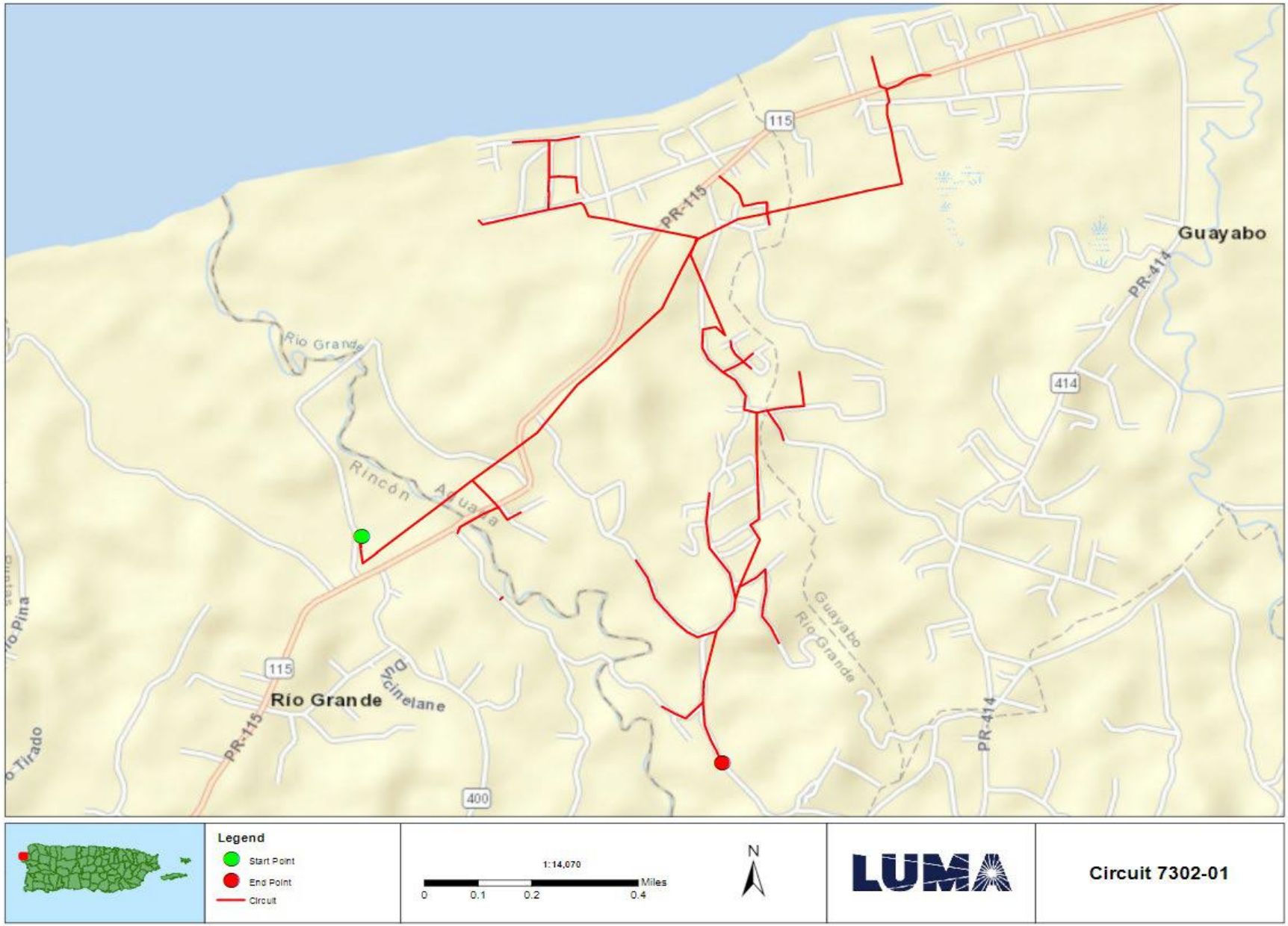
Environmental & Historic Preservation Requirements

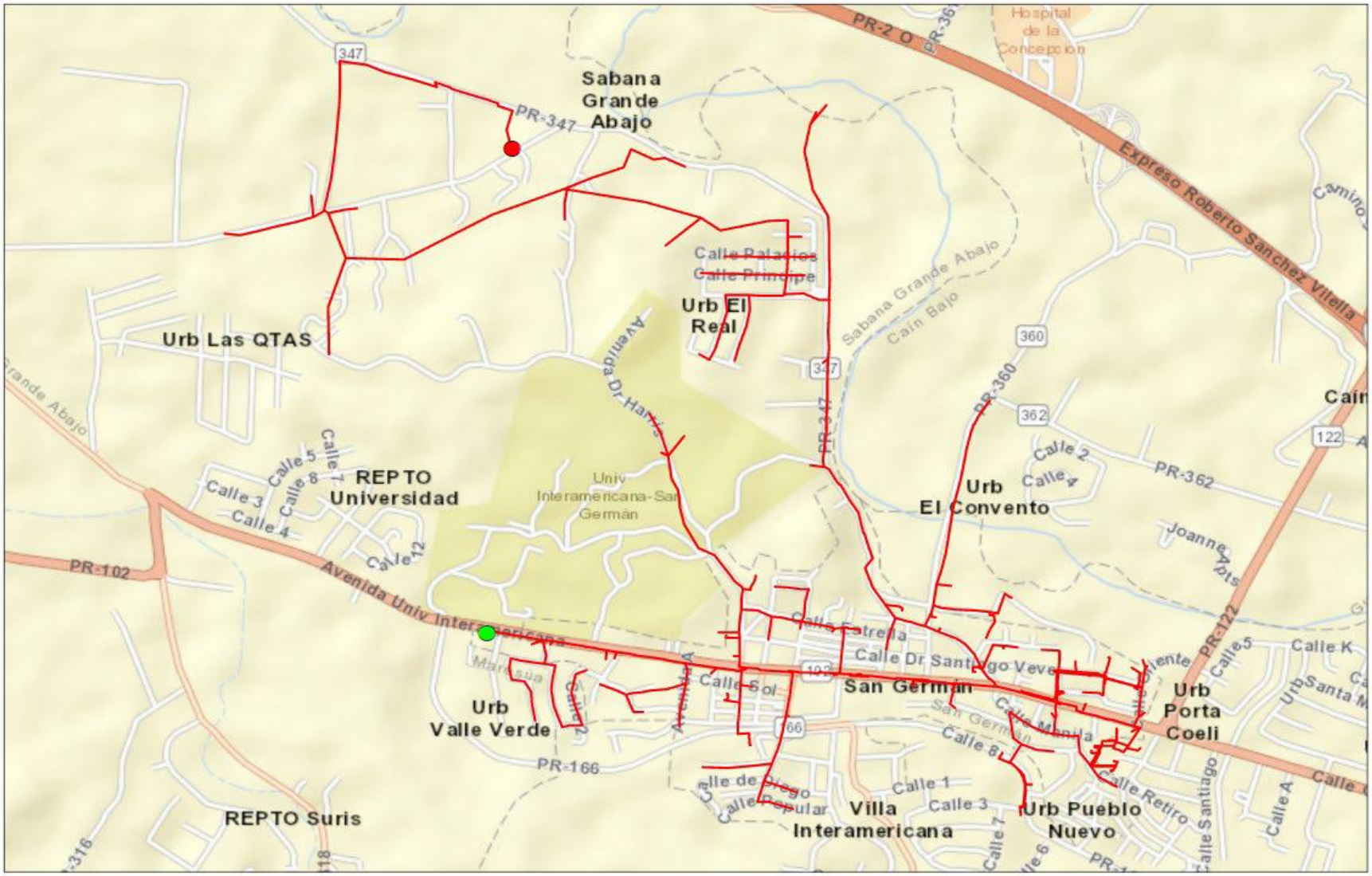
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

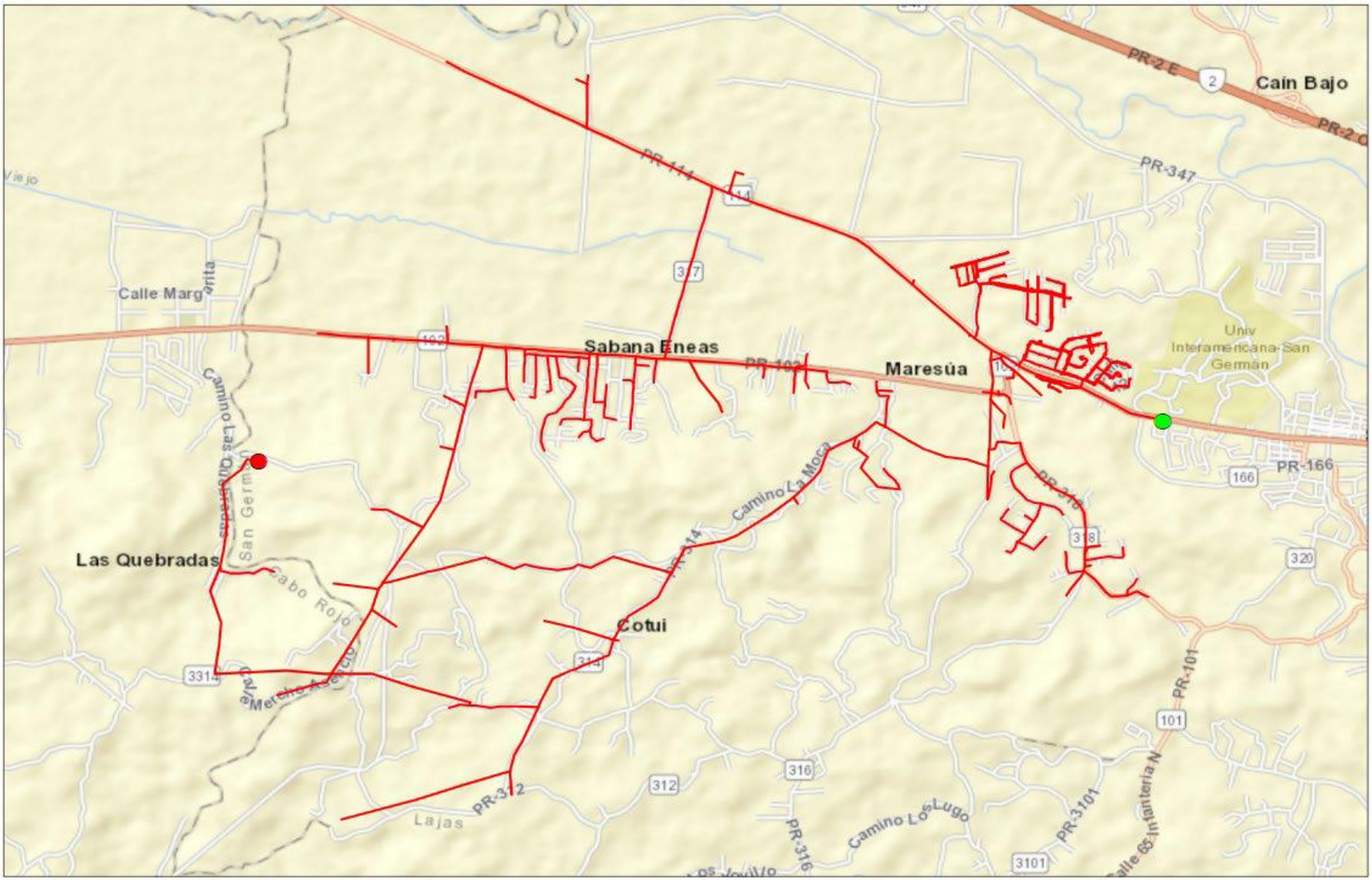
Attachments

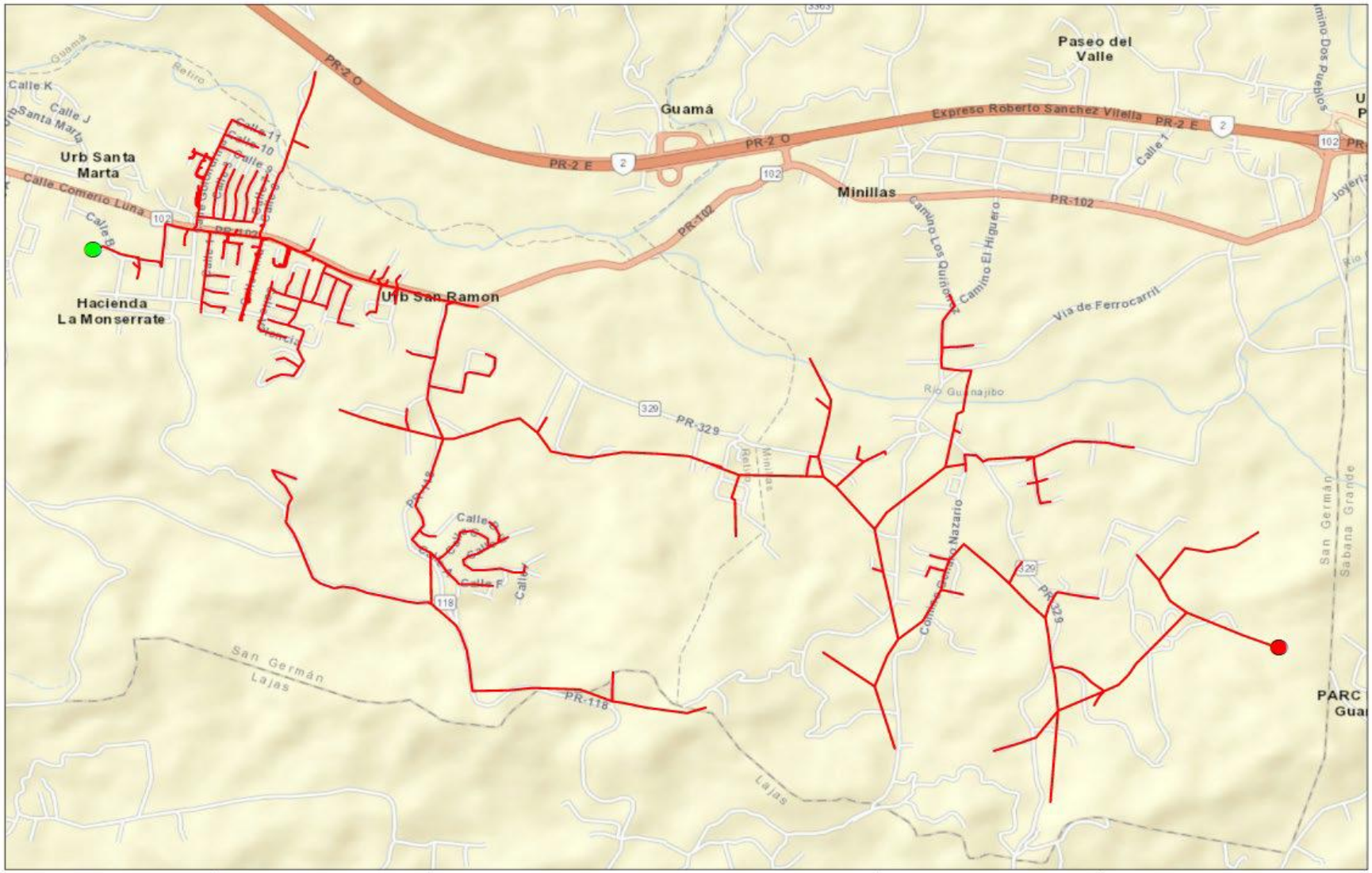
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 14 Location Maps	Location Maps and Site Picture

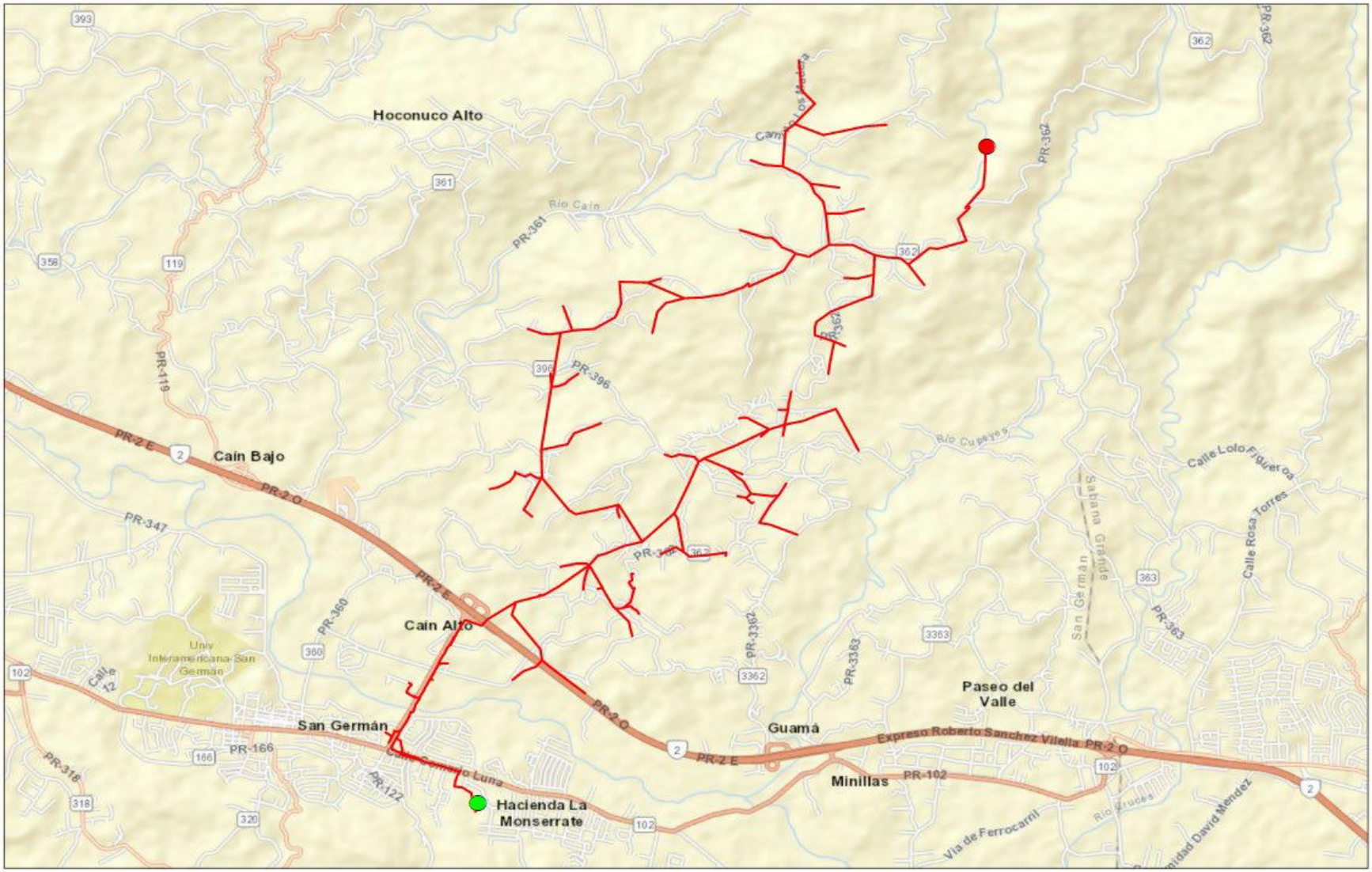

Ensenada
Vista Azul
EXT JARD de Rincon
JARD de Rincon
Rincón
Villa de la Pradera
Pueblo
Calle Los Robles
Avenida Vistamar
Cond Stella Royal
Cond Arenas de Mar
Calle Colon
Calle Union
Calle Nueva Final
Calle Las Fábricas
Calle Colibri
Calle Ruiseñor
Calle Num 11
Calle 12
Calle 15
Calle 16
PR-412
PR-414
PR-115
Carp Ramal
Camino Montero
Legend
Start Point
End Point
Circuit
1:13,280
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 7301-05

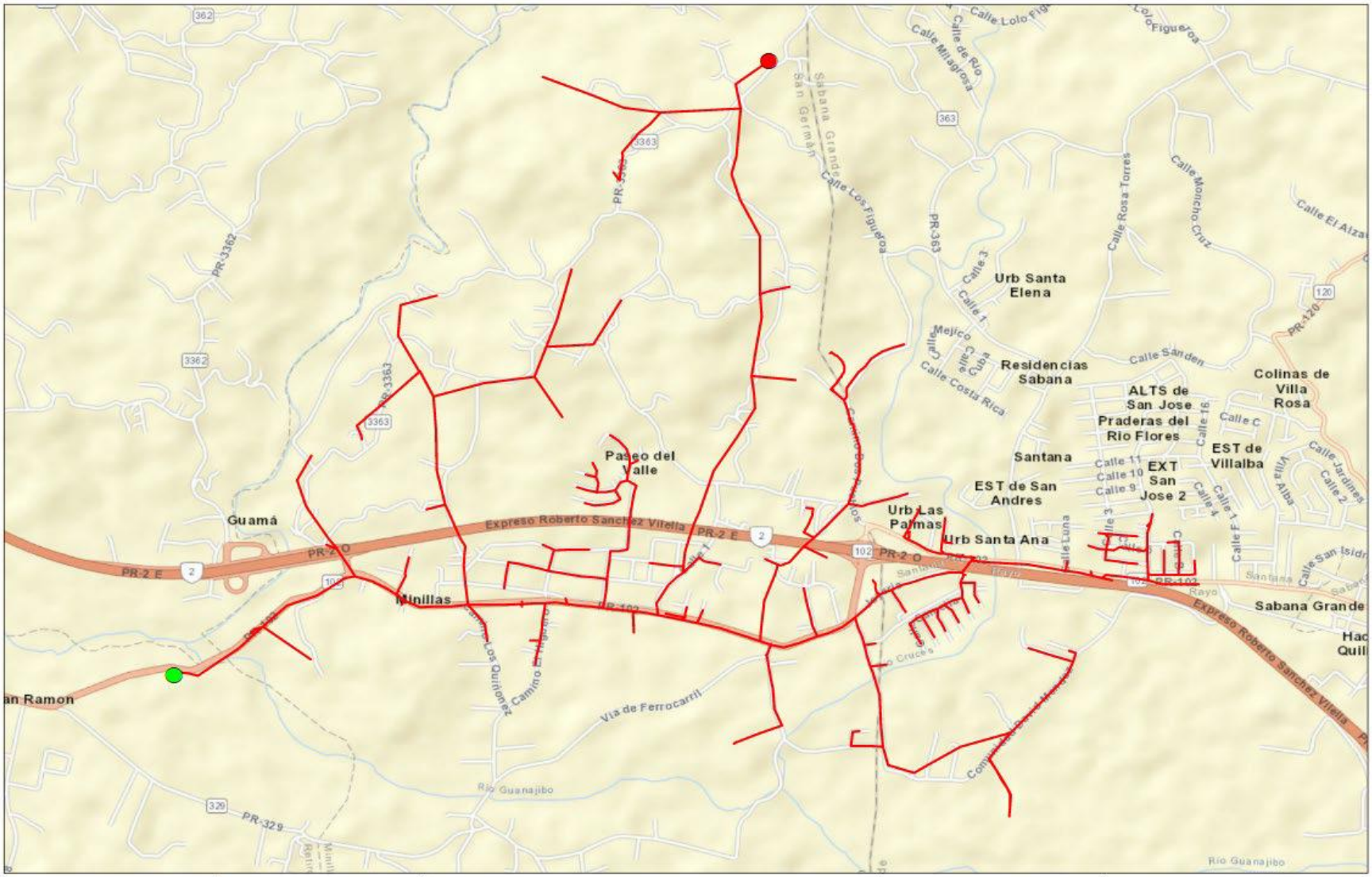

115
PR-115
Guayabo
PR-414
414
Río Grande
Rincón Aguada
Río Grande
115
PR-115
Río Grande
Escinelane
Guayabo
Río Grande
PR-414
400
Legend
Start Point
End Point
Circuit
1:14,070
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 7302-01


Sabana Grande Abajo
PR-347
347
PR-2 O
Expreso Roberto Sanchez Vilella
Hospital de la Concepcion
Urb Las QTAS
Urb El Real
Calle Palacios
Calle Principe
Sabana Grande Abajo
Cain Bajo
Avenida Dr Harris
PR-347
360
PR-360
362
PR-362
122
Calle 2
Calle 4
Urb El Convento
Joanne Apts
REPTO Universidad
Calle 5
Calle 7
Calle 8
Calle 3
Calle 4
Calle 12
Univ Interamericana-San Germán
PR-102
Avenida Univ Interamericana
Calle Estrella
Calle Dr Santiago Veve
San Germán
Calle Sol
Urb Valle Verde
Urb Porta Coeli
Calle Manila
Calle 8
Calle 5
Calle K
PR-166
Calle de Diego
Calle Popular
Villa Interamericana
Calle 1
Calle 3
Urb Pueblo Nuevo
Calle Retiro
Calle Santiago
Calle A
REPTO Suris
Legend
Start Point
End Point
Circuit
1:14,090
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 6401-02


Caín Bajo
PR-2 E
PR-2 O
PR-347
PR-114
Calle Margarita
Sabana Eneas
PR-102
Maresúa
Univ Interamericana-San Germán
PR-166
Camino Las Quebradas
Las Quebradas
Camino La Moca
PR-314
Cotuí
Cabo Rojo
Calle Mercedes Acevedo
PR-312
Lajas
PR-316
Camino Los Lugo
PR-3101
PR-101
Calle 65 Infantería N
Legend
Start Point
End Point
Circuit
1:25,840
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 6401-04


Paseo del Valle
Guamá
PR-2 O
PR-2 E
Expreso Roberto Sanchez Vilella
PR-2 E
PR-2 O
Urb Santa Marta
Calle Comercio Luna
Minillas
PR-102
Hacienda La Monserrate
Urb San Ramon
PR-102
Camino Los Quinones
Camino El Higuero
Via de Ferrocarril
Río Guaynajibo
PR-329
Minillas
Calle F
PR-118
San Germán
Lajas
Lajas
San Germán
Sabana Grande
PARC
Legend
Start Point
End Point
Circuit
1:15,750
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 6404-02


Hoconuco Alto
Cain Bajo
Cain Alto
San Germán
Guamá
Paseo del Valle
Minillas
Hacienda La Monserrate
Univ Interamericana San Germán
Río Cain
Río Cupeyes
Río Grande de San Germán
Sabana Grande
Calle Lolo Figueroa
Calle Rosa Torres
Calle Ramón Emeterio Betances
Calle Dr. Ramón Emeterio Betances
Calle Ramón Luna
Calle U-12
Expreso Roberto Sánchez Vilella PR-2 O
Vía de Ferrocarril
PR-2 E
PR-2 O
PR-119
PR-347
PR-360
PR-361
PR-362
PR-3362
PR-3363
PR-396
PR-166
PR-318
PR-122
PR-102
PR-363
Legend
Start Point
End Point
Circuit
1:38,730
0 0.3 0.6 1.2 Miles
N
LUMA
Circuit 6404-03


Guamá
Expreso Roberto Sanchez Vilella PR-2 E
PR-2 O
Minillas
Paseo del Valle
Urb Las Palmas
Urb Santa Ana
Urb Santa Elena
Residencias Sabana
Santana
EST de San Andres
ALTS de San Jose
Praderas del Rio Flores
EXT San Jose 2
EST de Villalba
Colinas de Villa Rosa
Sabana Grande
Via de Ferrocarril
Rio Guanajibo
PR-329
PR-3362
PR-3363
PR-363
PR-102
PR-120
Legend
Start Point
End Point
Circuit
1:20,840
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 6406-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 3

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 3
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term projects In the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
ARROYO	4101-01	[redacted]		4.16
ARROYO	4101-04			4.16
COAMO URBANO	4602-03			4.16
COAMO URBANO	4602-04			4.16
COAMO PDS	4603-02			4.16
GUAYAMA	4001-03			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$3.05M**
Estimated Budget for Procurement & Construction:	**$30.49M**
Estimated Overall Budget for the Project:	**$33.54M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

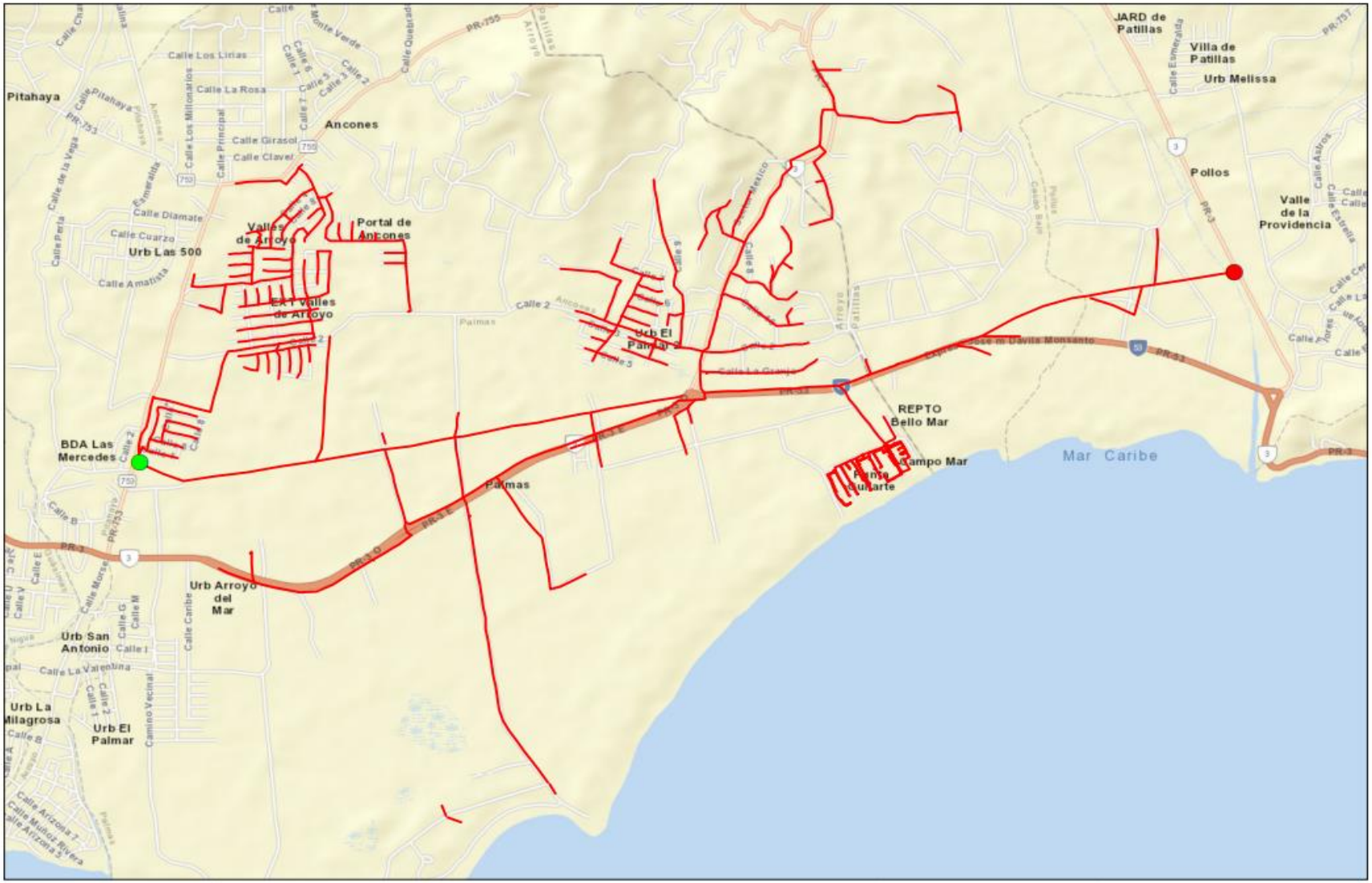
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 3 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

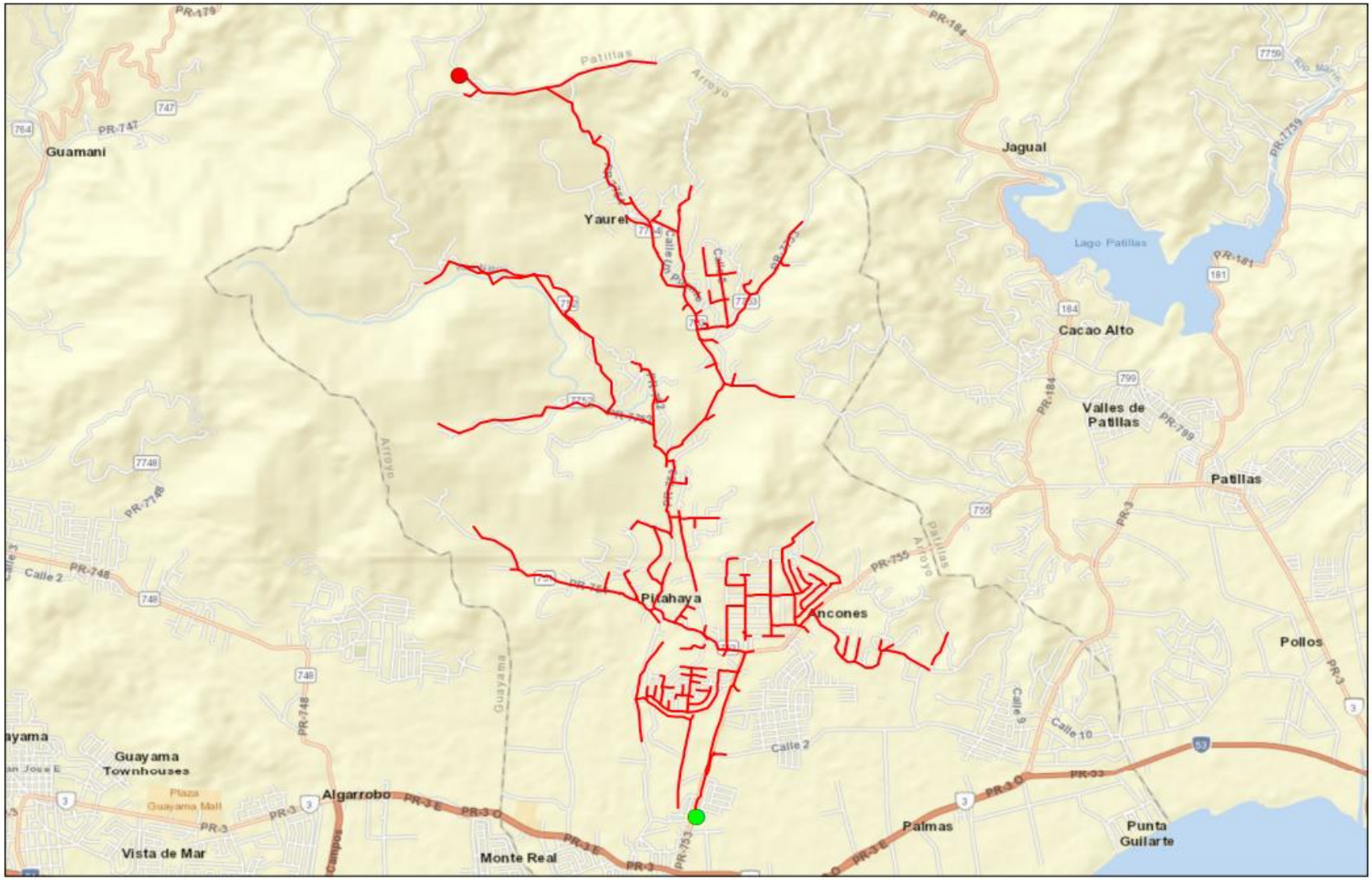
1:24,760

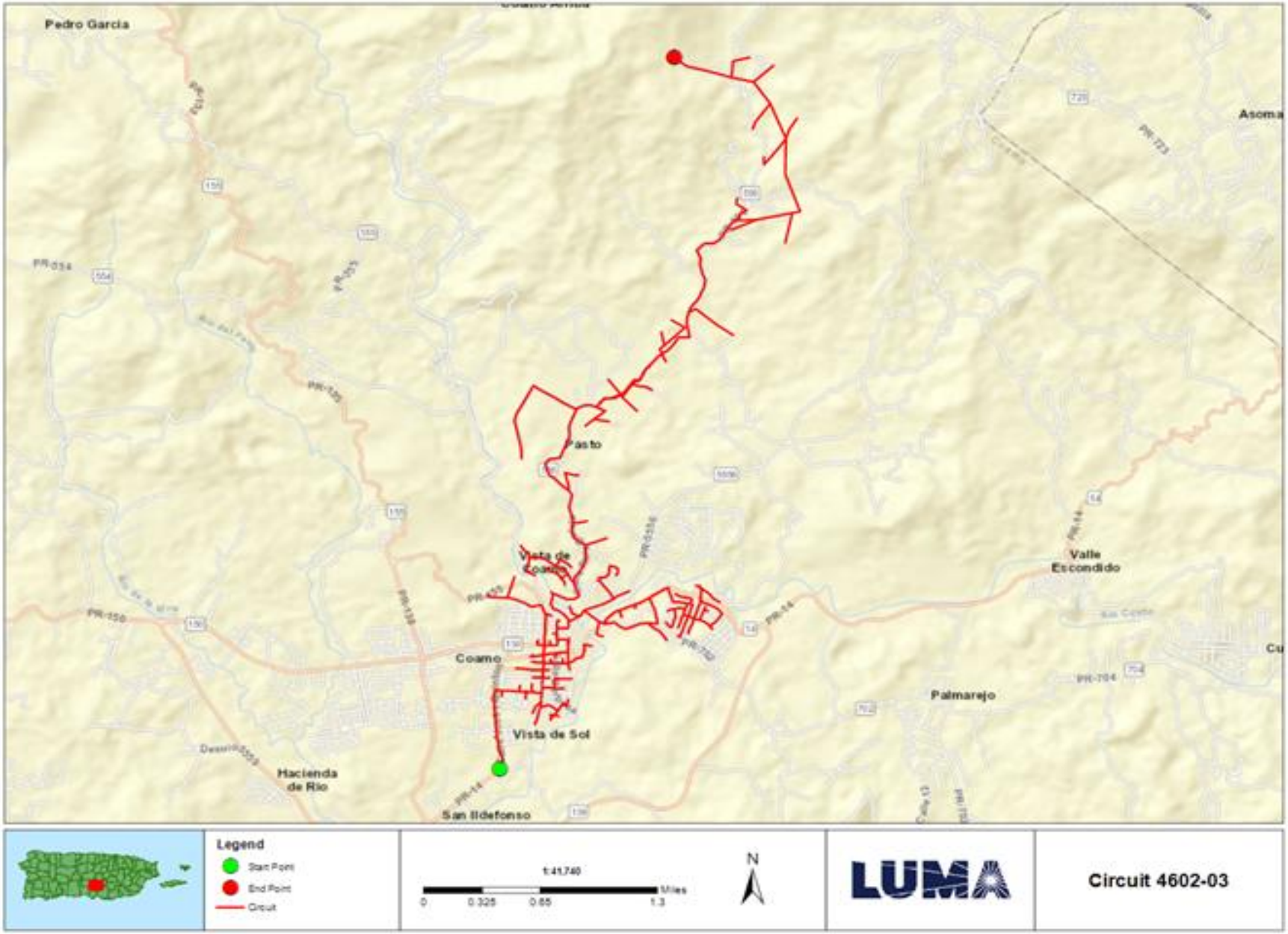
0 0.2 0.4 0.8 Miles

N

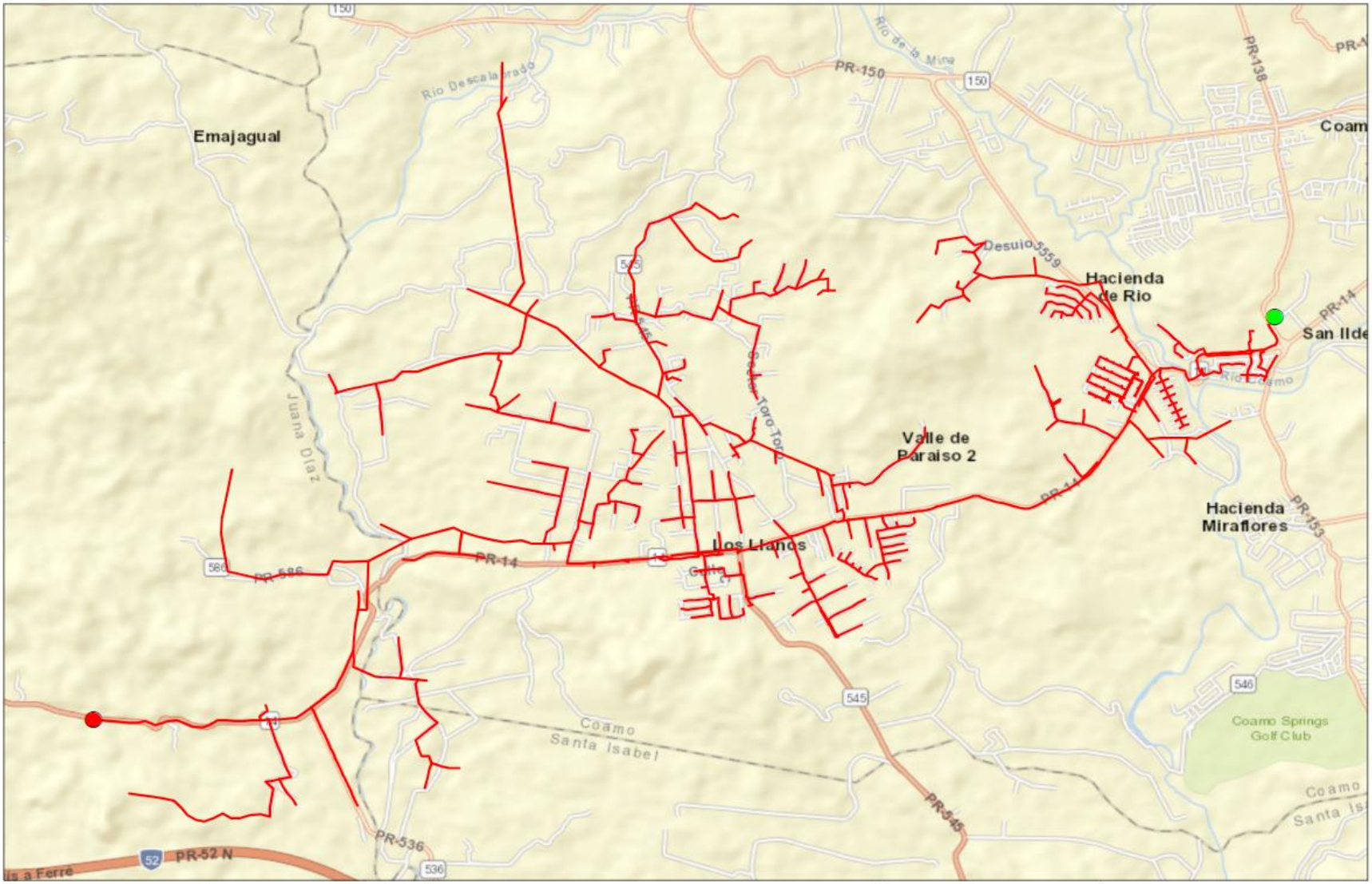
LUMA

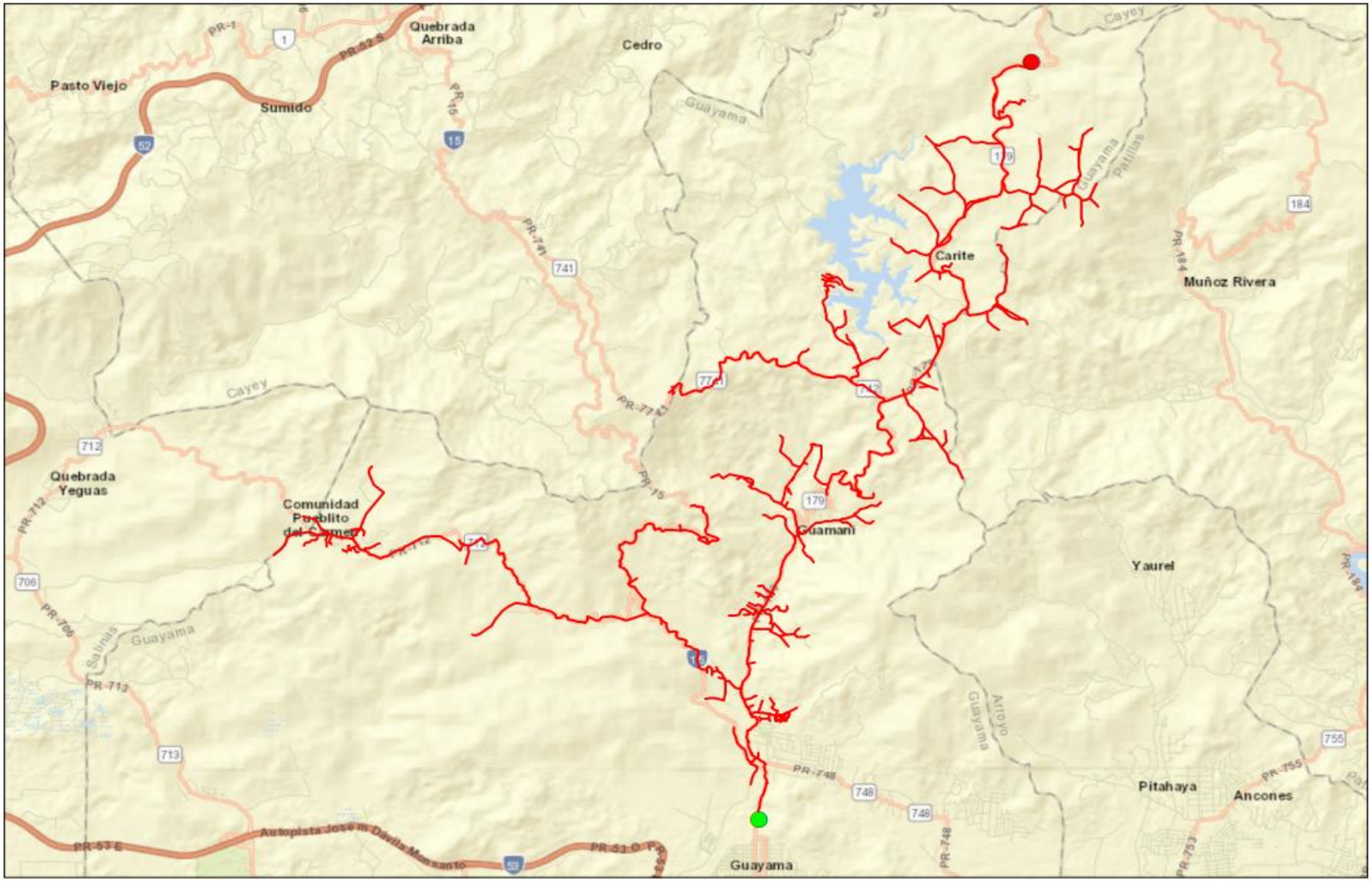
Circuit 4101-01


Guamani
Yaurel
Jagual
Lago Patillas
Cacao Alto
Valles de Patillas
Patillas
Pitahaya
Ancones
Pollos
Guayama Townhouses
Algarrobo
Vista de Mar
Monte Real
Palmas
Punta Guilarte
Legend
Start Point
End Point
Circuit
1:41,500
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 4101-04


Pedro Garcia
Asoma
Pasto
Vista de Coamo
Valle Escondido
Coamo
Palmarejo
Vista de Sol
Hacienda de Rio
San Ildefonso
PR-14
PR-150
PR-153
PR-154
PR-723
PR-704
Legend
Start Point
End Point
Circuit
1:41,740
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 4602-03


Villa Cristina
Colinas de Coamo
Urb. Coamo Gdns
JARD de Coamo
Coamo
EXT JARD de Coamo
JARD de San Blas
Valle Arriba Abajo
Urb Townhouses
Calle Principal
EXT El Eden
Vista de Sol
PR-138
Calle Varsovia
Calle Bobby Capo
Calle Mario Braschi
Calle Hermilio W Santaella
Calle Rodriguez Hidalgo
Calle Segundo Bernier
Calle Willie Rosario
Calle Barbosa
Calle Buenos Aires
Calle Yagrumo
Calle Caoba
Calle Cambalache
Calle Jose I Quinton
Legend
Start Point
End Point
Circuit
1:9,360
0
0.075
0.15
0.3
Miles
N
LUMA
Circuit 4602-04


Emajagual
Rio Descalabrado
PR-150
Rio de la Mina
PR-138
Coam
Desvio 5559
Hacienda
de Rio
San Ilde
PR-14
Juana Diaz
Valle de
Paraiso 2
Hacienda
Miraflores
PR-153
Los Llanos
PR-586
PR-14
Coamo
Santa Isabel
PR-545
Coamo Springs
Golf Club
PR-536
PR-52 N
Legend
Start Point
End Point
Circuit
1:33,760
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 4603-02


Pasto Viejo
Sumido
Quebrada Arriba
Cedro
Guayama
Cayey
Carite
Muñoz Rivera
Quebrada Yeguas
Comunidad Pueblito del Carmen
Guamani
Yaurel
Salinas
Pitahaya
Ancones
Autopista José M Dávila Monsanto
Guayama
Legend
Start Point
End Point
Circuit
t:72,270
0
0.5
1
2
Miles
N
LUMA
Circuit 4001-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 4

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 4
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
JOBOS T.C.	4003-02	[redacted]		13.2
JOBOS T.C.	4003-03			13.2
MAUNABO	4301-01			4.16
MAUNABO	4301-02			4.16
MAUNABO	4301-03			4.16
PATILLAS	4201-02			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.02M**
Estimated Budget for Procurement & Construction:	**$20.27M**
Estimated Overall Budget for the Project:	**$22.29M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

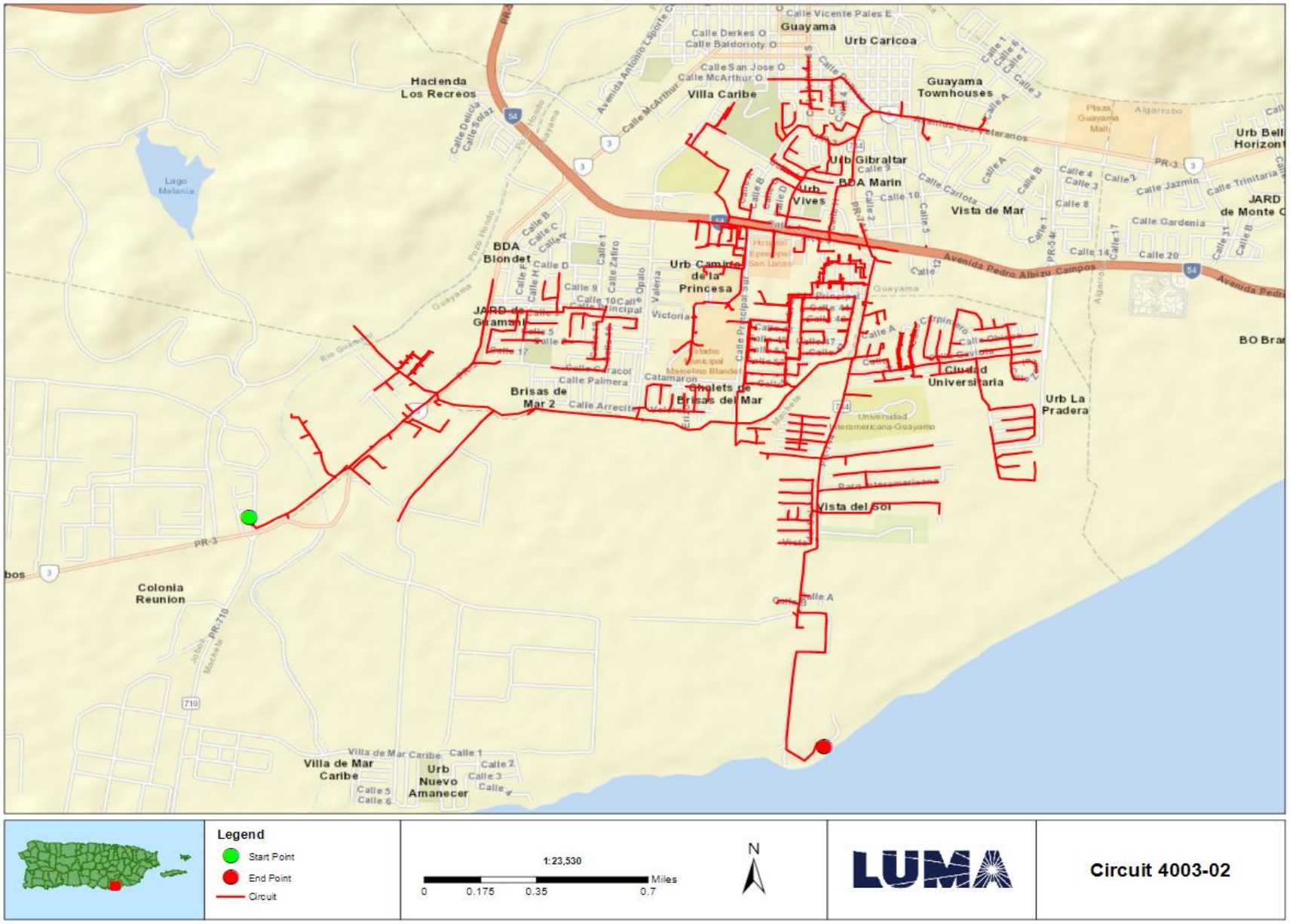
Note: If available, detailed engineering cost estimates will be included as an attachment.

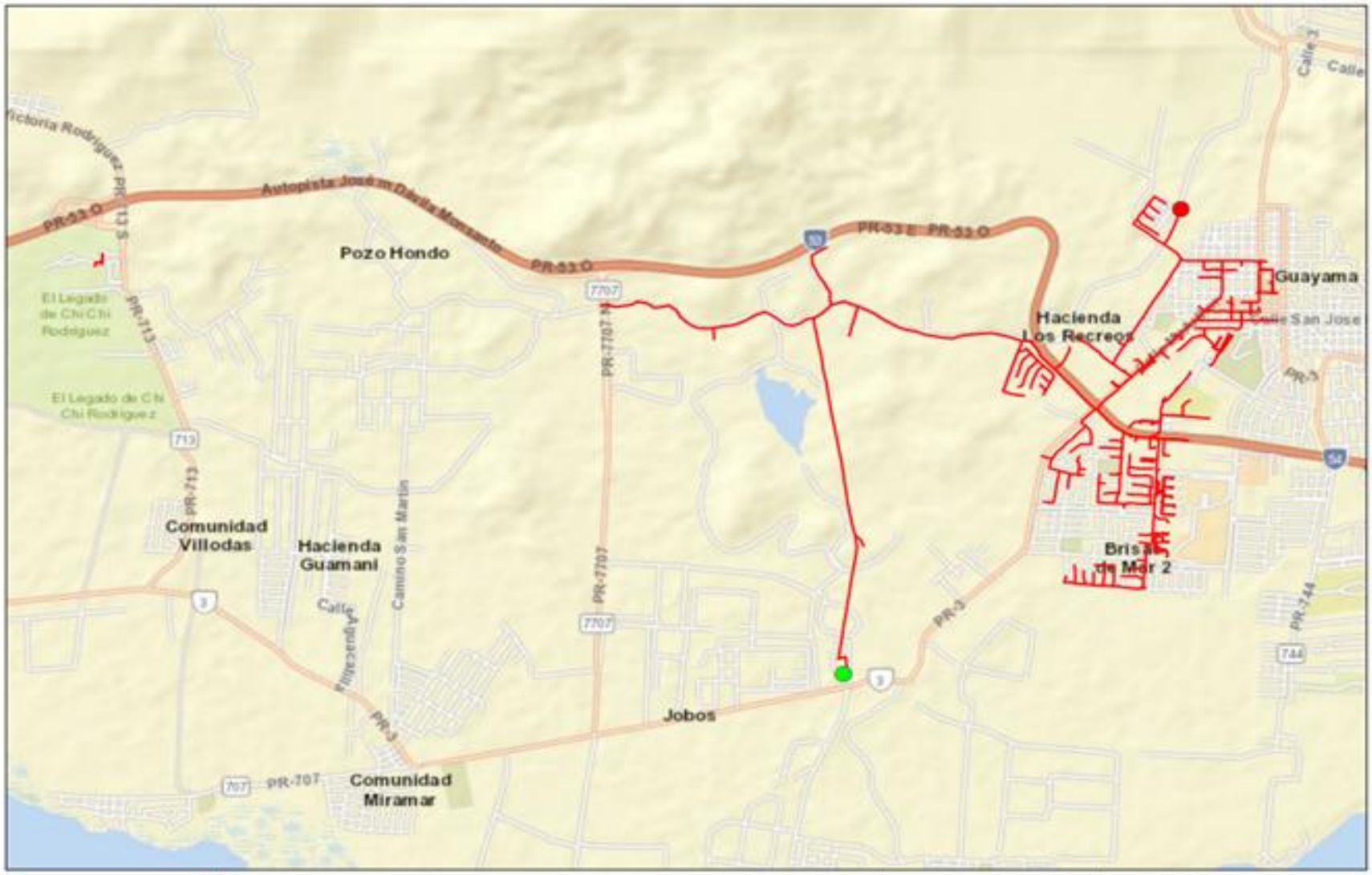
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 4 Location Maps	Location Maps and Site Picture


Hacienda
Los Recreos
Villa Caribe
Guayama
Urb Caricoa
Guayama
Townhouses
Urb Gibraltar
BDA Marin
Urb
Vives
Vista de Mar
BDA
Blondet
Urb Camino
de la
Princesa
JARD de
Guamani
Brisas de
Mar 2
Chalets de
Brisas del Mar
Ciudad
Universitaria
Urb La
Pradera
Vista del Sol
Colonia
Reunion
Villa de Mar
Caribe
Urb
Nuevo
Amanecer
Lago
Melania
Avenida Pedro Albizu Campos
PR-3
PR-710
Legend
Start Point
End Point
Circuit
1:23,530
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 4003-02



Legend

- Start Point
- End Point
- Circuit

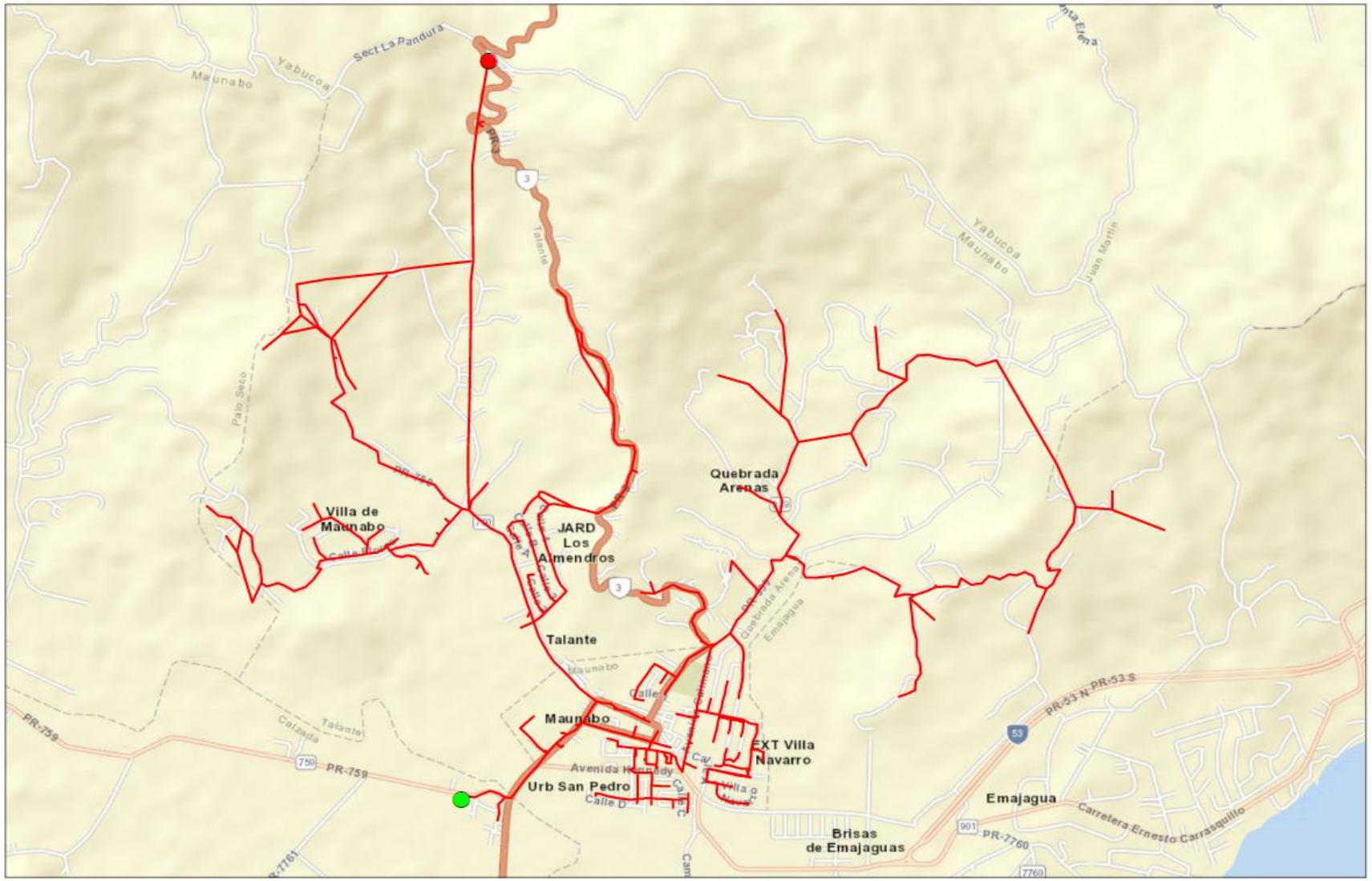
1:31,900

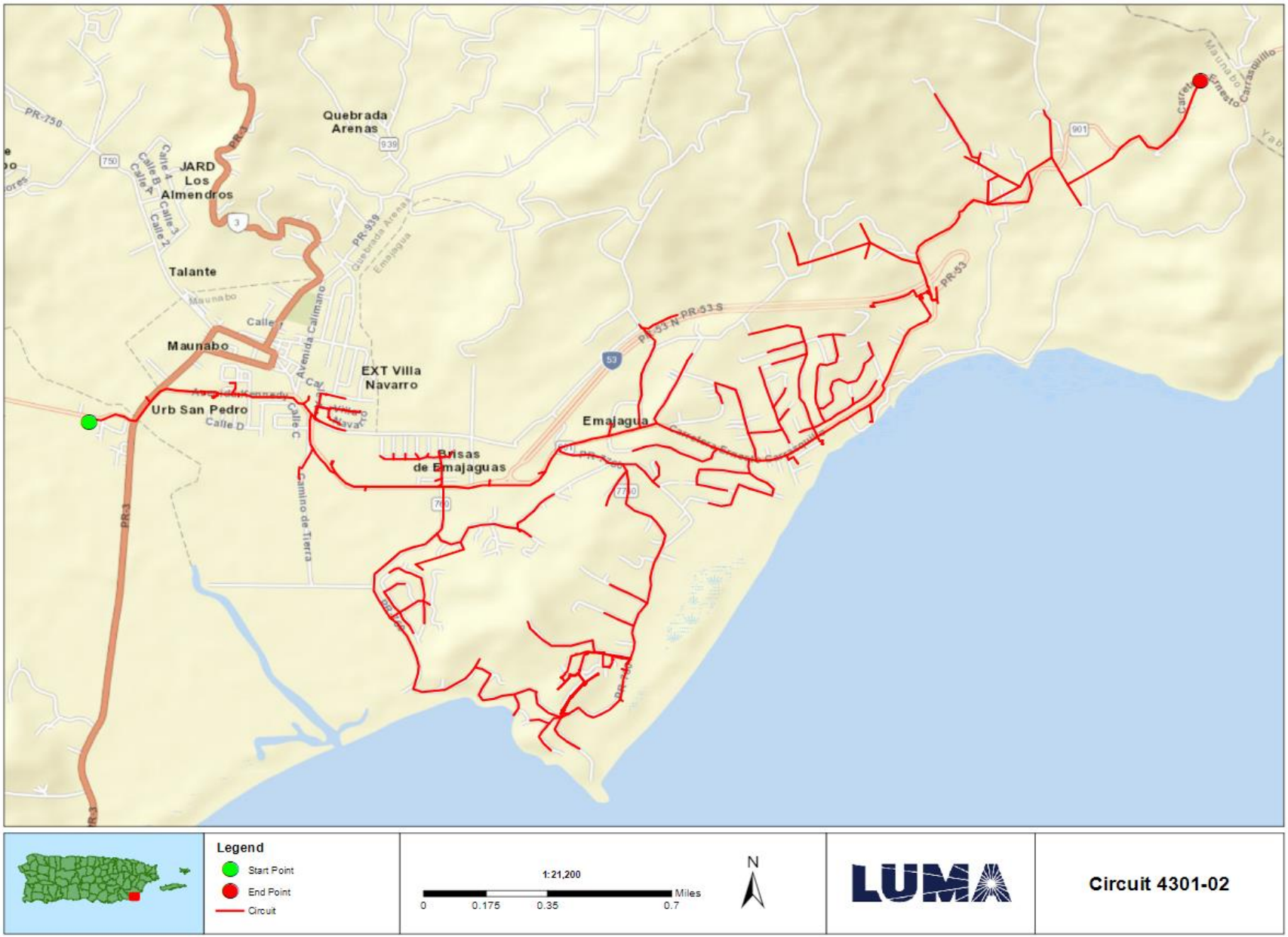
0 0.25 0.5 1 Miles

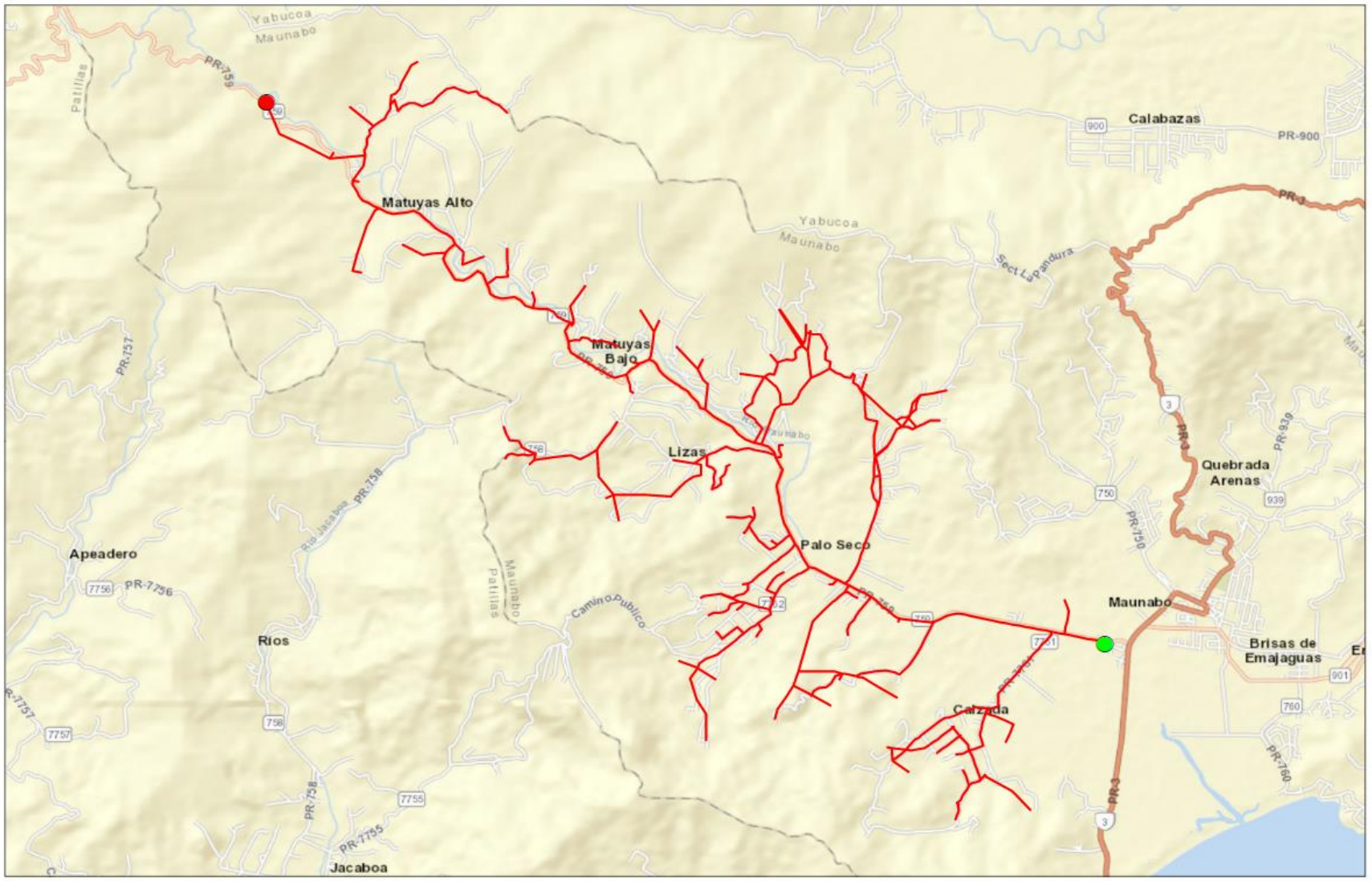
N

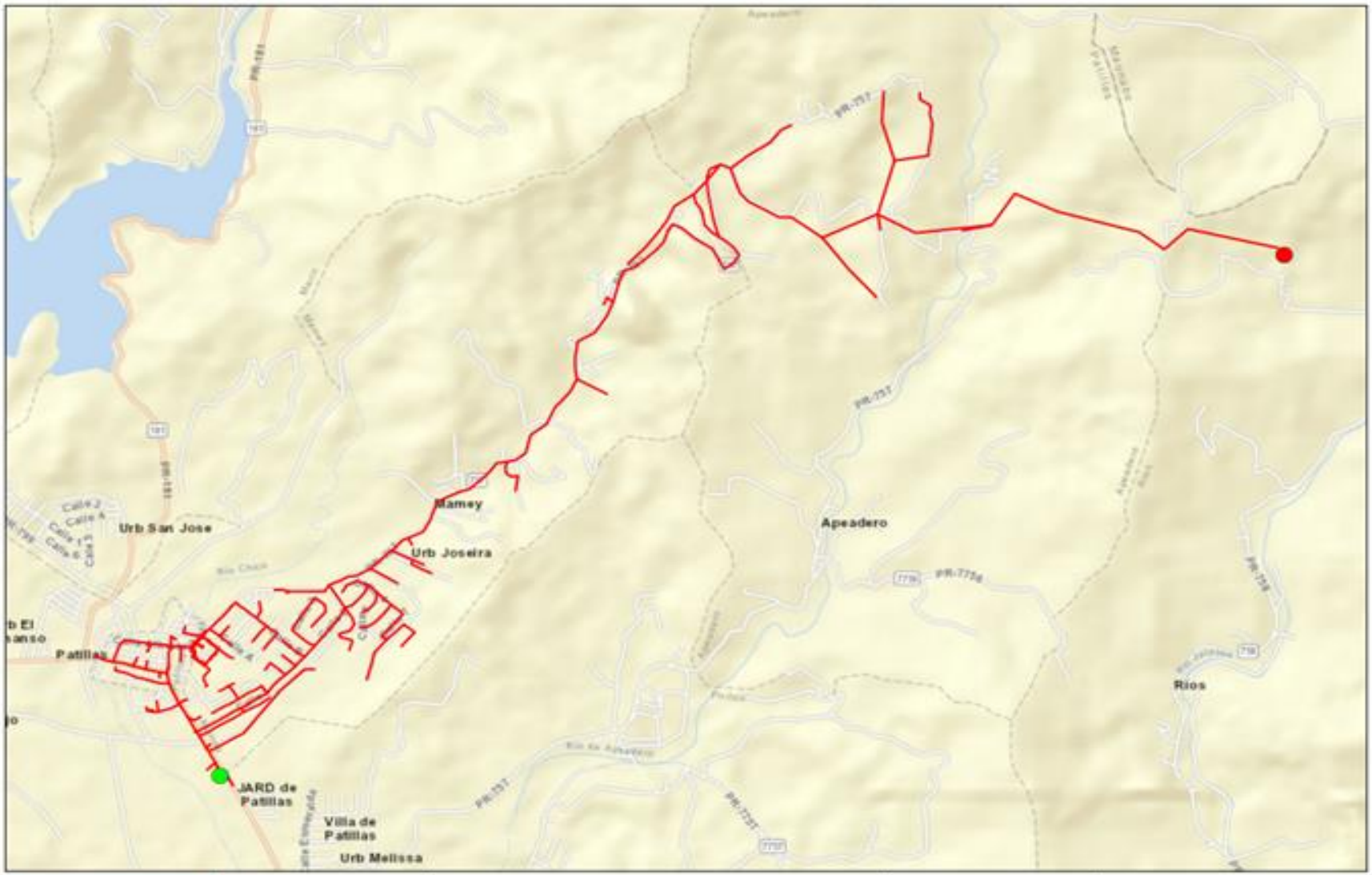
LUMA

Circuit 4003-03


Sect La Pandura
Yabucoa
Maunabo
PR-3
Talante
Yabucoa
Maunabo
Juan Martin
Palo Seco
PR-759
Villa de Maunabo
JARD Los Almendros
Quebrada Arenas
Talante
Maunabo
Calzada
Talantel
PR-759
Maunabo
Avenida Kennedy
Urb San Pedro
Calle D
Calle C
EXT Villa Navarro
Emajagua
Brisas de Emajaguas
PR-53 N PR-53 S
Carretera Ernesto Carrasquillo
PR-7760
Legend
Start Point
End Point
Circuit
1:21,190
Miles
0
0.175
0.35
0.7
N
LUMA
Circuit 4301-01


Quebrada Arenas
JARD Los Almendros
Talante
Maunabo
EXT Villa Navarro
Urb San Pedro
Brisas de Emajaguas
Emajagua
PR-750
PR-3
PR-939
PR-53
Avenida Calimano
Camino de Tierra
Legend
Start Point
End Point
Circuit
1:21,200
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 4301-02


Yabucoa
Maunabo
PR-759
Patillas
Matuyas Alto
Calabazas
PR-900
PR-3
Yabucoa
Maunabo
Sect La Pandura
PR-757
Matuyas Bajo
Lizas
Quebrada Arenas
PR-939
Río Jacabo
PR-758
Palo Seco
Apeadero
PR-7756
Maunabo
Patillas
Camino Publico
Maunabo
Ríos
Brisas de Emajaguas
Calzada
PR-7757
PR-758
PR-7755
Jacaboa
PR-760
Legend
Start Point
End Point
Circuit
1:40,680
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 4301-03


Mamey
Urb San Jose
Urb Joselra
Apeadero
Patillas
Rios
JARD de Patillas
Villa de Patillas
Urb Melissa
PR-757
PR-7758
PR-181
Legend
Start Point
End Point
Circuit
1:21,650
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 4201-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 5

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 5
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
PATILLAS	4201-03	[redacted]		4.16
PATILLAS	4201-04			4.16
SALINAS URBANO	4501-01			4.16
SALINAS URBANO	4501-04			4.16
BO. LAPAS	4504-01			4.16
SANTA ISABEL	4401-01			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.66M**
Estimated Budget for Procurement & Construction:	**$26.61M**
Estimated Overall Budget for the Project:	**$29.27M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

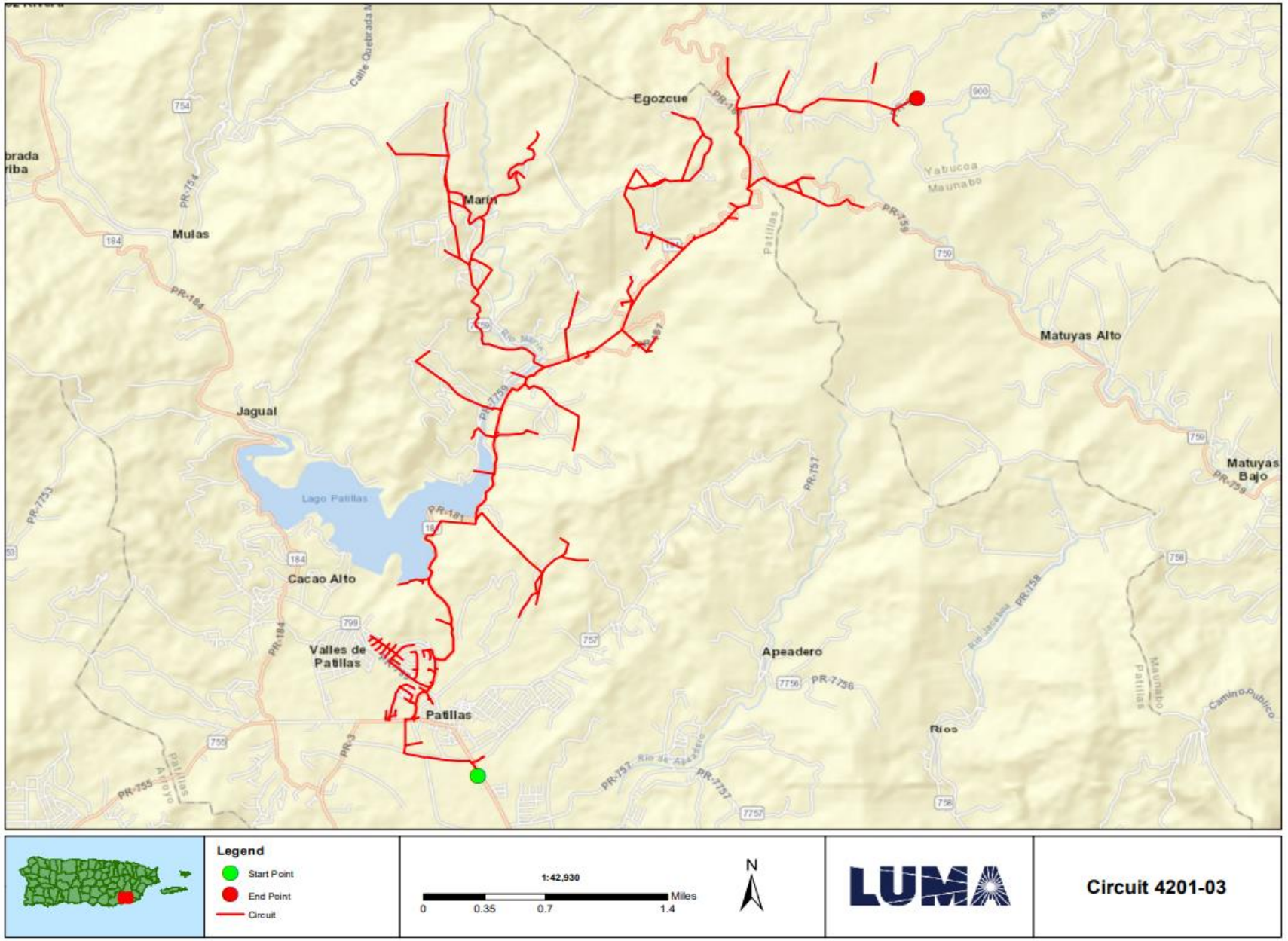
Note: If available, detailed engineering cost estimates will be included as an attachment.

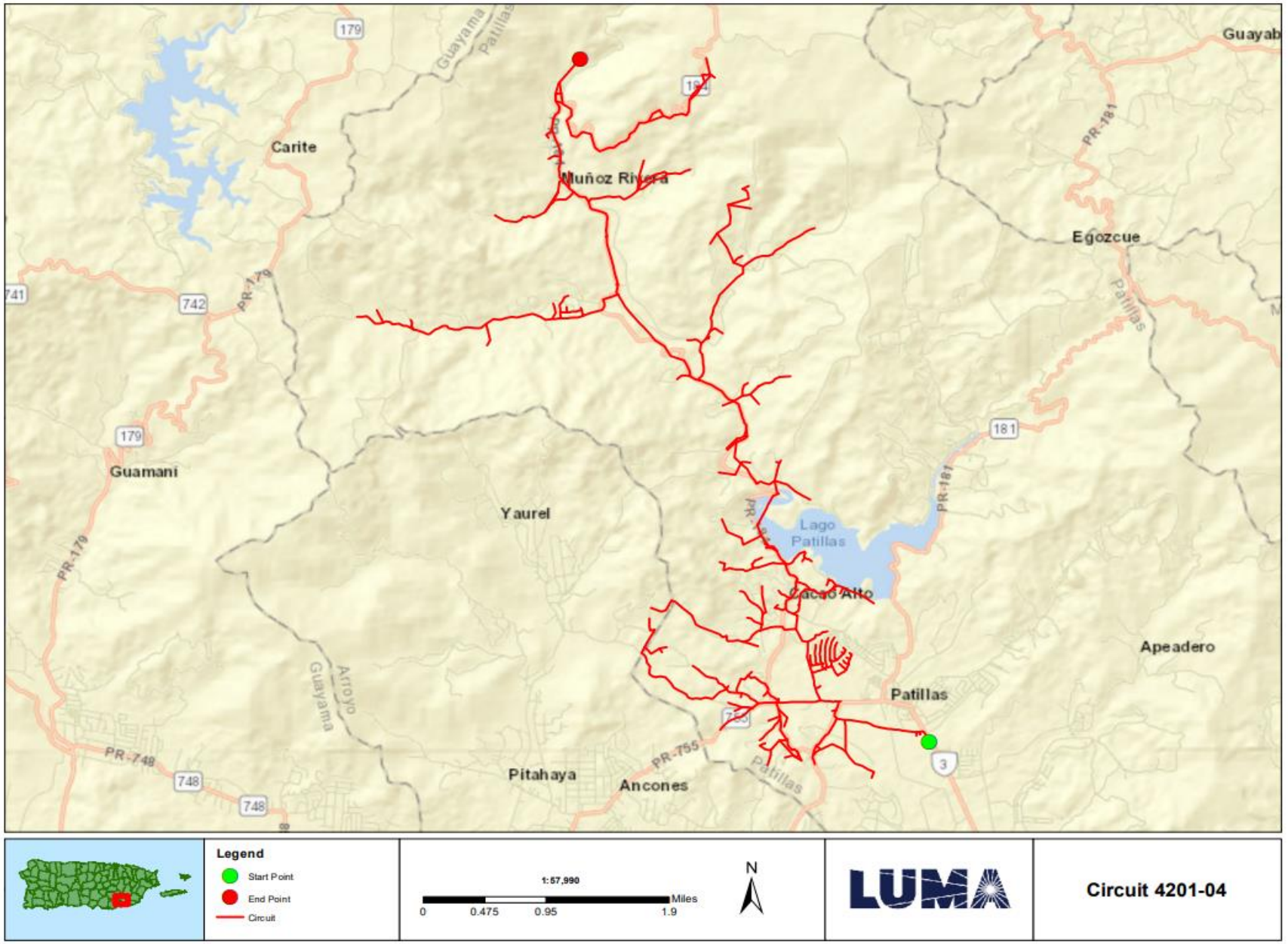
Environmental & Historic Preservation Requirements

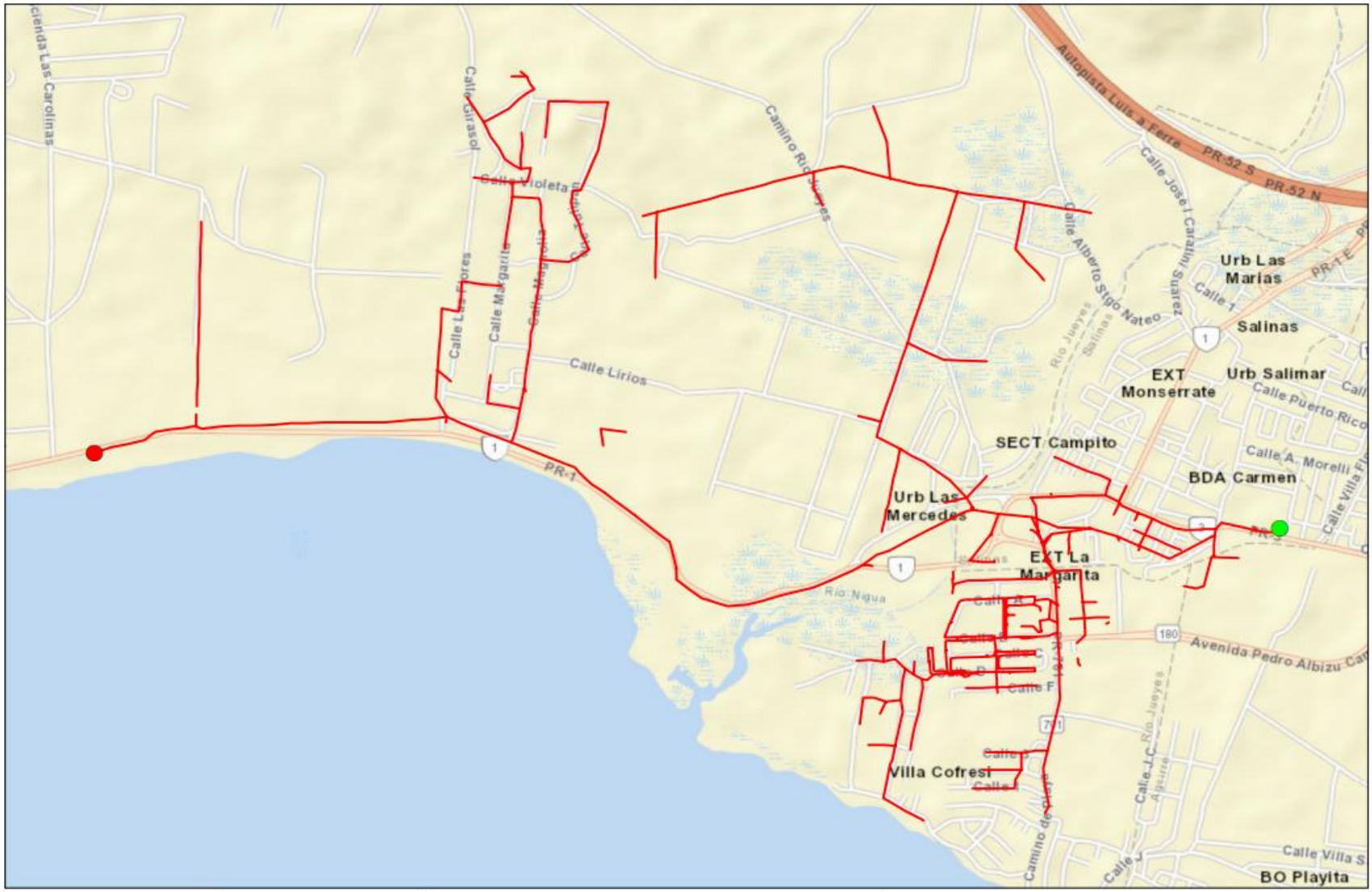
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 5 Location Maps	Location Maps and Site Picture


Egozcue
Marín
Mulas
Jagual
Lago Patillas
Cacao Alto
Valles de Patillas
Patillas
Apeadero
Ríos
Matuyas Alto
Matuyas Bajo
Yabucoa
Maunabo
PR-754
PR-184
PR-181
PR-759
PR-757
PR-756
PR-3
PR-755
PR-1753
Legend
Start Point
End Point
Circuit
1:42,930
0
0.35
0.7
1.4
Miles
N
LUMA
Circuit 4201-03


Carite
Muñoz Rivera
Egozcue
Guamani
Yaurel
Lago Patillas
Cacao Alto
Apeadero
Patillas
Pitahaya
Ancones
Arroyo Guayama
Guayama
Patillas
PR-179
PR-181
PR-748
PR-755
179
181
742
748
3
Legend
Start Point
End Point
Circuit
1:57,990
0
0.475
0.95
1.9
Miles
N
LUMA
Circuit 4201-04



Legend

- Start Point
- End Point
- Circuit

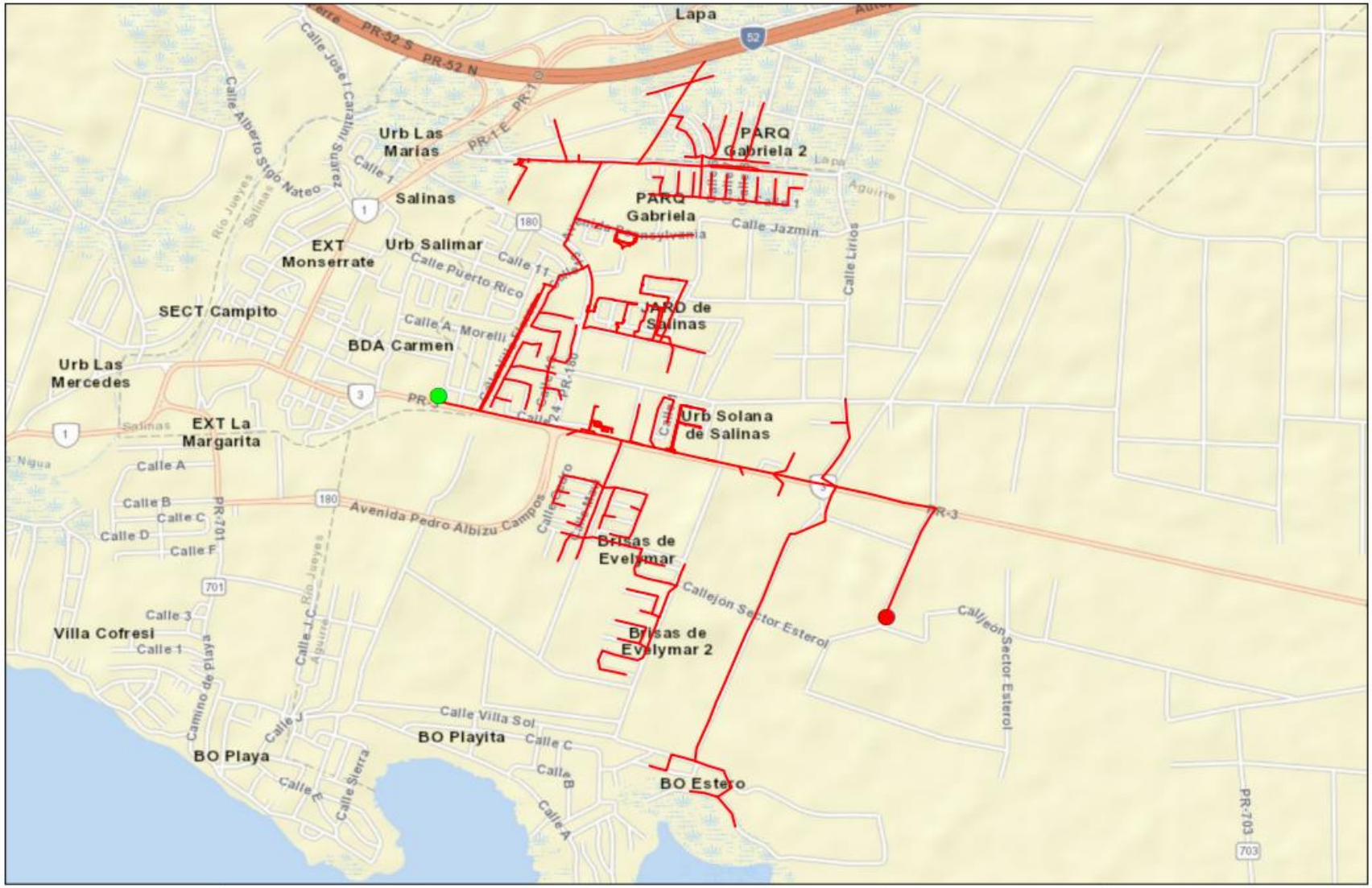
1:17,780

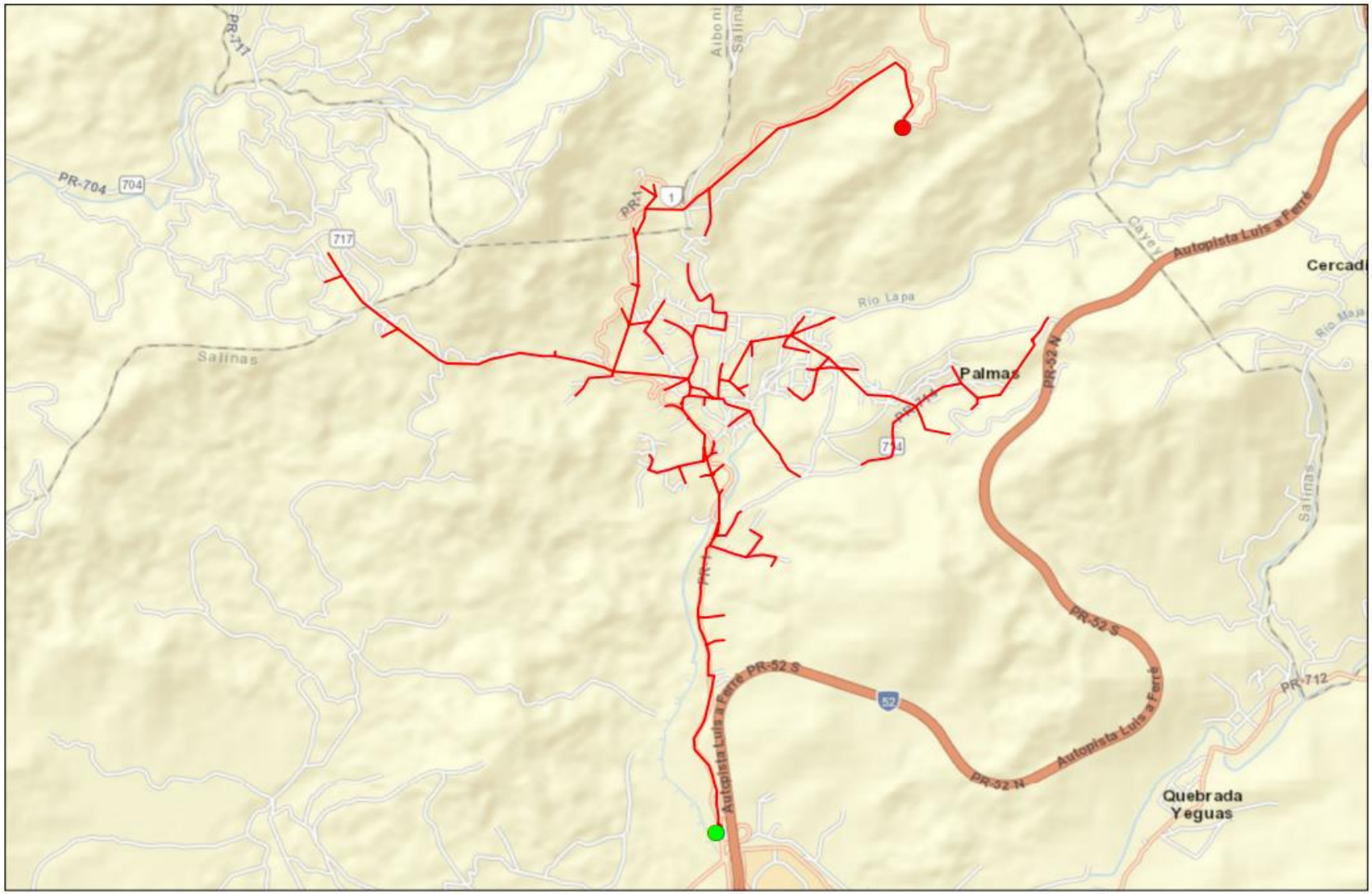
0 0.125 0.25 0.5 Miles

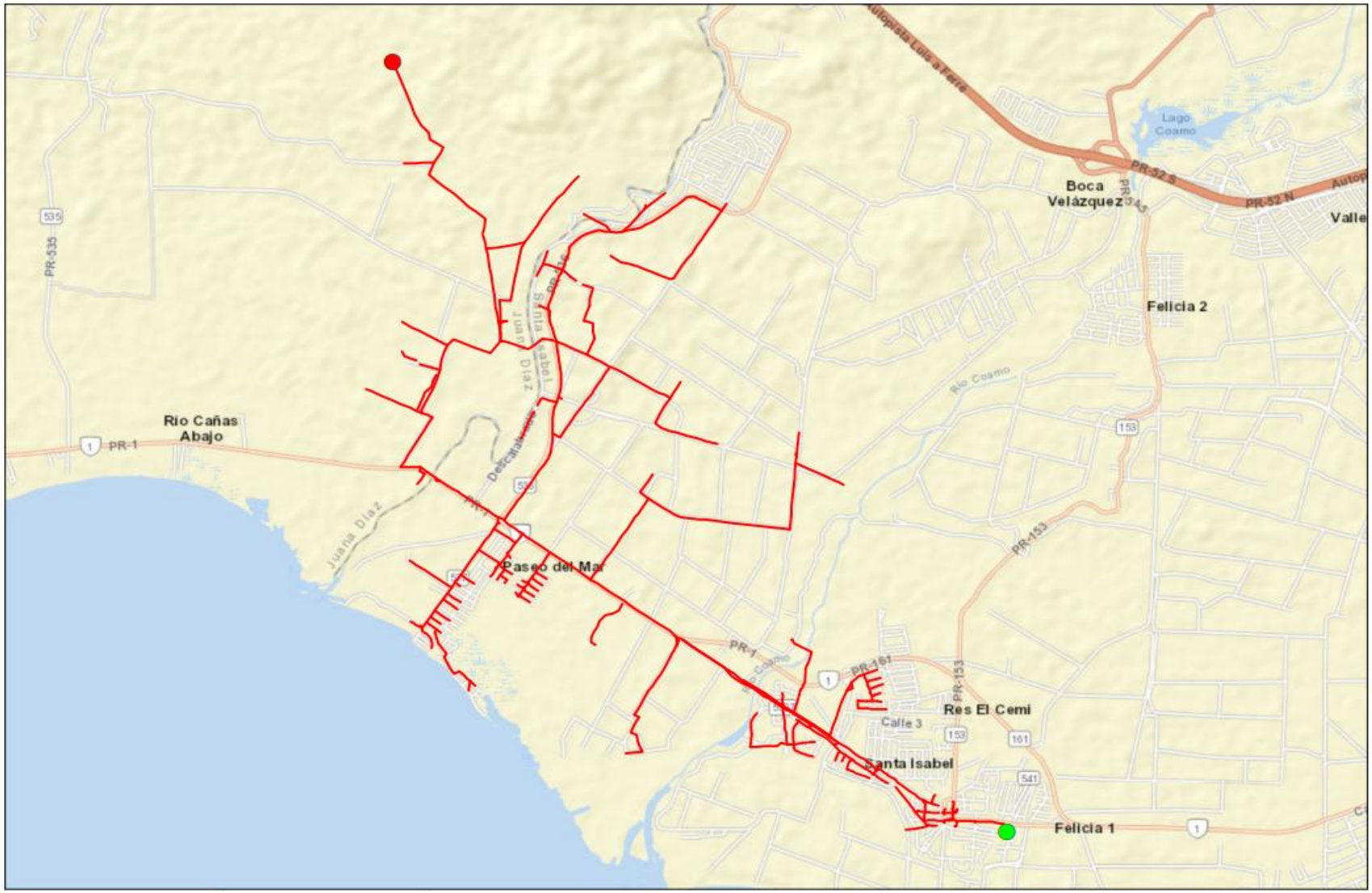
N

LUMA

Circuit 4501-01


Lapa
PR-52 S
PR-52 N
PR-1 E
PR-1 O
Urb Las Marías
Calle 1
Salinas
PARQ Gabriela 2
PARQ Gabriela
Calle Jazmín
Calle Lirios
EXT Monserrate
Urb Salimar
Calle Puerto Rico
Calle 11
SECT Campito
PARQ de Salinas
Calle A. Morelli
BDA Carmen
Urb Las Mercedes
PR-3
Calle 24
Urb Solana de Salinas
EXT La Margarita
Calle A
Calle B
Calle C
Calle D
Calle F
PR-701
Avenida Pedro Albizu Campos
Brisas de Evelymar
Callejón Sector Esterol
Brisas de Evelymar 2
Villa Cofresi
Calle 3
Calle 1
Calle J C
Río Jueyes
Camino de playa
Calle Villa Sol
BO Playita
BO Playa
Calle J
Calle E
Calle Sierra
BO Estero
PR-703
Legend
Start Point
End Point
Circuit
1:18,120
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 4501-04


PR-704
704
717
PR-1
1
Salinas
Río Lapa
Palmas
PR-52 N
PR-52 S
Autopista Luis a Ferré
Cercadi
Río Maja
PR-712
Quebrada
Yeguas
Legend
Start Point
End Point
Circuit
1:34,660
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 4504-01


Rio Cañas Abajo
PR-1
Paseo del Mar
Juana Diaz
Boca Velázquez
Felicia 2
Lago Coamo
Rio Coamo
PR-153
PR-161
Calle 3
Res El Cemi
Santa Isabel
Felicia 1
PR-535
PR-52 S
PR-52 N
Legend
Start Point
End Point
Circuit
1:39,110
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 4401-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 6

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 6
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
JUANA DIAZ 4 KV	5802-01	[redacted]		4.16
JUANA DIAZ 4 KV	5802-03			4.16
FORT ALLEN 13 KV	5803-02			4.16
SANTA ISABEL	4401-02			4.16
USERA	4601-01			4.16
USERA	4601-04			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.88M**
Estimated Budget for Procurement & Construction:	**$28.88M**
Estimated Overall Budget for the Project:	**$31.76M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

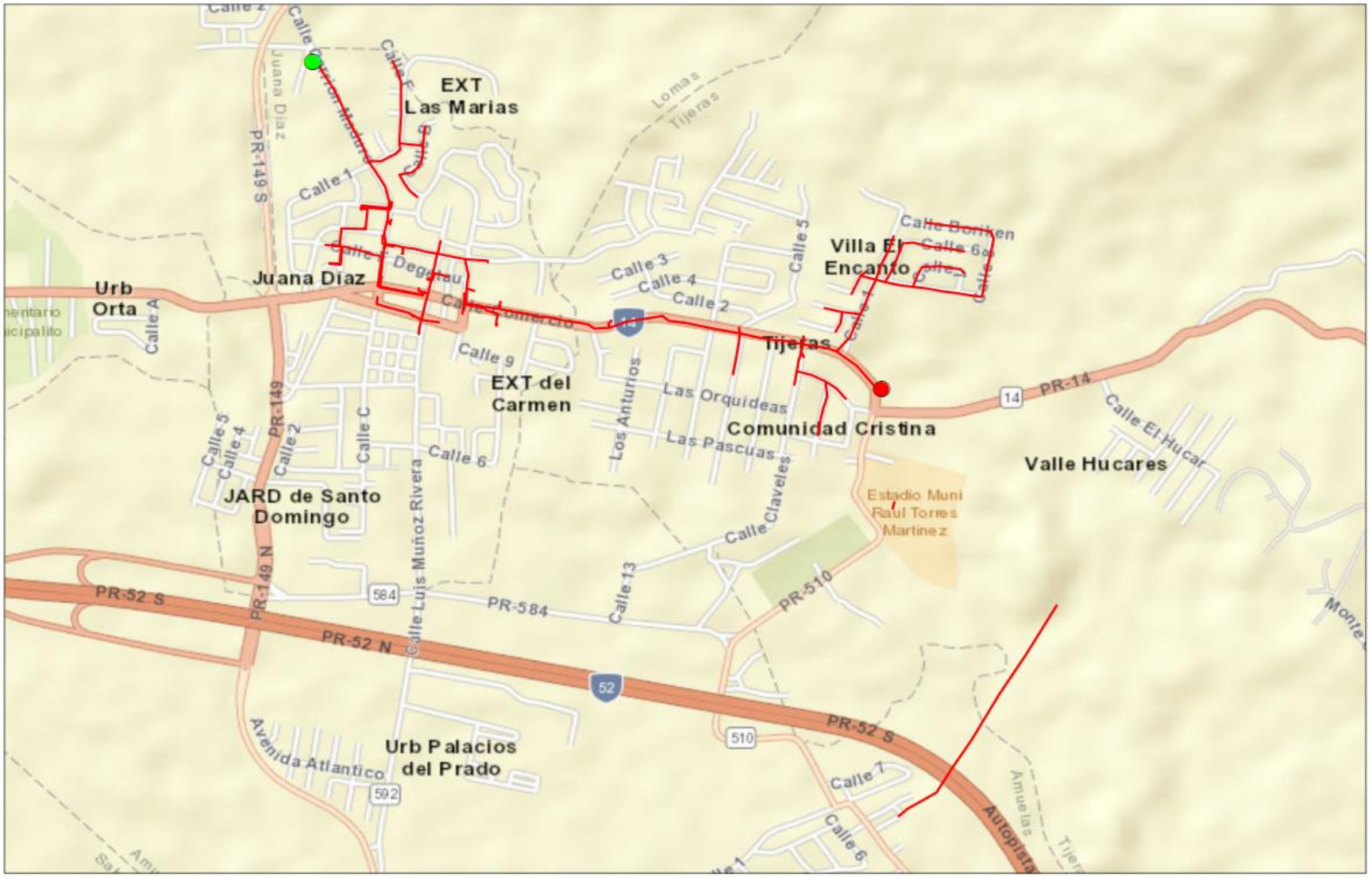
Note: If available, detailed engineering cost estimates will be included as an attachment.

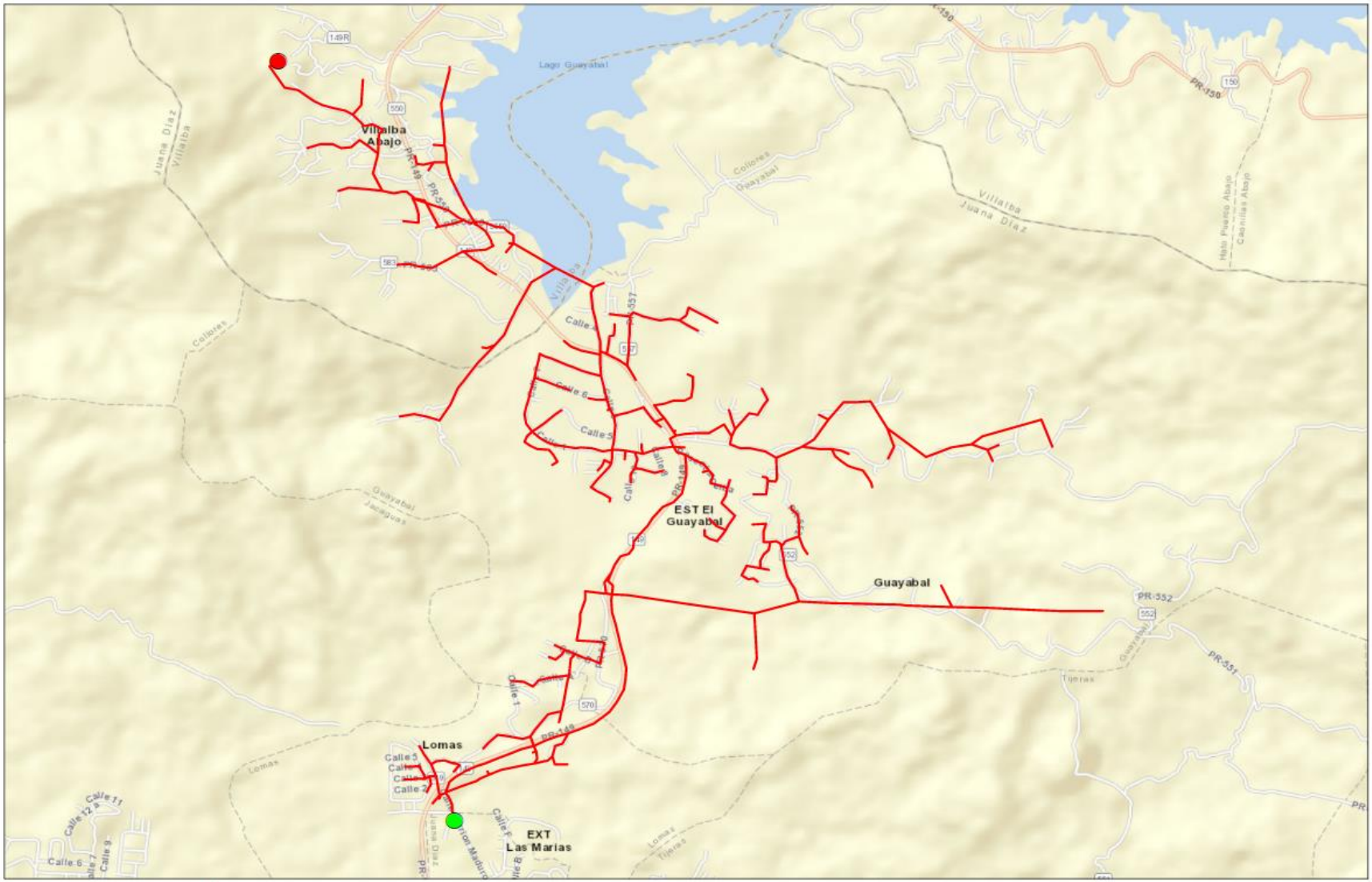
Environmental & Historic Preservation Requirements

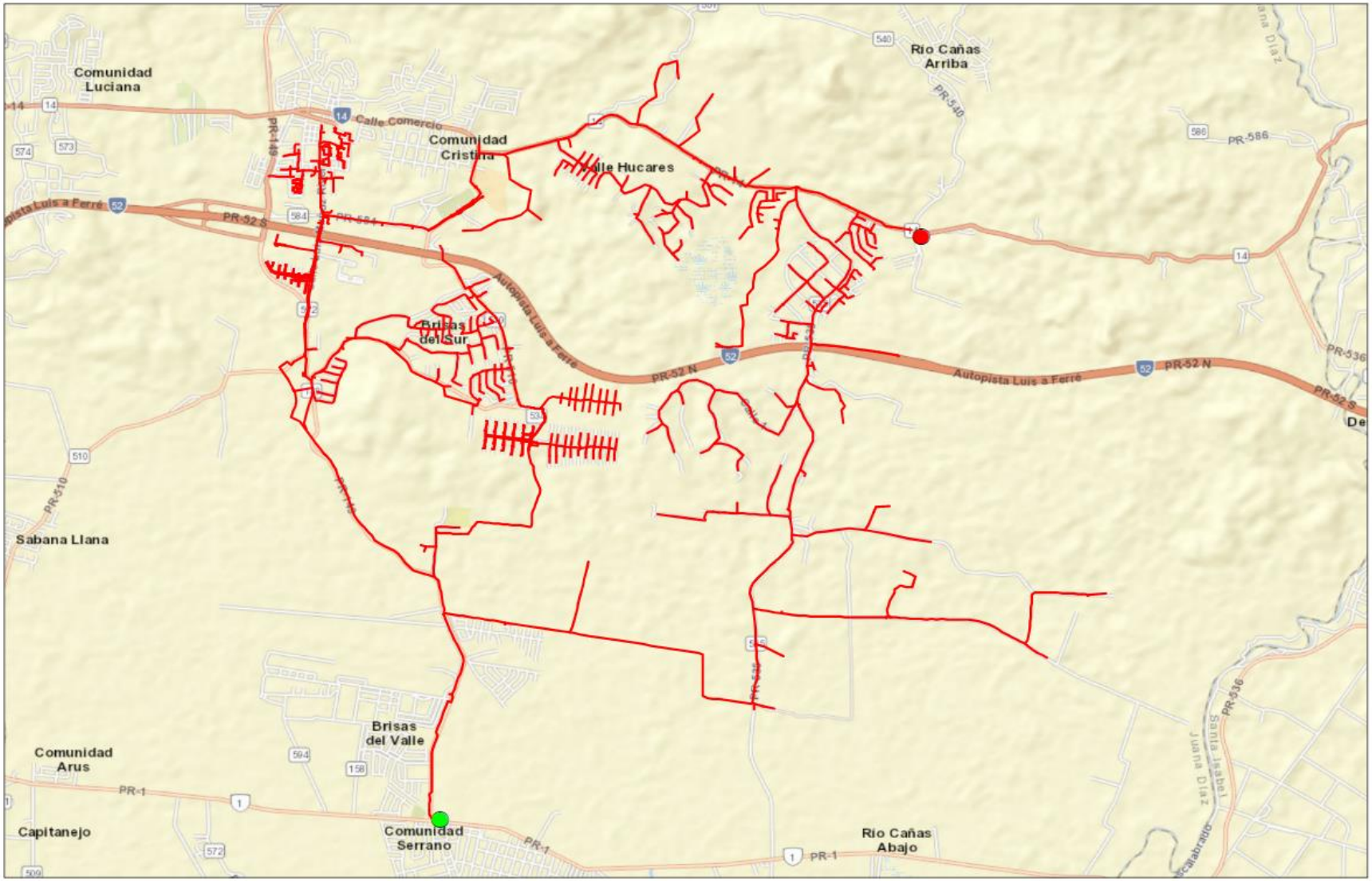
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 6 Location Maps	Location Maps and Site Picture


EXT
Las Marias
Juana Diaz
Urb
Orta
Villa El
Encanto
Tijetas
EXT del
Carmen
Comunidad Cristina
Valle Hucares
JARD de Santo
Domingo
Urb Palacios
del Prado
Estadio Muni
Raul Torres
Martinez
PR-52 S
PR-52 N
PR-584
PR-510
PR-14
PR-149
PR-149 S
PR-149 N
Calle 1
Calle 2
Calle 3
Calle 4
Calle 5
Calle 6
Calle 7
Calle 9
Calle 13
Calle A
Calle C
Calle Comercio
Calle Degetau
Calle Luis Muñoz Rivera
Calle Claveles
Calle El Hucar
Calle Bonken
Avenida Atlantico
Las Orquideas
Las Pascuas
Los Anturios
Lomas
Tijeras
Amuelas
Autopista
Legend
Start Point
End Point
Circuit
1:14,280
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 5802-01


Villalba Abajo
EST El Guayabal
Guayabal
Lomas
EXT Las Marias
Lago Guayabal
PR-150
PR-552
PR-551
Legend
Start Point
End Point
Circuit
1:25,030
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 5802-03



Legend

- Start Point
- End Point
- Circuit

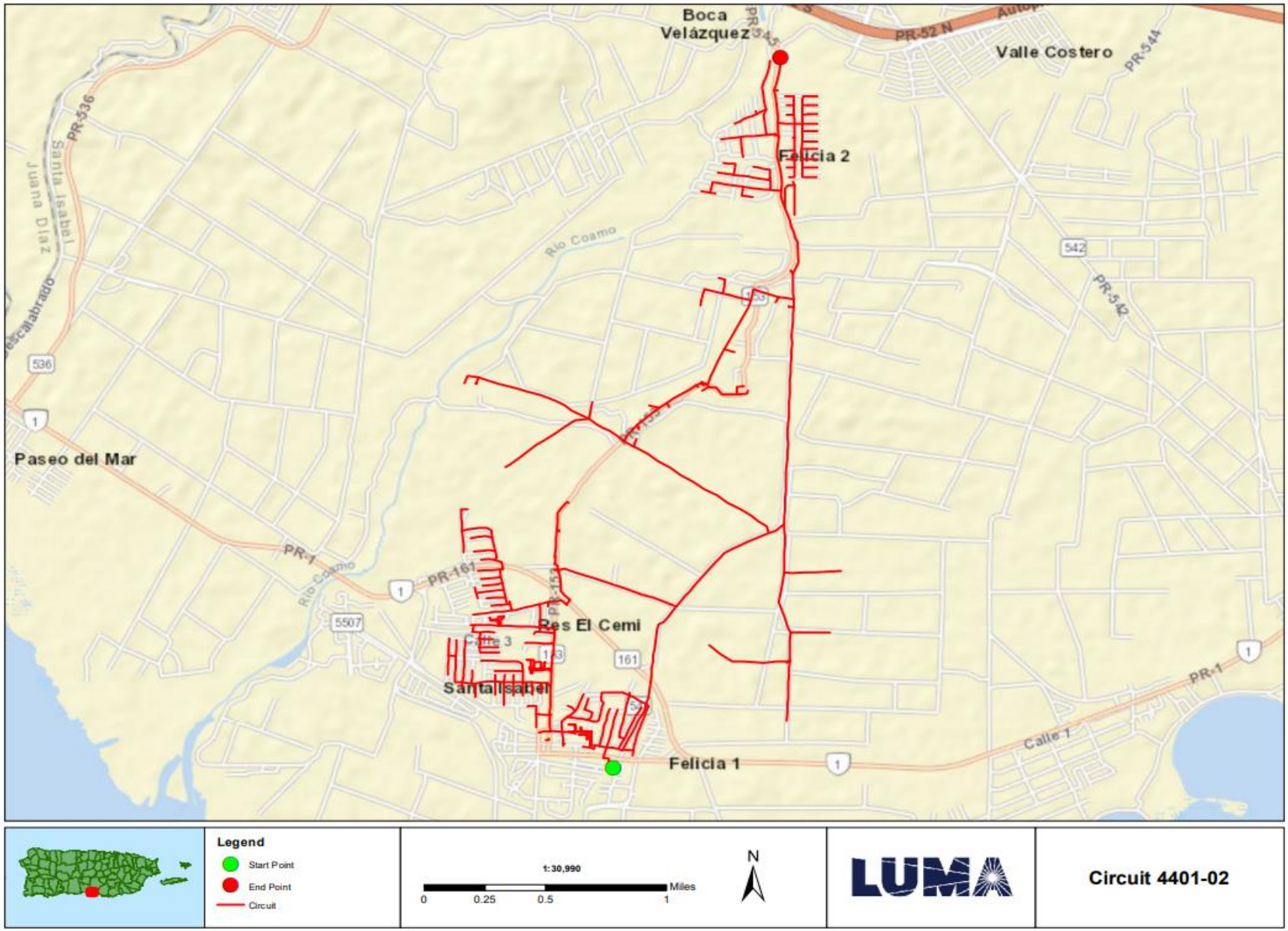
1:41,580

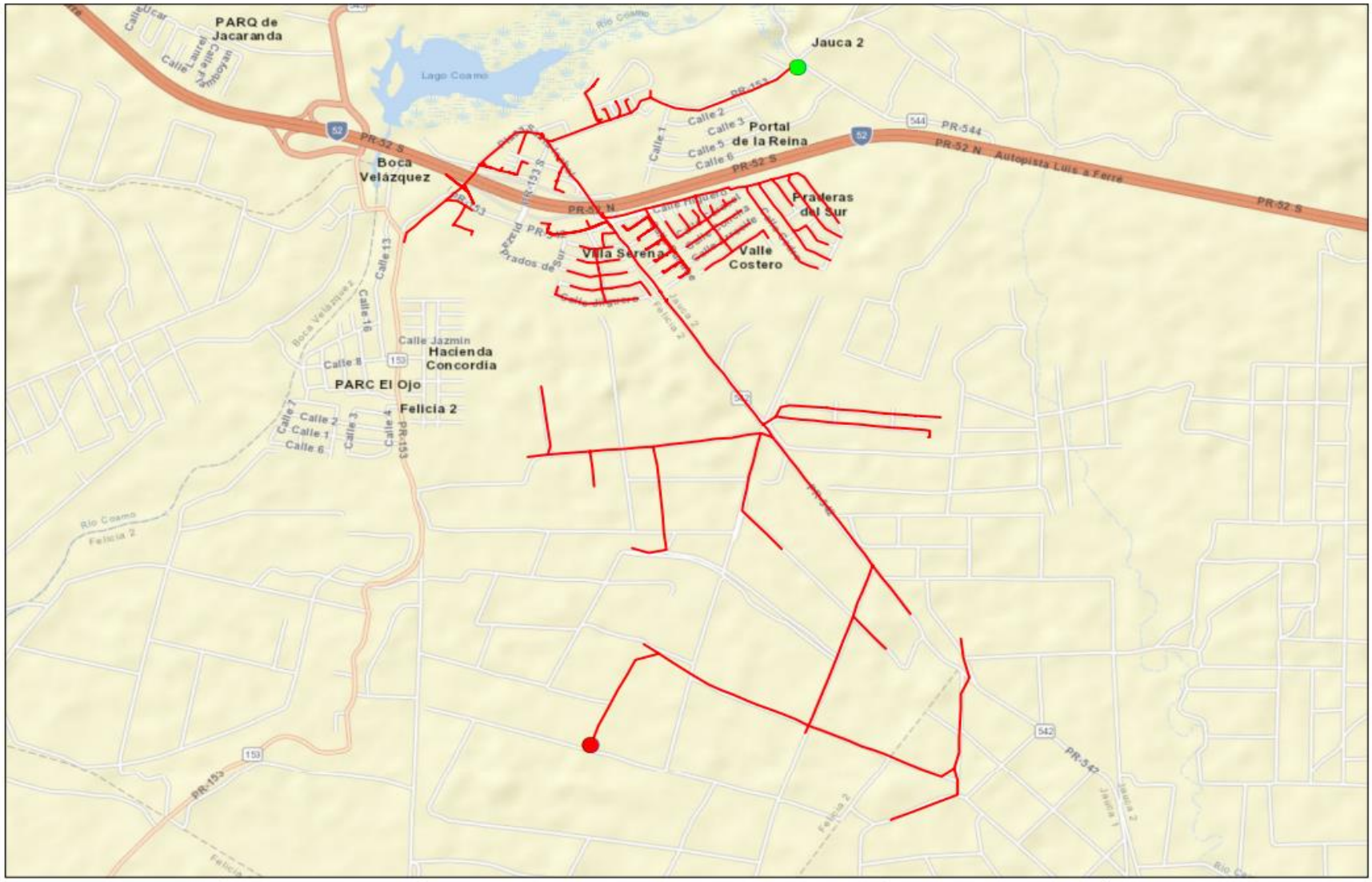
0 0.325 0.65 1.3 Miles

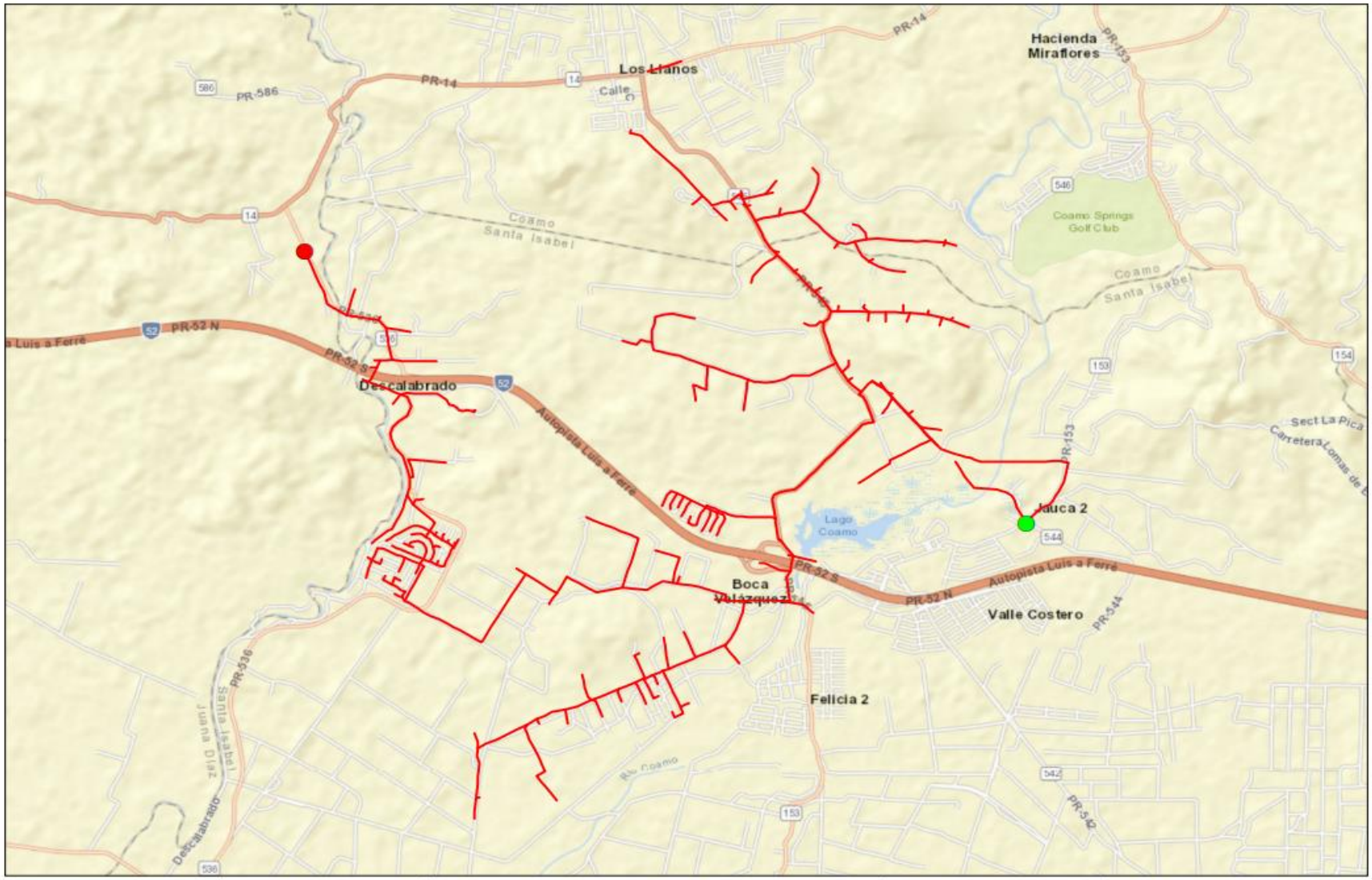
N

LUMA

Circuit 5803-02


Boca Velázquez
PR-52 N
Valle Costero
PR-544
PR-536
Santa Isabel
Juana Díaz
Felicia 2
Río Coamo
542
PR-542
536
1
Paseo del Mar
PR-1
PR-161
Río Coamo
5507
Res El Cemi
Calle 3
161
Santa Isabel
Felicia 1
Calle 1
Legend
Start Point
End Point
Circuit
1:30,990
0
0.25
0.5
1
Miles
N
LUMA
Circuit 4401-02


PARQ de Jacaranda
Jauca 2
Lago Coamo
Río Coamo
Portal de la Reina
Boca Velázquez
Praderas del Sur
Villa Serena
Valle Costero
Hacienda Concordia
PARC El Ojo
Felicia 2
PR-52 S
PR-52 N
Autopista Luis a Ferre
PR-544
PR-153
PR-542
Legend
Start Point
End Point
Circuit
1:21,930
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 4601-01


Hacienda Miraflores
Los Llanos
PR-14
PR-586
Coamo Springs Golf Club
Coamo Santa Isabel
PR-52 N
PR-52 S
Descalabrado
Autopista Luis a Ferré
Lago Coamo
Boca Velázquez
Valle Costero
PR-544
PR-153
PR-536
Felicia 2
Río Coamo
PR-542
Sect La Pica
Carretera Lomas de
Legend
Start Point
End Point
Circuit
1:40,460
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 4601-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 7

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 7
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects In the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CANAS T.C. 4.16 KV	5002-03	[redacted]		4.16
CANAS T.C. 4.16 KV	5002-04			4.16
PAMPANOS	5005-03			4.16
BUENA VISTA	5007-01			4.16
AVE HOSTOS 13 KV	5011-03			13.2
AVE HOSTOS 13 KV	5011-04			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$1.91M**
Estimated Budget for Procurement & Construction:	**$19.14M**
Estimated Overall Budget for the Project:	**$21.05M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

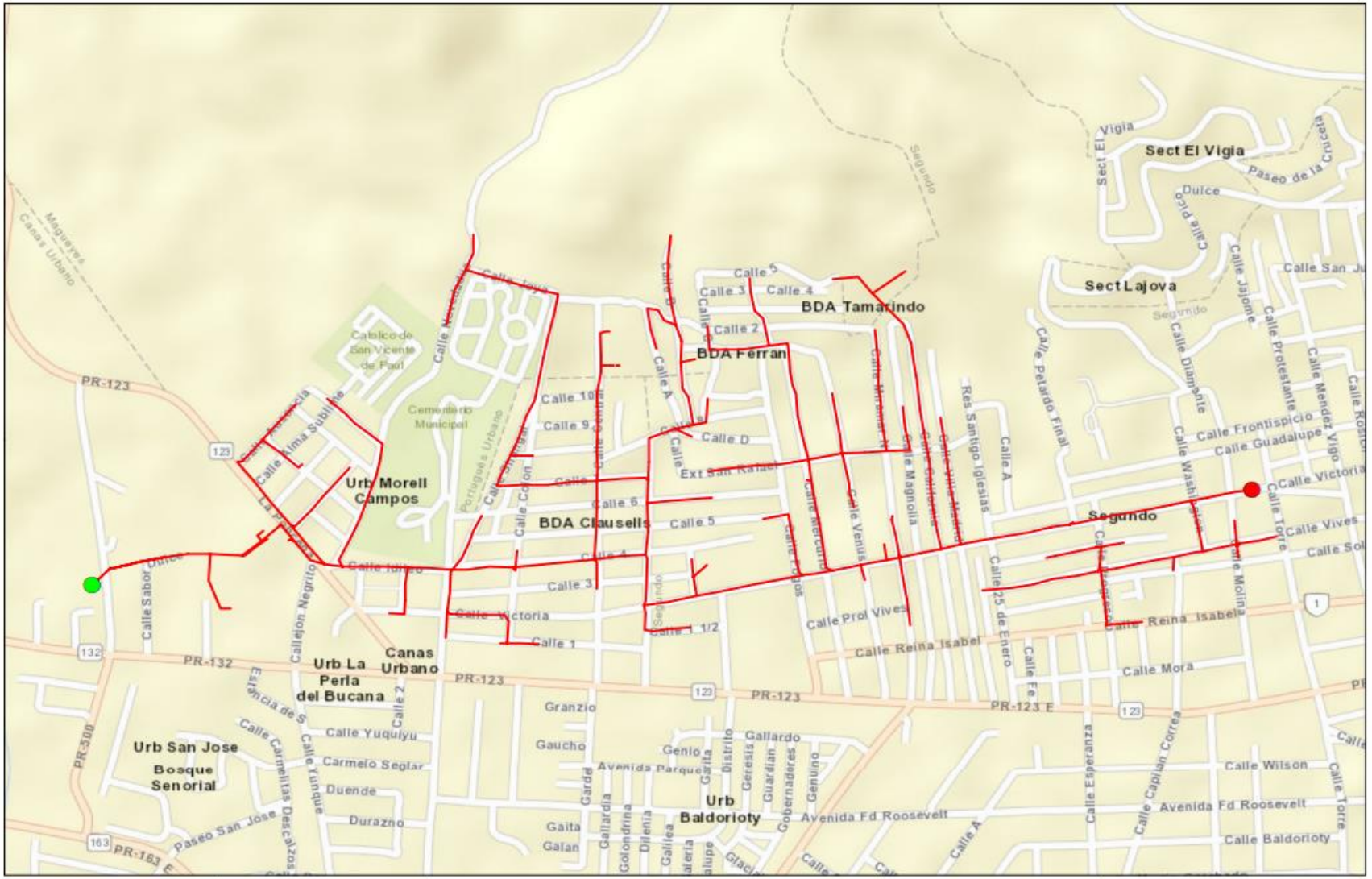
Note: If available, detailed engineering cost estimates will be included as an attachment.

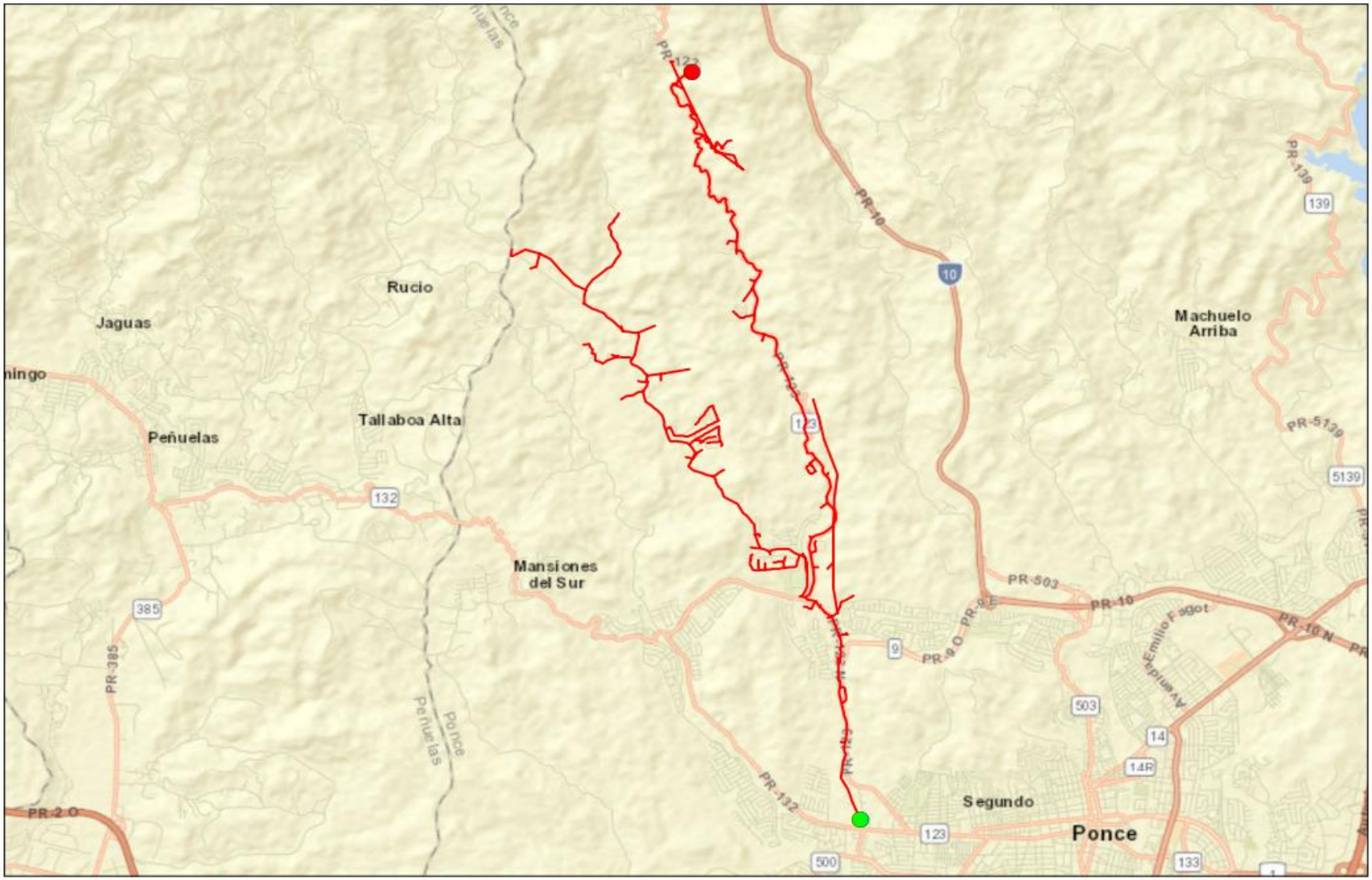
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 7 Location Maps	Location Maps and Site Picture


Sect El Vigia
Sect Lajova
BDA Tamarindo
BDA Ferran
BDA Clausells
Urb Morell Campos
Segundo
Urb La Perla del Bucana
Canas Urbano
Urb San Jose
Bosque Senorial
Urb Baldorioty
Cementerio Municipal
Catolico de San Vicente de Paul
Calle 1
Calle 2
Calle 3
Calle 4
Calle 5
Calle 6
Calle 7
Calle 8
Calle 9
Calle 10
Calle A
Calle B
Calle C
Calle D
Calle 1 1/2
Ext San Rafael
Calle Victoria
Calle Ibrigo
Calle Prol Vives
Calle Reina Isabel
Calle Mora
Calle Wilson
Avenida Fd Roosevelt
Calle Baldorioty
Calle Frontispicio
Calle Guadalupe
Calle Victoria
Calle Vives
Calle Torre
Calle Molina
Calle Jalome
Calle Diamante
Calle Protestante
Calle Mendez Vigo
Calle Washington
Calle 25 de Enero
Calle Esperanza
Calle Capitan Correa
Calle Fe
Calle Petardo Final
Res Santigo Iglesias
Calle Magnolia
Calle Venus
Calle Mercurio
Calle Pelayo
Calle Sabor
Calle Yuquiyu
Calle Carmelitas Descalzos
Calle Yunque
Calle Duende
Calle Durazno
Calle Carmelo Seglar
Avenida Parquea
Granzio
Gaucho
Genio
Gallardo
Gaita
Galan
Paseo San Jose
Paseo de la Princesa
Calle Dulce
Calle Alma Sublime
Calle Nazaret
Calle Jesus
Calle Sn Miguel
Calle Central
Calle Colon
Calle Negrito
Callejon Negrito
Portugues Urbano
Magueyes Canas Urbano
PR-123
PR-132
PR-300
PR-163
PR-123 E
Legend
Start Point
End Point
Circuit
1:9,520
0
0.075
0.15
0.3
Miles
N
LUMA
Circuit 5002-03



Legend

- Start Point
- End Point
- Circuit

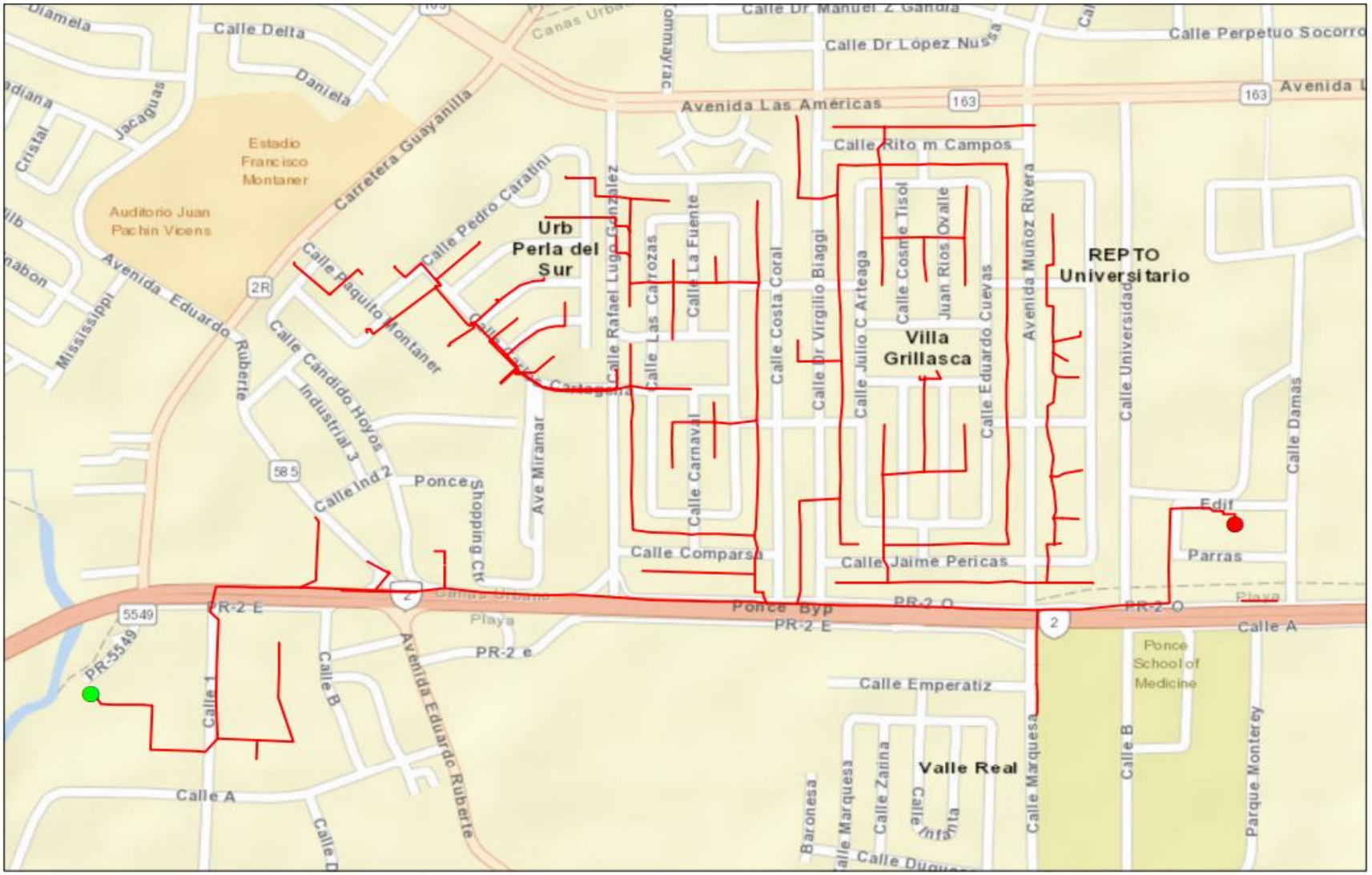
1:61,300

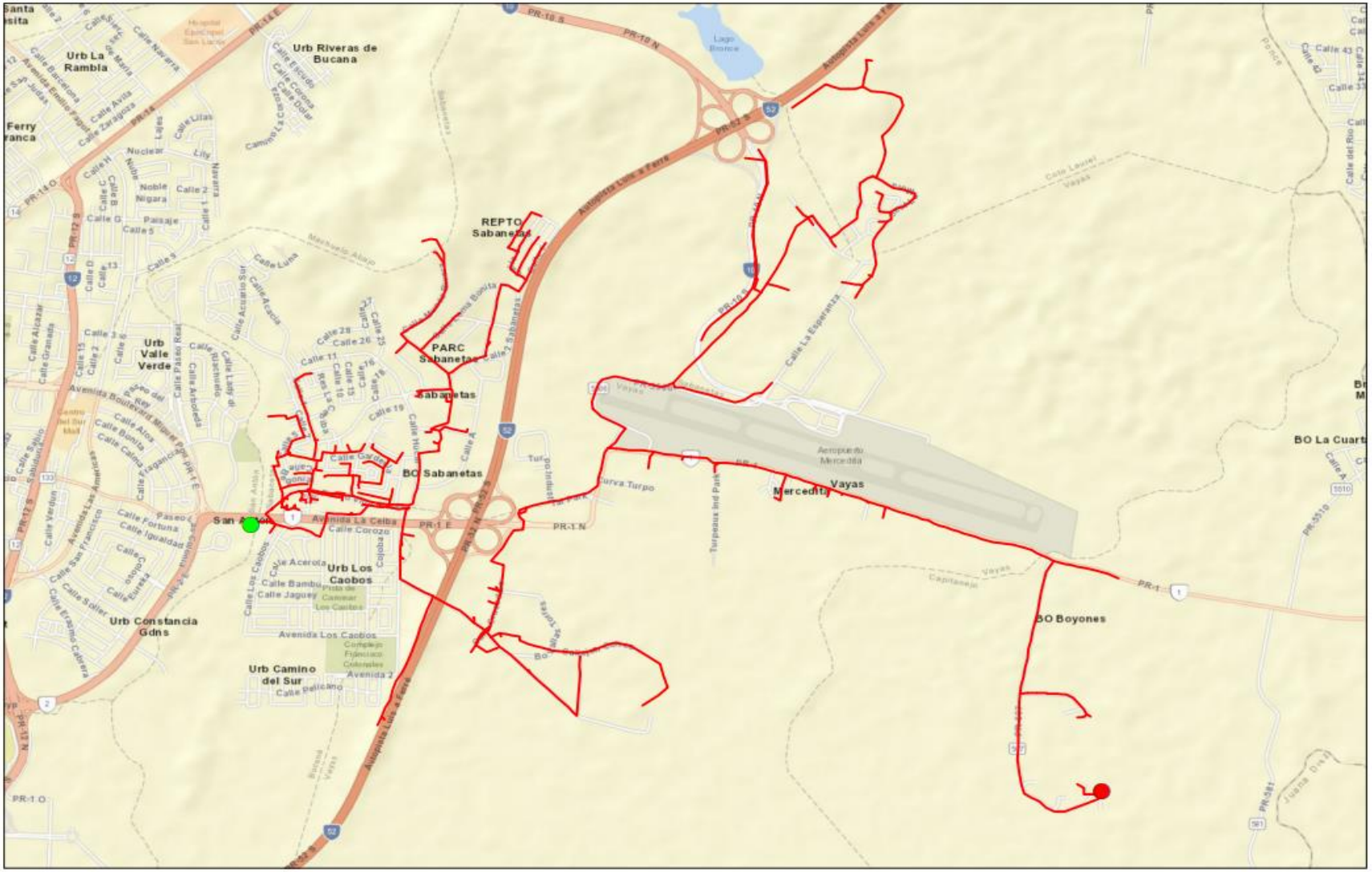
0 0.5 1 2 Miles

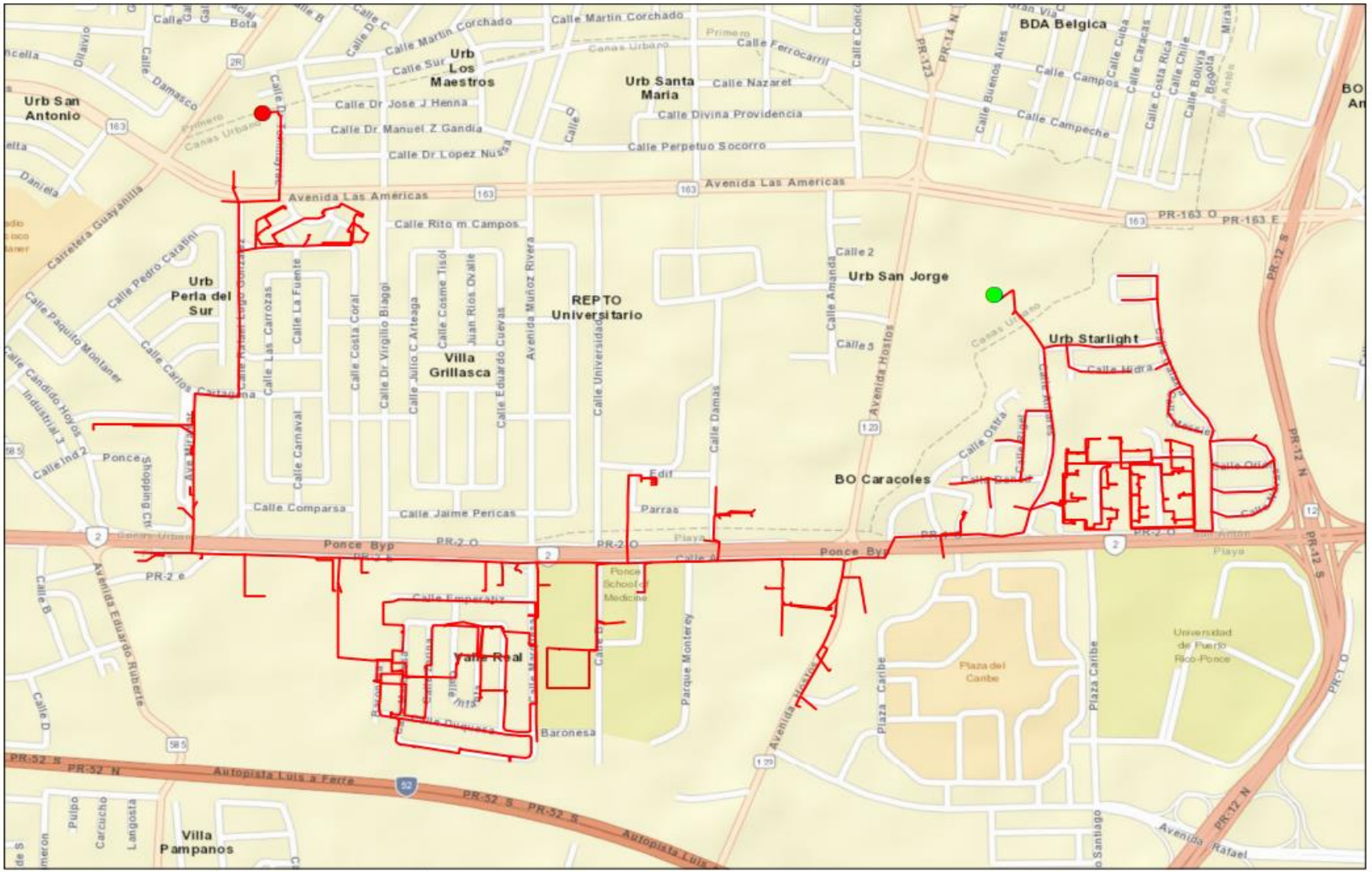
N

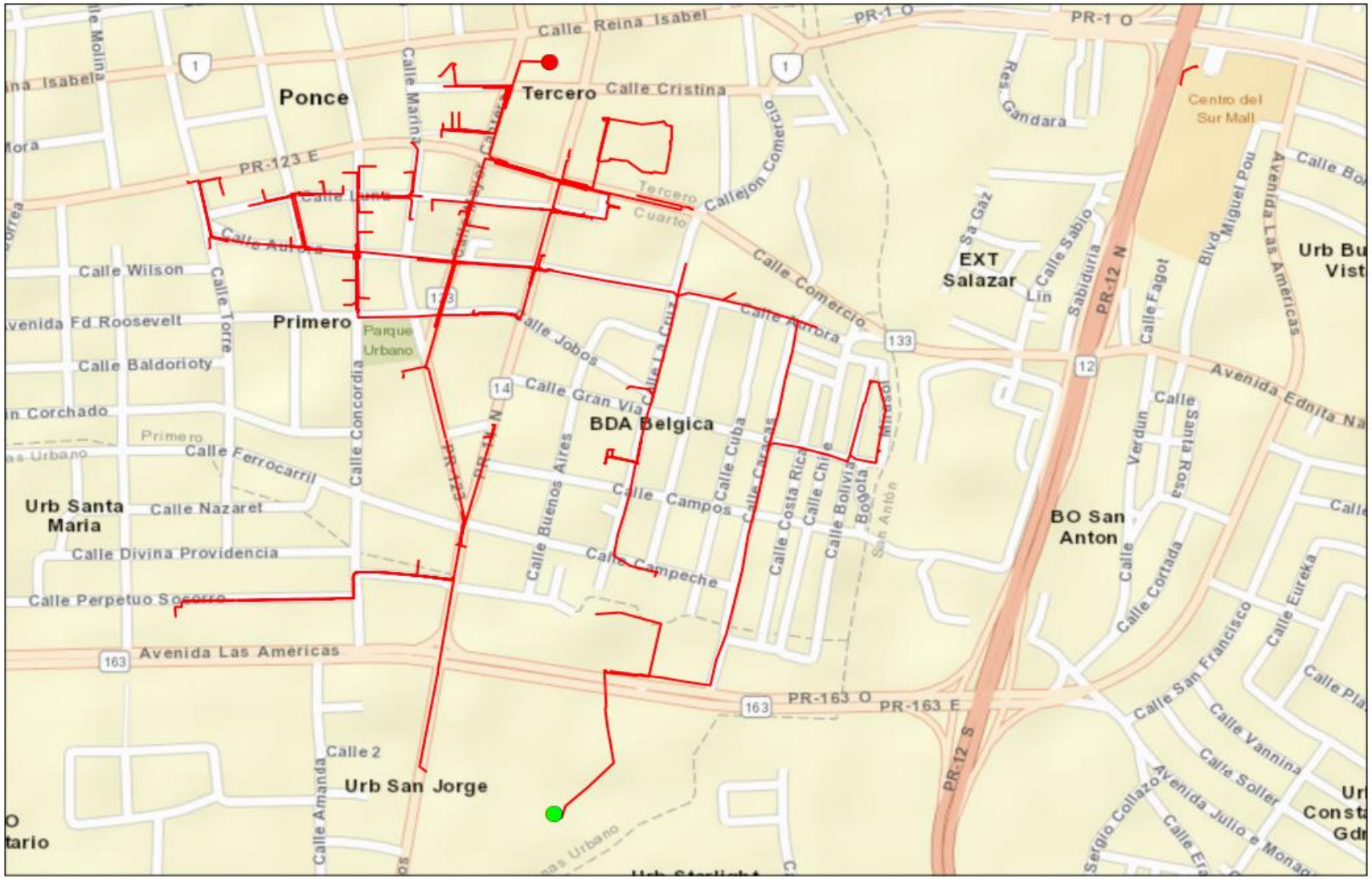
LUMA

Circuit 5002-04


Calle Delta
Daniela
Jacaguas
Cristal
Estadio Francisco Montaner
Auditorio Juan Pachin Vicens
Carretera Guayanilla
Avenida Las Américas
163
Calle Dr Manuel Z Gandía
Calle Dr López Nussa
Calle Perpetuo Socorro
Avenida L
Calle Rito m Campos
Urb Perla del Sur
Calle Pedro Caratini
Calle Paquito Montaner
Calle Rafael Lugo Gonzalez
Calle La Fuente
Calle Las Carrozas
Calle Costa Coral
Calle Dr Virgilio Biaggi
Calle Julio C Arteaga
Calle Cosme Tisol
Juan Rios Ovalle
Calle Eduardo Cuevas
Avenida Muñoz Rivera
REPTO Universitario
Villa Grillasca
Calle Universidad
Calle Damas
Avenida Eduardo Ruberte
2R
Calle Cándido Hoyos
Industrial 3
Calle Ind 2
Ponce Shopping Ctr
Ave Miramar
Calle Carnaval
Calle Comparsa
Calle Jaime Pericas
Edif
Parras
5549
PR-2 E
PR-2 e
Ponce Byp
PR-2 O
Playa
Calle A
Ponce School of Medicine
Calle 1
Calle B
Avenida Eduardo Ruberte
Calle Emperatiz
Valle Real
Calle Marquesa
Calle Zafina
Parque Monterey
Baronesa
Legend
Start Point
End Point
Circuit
1:7,490
Miles
0
0.05
0.1
0.2
N
LUMA
Circuit 5005-03


Urb La Rambla
Urb Riveras de Bucana
Ferry
Urb Valle Verde
REPTO Sabanetas
PARC Sabanetas
Sabanetas
BO Sabanetas
Urb Los Caobos
Urb Constancia Gdns
Urb Camino del Sur
Vayas
Mercedita
BO Boyones
BO La Cuarta
Aeropuerto Mercedita
Avenida La Celba
Avenida Los Caobos
Autopista Luis a Ferre
PR-1 E
PR-1 N
PR-1 O
PR-52 S
PR-18 N
PR-18 S
Legend
Start Point
End Point
Circuit
1:26,460
0 0.2 0.4 0.8 Miles
N
LUMA
Circuit 5007-01


Urb San Antonio
Urb Los Maestros
Urb Santa Maria
BDA Belgica
Urb Perla del Sur
REPTO Universitario
Villa Grillasca
Urb San Jorge
Urb Starlight
BO Caracoles
Valle Real
Villa Pampanos
Avenida Las Americas
Calle Martin Corchado
Calle Rito m Campos
Ponce Byp
PR-2 O
PR-163 O
PR-163 E
PR-12 S
PR-12 N
PR-52 S
PR-52 N
Autopista Luis a Ferre
Ponce School of Medicine
Parque Monterey
Plaza del Caribe
Universidad de Puerto Rico-Ponce
Legend
Start Point
End Point
Circuit
1:10,760
0 0.075 0.15 0.3 Miles
N
LUMA
Circuit 5011-03


Ponce
Tercero
Primero
BDA Belgica
Urb Santa Maria
Urb San Jorge
BO San Anton
EXT Salazar
Calle Reina Isabel
Calle Cristina
Calle Comercio
Calle Aurora
Calle Jobos
Calle Gran Via
Calle Campos
Calle Campeche
Calle Ferrocarril
Calle Nazaret
Calle Divina Providencia
Calle Perpetuo Socorro
Calle Wilson
Calle Baldorioty
Avenida Fd Roosevelt
Avenida Las Americas
Avenida Ednita Na
PR-123 E
PR-1 O
PR-12 N
PR-12 S
PR-163 O
PR-163 E
Parque Urbano
Centro del Sur Mall
Legend
Start Point
End Point
Circuit
1:7,520
0 0.05 0.1 0.2 Miles
N
LUMA
Circuit 5011-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 8

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 8
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects In the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
INABON 4 KV	5013-01			4.16
INABON 4 KV	5013-02			4.16
INABON 4 KV	5013-03			4.16
VILLA DEL CARMEN	5016-01			13.2
CANAS T.C. 13 KV	5018-02			13.2
CANAS T.C. 13 KV	5018-04			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.33M**
Estimated Budget for Procurement & Construction:	**$23.31M**
Estimated Overall Budget for the Project:	**$25.64M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

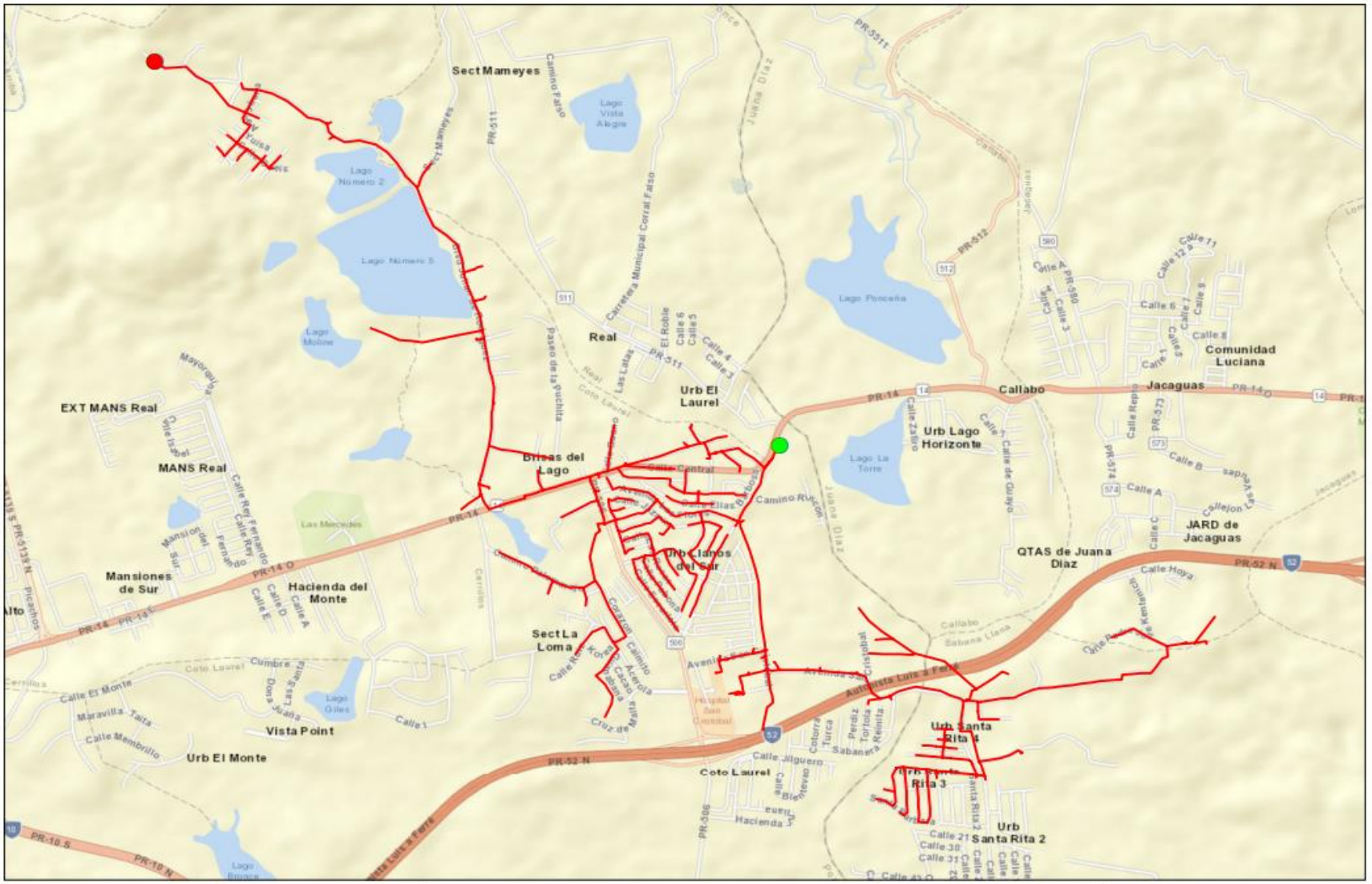
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 8 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

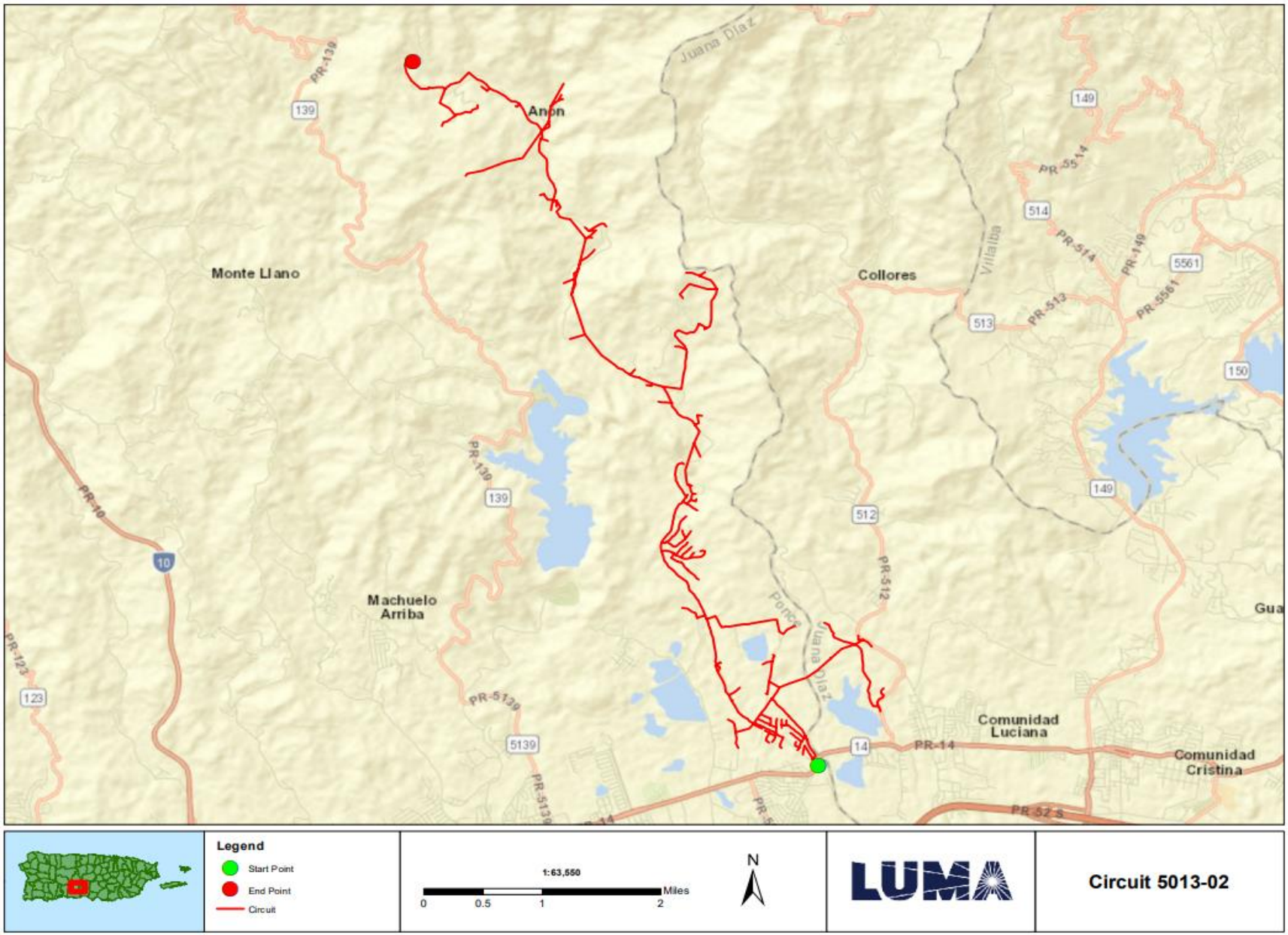
1:24,470

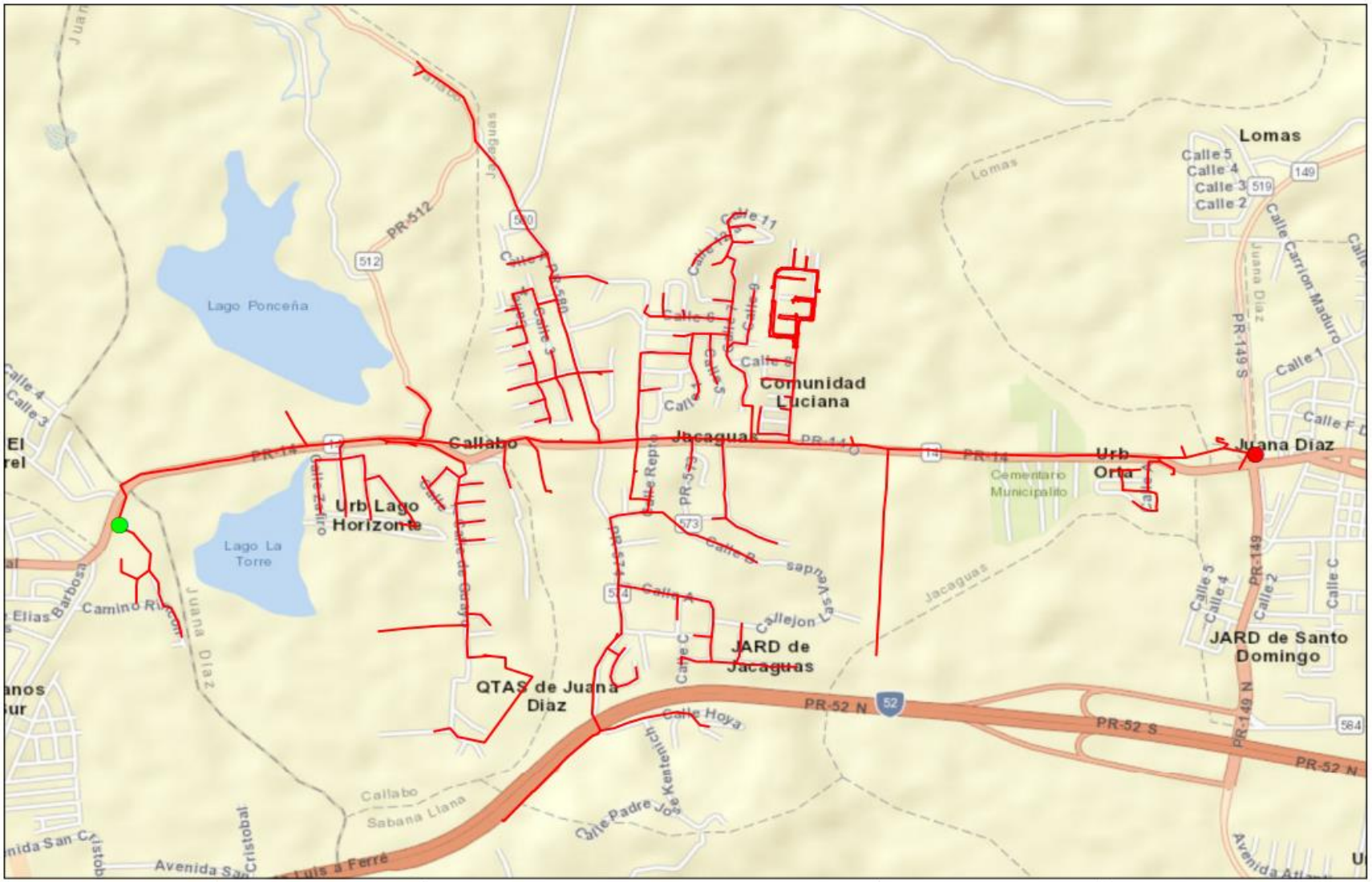
0 0.2 0.4 0.8 Miles

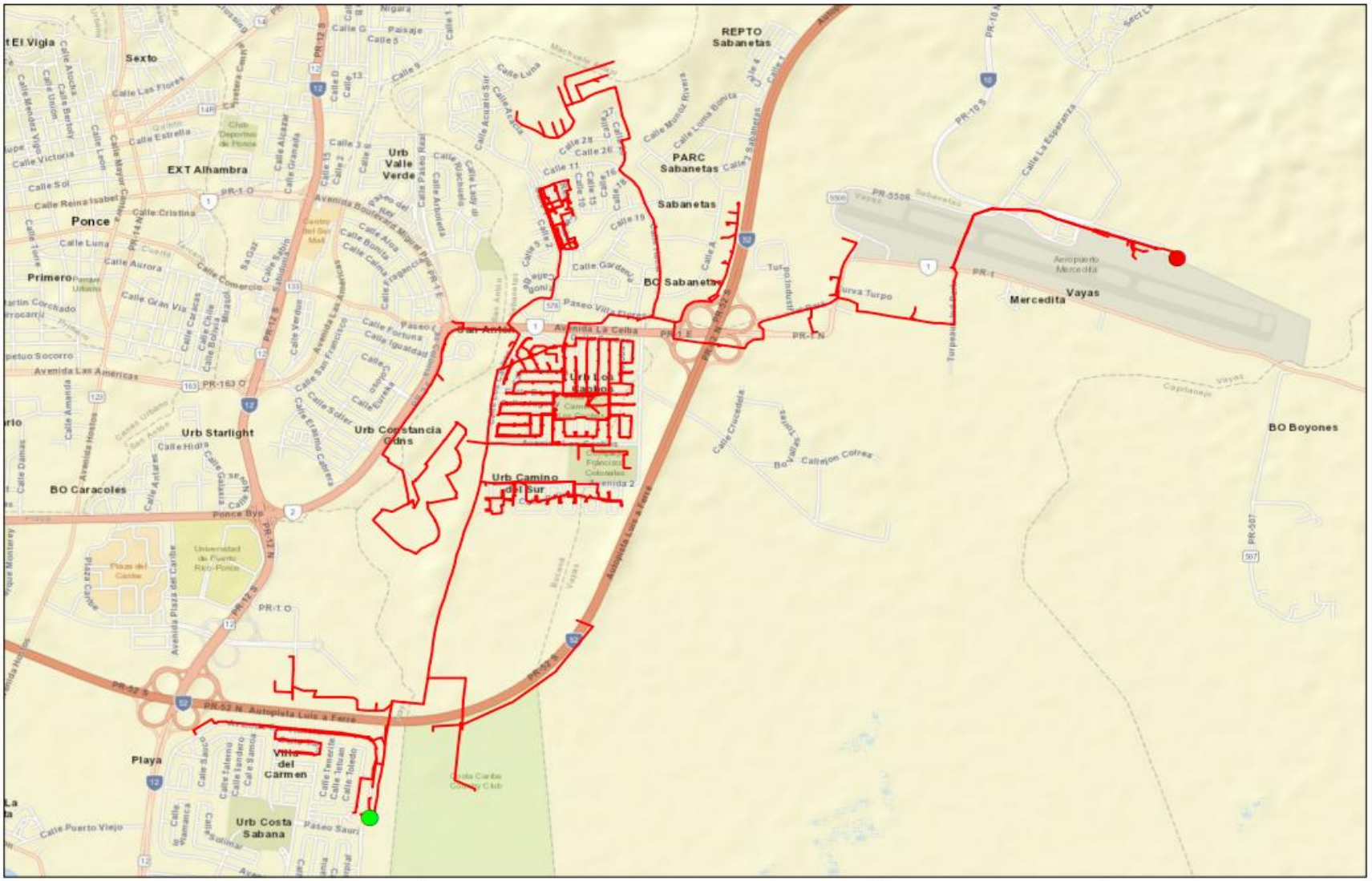
N

LUMA

Circuit 5013-01


Anon
Monte Llano
Collores
Machuelo Arriba
Comunidad Luciana
Comunidad Cristina
Juana Diaz
Villalba
PR-139
PR-10
PR-123
PR-5139
PR-512
PR-514
PR-149
PR-5561
PR-14
PR-52
139
10
123
5139
512
513
514
149
5561
150
14
Legend
Start Point
End Point
Circuit
1:63,550
0
0.5
1
2
Miles
N
LUMA
Circuit 5013-02


Lomas
Calle 5
Calle 4
Calle 3
Calle 2
149
519
Calle Carrion Maduro
Juana Diaz
PR-149 S
Calle 1
Lago Ponceña
PR-512
512
500
Jacaguas
Calle 11
Calle 10
Calle 9
Calle 8
Calle 7
Calle 6
Calle 5
Calle 4
Calle 3
Calle 2
Calle 1
Comunidad Luciana
Callabo
Jacaguas
PR-14
Urb Orta
Juana Diaz
Cementario Municipalito
Urb Lago Horizonte
Lago La Torre
Camino Rivera
Juana Diaz
Calle Repto
PR-573
573
Calle B
Sabanas
Callejon Las Vegas
Calle A
574
Calle C
JARD de Jacaguas
JARD de Santo Domingo
QTAS de Juana Diaz
PR-52 N
52
PR-52 S
PR-149 N
564
Calle Hoya
Callabo
Sabana Llana
Calle Padre Jose Kentenich
Avenida San Cristobal
Avenida Luis A Ferré
Legend
Start Point
End Point
Circuit
1:16,240
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 5013-03



Legend

- Start Point
- End Point
- Circuit

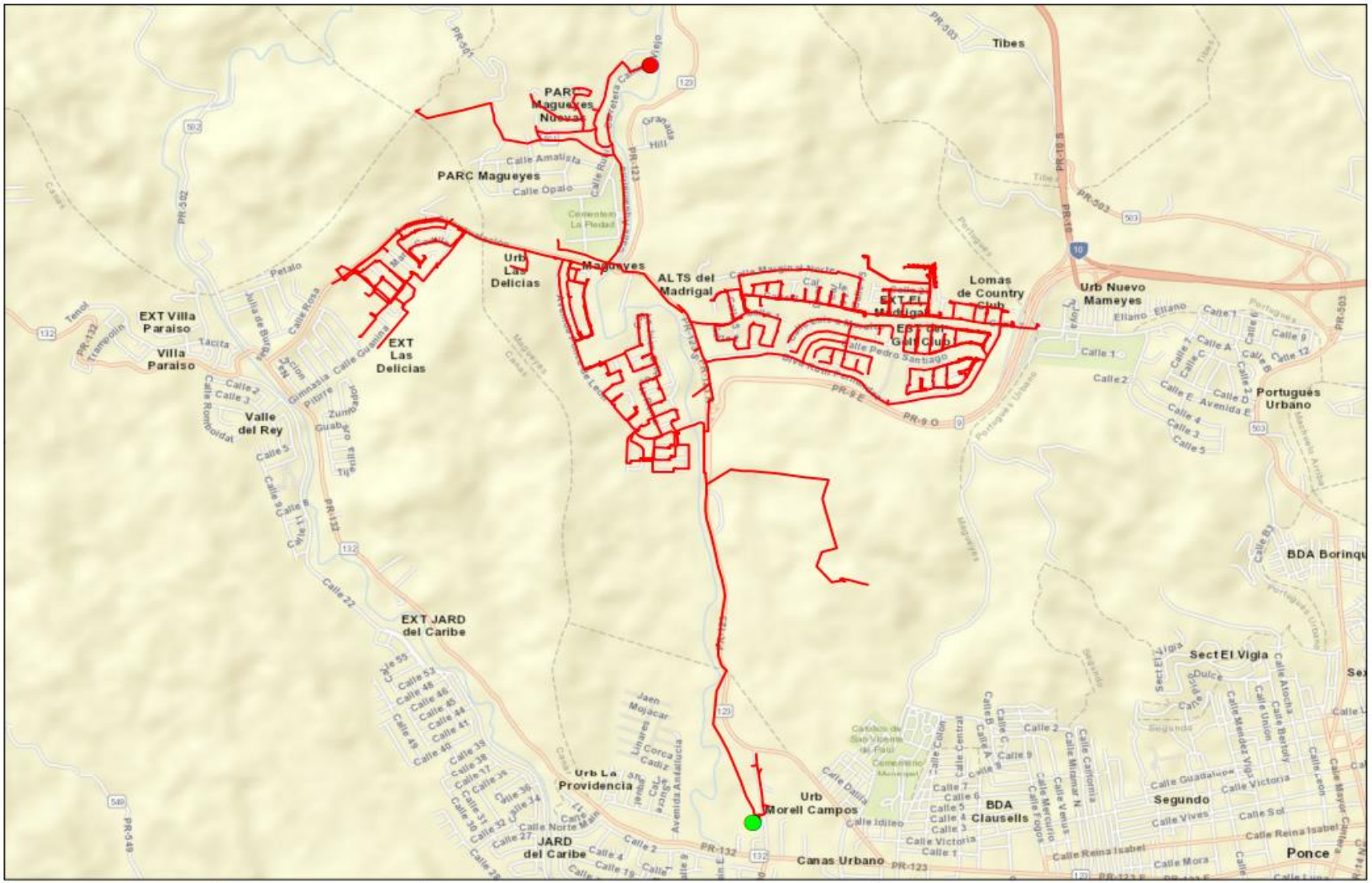
1:26,790

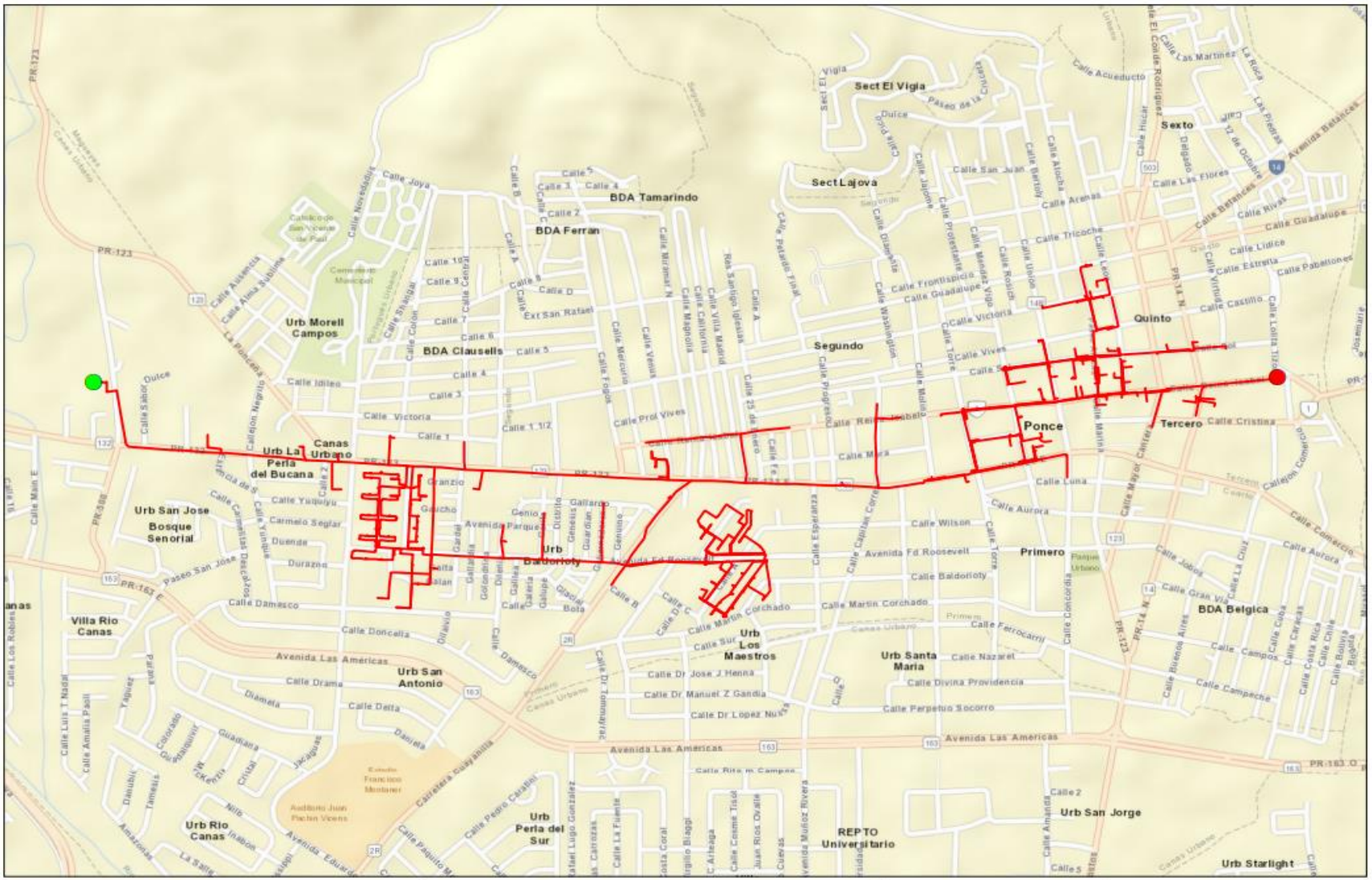
0 0.2 0.4 0.8 Miles

N

LUMA

Circuit 5016-01


Tibes
PARC Magueyes Nuevas
PARC Magueyes
Urb Las Delicias
Magueyes
ALTS del Madrigal
EXT El Madrigal
Lomas de Country Club
Urb Nuevo Mameyes
EXT Villa Paraiso
Villa Paraiso
EXT Las Delicias
Valle del Rey
Portugués Urbano
BDA Borinqu
EXT JARD del Caribe
Sect El Vigia
Urb La Providencia
Urb Morell Campos
BDA Clausells
Segundo
JARD del Caribe
Canas Urbano
Ponce
Legend
Start Point
End Point
Circuit
1:24,100
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 5018-02


Sect El Vigia
Sect Lajova
BDA Tamarindo
BDA Ferran
BDA Clausells
Urb Morell Campos
Urb La Perla del Bucana
Canas Urbano
Urb San Jose
Bosque Senorial
Urb Baldorioty
Urb Los Maestros
Urb Santa Maria
Urb San Antonio
Villa Rio Canas
Urb Rio Canas
Urb Perla del Sur
REPTO Universitario
Urb San Jorge
Urb Starlight
BDA Belgica
Segundo
Quinto
Sexto
Primero
Tercero
Ponce
Avenida Las Americas
Avenida Fd Roosevelt
Calle Baldorioty
Calle Martin Corchado
Calle Ferrocarril
Calle Nazaret
Calle Dr Jose J Henna
Calle Dr Manuel Z Gandia
Calle Dr Lopez Nuss
Calle Perpetuo Socorro
Calle Rita m Campos
Calle Damasco
Calle Doncella
Calle Drama
Calle Delta
Calle Diamela
Calle Victoria
Calle Idileo
Calle Joya
Calle Central
Calle Colon
Calle Mercurio
Calle Venus
Calle Fogos
Calle Prof Vives
Calle Mura
Calle Luna
Calle Aurora
Calle Wilson
Calle Esperanza
Calle Capitan Correa
Calle Concordia
Calle Comercio
Calle Jobos
Calle Gran Via
Calle Campos
Calle Campeche
Calle Divina Providencia
Calle Cristina
Calle Castillo
Calle Estrella
Calle Guadalupe
Calle Tricoche
Calle Arenas
Calle San Juan
Calle Las Flores
Calle Betances
Calle Rivas
Calle Lidice
Calle Papalones
Calle Virtudes
Calle Loiza Tizol
Calle Acueducto
Calle Las Martinez
Calle Hostos
Calle Delgado
Calle Las Piedras
Avenida Betances
Paseo San Jose
Paseo de la Vigia
Ext San Rafael
Calle Sabor
Calle Yuquiyu
Calle Carmelo Seglar
Calle Durazno
Calle Granzio
Calle Gaucho
Calle Genio
Calle Distrito
Calle Genesis
Calle Guardian
Calle Gallardo
Calle Gallineta
Calle Golondrina
Calle Gallina
Calle Careta
Calle Galupe
Calle Gazual
Calle Bota
Calle Oliveto
Calle Yaguez
Calle Amalia Pasil
Calle Luis T Nadal
Calle Diamela
Calle Guadiana
Calle Jacagua
Calle Cristal
Calle Danubio
Calle Tamesis
Calle Nilo
Calle Inabon
Calle Amazonas
Calle Pedro Catalino
Calle Paquito M
Calle Rafael Lugo Gonzalez
Calle La Fuente
Calle Costa Coral
Calle Cosme Tiol
Calle Juan Rios Olivalle
Calle Cuevas
Calle Amanda
Calle 5
Calle 2
Calle Buenos Aires
Calle Cuba
Calle Caracas
Calle Costa Rica
Calle Chile
Calle Bolivia
Calle Bogota
Calle Los Robles
Calle Main E
Calle Alma Sublime
Calle Asuncion
Calle Norestadio
Calle Shangai
Calle Idileo
Calle Victoria
Calle Damasco
Calle Doncella
Calle Drama
Calle Delta
Calle Diamela
Calle Dr Jose J Henna
Calle Dr Manuel Z Gandia
Calle Dr Lopez Nuss
Calle Perpetuo Socorro
Calle Rita m Campos
Calle Martin Corchado
Calle Baldorioty
Calle Wilson
Calle Luna
Calle Aurora
Calle Comercio
Calle Jobos
Calle Gran Via
Calle Campos
Calle Campeche
Calle Divina Providencia
Calle Nazaret
Calle Ferrocarril
Calle Concordia
Calle Capitan Correa
Calle Esperanza
Calle Mura
Calle Prof Vives
Calle Fogos
Calle Mercurio
Calle Venus
Calle Magnolia
Calle California
Calle Villa Madrid
Calle 25 de Julio
Calle Progreso
Calle Reina Isabel
Calle Mariela
Calle Torre
Calle Frontispicio
Calle Guadalupe
Calle Victoria
Calle Vives
Calle Mendez Vigo
Calle Rosich
Calle Union
Calle Washington
Calle Diputado
Calle Jalome
Calle Bertoly
Calle Atocha
Calle Tricoche
Calle Arenas
Calle San Juan
Calle Las Flores
Calle Betances
Calle Rivas
Calle Guadalupe
Calle Lidice
Calle Estrella
Calle Papalones
Calle Virtudes
Calle Loiza Tizol
Calle Castillo
Calle Cristina
Calle Acueducto
Calle Las Martinez
Calle Hostos
Calle Delgado
Calle Las Piedras
Avenida Betances
Paseo de la Vigia
Ext San Rafael
Calle Sabor
Calle Yuquiyu
Calle Carmelo Seglar
Calle Durazno
Calle Granzio
Calle Gaucho
Calle Genio
Calle Distrito
Calle Genesis
Calle Guardian
Calle Gallardo
Calle Gallineta
Calle Golondrina
Calle Gallina
Calle Careta
Calle Galupe
Calle Gazual
Calle Bota
Calle Oliveto
Calle Yaguez
Calle Amalia Pasil
Calle Luis T Nadal
Calle Diamela
Calle Guadiana
Calle Jacagua
Calle Cristal
Calle Danubio
Calle Tamesis
Calle Nilo
Calle Inabon
Calle Amazonas
Calle Pedro Catalino
Calle Paquito M
Calle Rafael Lugo Gonzalez
Calle La Fuente
Calle Costa Coral
Calle Cosme Tiol
Calle Juan Rios Olivalle
Calle Cuevas
Calle Amanda
Calle 5
Calle 2
Calle Buenos Aires
Calle Cuba
Calle Caracas
Calle Costa Rica
Calle Chile
Calle Bolivia
Calle Bogota
Calle Los Robles
Calle Main E
Calle Alma Sublime
Calle Asuncion
Calle Norestadio
Calle Shangai
Calle Idileo
Calle Victoria
Calle Damasco
Calle Doncella
Calle Drama
Calle Delta
Calle Diamela
Calle Dr Jose J Henna
Calle Dr Manuel Z Gandia
Calle Dr Lopez Nuss
Calle Perpetuo Socorro
Calle Rita m Campos
Calle Martin Corchado
Calle Baldorioty
Calle Wilson
Calle Luna
Calle Aurora
Calle Comercio
Calle Jobos
Calle Gran Via
Calle Campos
Calle Campeche
Calle Divina Providencia
Calle Nazaret
Calle Ferrocarril
Calle Concordia
Calle Capitan Correa
Calle Esperanza
Calle Mura
Calle Prof Vives
Calle Fogos
Calle Mercurio
Calle Venus
Calle Magnolia
Calle California
Calle Villa Madrid
Calle 25 de Julio
Calle Progreso
Calle Reina Isabel
Calle Mariela
Calle Torre
Calle Frontispicio
Calle Guadalupe
Calle Victoria
Calle Vives
Calle Mendez Vigo
Calle Rosich
Calle Union
Calle Washington
Calle Diputado
Calle Jalome
Calle Bertoly
Calle Atocha
Calle Tricoche
Calle Arenas
Calle San Juan
Calle Las Flores
Calle Betances
Calle Rivas
Calle Guadalupe
Calle Lidice
Calle Estrella
Calle Papalones
Calle Virtudes
Calle Loiza Tizol
Calle Castillo
Calle Cristina
PR-123
PR-132
PR-133
PR-163
PR-14
PR-388
Legend
Start Point
End Point
Circuit
1:13,390
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 5018-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 9

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 9
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects In the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CANAS T.C. 13 KV	5018-05	[redacted]		4.16
PORTUGUES 4 KV	5021-01			4.16
VILLALBA 4 KV	5901-01			4.16
VILLALBA 4 KV	5901-02			4.16
VILLALBA 4 KV	5901-03			4.16
TOA VACA	5902-02			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.25M**
Estimated Budget for Procurement & Construction:	**$22.53M**
Estimated Overall Budget for the Project:	**$24.78M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

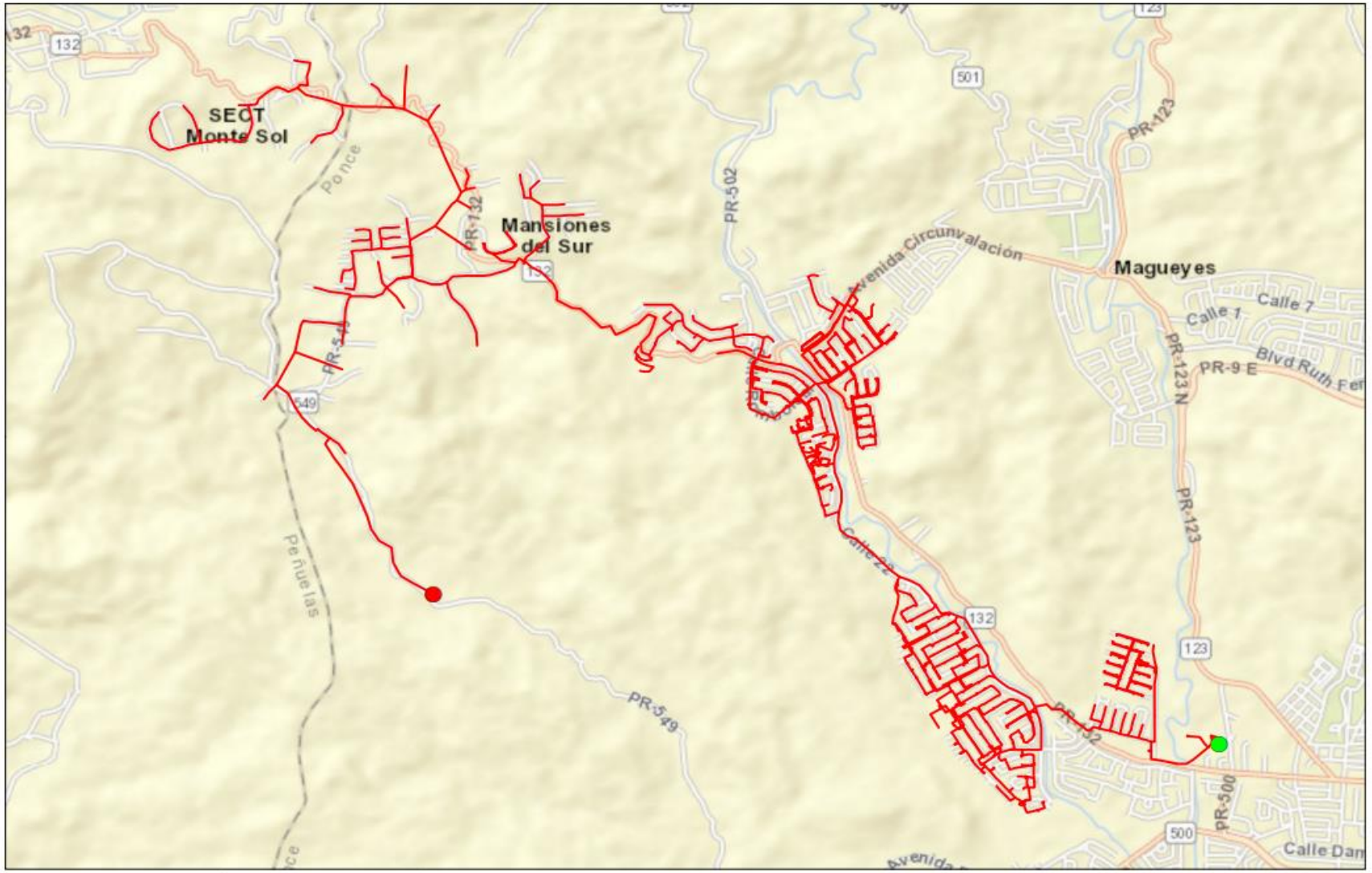
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 9 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

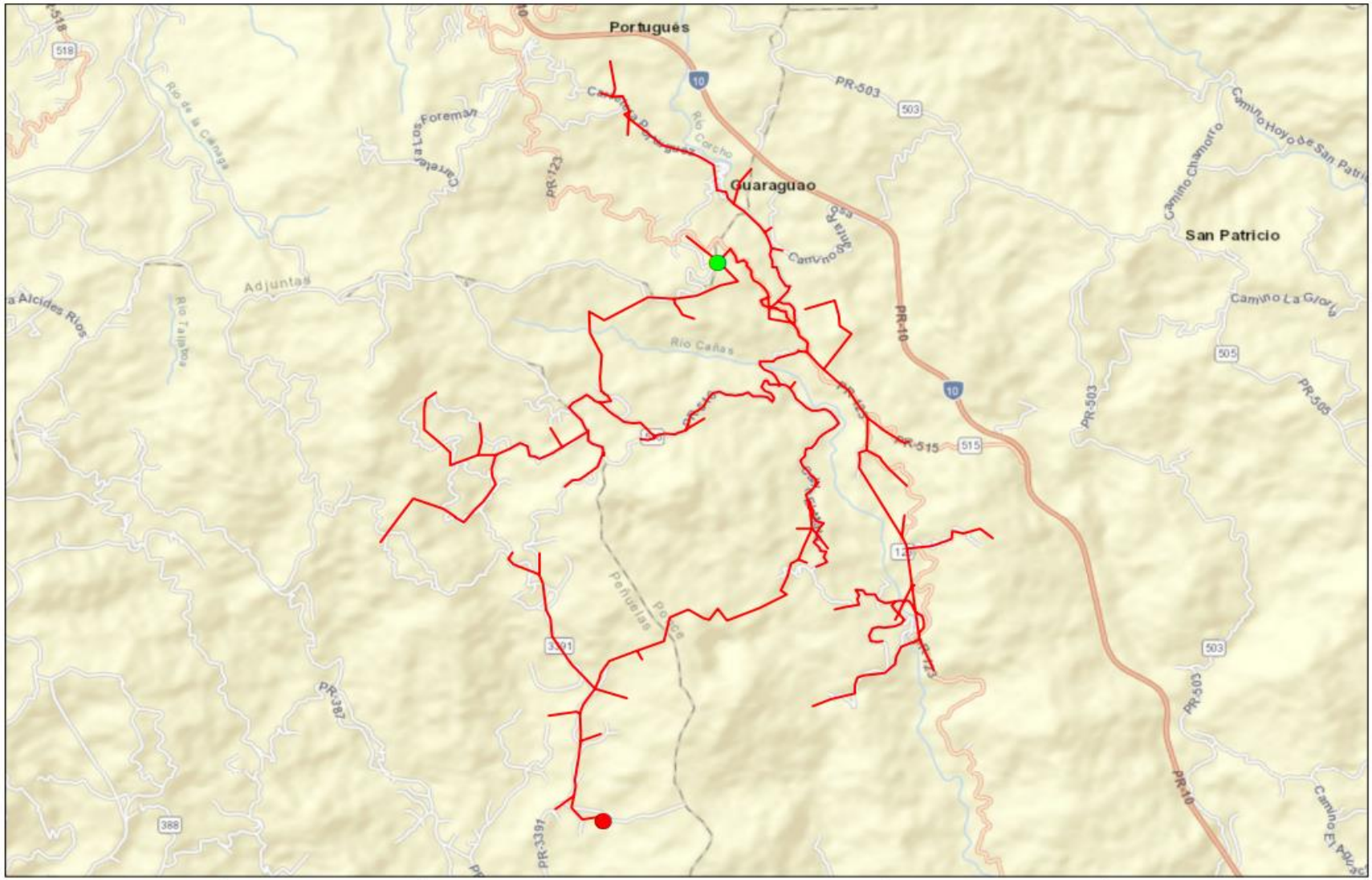
1:28,020

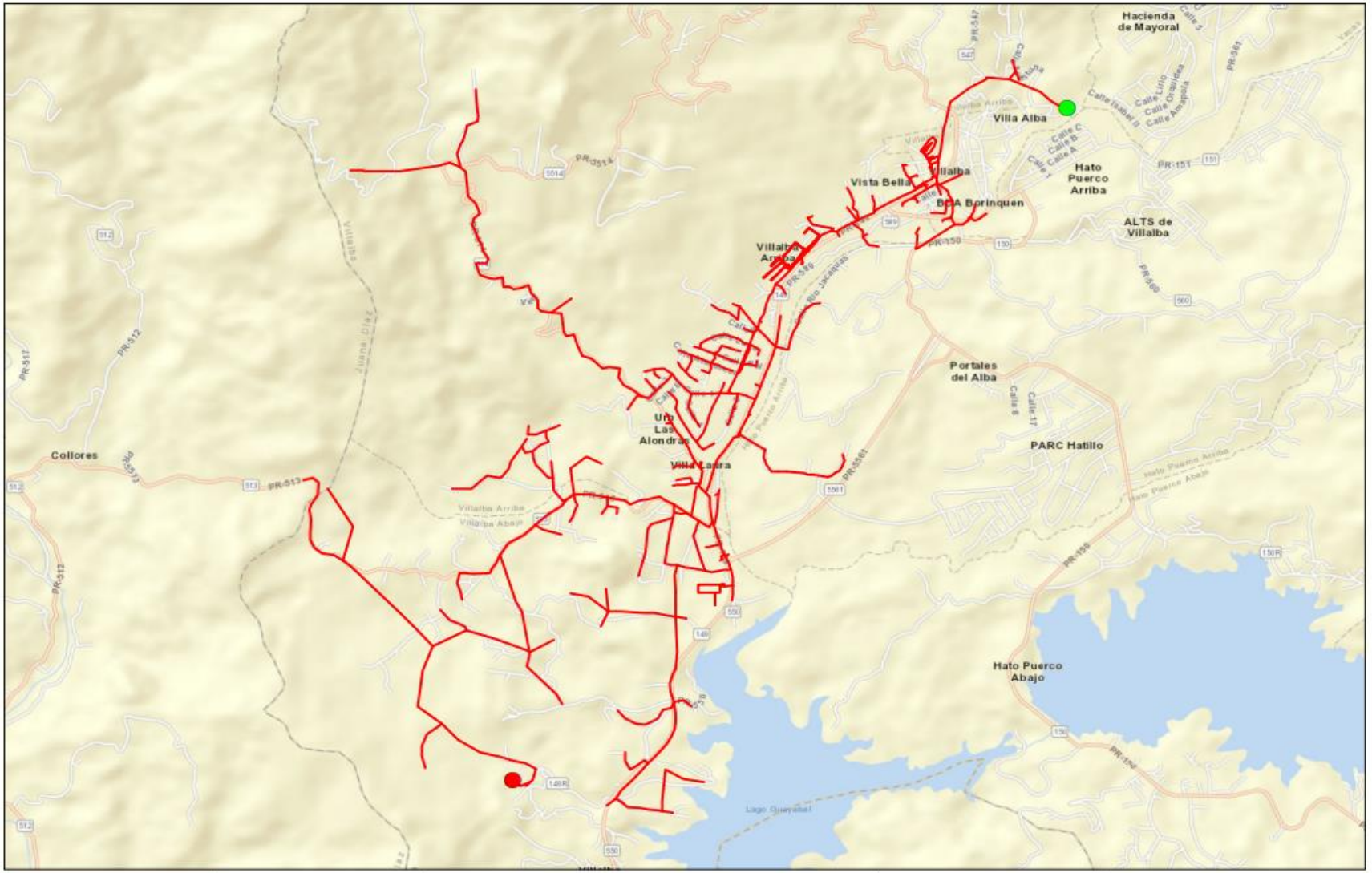
0 0.225 0.45 0.9 Miles

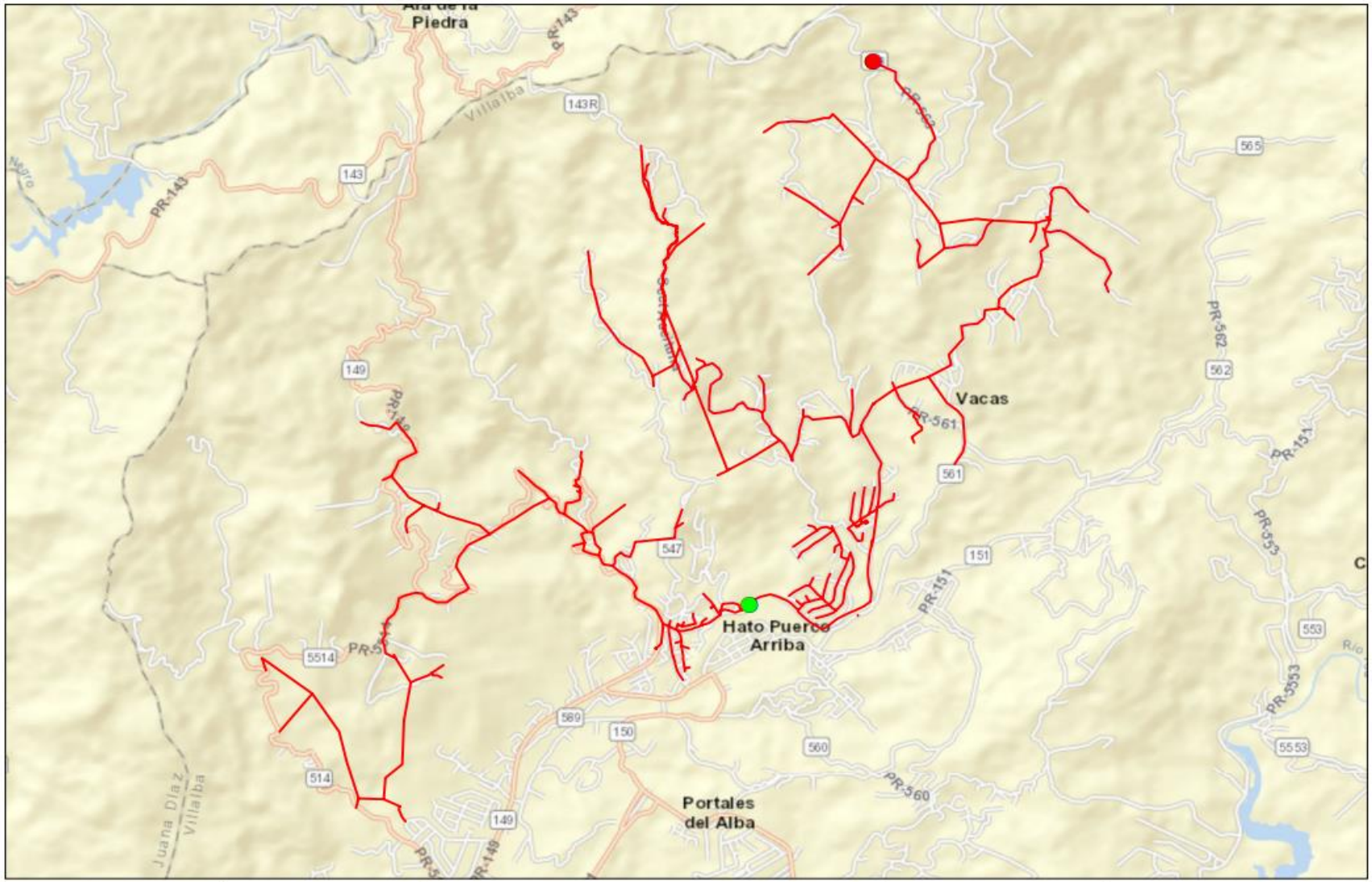
N

LUMA

Circuit 5018-05


Portugués
Guaraguao
San Patricio
Adjuntas
Río Caña
Río Cañas
PR-10
PR-503
PR-515
PR-123
PR-387
PR-3391
Legend
Start Point
End Point
Circuit
1:36,780
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 5021-01


Hacienda de Mayoral
Villa Alba
Villalba
Vista Bella
Hato Puerco Arriba
ALTS de Villalba
Villalba Arriba
Portales del Alba
PARC Hatillo
Villa Laura
Collores
Hato Puerco Abajo
Legend
Start Point
End Point
Circuit
1:26,560
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 5901-01



Legend

- Start Point
- End Point
- Circuit

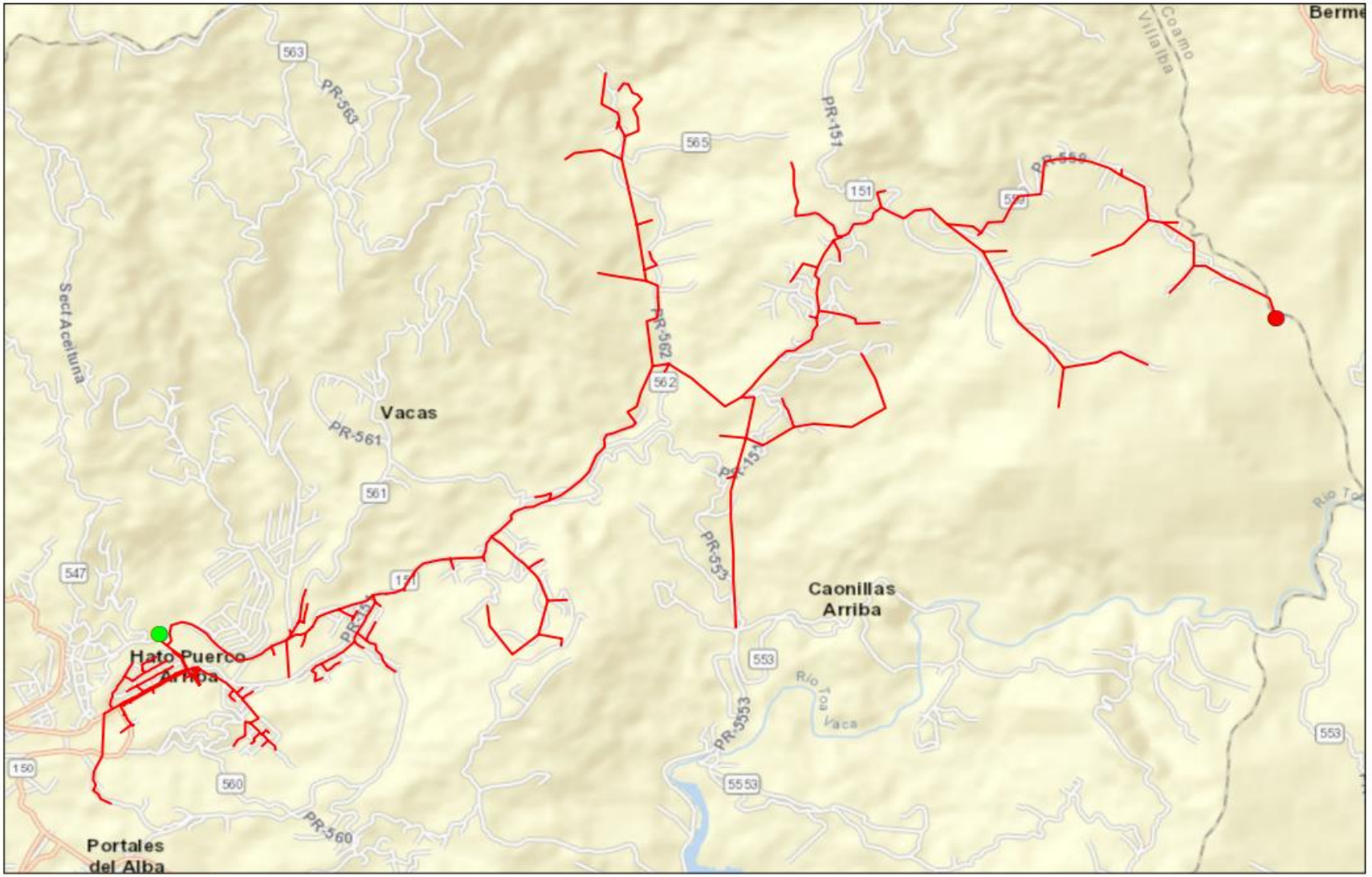
1:32,700

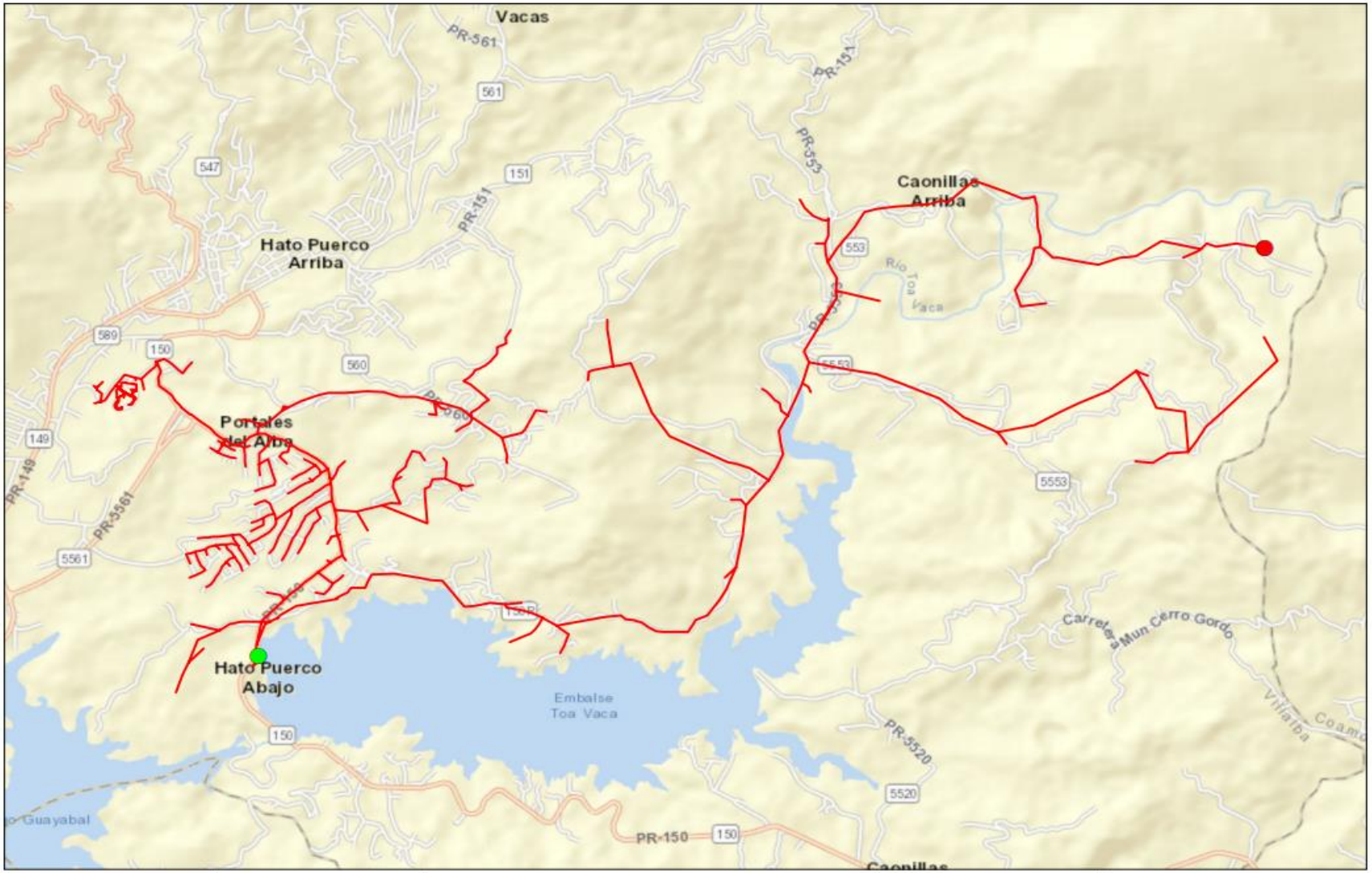
0 0.25 0.5 1 Miles

N

LUMA

Circuit 5901-02


Berme
Coamo
Villalba
563
PR-563
565
PR-151
151
PR-562
562
Vacas
PR-561
561
Sect Aceituna
547
171
PR-553
Caonillas
Arriba
Hato Puerco
Arriba
553
Río Toa Vaca
PR-3553
5553
150
560
PR-560
Portales
del Alba
Legend
Start Point
End Point
Circuit
1:30,410
0
0.25
0.5
1
Miles
N
LUMA
Circuit 5901-03


Vacas
PR-561
561
PR-151
547
151
PR-553
Caonillas Arriba
Hato Puerco Arriba
553
Río Toa Vaca
589
150
560
5553
Portales del Alba
149
PR-149
PR-5561
5561
5553
Carretera Mun Cerro Gordo
Hato Puerco Abajo
Embalse Toa Vaca
PR-5520
5520
Villalba
Guayabal
PR-150
150
Caonillas
Legend
Start Point
End Point
Circuit
1:32,430
0
0.25
0.5
1
Miles
N
LUMA
Circuit 5902-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Caguas Short Term Group 13

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Caguas Short Term Group 13
Project Type:	Restoration to Codes/Standards
Region:	Caguas
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Caguas Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder – Caguas Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
RIO CAÑAS	3014-04	[redacted]		4.16
GURABO	3101-04			4.16
VEREDAS	3103-02			13.2
JUNCOS	3201-02			4.16
JUNCOS 2 13.2 KV	3205-08			13.2
SAN LORENZO II	3302-03			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.91M**
Estimated Budget for Procurement & Construction:	**$29.10M**
Estimated Overall Budget for the Project:	**$32.01M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

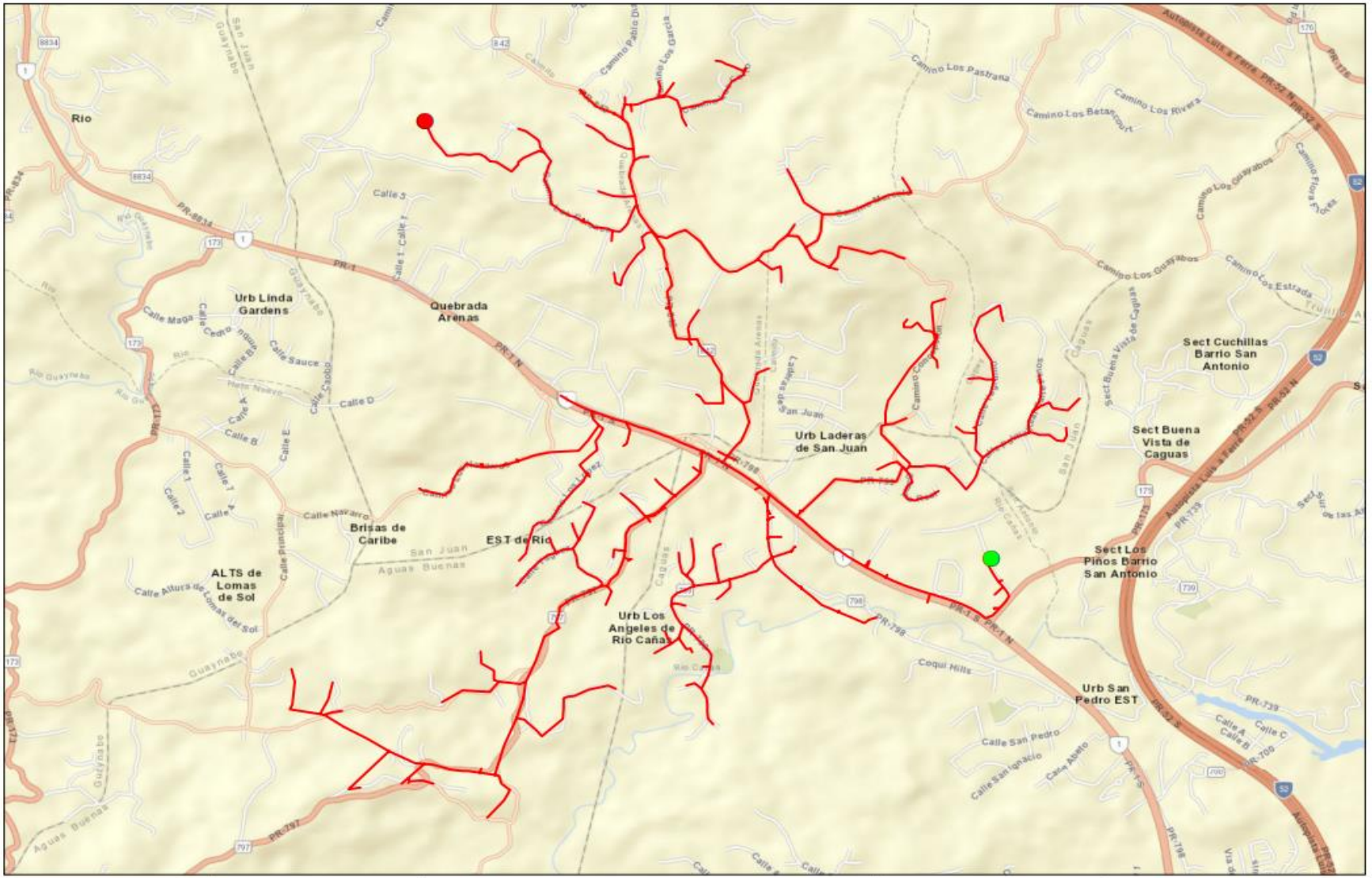
Note: If available, detailed engineering cost estimates will be included as an attachment.

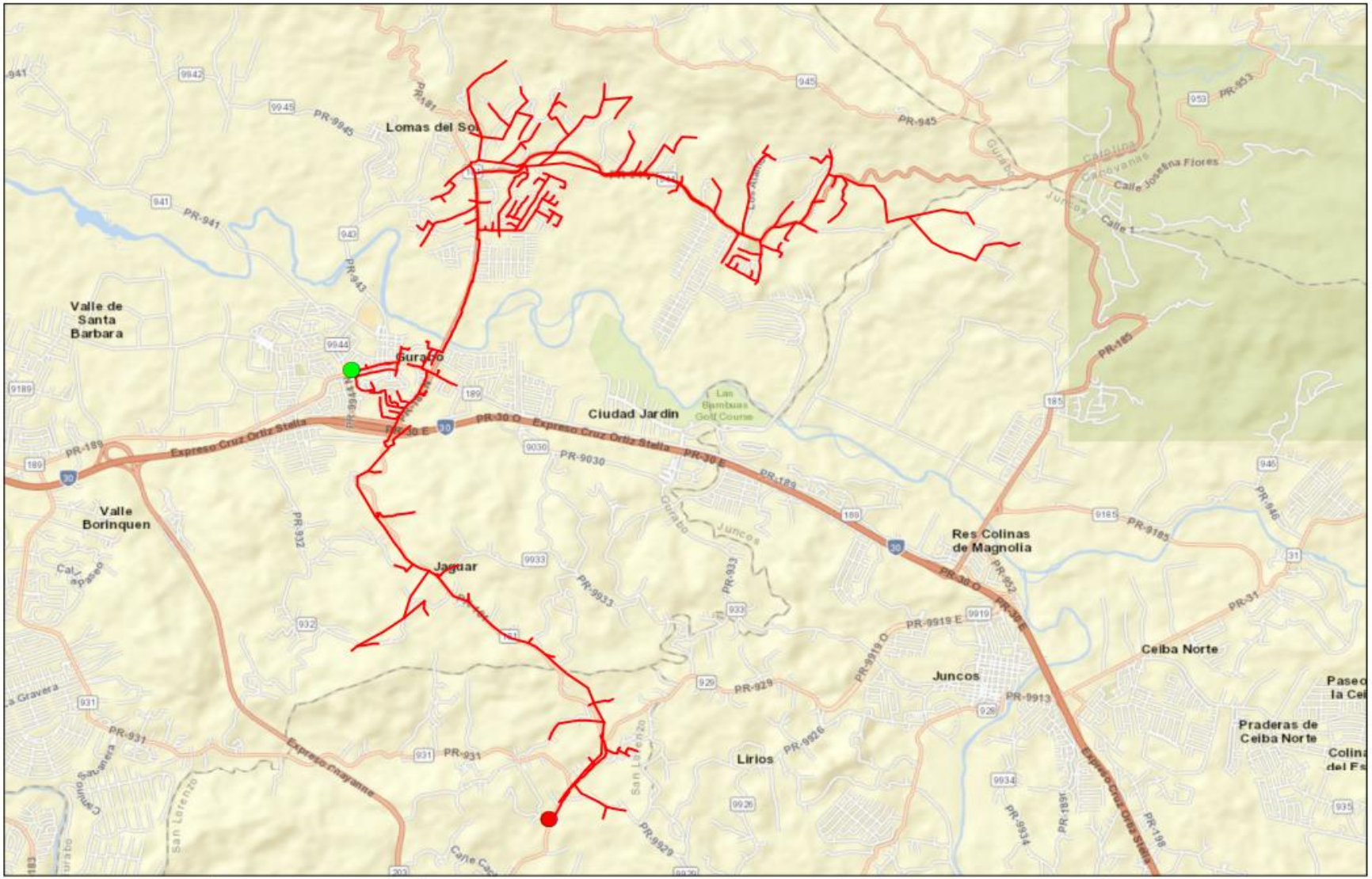
Environmental & Historic Preservation Requirements

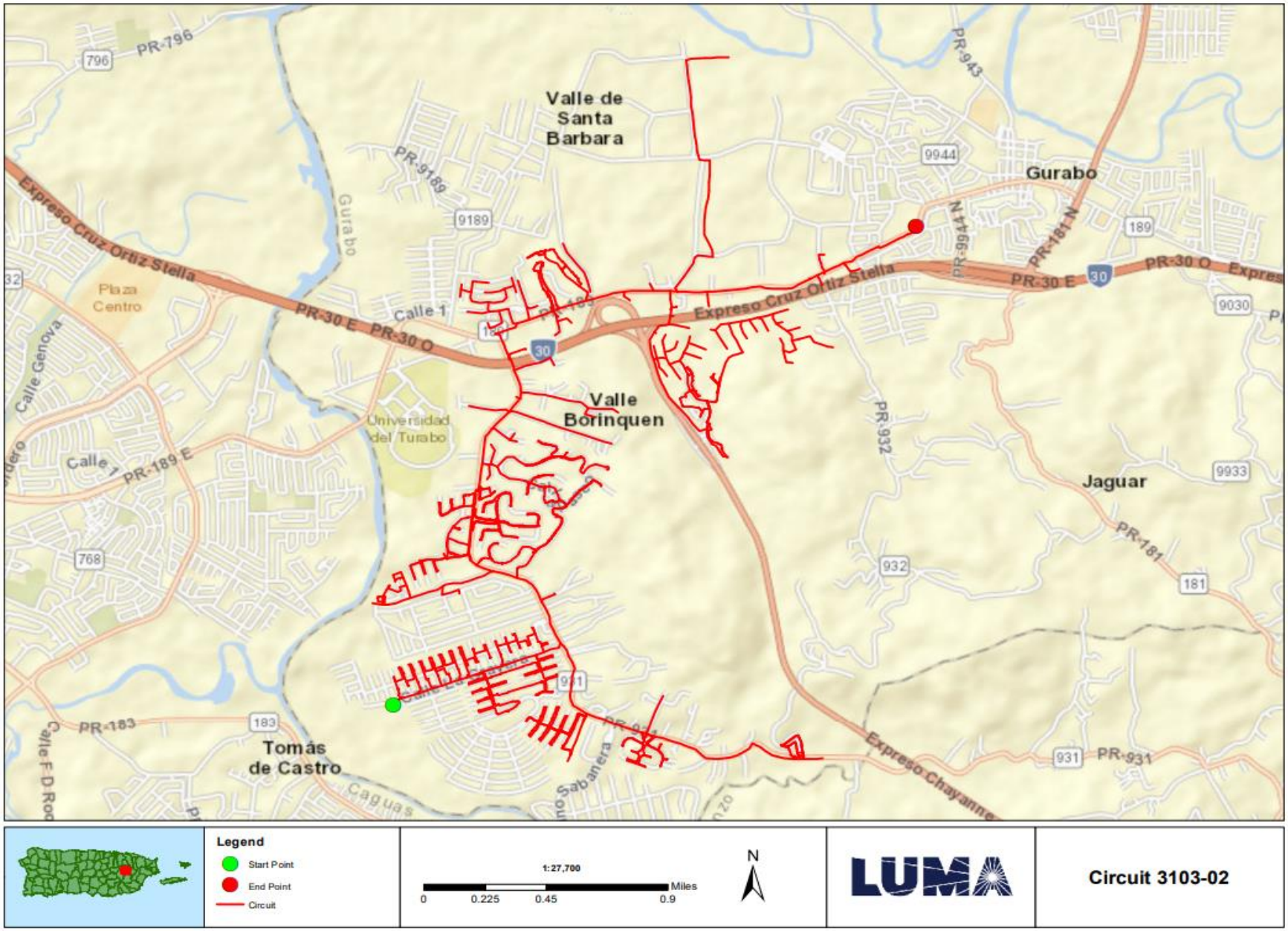
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

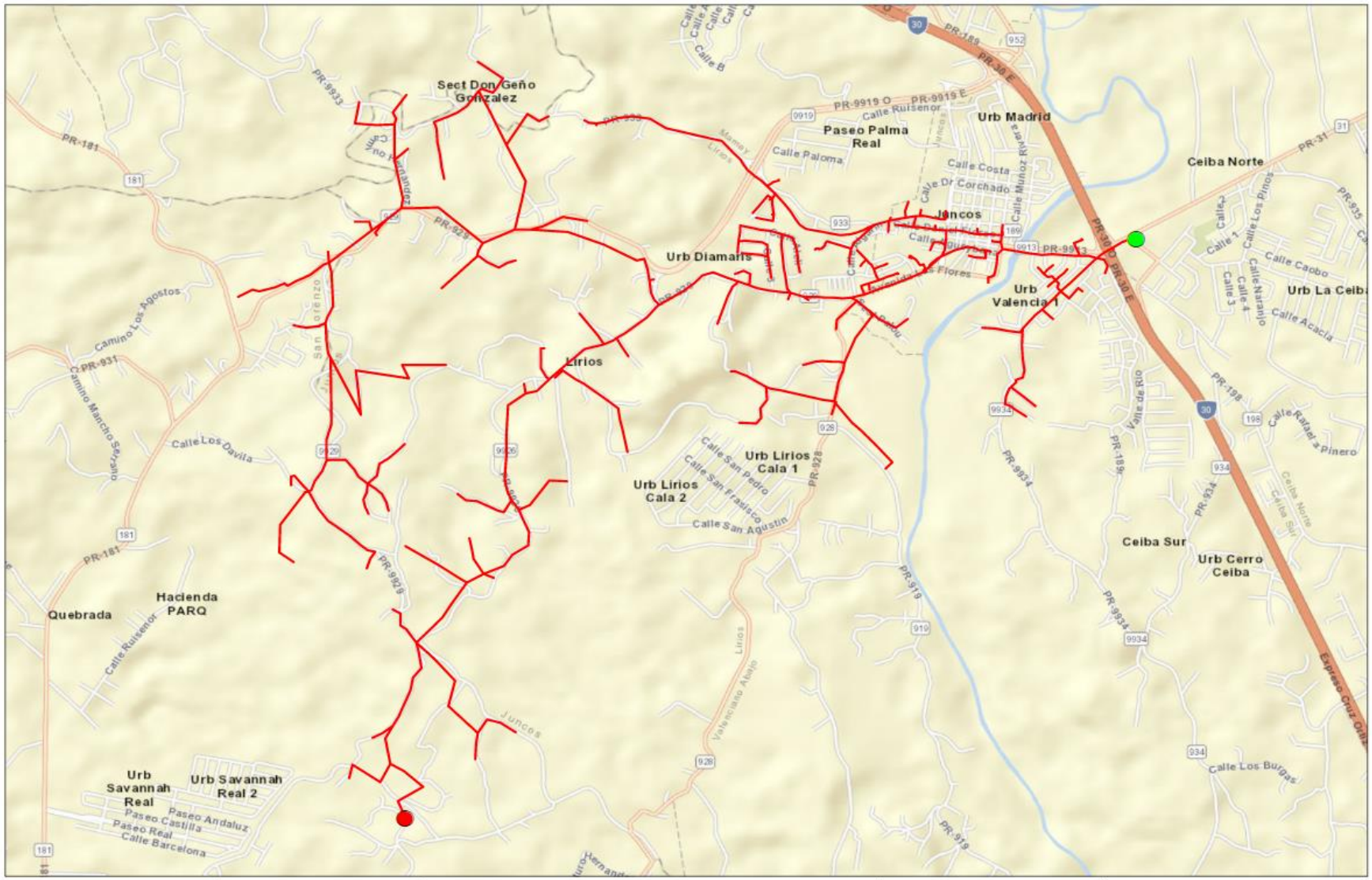
Attachments

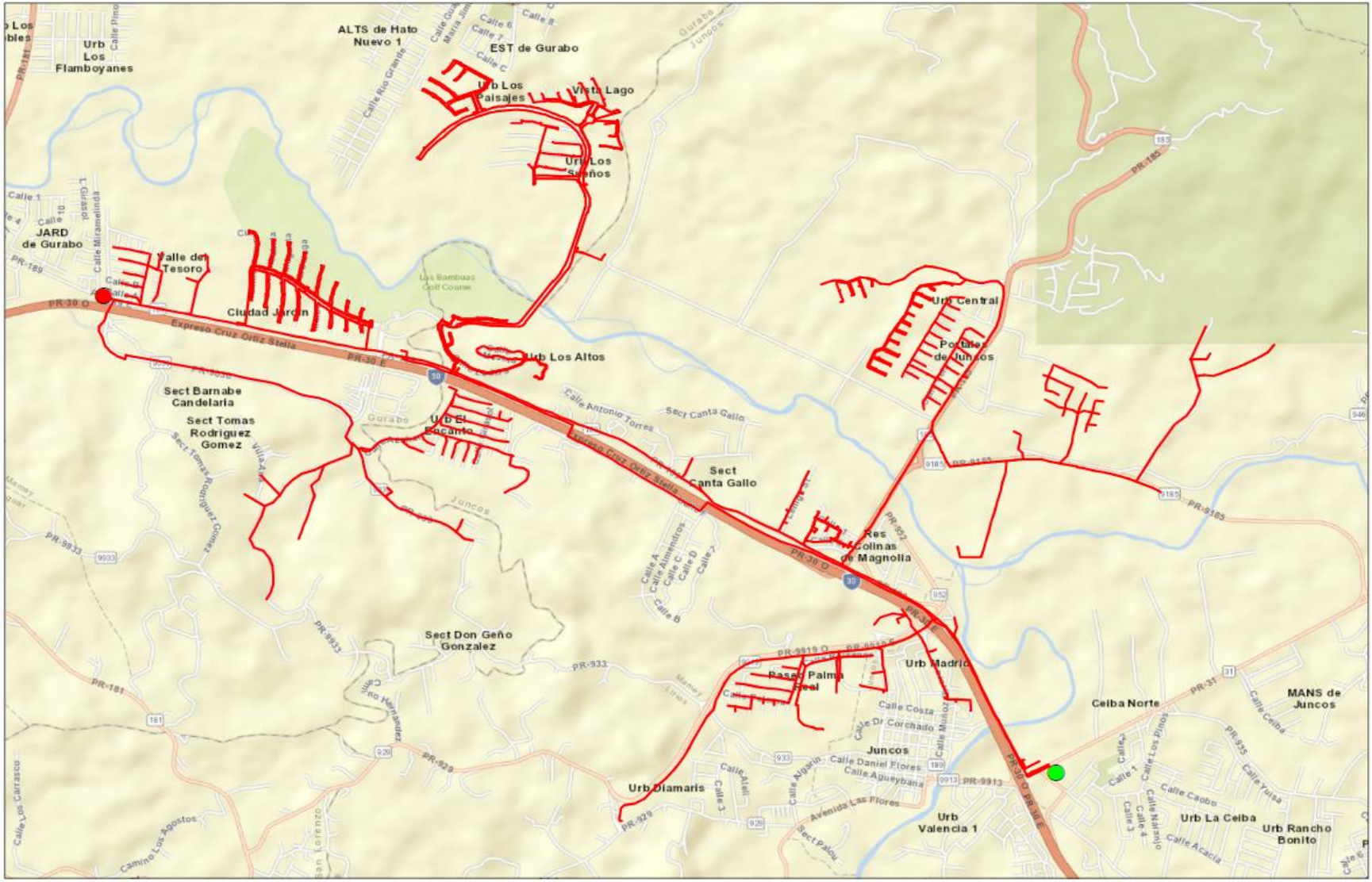
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Caguas Short Term Group 13 Location Maps	Location Maps and Site Picture

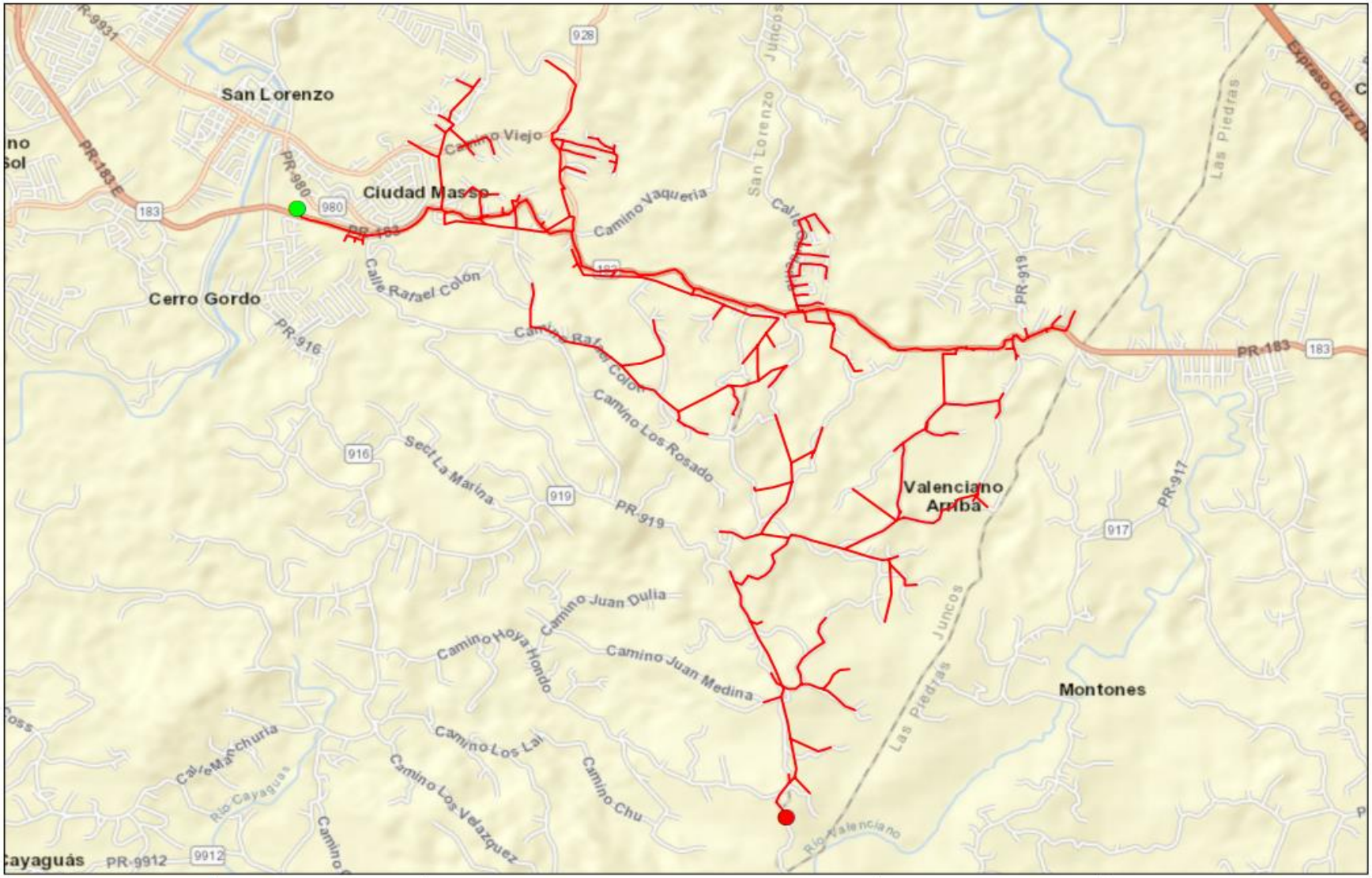

Rio
Urb Linda Gardens
Quebrada Arenas
Urb Laderas de San Juan
Sect Cuchillas Barrio San Antonio
Sect Buena Vista de Caguas
Brisas de Caribe
EST de Rio
ALTS de Lomas de Sol
Urb Los Angeles de Rio Cañas
Sect Los Piños Barrio San Antonio
Urb San Pedro EST
Coqui Hills
Legend
Start Point
End Point
Circuit
1:25,310
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 3014-04


Lomas del Sol
Valle de Santa Barbara
Gurabo
Ciudad Jardin
Las Bambuas Golf Course
Expreso Cruz Ortiz Stella
Valle Borinquen
Jaguar
Res Colinas de Magnolia
Juncos
Celba Norte
Praderas de Celba Norte
Lirios
Calle Josefina Flores
Calle 1
PR-945
PR-941
PR-943
PR-9945
PR-9030
PR-9933
PR-9919
PR-929
PR-9926
PR-9934
PR-9929
PR-185
PR-189
PR-932
PR-933
PR-31
PR-9913
PR-9185
PR-946
PR-952
PR-953
PR-198
Legend
Start Point
End Point
Circuit
1:43,540
0
0.35
0.7
1.4
Miles
N
LUMA
Circuit 3101-04


Valle de Santa Barbara
Gurabo
Valle Borinquen
Jaguar
Tomás de Castro
Expreso Cruz Ortiz Stella
PR-30 E
PR-30 O
Calle 1
Calle 7
PR-189 E
PR-796
PR-9189
PR-943
PR-9941
PR-181 N
PR-932
PR-181
PR-183
PR-931
Expreso Chayanne
Universidad del Turabo
Plaza Centro
Calle Génova
Caguas
796
9944
9189
189
30
9030
9933
932
181
768
183
931
Legend
Start Point
End Point
Circuit
1:27,700
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 3103-02


Sect Don Geño Gonzalez
Paseo Palma Real
Urb Madrid
Ceiba Norte
Juncos
Urb Diamaris
Urb Valencia 1
Urb La Ceiba
Lirios
Urb Lirios Cala 1
Urb Lirios Cala 2
Ceiba Sur
Urb Cerro Ceiba
Hacienda PARQ
Quebrada
Urb Savannah Real
Urb Savannah Real 2
Calle Paloma
Calle Costa
Calle Dr Corchado
Calle Ruisenor
Calle San Pedro
Calle San Francisco
Calle San Agustin
Calle Los Burgos
Calle Los Davila
Camino Los Agostos
Camino Marcho Severo
Paseo Andaluz
Paseo Castilla
Paseo Real
Calle Barcelona
Valle de Rio
Calle Rafael a Pinero
Calle Acacia
Calle Naranjo
Calle Los Pinos
Expreso Cruz Ortiz
PR-181
PR-931
PR-9933
PR-928
PR-9928
PR-9919 O
PR-9919 E
PR-9913
PR-9934
PR-919
PR-198
PR-189
PR-31
PR-30 E
PR-30 O
Legend
Start Point
End Point
Circuit
1:22,760
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 3201-02


ALTS de Hato Nuevo 1
EST de Gurabo
Urb Los Flamboyanes
Urb Los Palsajes
Vista Lago
Urb Los Sueños
JARD de Gurabo
Valle del Tesoro
Ciudad Jardín
Urb Los Altos
Expreso Cruz Ortiz Stella
PR-30 O
PR-30 E
Sect Barnabe Candelaria
Sect Tomas Rodriguez Gomez
Urb El Encanto
Sect Canta Gallo
Urb Central
Portales de Juncos
Res Colinas de Magnolia
Sect Don Geño Gonzalez
Urb Madrid
Paseo Palma Real
Celba Norte
MANS de Juncos
Juncos
Urb Diamaris
Urb Valencia 1
Urb La Celba
Urb Rancho Bonito
Legend
Start Point
End Point
Circuit
1:25,630
0 0.2 0.4 0.8 Miles
N
LUMA
Circuit 3205-08



Legend

- Start Point
- End Point
- Circuit

1:31,780

0 0.25 0.5 1 Miles

N

LUMA

Circuit 3302-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Caguas Short Term Group 14

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Caguas Short Term Group 14
Project Type:	Restoration to Codes/Standards
Region:	Caguas
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Caguas Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Caguas Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
HUMACAO PUEBLO	2601-01			8.32
HUMACAO T.C. 13 KV	2603-09			13.2
CANDELERO	2604-01			13.2
CANDELERO	2604-02			8.32
CANDELERO	2604-03			8.32
SAN LORENZO II	3302-04			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$3.13M**
Estimated Budget for Procurement & Construction:	**$31.26M**
Estimated Overall Budget for the Project:	**$34.39M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

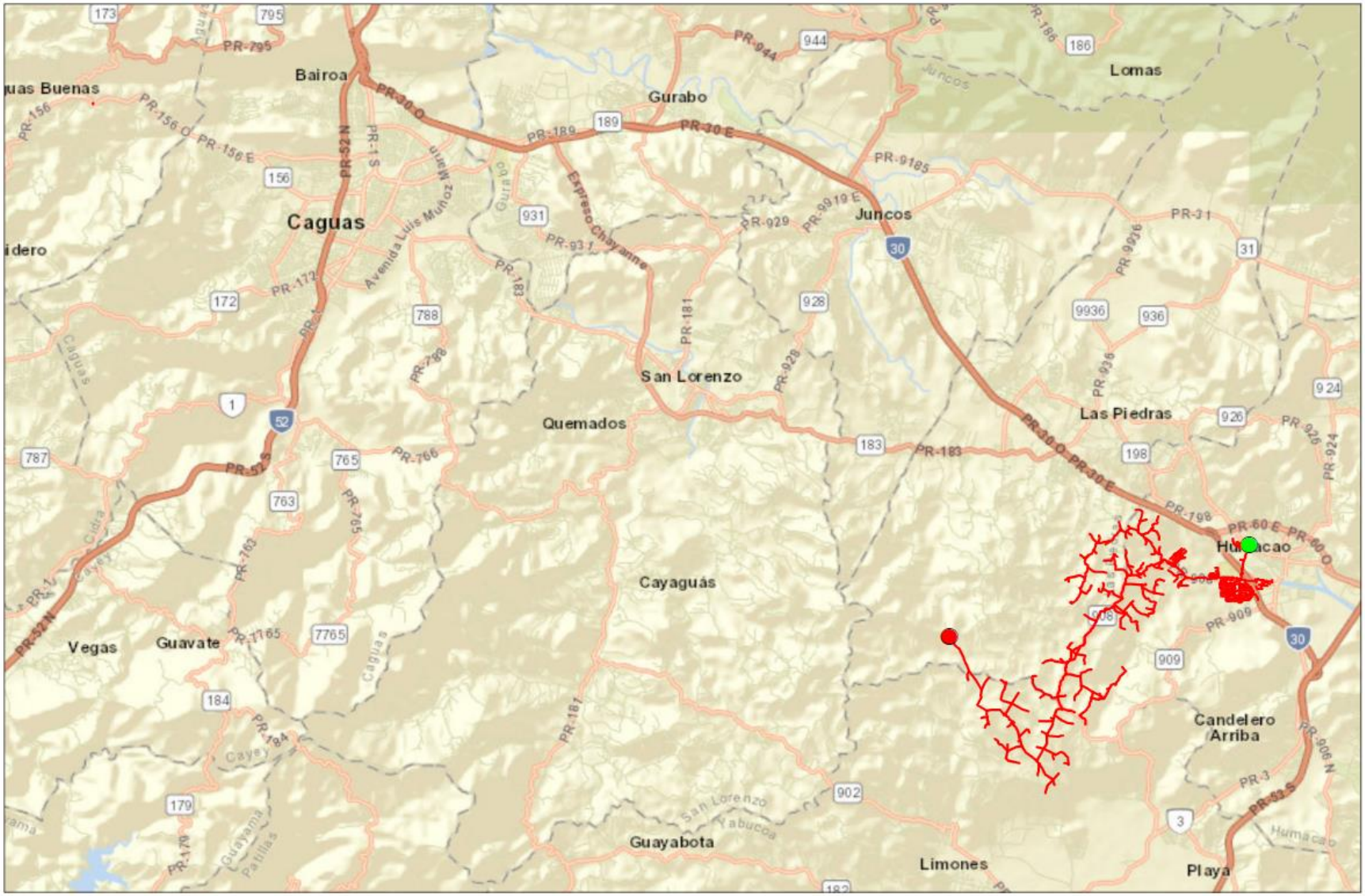
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

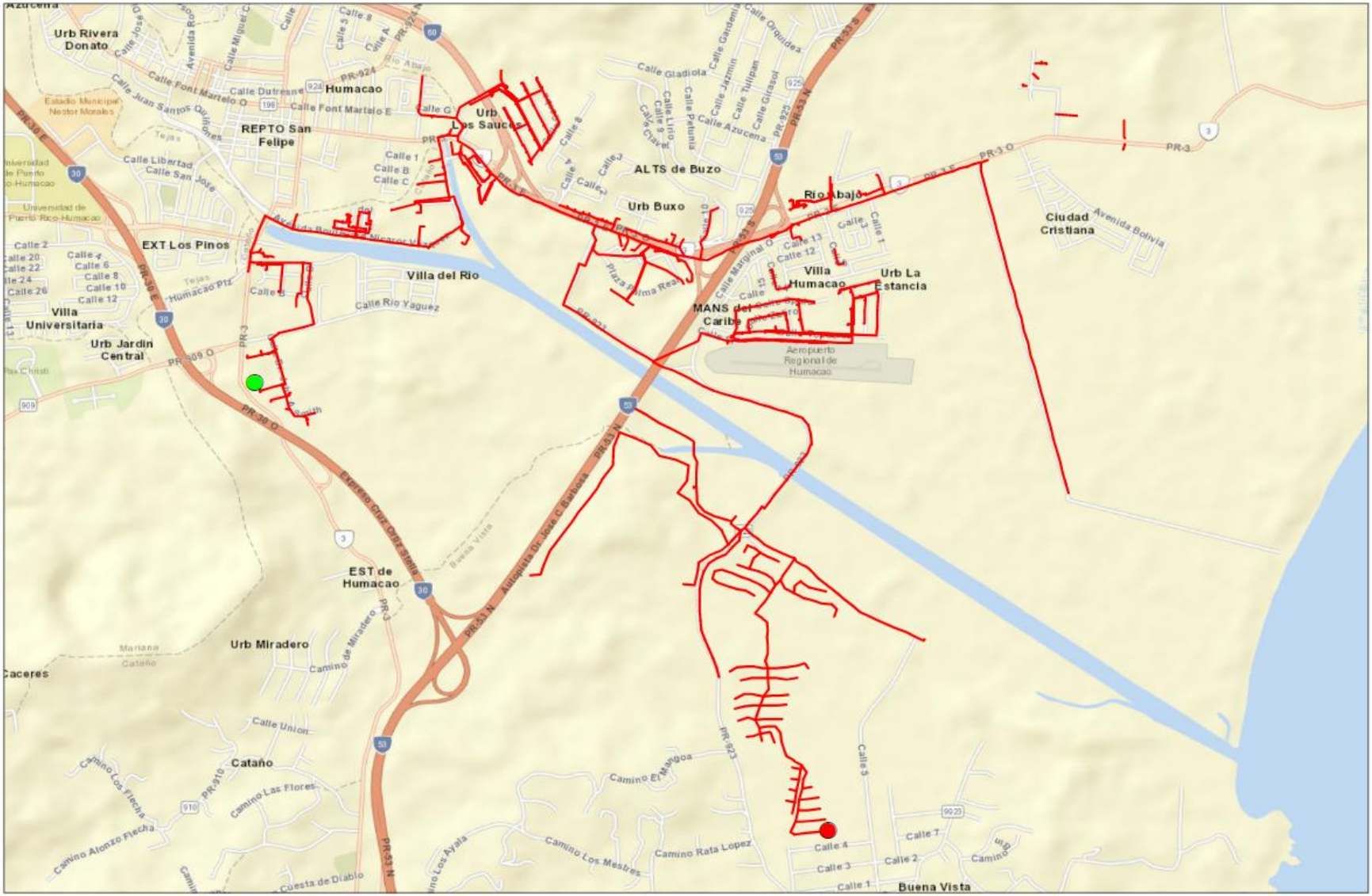
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

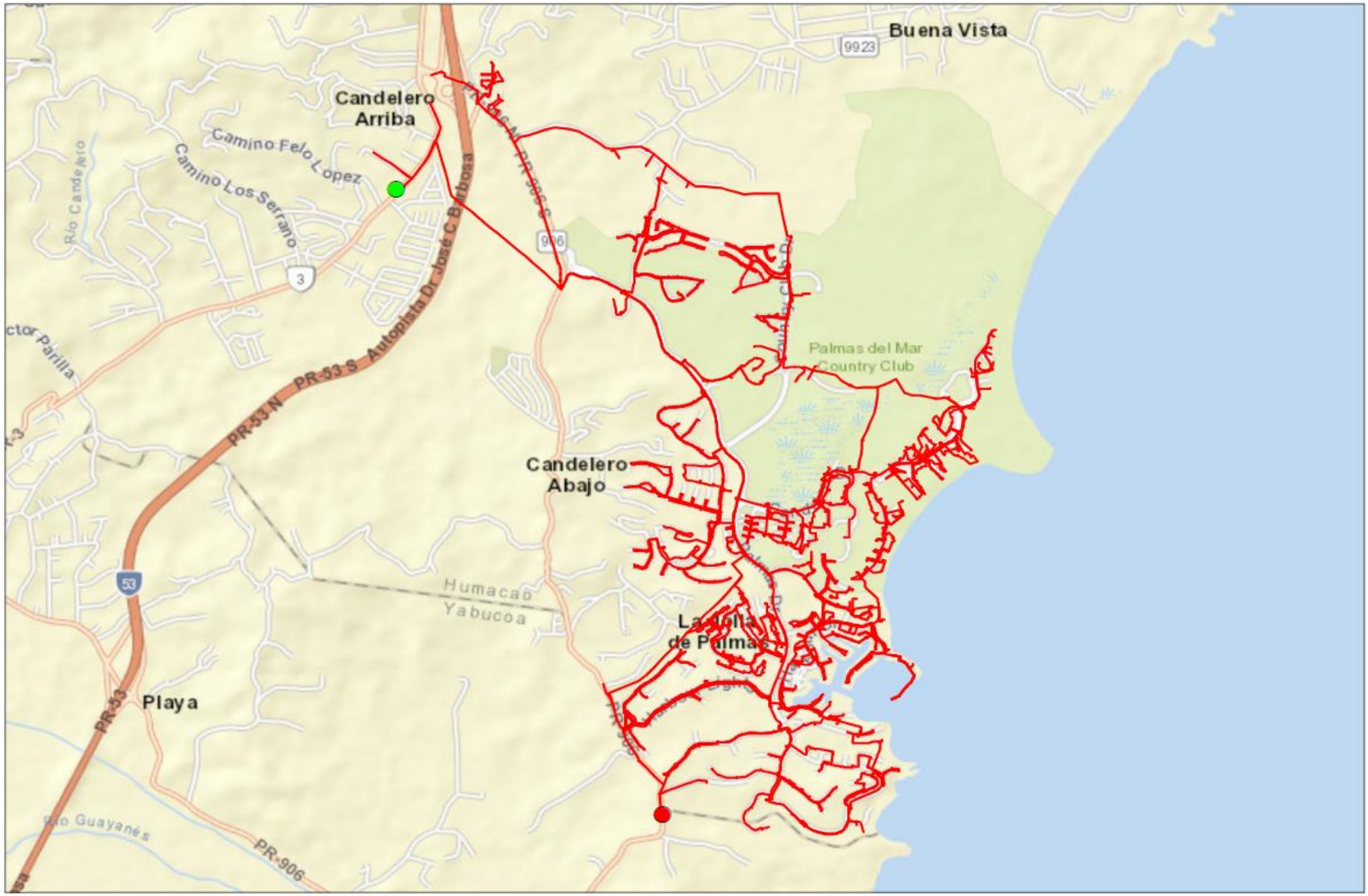
Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Caguas Short Term Group 14 Location Maps	Location Maps and Site Picture



Circuit 2601-01


Urb Rivera Donato
Humacao
REPTO San Felipe
Urb Los Sauces
ALTS de Buzo
Urb Buxo
Rio Abajo
Ciudad Cristiana
EXT Los Pinos
Villa del Rio
Villa Humacao
Urb La Estancia
MANS del Caribe
Villa Universitaria
Urb Jardin Central
Aeropuerto Regional de Humacao
EST de Humacao
Urb Miradero
Caceres
Cataño
Buena Vista
Legend
Start Point
End Point
Circuit
1:24,890
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 2603-09



Legend

- Start Point
- End Point
- Circuit

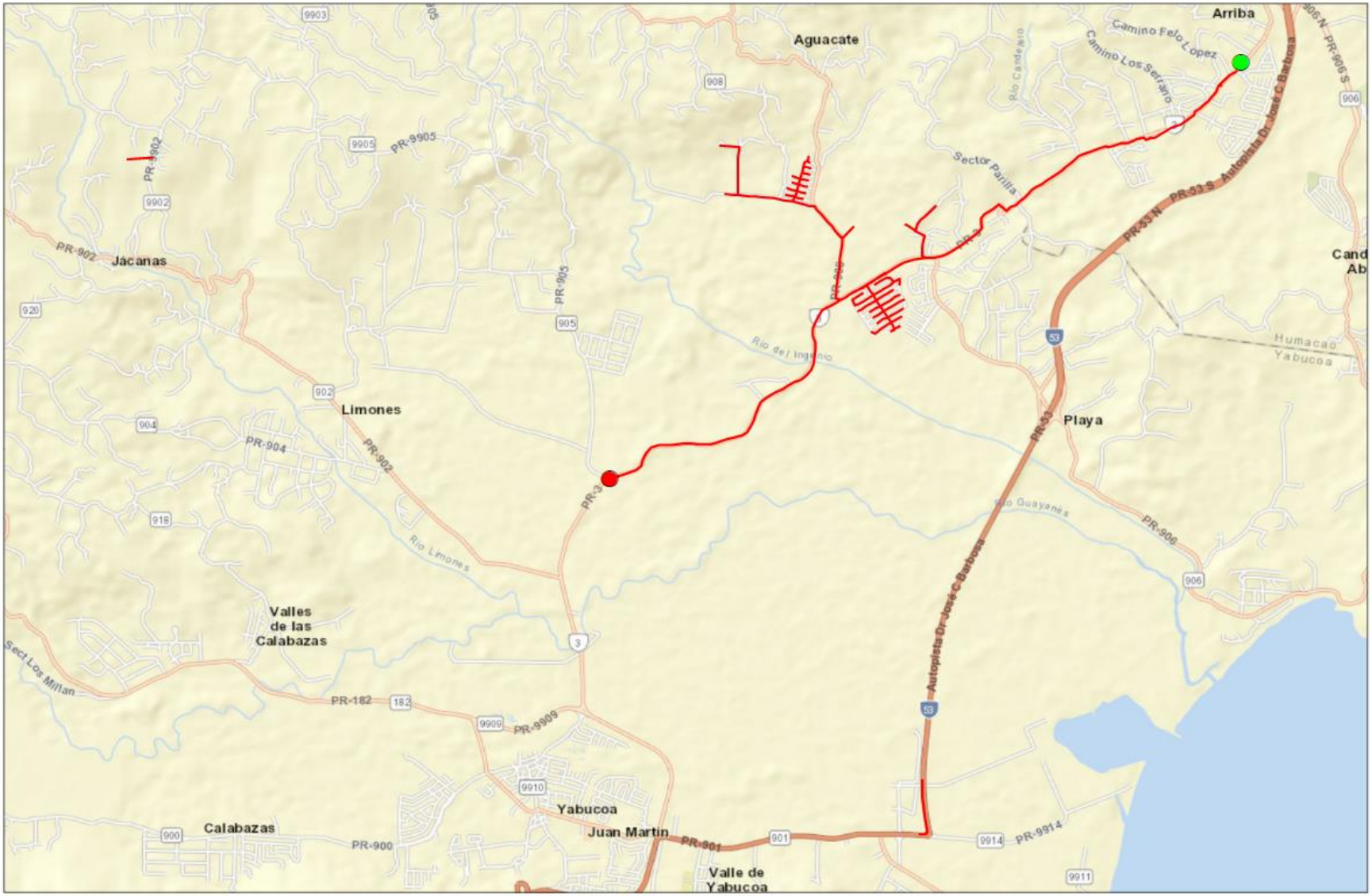
1:28,720

0 0.225 0.45 0.9 Miles

N

LUMA

Circuit 2604-01



Legend

- Start Point
- End Point
- Circuit

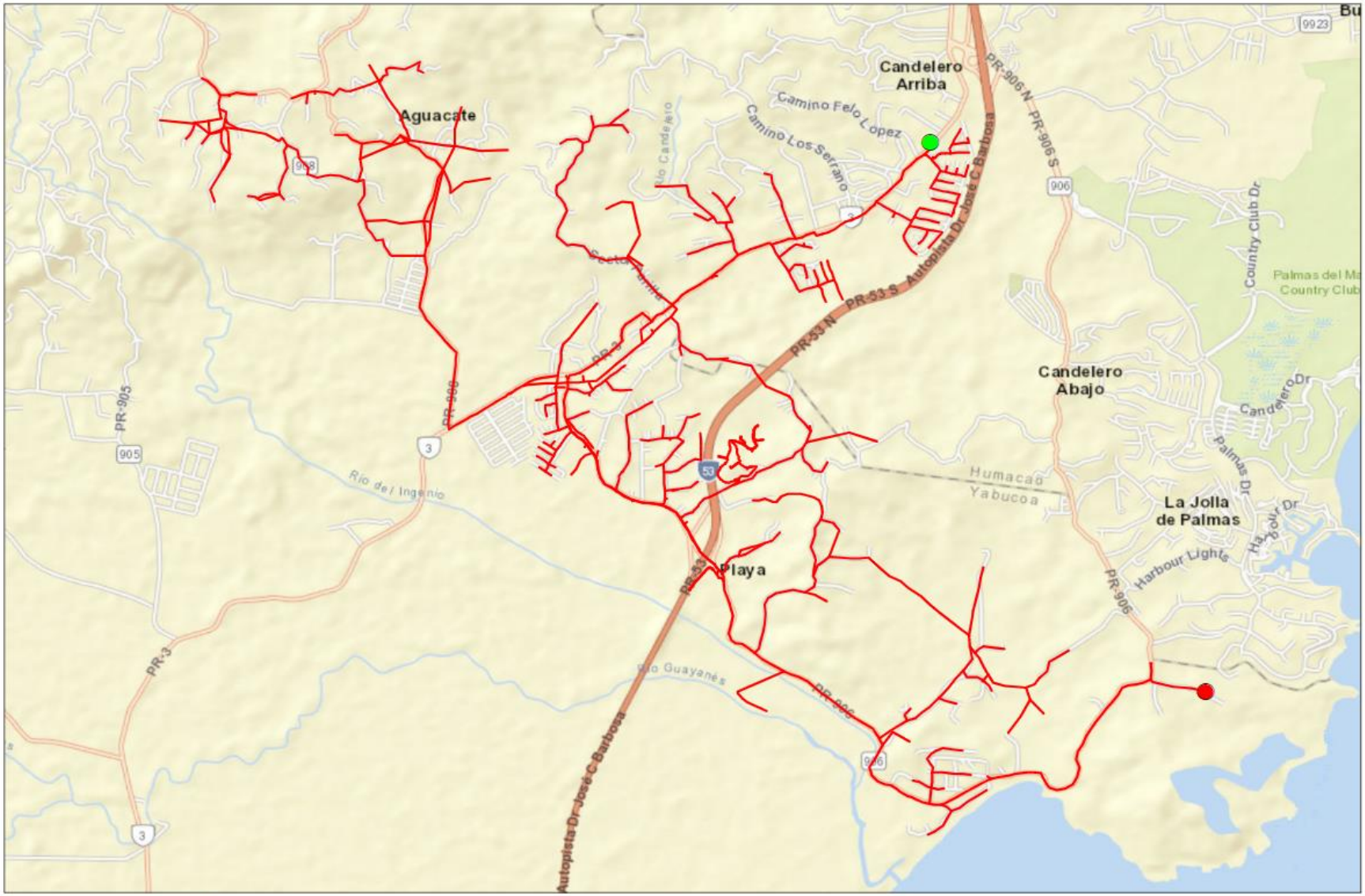
1:41,200

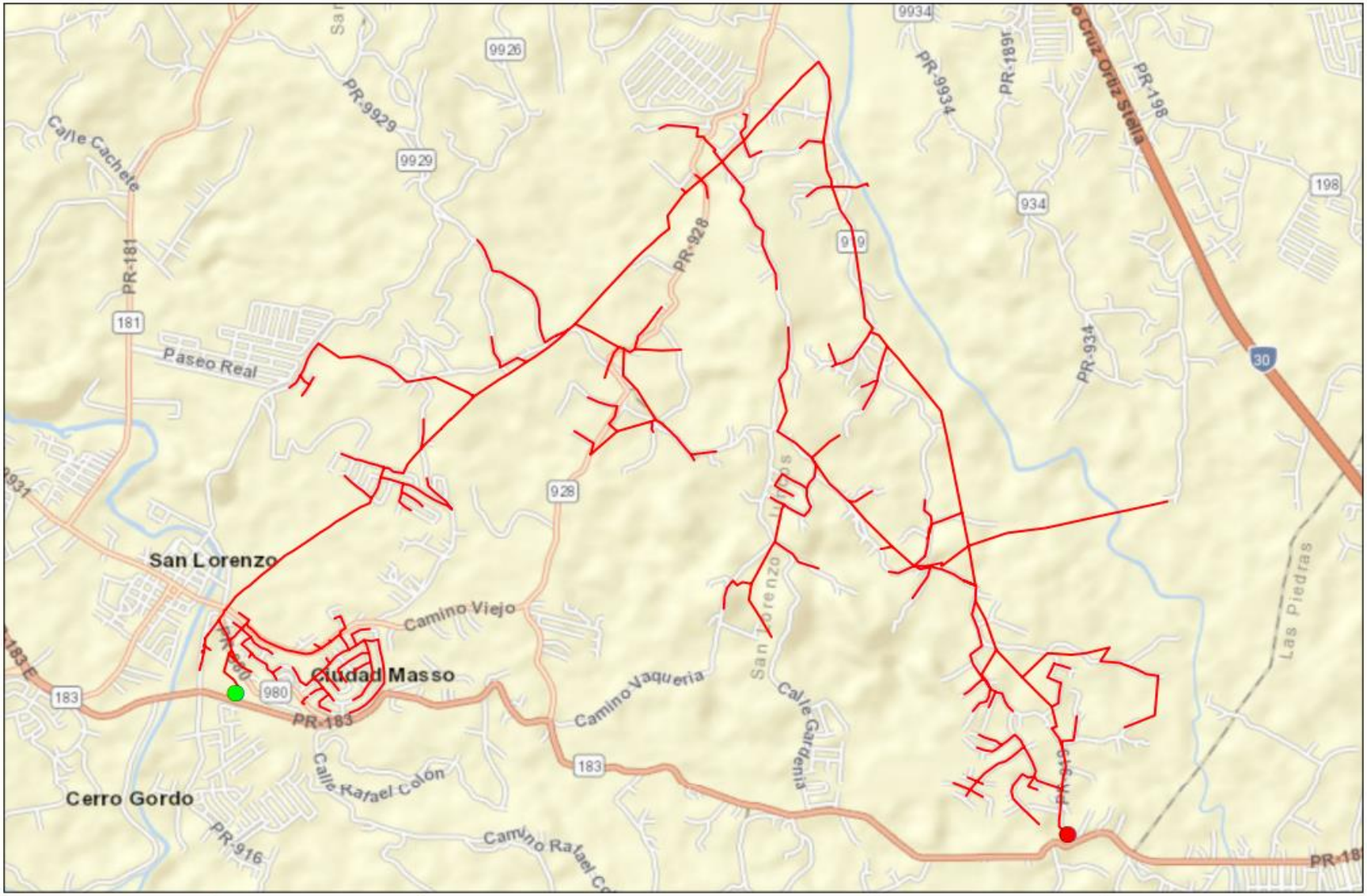
0 0.325 0.65 1.3 Miles

N

LUMA

Circuit 2604-02


Aguacate
Candelero Arriba
Candelero Abajo
La Jolla de Palmas
Playa
Camino Felo Lopez
Camino Los Serrano
Rio Candelero
Rio del Ingenio
Rio Guayanés
Humacao Yabucoa
Autopista Dr. José C Barbosa
PR-53 N
PR-53 S
PR-906 N
PR-906 S
PR-905
PR-3
PR-906
PR-908
Country Club Dr
Candelero Dr
Palmas Dr
Harbour Dr
Harbour Lights
Palmas del Mar Country Club
Legend
Start Point
End Point
Circuit
1:34,510
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 2604-03



Legend

- Start Point
- End Point
- Circuit

1:27,710

0 0.225 0.45 0.9 Miles

N

LUMA

Circuit 3302-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Caguas Short Term Group 15

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	10JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Caguas Short Term Group 15
Project Type:	Restoration to Codes/Standards
Region:	Caguas
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Caguas Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Caguas Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
PUEBLITO DEL RIO	2803-03	[redacted]		4.16
NAGUABO	2701-02			8.32
RIO BLANCO	2702-01			8.32
YABUCOA PUEBLO	2901-01			8.32
YABUCOA PUEBLO	2901-02			8.32
YABUCOA PUEBLO	2901-04			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.69M**
Estimated Budget for Procurement & Construction:	**$26.93M**
Estimated Overall Budget for the Project:	**$29.62M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**

Estimated Overall Budget for the Project:	**Unknown at this time**

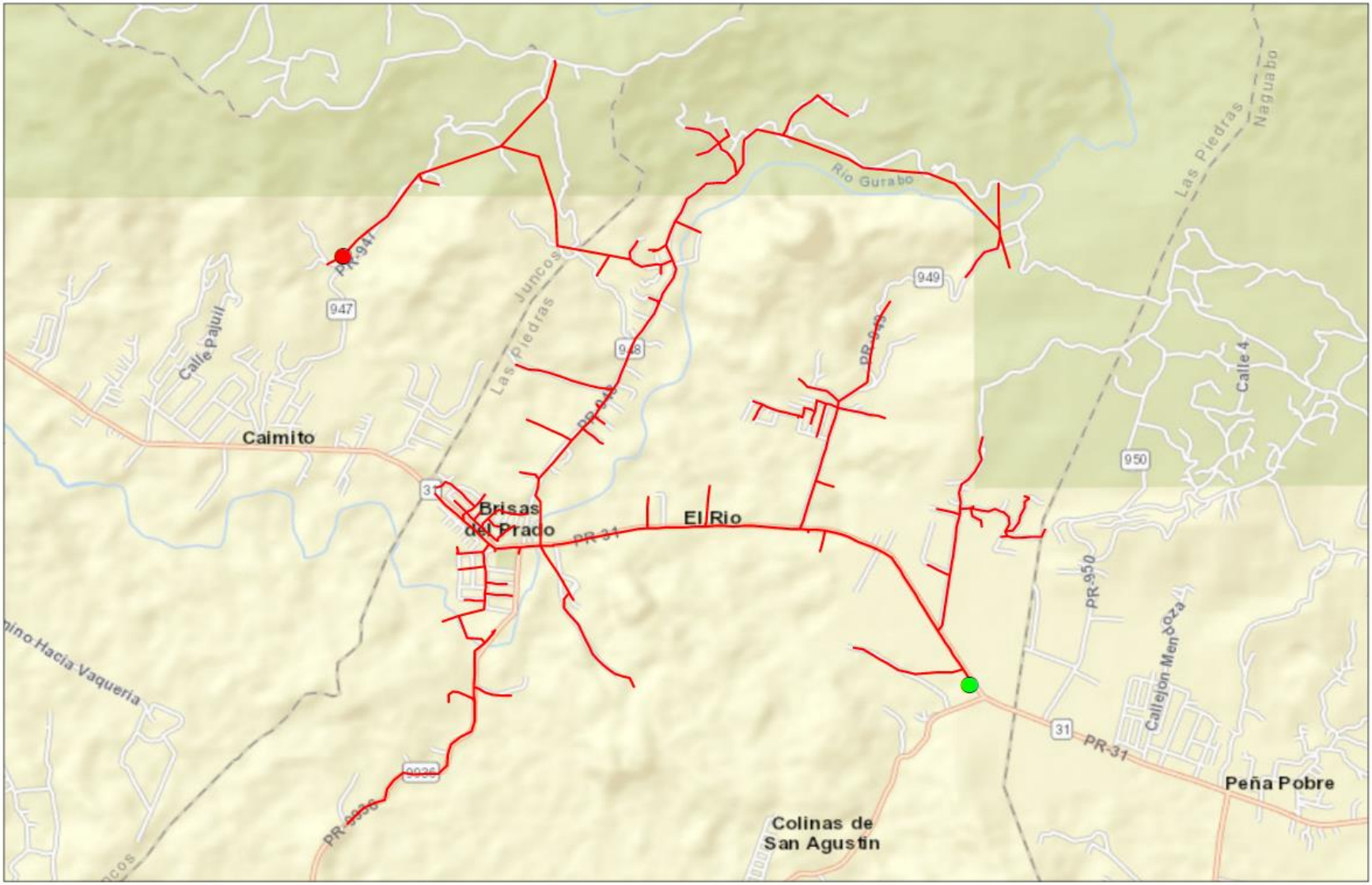
Note: If available, detailed engineering cost estimates will be included as an attachment.

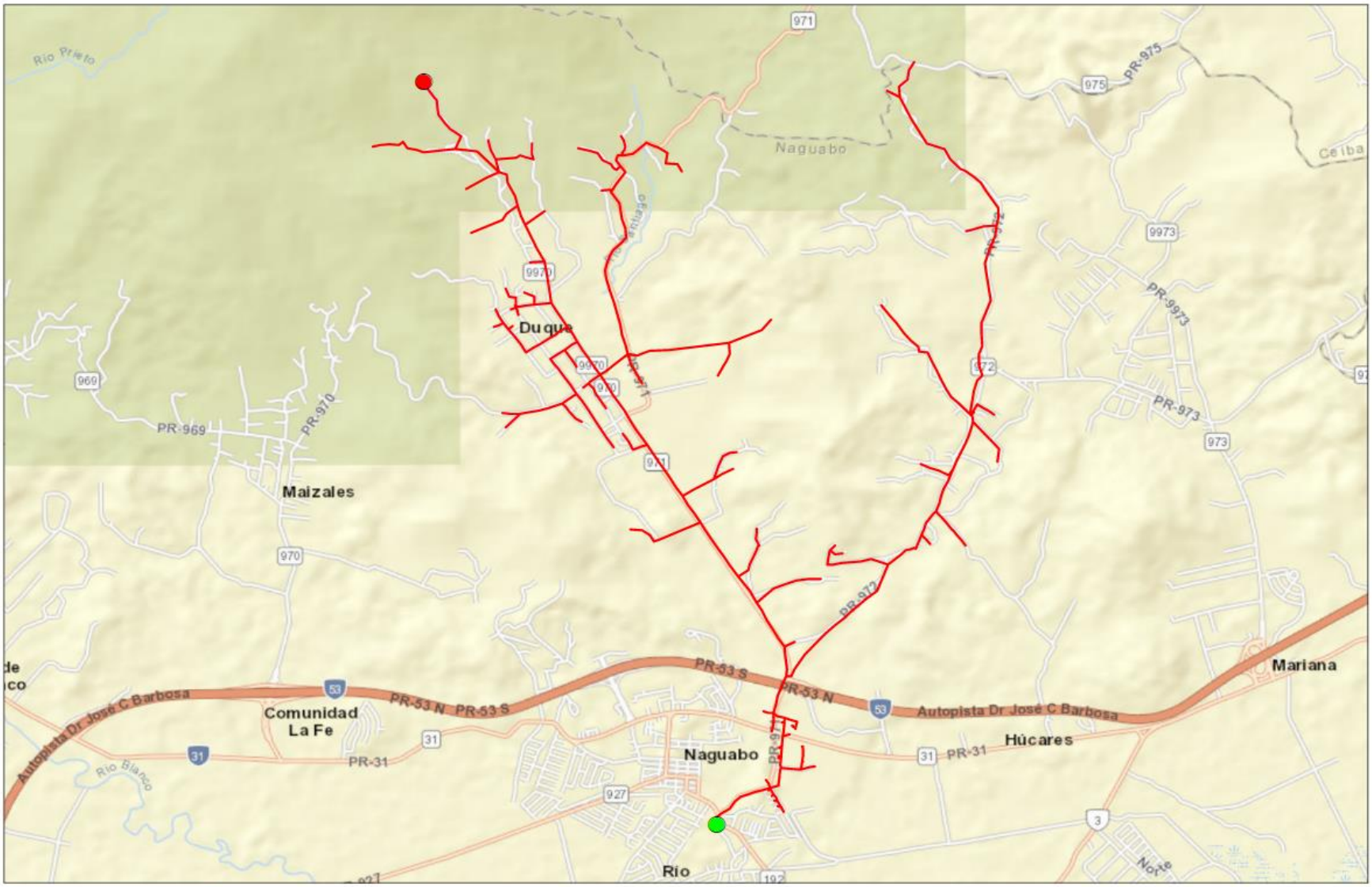
Environmental & Historic Preservation Requirements

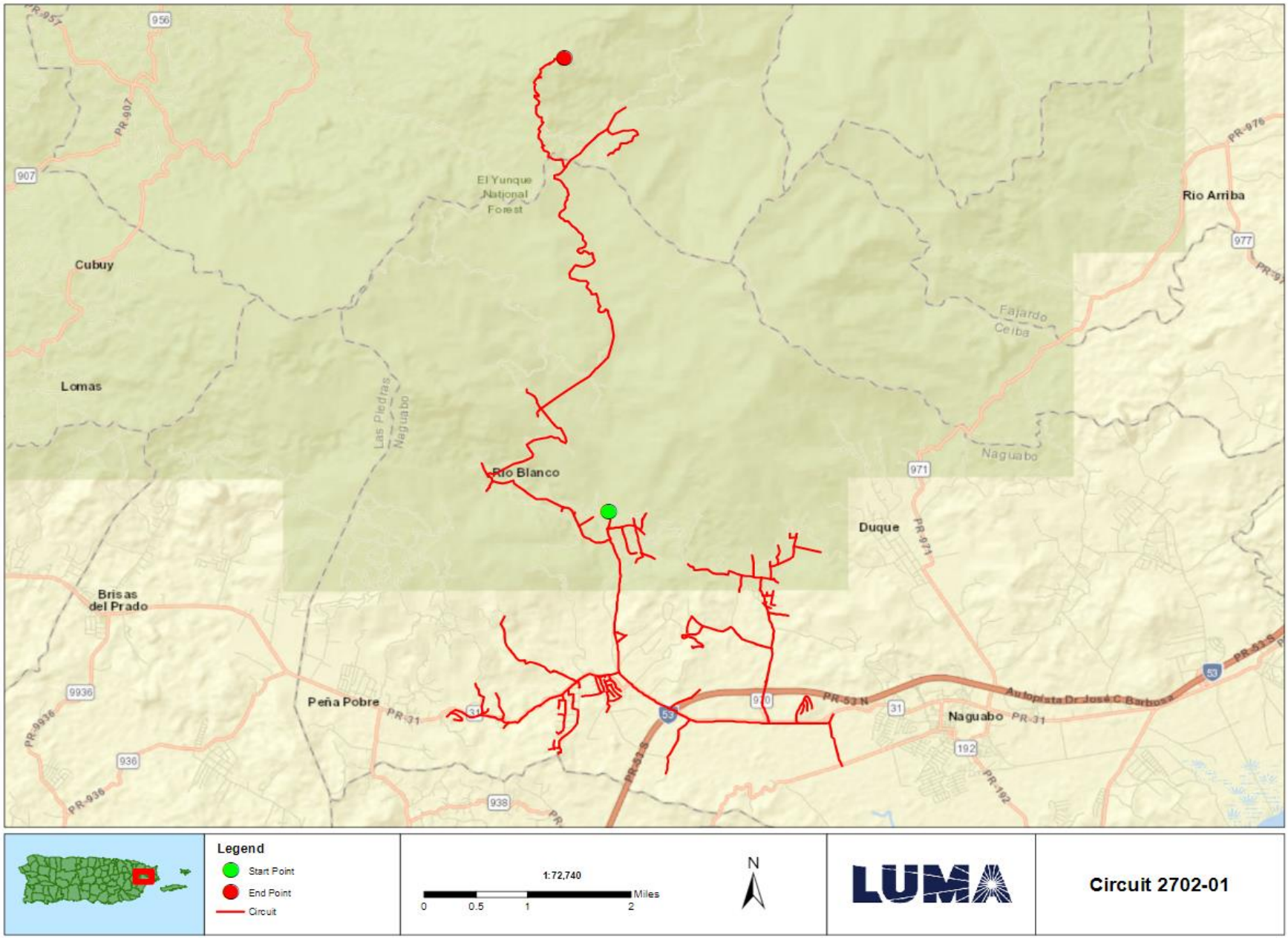
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

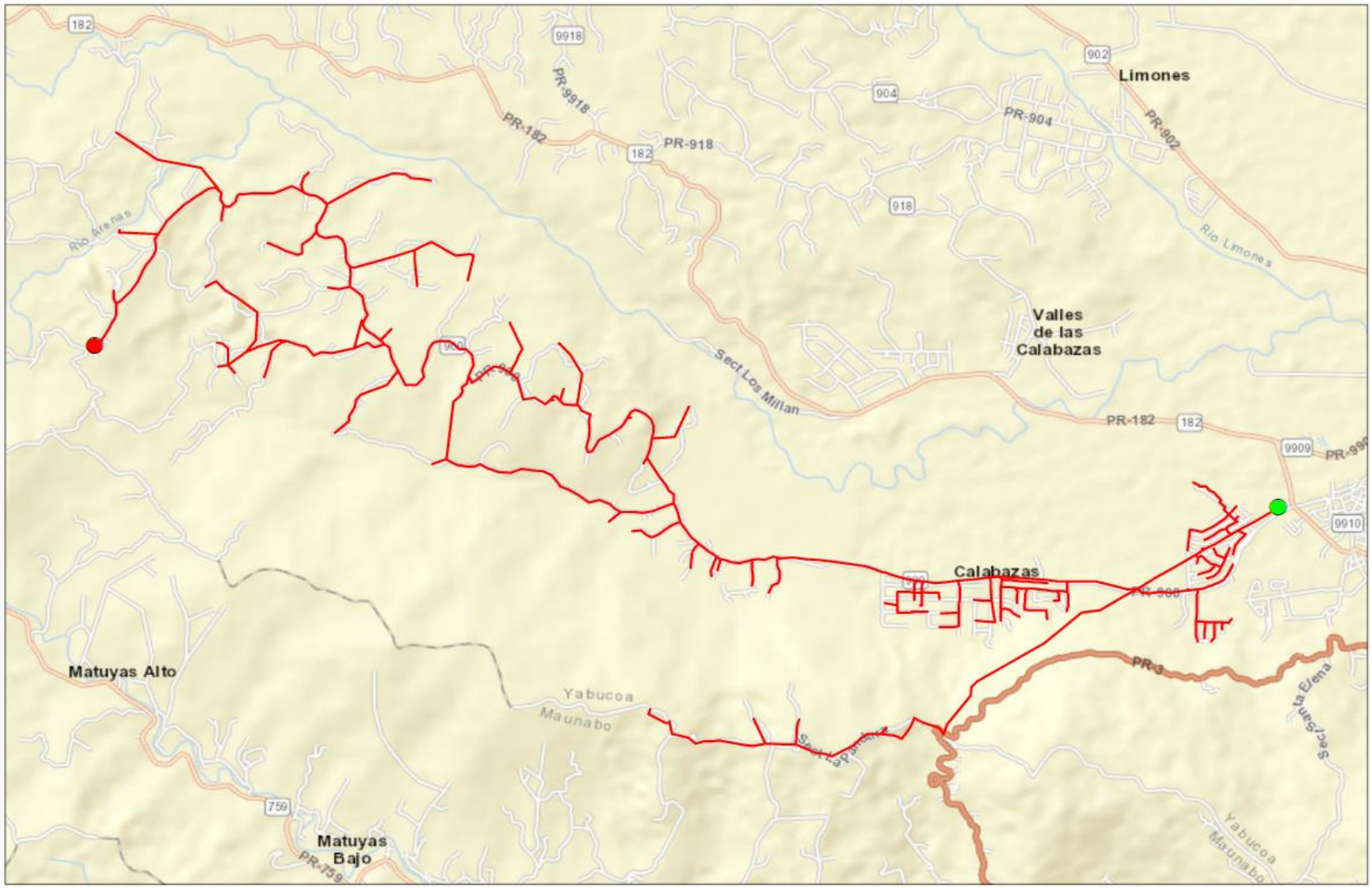
Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Caguas Short Term Group 15 Location Maps	Location Maps and Site Picture


Caimito
Brisas del Prado
El Rio
Colinas de San Agustin
Peña Pobre
Las Piedras
Juncos
Río Gurabo
Naguabo
Calle Pajuil
Calle 4
Callejón Mendoza
PR-941
PR-31
PR-950
PR-9936
947
948
949
950
31
9936
Legend
Start Point
End Point
Circuit
1:29,740
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 2803-03


Rio Prieto
971
PR-975
975
Naguabo
Ceiba
9973
PR-9973
PR-972
9970
Duque
PR-971
970
972
PR-973
973
969
PR-969
PR-970
Maizales
970
PR-53 S
PR-53 N
Mariana
Autopista Dr José C Barbosa
53
Comunidad
La Fe
PR-53 N PR-53 S
Autopista Dr José C Barbosa
31
PR-31
Río Blanco
Naguabo
PR-31
Húcares
927
3
Río
Norte
Legend
Start Point
End Point
Circuit
1:34,590
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 2701-02


El Yunque National Forest
Cubuy
Lomas
Las Piedras
Naguabo
Río Blanco
Duque
Naguabo
Rio Arriba
Fajardo
Ceiba
Brisas del Prado
Peña Pobre
Naguabo
Autopista Dr. José C. Barbosa
PR-53 N
PR-53 S
PR-31
PR-907
PR-957
PR-976
PR-971
PR-9936
PR-936
PR-192
956
907
977
971
9936
936
938
31
53
192
Legend
Start Point
End Point
Circuit
1:72,740
0
0.5
1
2
Miles
N
LUMA
Circuit 2702-01



Legend

- Start Point
- End Point
- Circuit

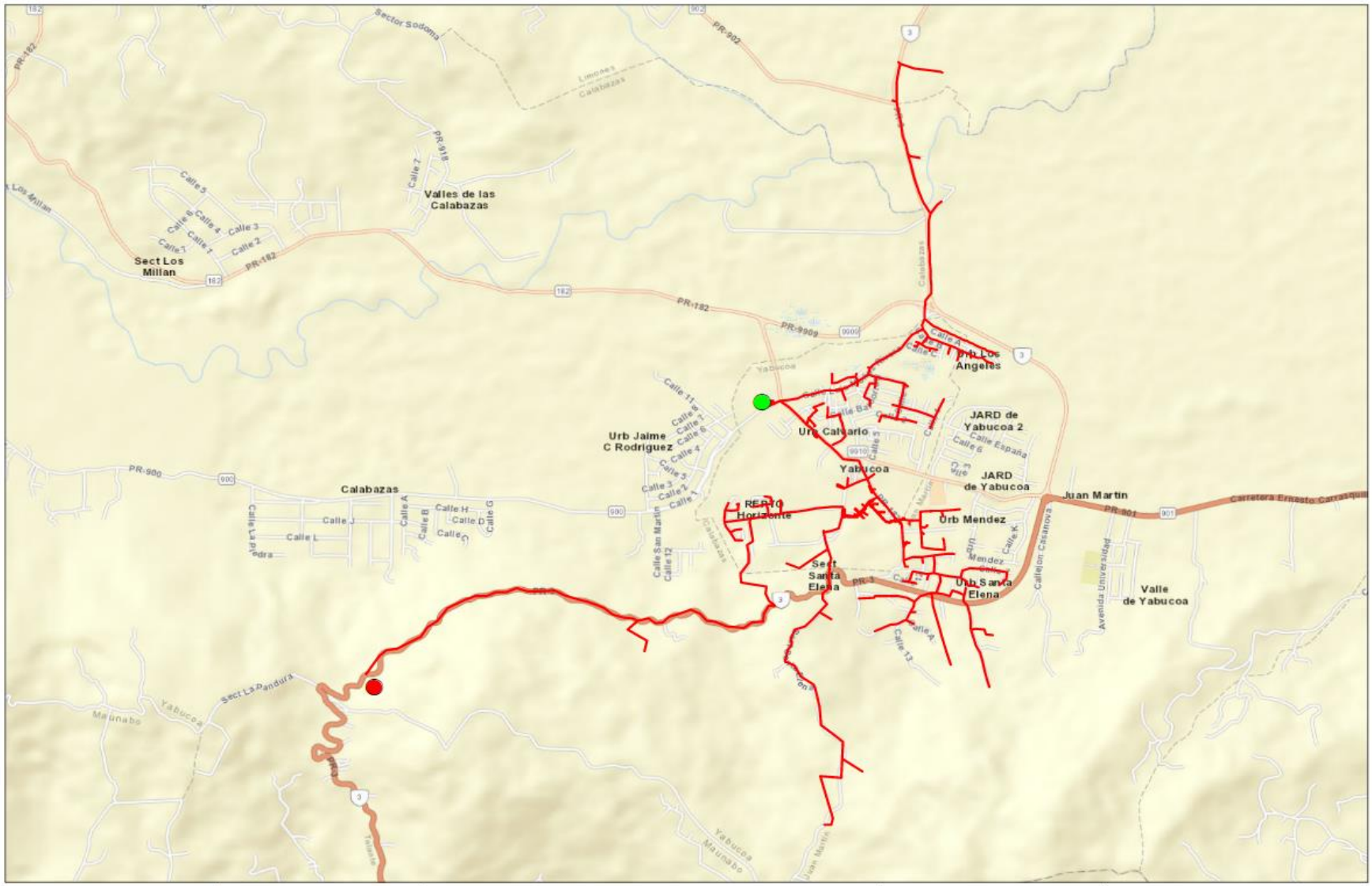
1:34,360

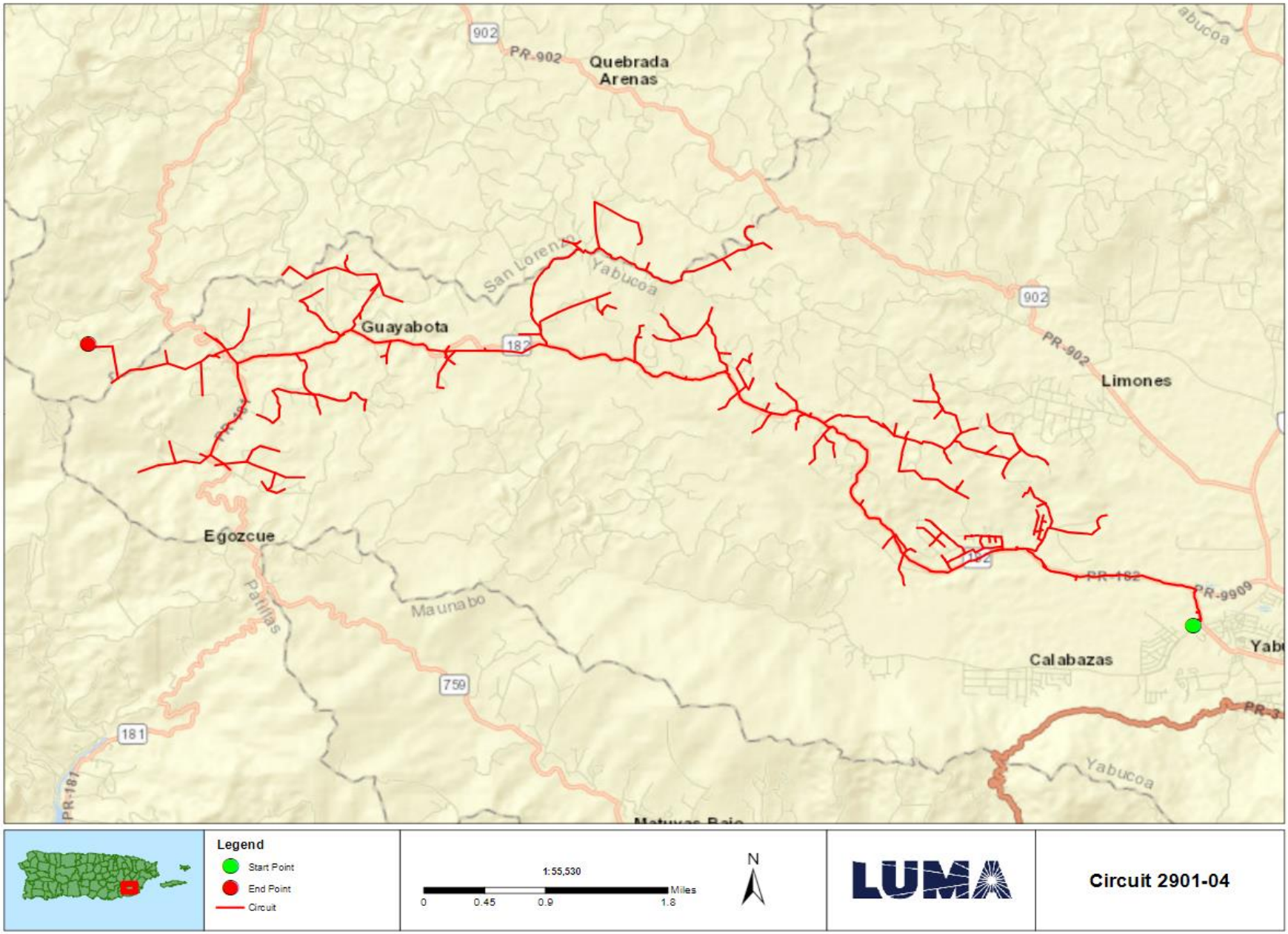
0 0.275 0.55 1.1 Miles

N

LUMA

Circuit 2901-01


Valles de las Calabazas
Sect Los Millan
PR-182
PR-902
PR-918
PR-900
PR-9909
Urb Los Angeles
JARD de Yabucoa 2
Urb Calvario
Urb Jaime C Rodriguez
Yabucoa
JARD de Yabucoa
Juan Martin
Carretera Ernesto Carrasquillo
Urb Mendez
RE-10 Horizonte
Sect Santa Elena
Urb Santa Elena
Valle de Yabucoa
Calabazas
Sect La Pandura
Maunabo
Legend
Start Point
End Point
Circuit
1:26,660
0 0.2 0.4 0.8 Miles
N
LUMA
Circuit 2901-02



Legend

- Start Point
- End Point
- Circuit

1:55,530

0 0.45 0.9 1.8 Miles

N

LUMA

Circuit 2901-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 5

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 5
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
AGUADA	7201-03	[redacted]		4.16
AGUADA	7201-05			4.16
ATALAYA	7303-02			4.16
OJO DE AGUA	7002-03			4.16
OJO DE AGUA	7002-04			4.16
AGUADILLA HOSPITAL	7003-02			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are; poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.07M**
Estimated Budget for Procurement & Construction:	**$20.69M**
Estimated Overall Budget for the Project:	**$22.76M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

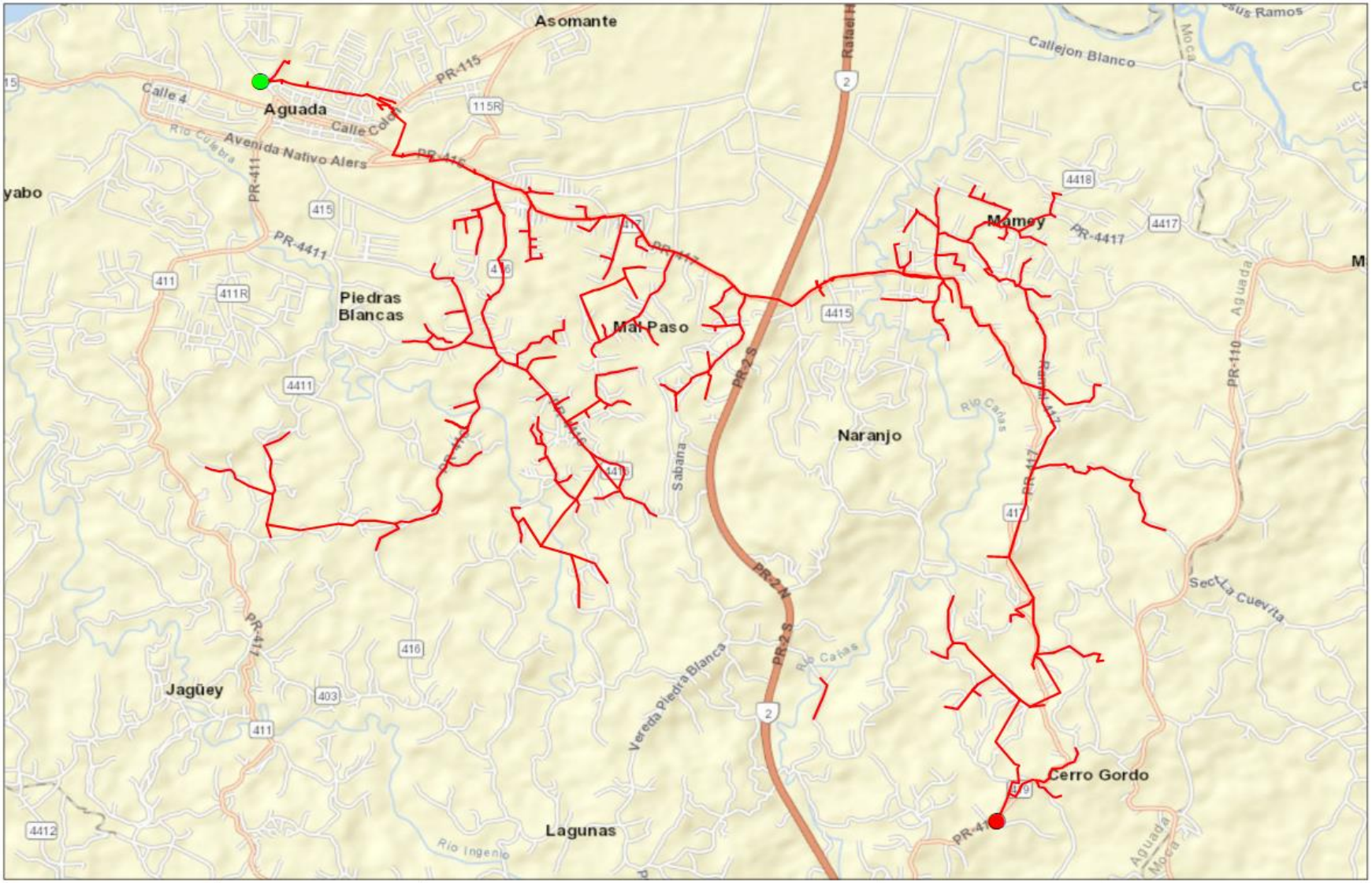
Note: If available, detailed engineering cost estimates will be included as an attachment.

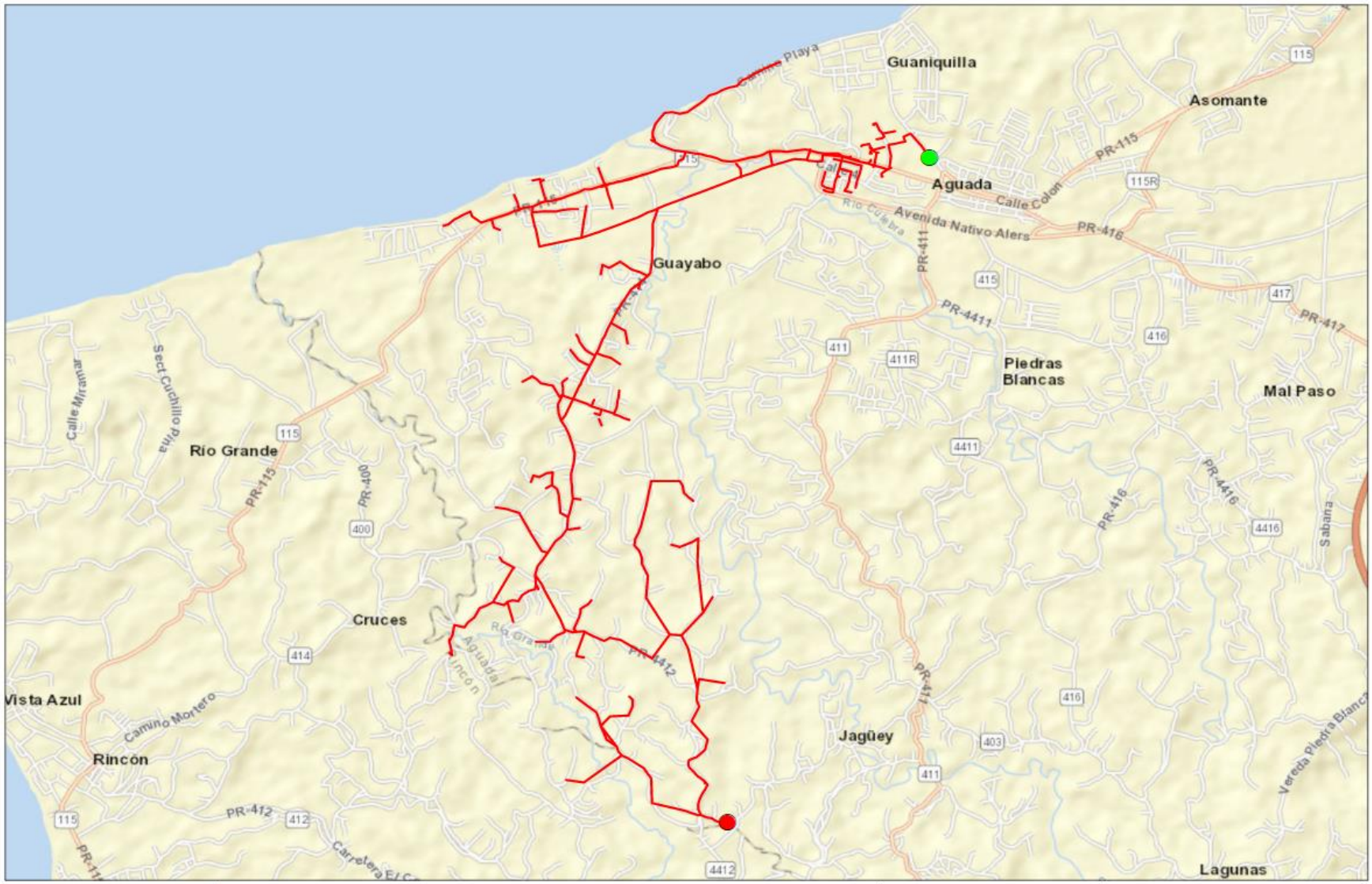
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 5 Location Maps	Location Maps and Site Picture


Asomante
Aguada
Calle 4
Calle Cola
PR-115
115R
Avenida Nativo Alers
PR-411
415
PR-4411
411
411R
Piedras Blancas
Mal Paso
4411
PR-2-S
Sabana
Naranjo
Callejon Blanco
4418
Mamey
PR-4417
4417
4415
PR-110
Aguada
Río Culebra
Río Cañas
PR-417
PR-2-N
Vereda Piedra Blanca
Jagüey
416
403
4412
Río Ingenio
Lagunas
Cerro Gordo
La Cuevita
Sec.
Legend
Start Point
End Point
Circuit
1:34,630
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 7201-03



Legend

- Start Point
- End Point
- Circuit

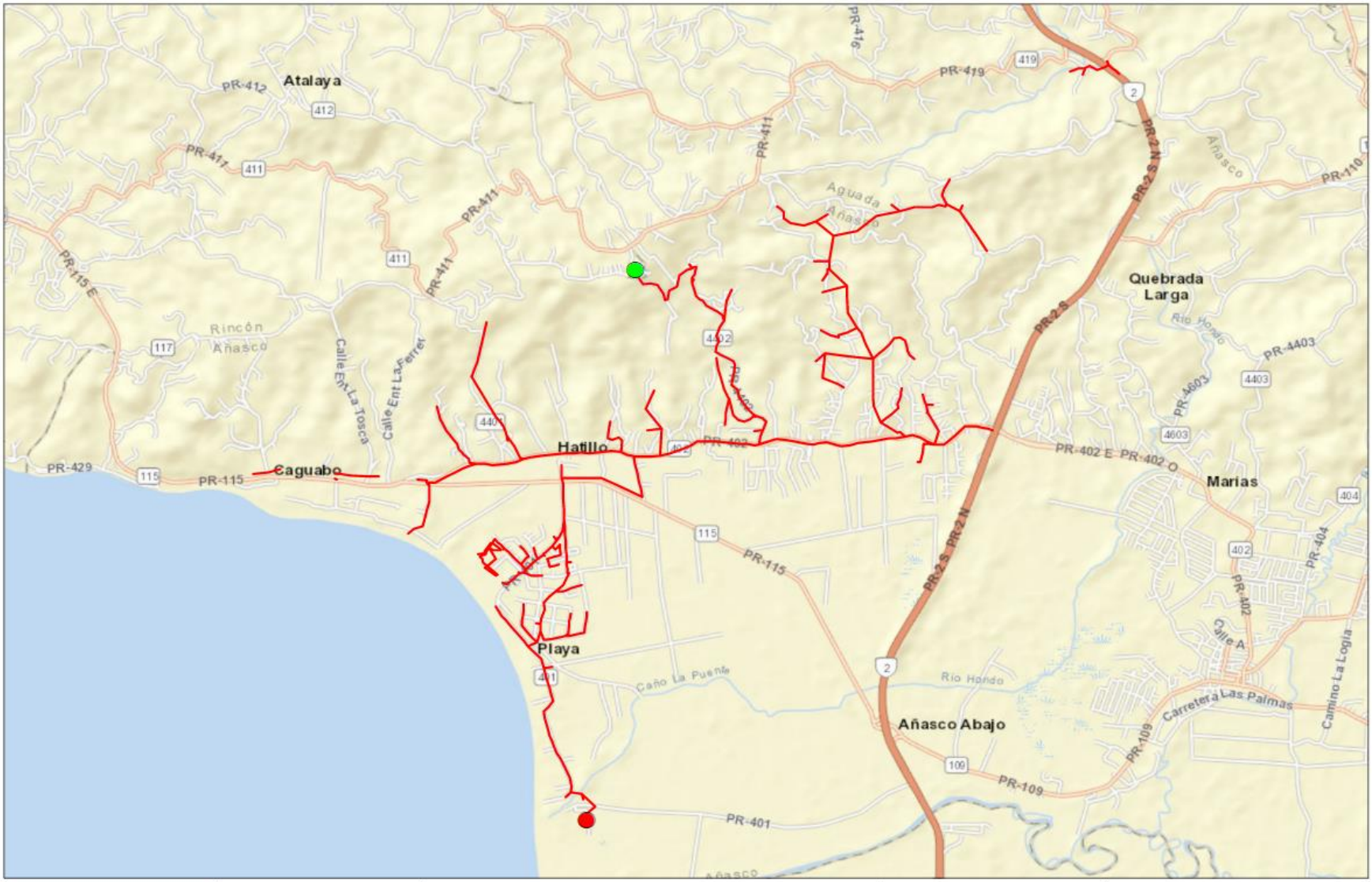
1:36,430

0 0.3 0.6 1.2 Miles

N

LUMA

Circuit 7201-05



Legend

- Start Point
- End Point
- Circuit

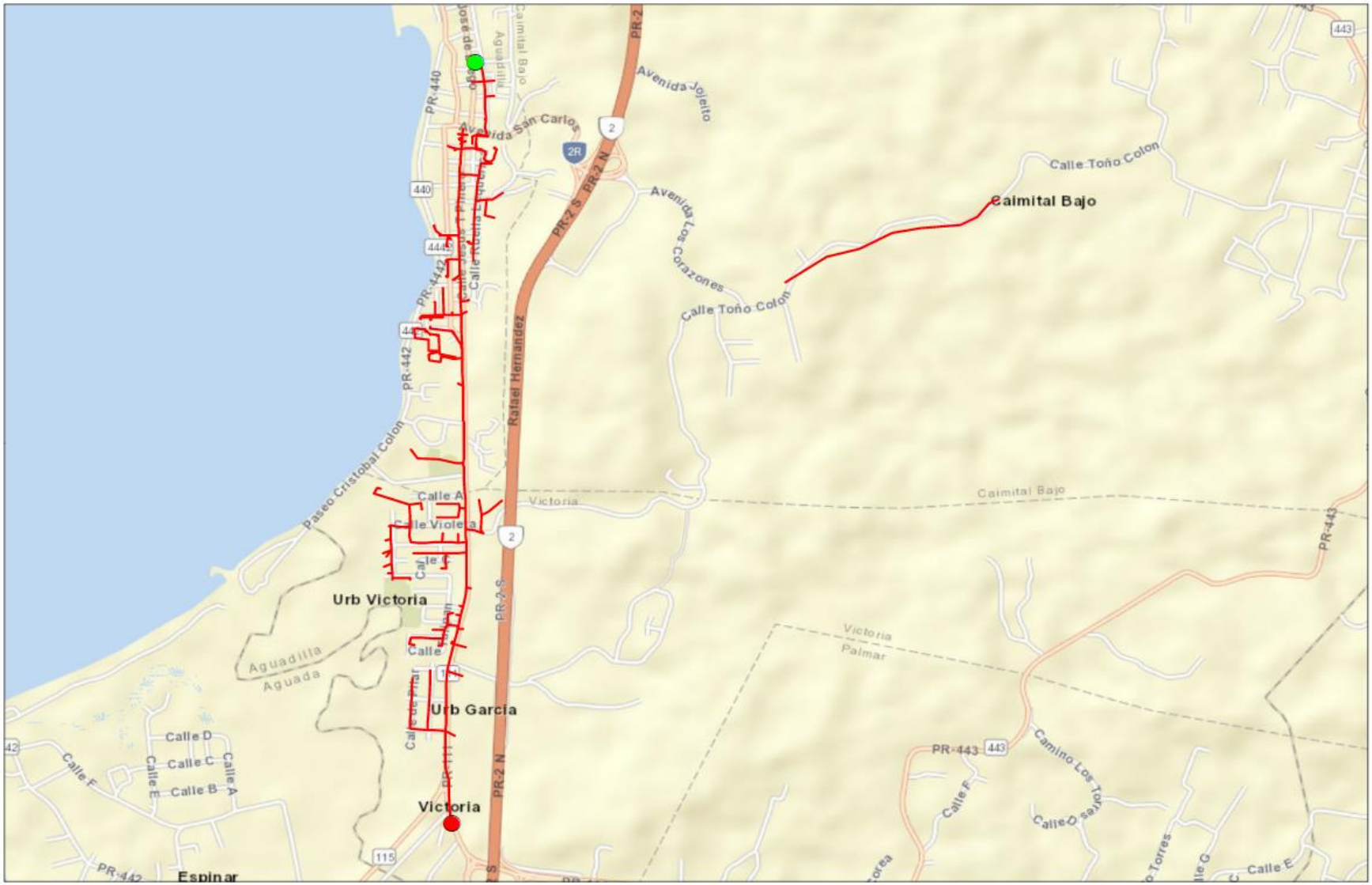
1:37,120

0 0.3 0.6 1.2 Miles

N

LUMA

Circuit 7303-02



Legend

- Start Point
- End Point
- Circuit

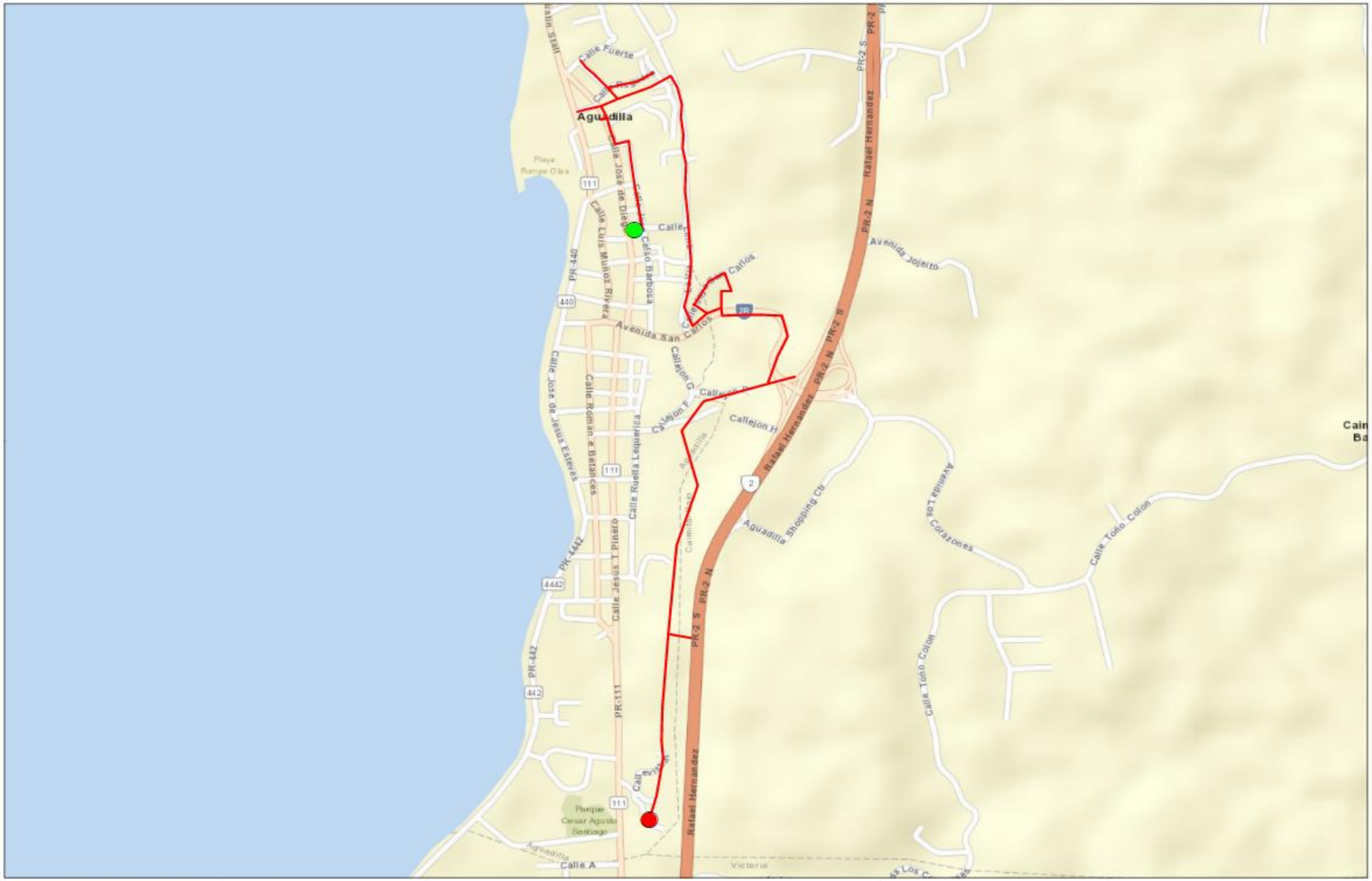
1:18,760

0 0.15 0.3 0.6 Miles

N

LUMA

Circuit 7002-03



Legend

- Start Point
- End Point
- Circuit

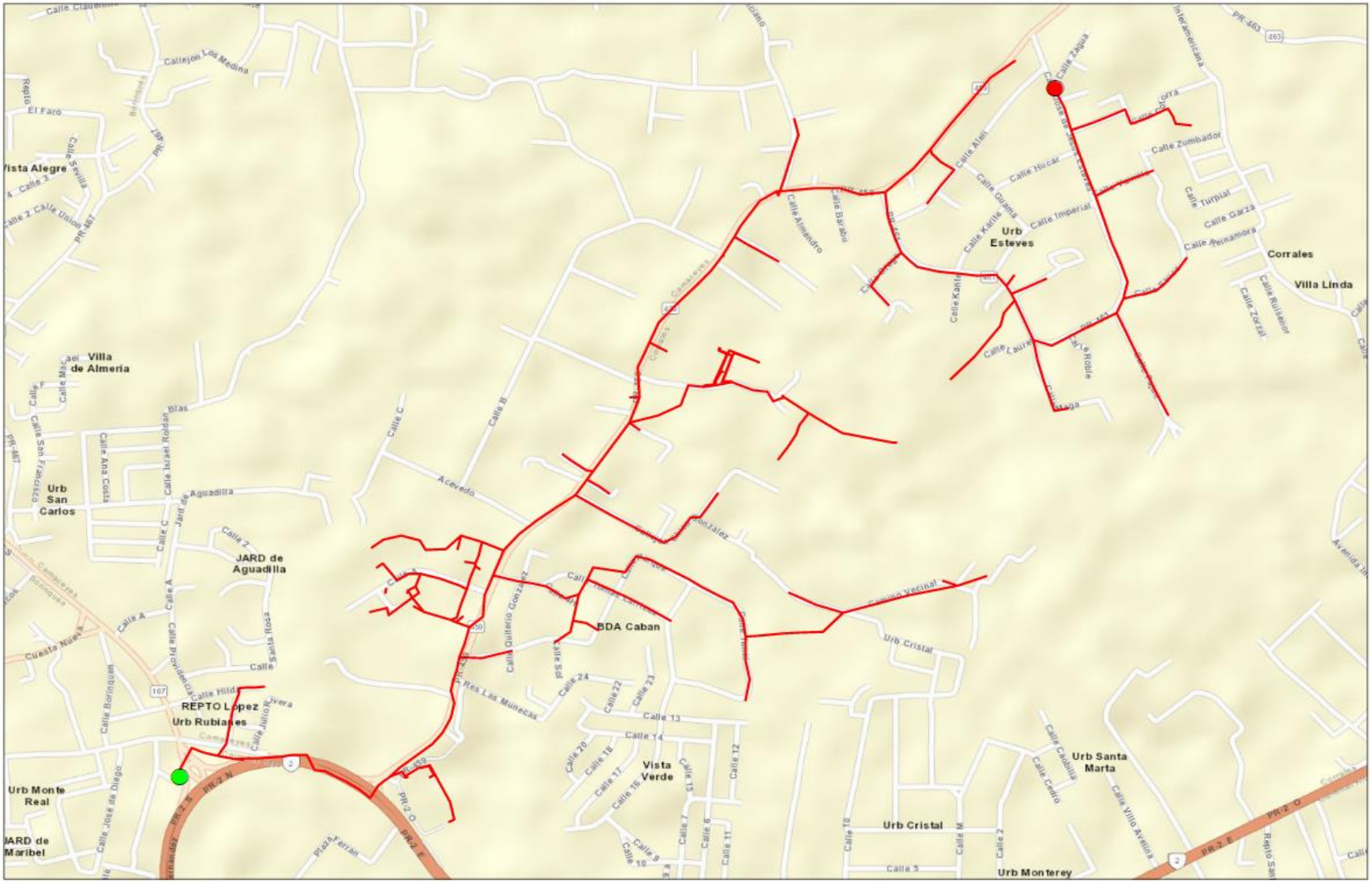
1:12,750

0 0.1 0.2 0.4 Miles

N

LUMA

Circuit 7002-04



Legend

- Start Point
- End Point
- Circuit

1:13,540

0 0.1 0.2 0.4 Miles

N

LUMA

Circuit 7003-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 6

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 6
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects In the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
AGUADILLA HOSPITAL	7003-03			4.16
RAMEY FIELD 2	7005-03			4.16
RAMEY FIELD 3	7006-01			4.16
RAMEY FIELD 3	7006-03			4.16
VICTORIA 13.2 kV	7008-04			13.2
T- BONE	7011-01			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are; poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.20M**
Estimated Budget for Procurement & Construction:	**$22.01M**
Estimated Overall Budget for the Project:	**$24.21M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

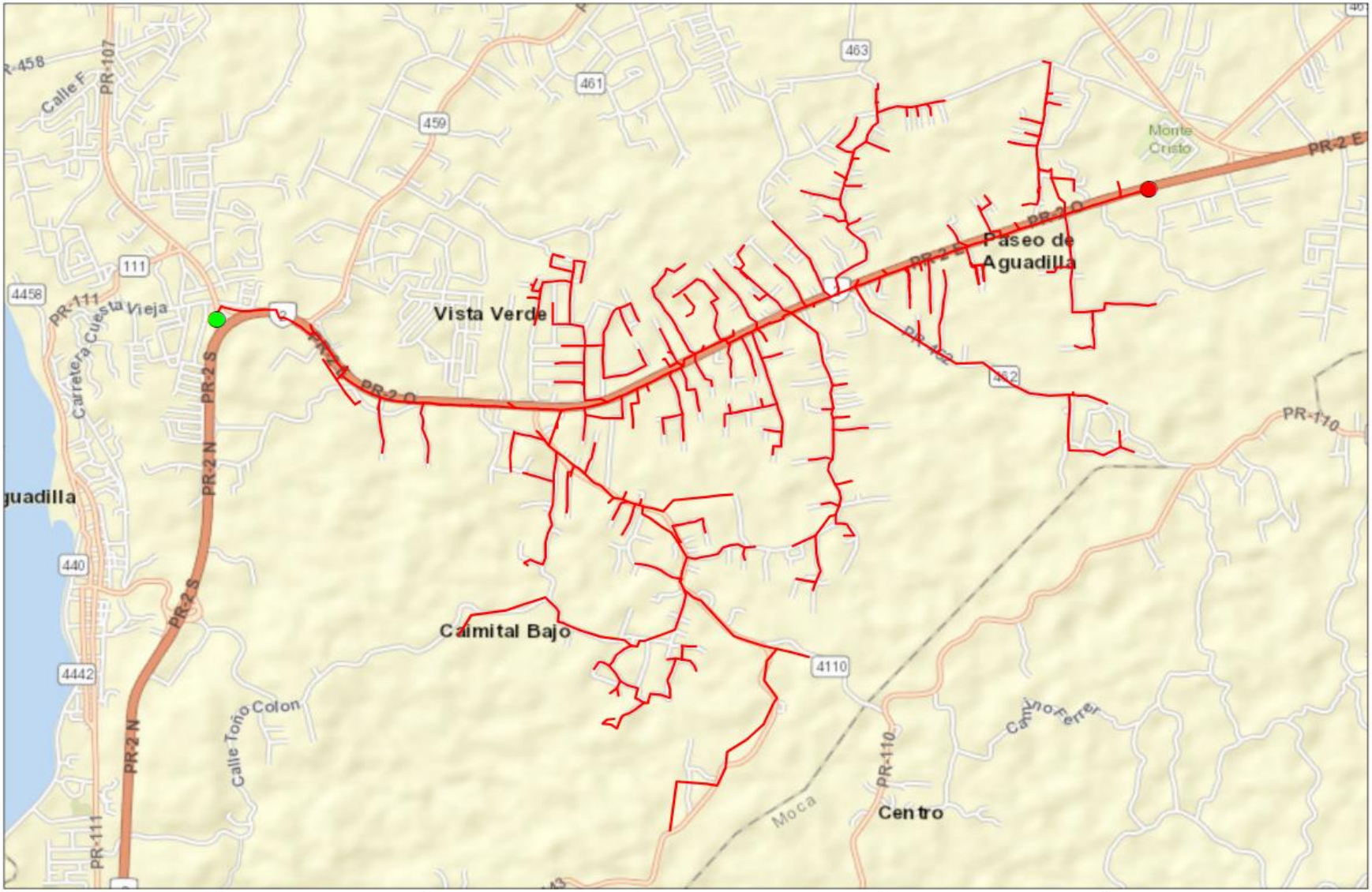
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 6 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

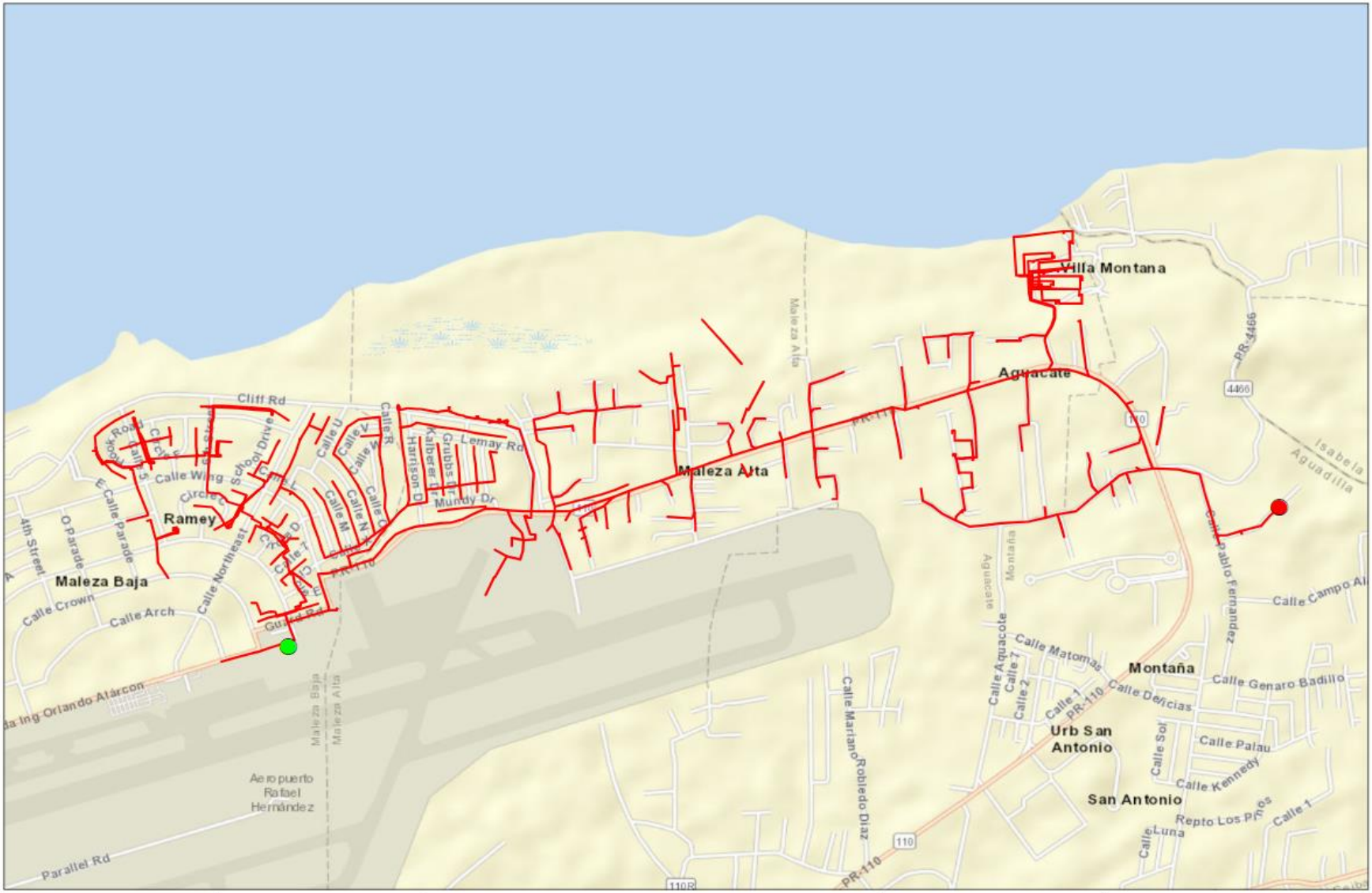
1:28,730

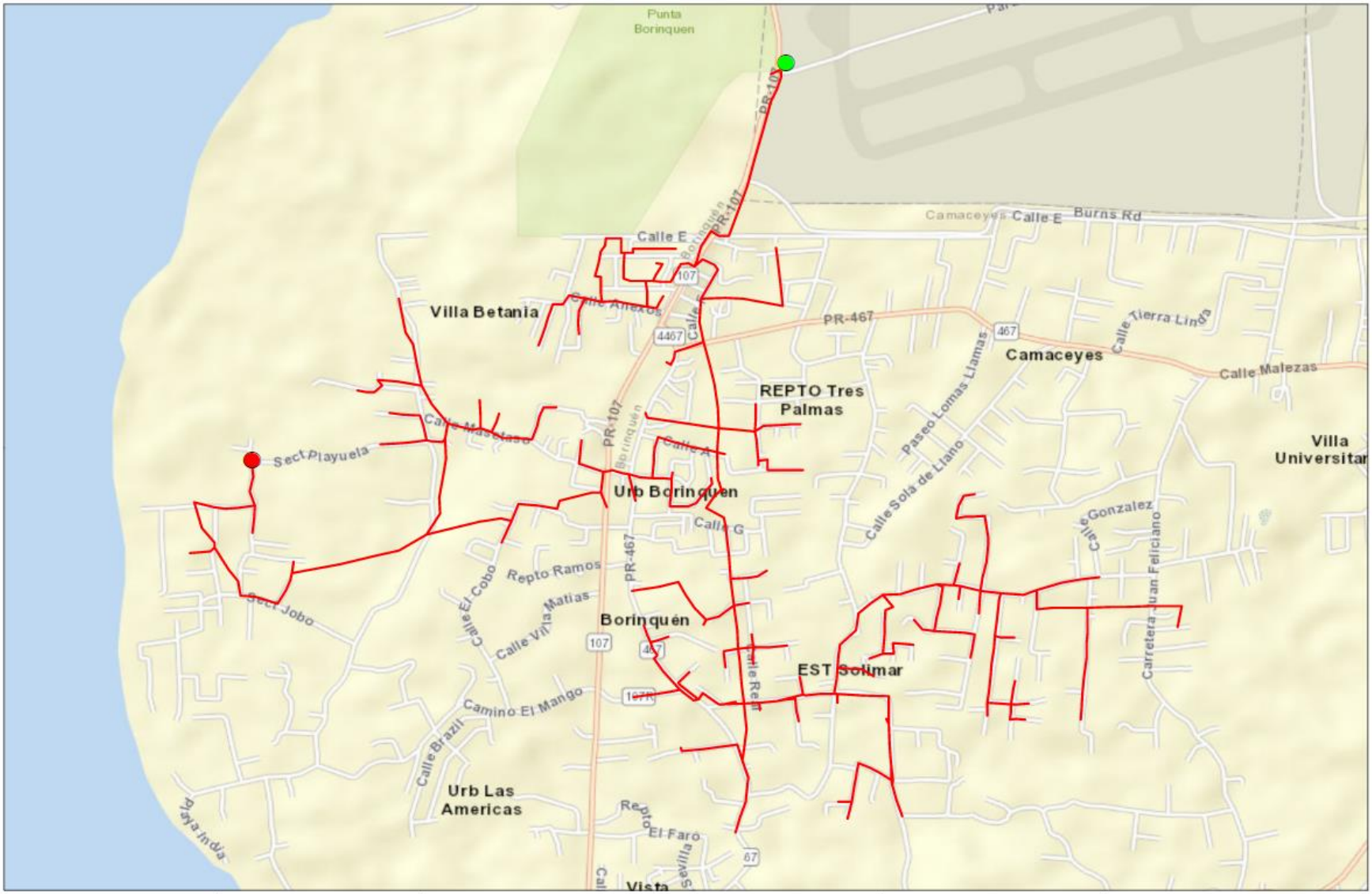
0 0.225 0.45 0.9 Miles

N

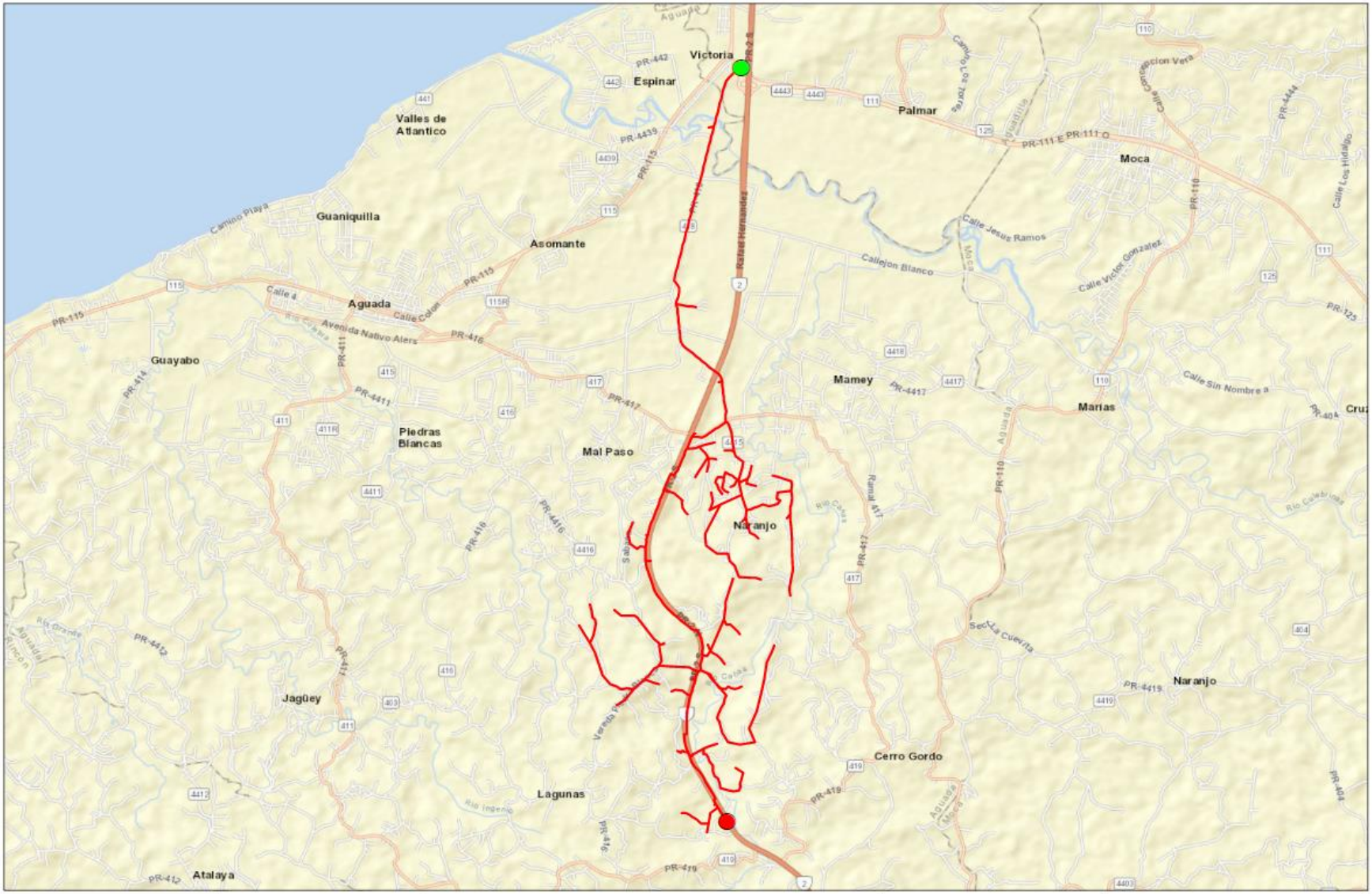
LUMA

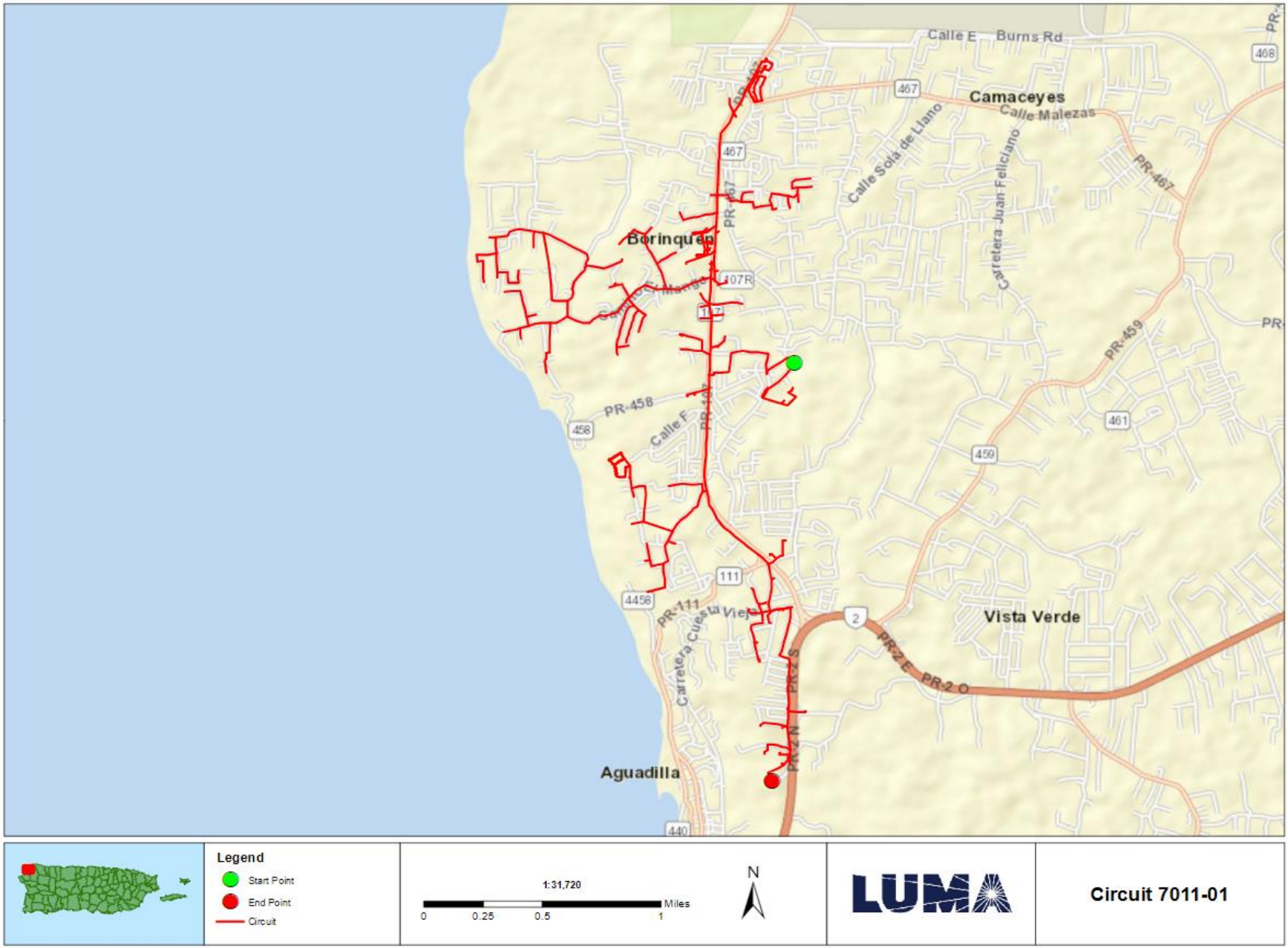
Circuit 7003-03


Villa Montana
Aguacate
Maleza Alta
Ramey
Maleza Baja
Montaña
Urb San Antonio
San Antonio
Aeropuerto Rafael Hernández
Cliff Rd
Lemay Rd
Mundy Dr
Calle Wing
Calle Northeast
Calle Crown
Calle Arch
Parallel Rd
Calle Matomas
Calle Genaro Badillo
Calle Palau
Calle Kennedy
Calle Luna
Calle Pablo Fernandez
Calle Mariano Robledo Diaz
PR-110
PR-4466
Isabela
Aguadilla
Legend
Start Point
End Point
Circuit
1:19,370
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 7005-03


Punta Borinquen
PR-107
Calle E
Burns Rd
Villa Betania
Calle Anexos
PR-467
Calle Tierra Linda
Camaceyes
Calle Malezas
REPTO Tres Palmas
Paseo Lomas Llamas
Calle Sola de Llano
Villa Universitar
Sect Playuela
Calle Mastetaso
Calle A
Urb Borinquen
Calle G
Calle Gonzalez
Carretera Juan Feliciano
Repto Ramos
Calle El Cobo
Calle Vila Matias
Sect Jobo
Borinquen
EST Solimar
Calle Real
Camino El Mango
Calle Brazil
Urb Las Americas
Repto El Faro
Playa India
Vista
Legend
Start Point
End Point
Circuit
1:17,350
0 0.125 0.25 0.5 Miles
N
LUMA
Circuit 7006-01


Punta Borinquen
Punta Borinquen
Parallel Rd
PR-107
Maleza Baja
Burns Rd
Calle E
Calle A
Calle B
Calle C
Calle D
Calle F
Calle Anexos
Repto Sola
PR-467
Camaceyes
Paraiso
Calle Vista del Rum
Calle Tierra Linda
Calle Las Llamas
Calle Cerro de Llano
Calle Gonzalez
Calle Juan Feliciano
Paseo de Parq
Liceo Agustiliano Cabrera
Calle Maleza
Calle Upr
Calle Rum
Calle U C
Calle Harvard
Calle Obdulio Vega
Calle Guavate
Calle G
Calle Iguaca
Villa de Palma
REPTO Tres Palmas
Calle Jose R Soto
Urb Borinquen
EXT El Verde
Urb El Verde
Villa Universitaria
PARQ La Arboleda
Urb Maleza Gdns
Legend
Start Point
End Point
Circuit
1:11,690
0 0.075 0.15 0.3 Miles
N
LUMA
Circuit 7006-03


Victoria
Espinar
Valles de Atlantico
Guaniquilla
Asomante
Aguada
Guayabo
Piedras Blancas
Mal Paso
Palmar
Moca
Mamey
Marias
Naranjo
Jagüey
Lagunas
Cerro Gordo
Atalaya
Legend
Start Point
End Point
Circuit
1:51,600
0
0.425
0.85
1.7
Miles
N
LUMA
Circuit 7008-04


Calle E Burns Rd
Camaceyes
Calle Malezas
Calle Solá de Llano
Carretera Juan Feliciano
PR-467
Borinquen
PR-459
PR-458
Calle F
Carretera Cuesta Vieja
PR-111
Vista Verde
PR-2 E
PR-2 O
PR-2 N
PR-2 S
Aguadilla
467
468
458
459
461
111
4458
2
440
Legend
Start Point
End Point
Circuit
1:31,720
0
0.25
0.5
1
Miles
N
LUMA
Circuit 7011-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 7

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 7
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
T-BONE	7011-02	[redacted]	[redacted]	13.2
CEIBA BAJA	7012-01			4.16
CAMPAMENTO MORA	7502-01			4.16
CAMPAMENTO MORA	7502-02			4.16
CAMPAMENTO MORA	7502-03			4.16
ISABELA	7503-04			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are; poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.32M**
Estimated Budget for Procurement & Construction:	**$23.19M**
Estimated Overall Budget for the Project:	**$25.51M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

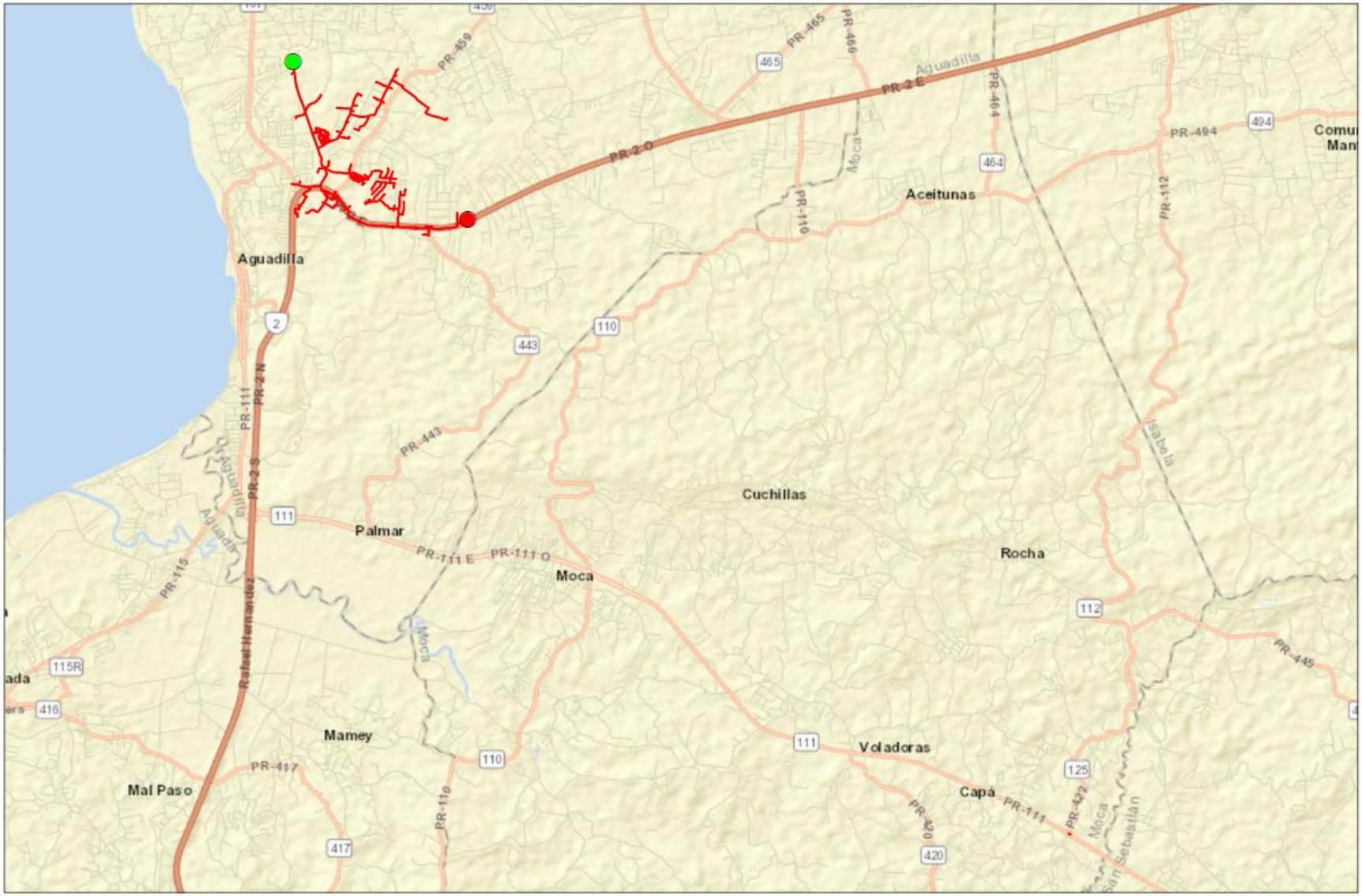
Note: If available, detailed engineering cost estimates will be included as an attachment.

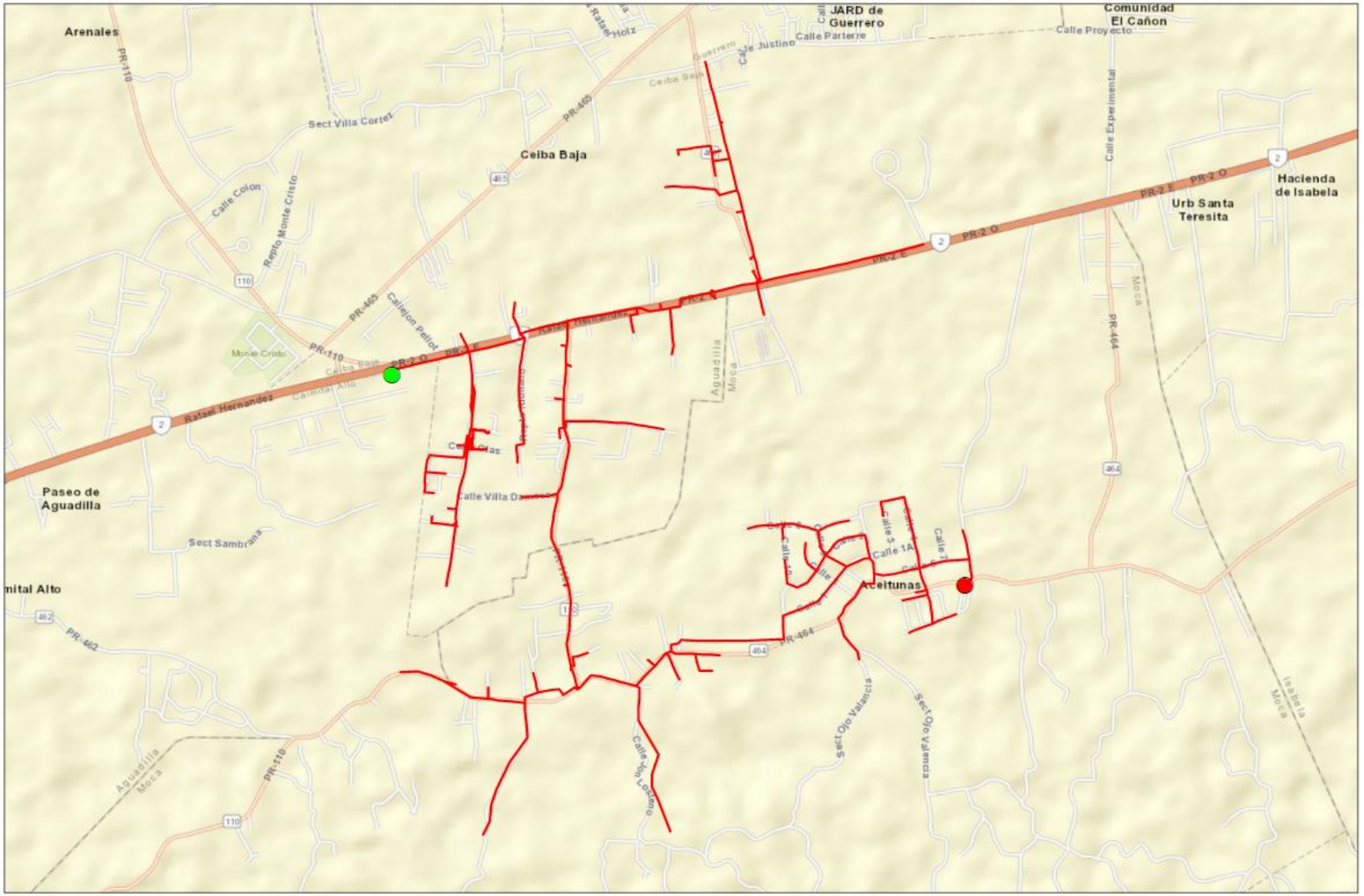
Environmental & Historic Preservation Requirements

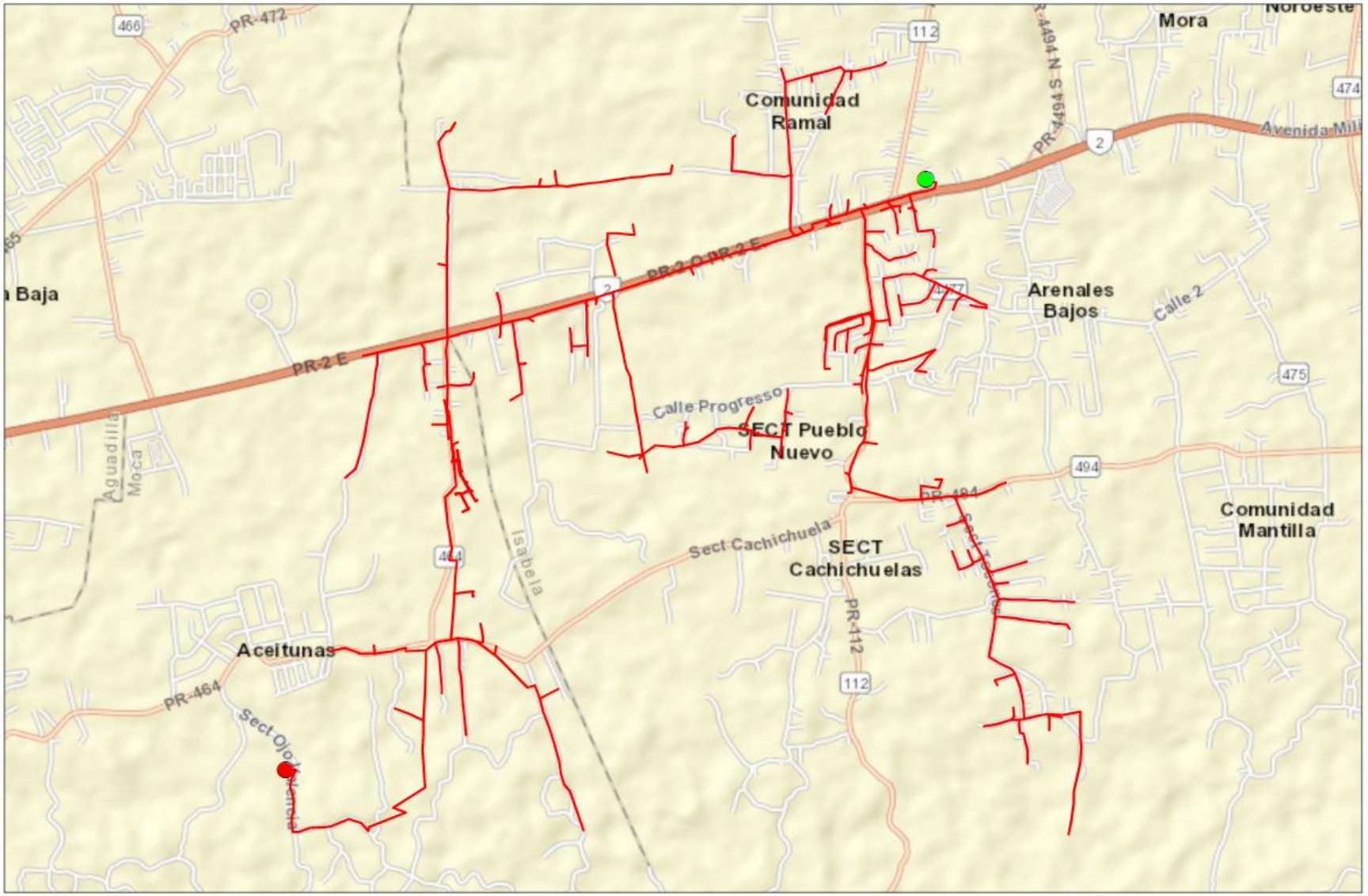
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 7 Location Maps	Location Maps and Site Picture


Aguadilla
Aceitunas
Cuchillas
Palmar
Moca
Rocha
Mamey
Mal Paso
Voladoras
Capá
PR-2 O
PR-2 E
PR-2 N
PR-2 S
PR-111
PR-111 E
PR-111 O
PR-110
PR-112
PR-115
PR-417
PR-443
PR-445
PR-459
PR-464
PR-465
PR-466
PR-494
PR-420
PR-422
Rafael Hernández
Isabela
Moca
San Sebastián
Aguadilla
Legend
Start Point
End Point
Circuit
1:68,040
0
0.5
1
2
Miles
N
LUMA
Circuit 7011-02


Arenales
JARD de Guerrero
Comunidad El Cañon
Calle Proyecto
Calle Justino
Calle Parterre
Sect Villa Cortez
Ceiba Baja
Calle Colon
Repto Monte Cristo
Calle Experimental
Hacienda de Isabela
Urb Santa Teresita
PR-2 E
PR-2 O
Rafael Hernandez
Callejon Pellot
Monte Cristo
Calimital Alto
Aguadilla
Moca
PR-464
Paseo de Aguadilla
Sect Sambrana
Calle Villa Dam
Calle 5 1A
Aceitunas
PR-462
PR-110
Sect Ojo Valancia
Calle Jon Lozano
Isabela
Legend
Start Point
End Point
Circuit
1:24,080
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 7012-01



Legend

- Start Point
- End Point
- Circuit

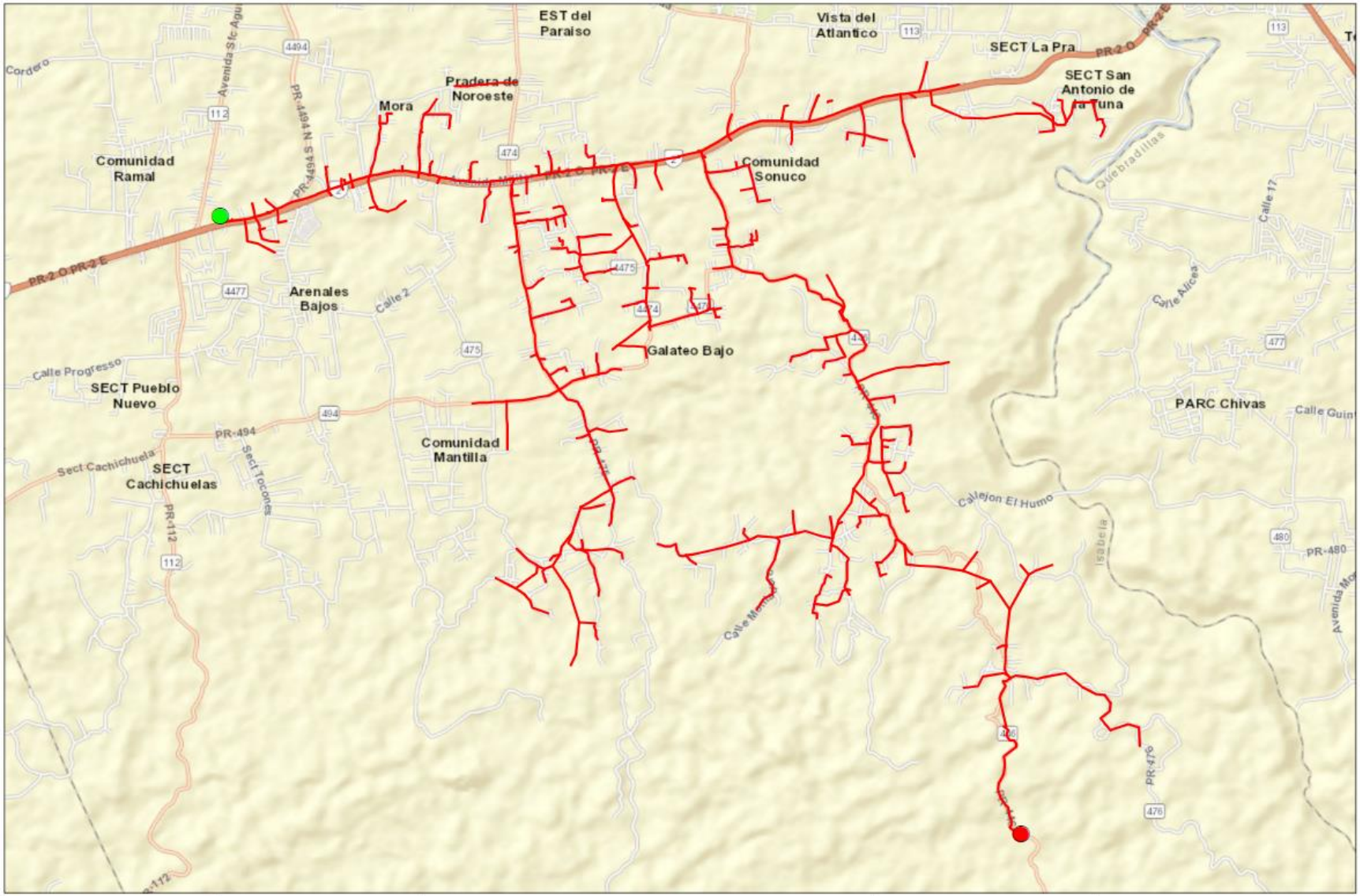
1:28,630

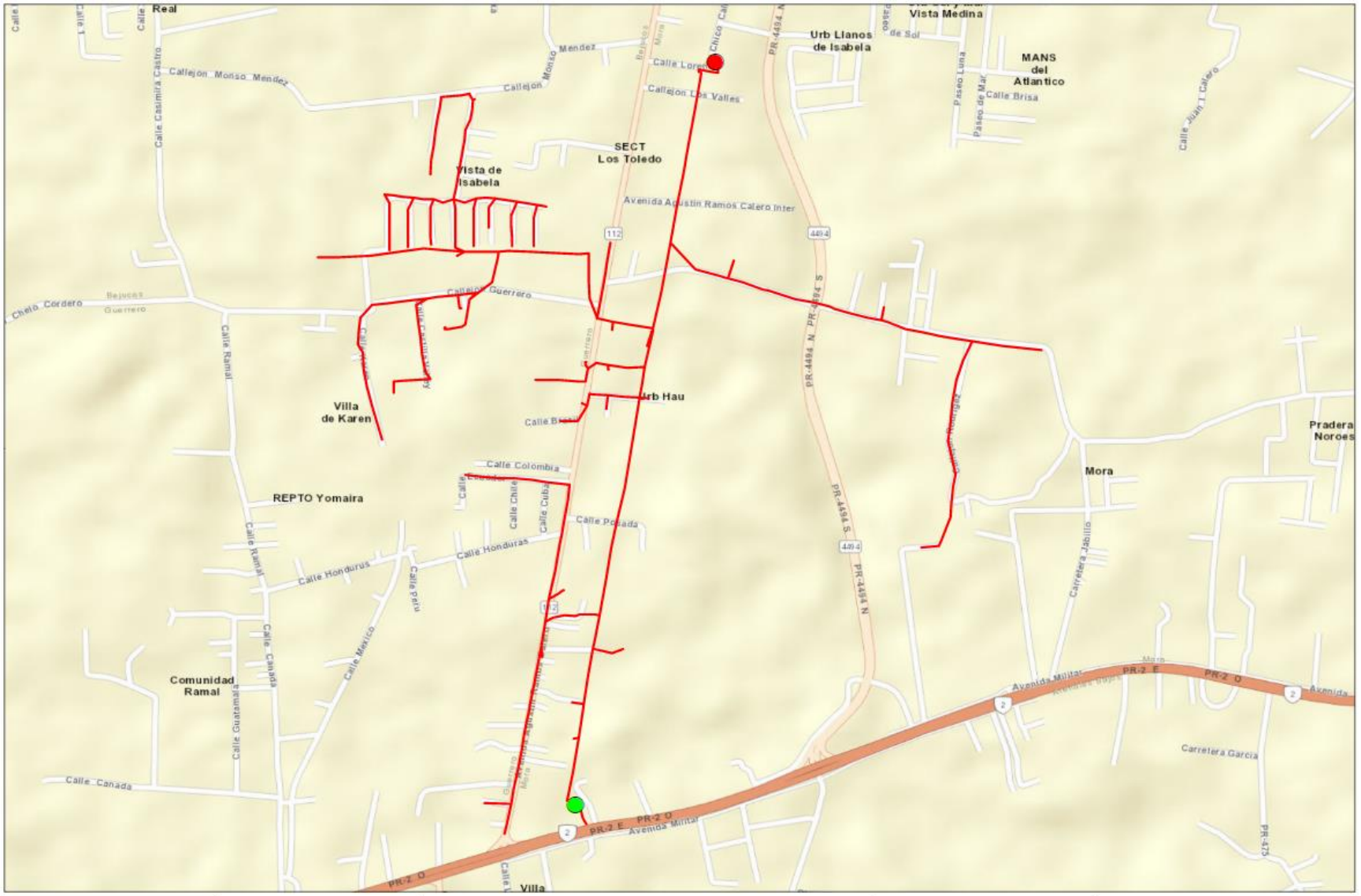
0 0.225 0.45 0.9 Miles

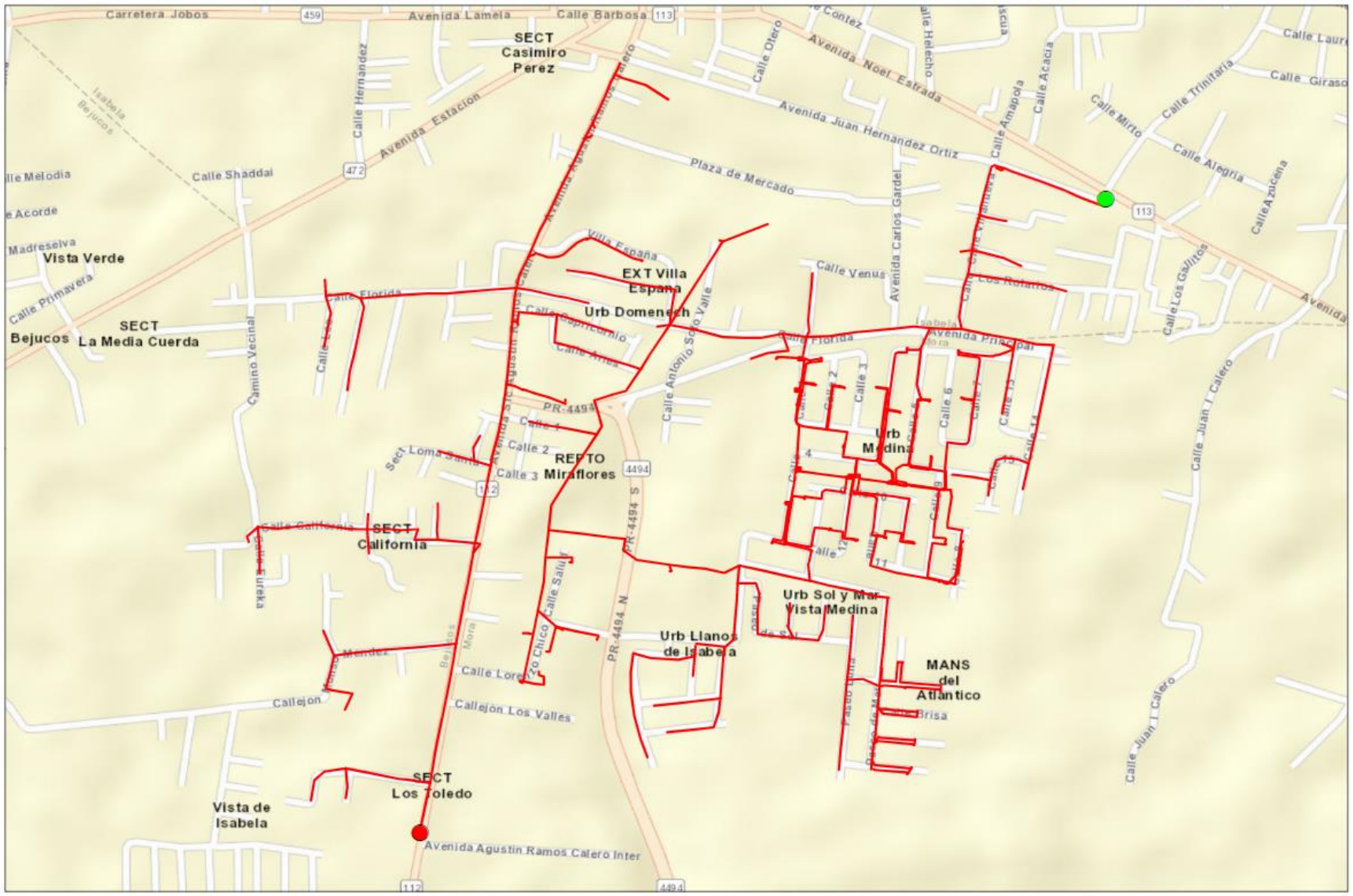
N

LUMA

Circuit 7502-01


EST del Paraiso
Vista del Atlantico
SECT La Pra
SECT San Antonio de la Tuna
Pradera de Noroeste
Mora
Comunidad Ramal
Comunidad Sonuco
Arenales Bajos
Galateo Bajo
SECT Pueblo Nuevo
Comunidad Mantilla
SECT Cachichuelas
PARC Chivas
Callejon El Humo
PR-2 O PR-2 E
PR-494
PR-112
PR-480
PR-476
Legend
Start Point
End Point
Circuit
1:41,620
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 7502-02


Real
Callejon Monso Mendez
Calle Casimira Castro
Callejon Monso Mendez
Calle Lorena
Callejon Los Valles
Urb Llanos de Isabela
Vista Medina
MANS del Atlantico
Calle Brisa
Calle Juan T Calero
SECT Los Toledo
Vista de Isabela
Avenida Agustin Ramos Calero Inter
112
4494
Callejon Guerrero
Calle Ramal
Villa de Karen
Urb Hau
Calle Colombia
Pradera Noroes
Mora
REPTO Yomaira
Calle Honduras
Calle Peru
Calle Mexico
Calle Canada
Comunidad Ramal
Carretera Jobillo
Avenida Militar
PR-2 E
PR-2 O
Carretera Garcia
PR-475
Villa
Legend
Start Point
End Point
Circuit
1:13,050
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 7502-03


Carretera Jobos
Avenida Lamela
Calle Barbosa
SECT Casimiro Perez
Avenida Noel Estrada
Avenida Juan Hernandez Ortiz
Avenida Estacion
Calle Shaddai
Plaza de Mercado
Vista Verde
SECT Bejucos
SECT La Media Cuerda
Villa España
EXT Villa España
Urb Domenech
Calle Venus
Calle Florida
Avenida Principal
Urb Medina
PR-4494
REPTO Miraflores
Sect Loma Santa
SECT California
Urb Sol y Mar
Vista Medina
Urb Llanos de Isabela
MANS del Atlantico
Callejon
Callejon Los Valles
SECT Los Toledo
Vista de Isabela
Avenida Agustin Ramos Calero Inter
Legend
Start Point
End Point
Circuit
1:10,280
0
0.075
0.15
0.3
Miles
N
LUMA
Circuit 7503-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 8

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 8
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
ISABELA	7503-05	[redacted]	[redacted]	4.16
ISABELA PLANTA 3	7504-01			4.16
MORA 13.2kV	7505-05			4.16
LARES	7901-03			4.16
LARES	7901-04			4.16
LAS MARIAS	6201-02			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are; poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$3.14M**
Estimated Budget for Procurement & Construction:	**$31.48M**
Estimated Overall Budget for the Project:	**$34.63M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

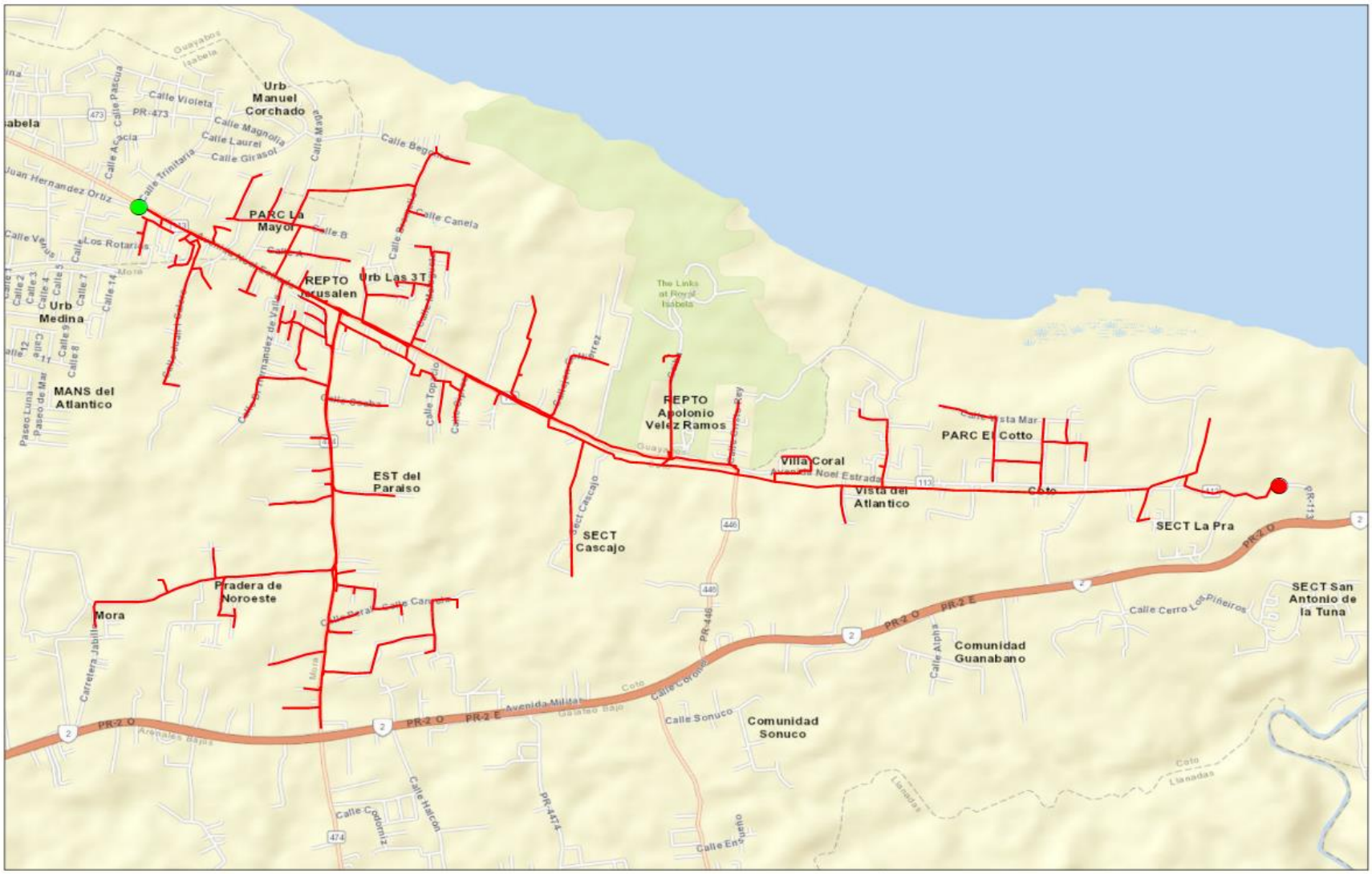
Note: If available, detailed engineering cost estimates will be included as an attachment.

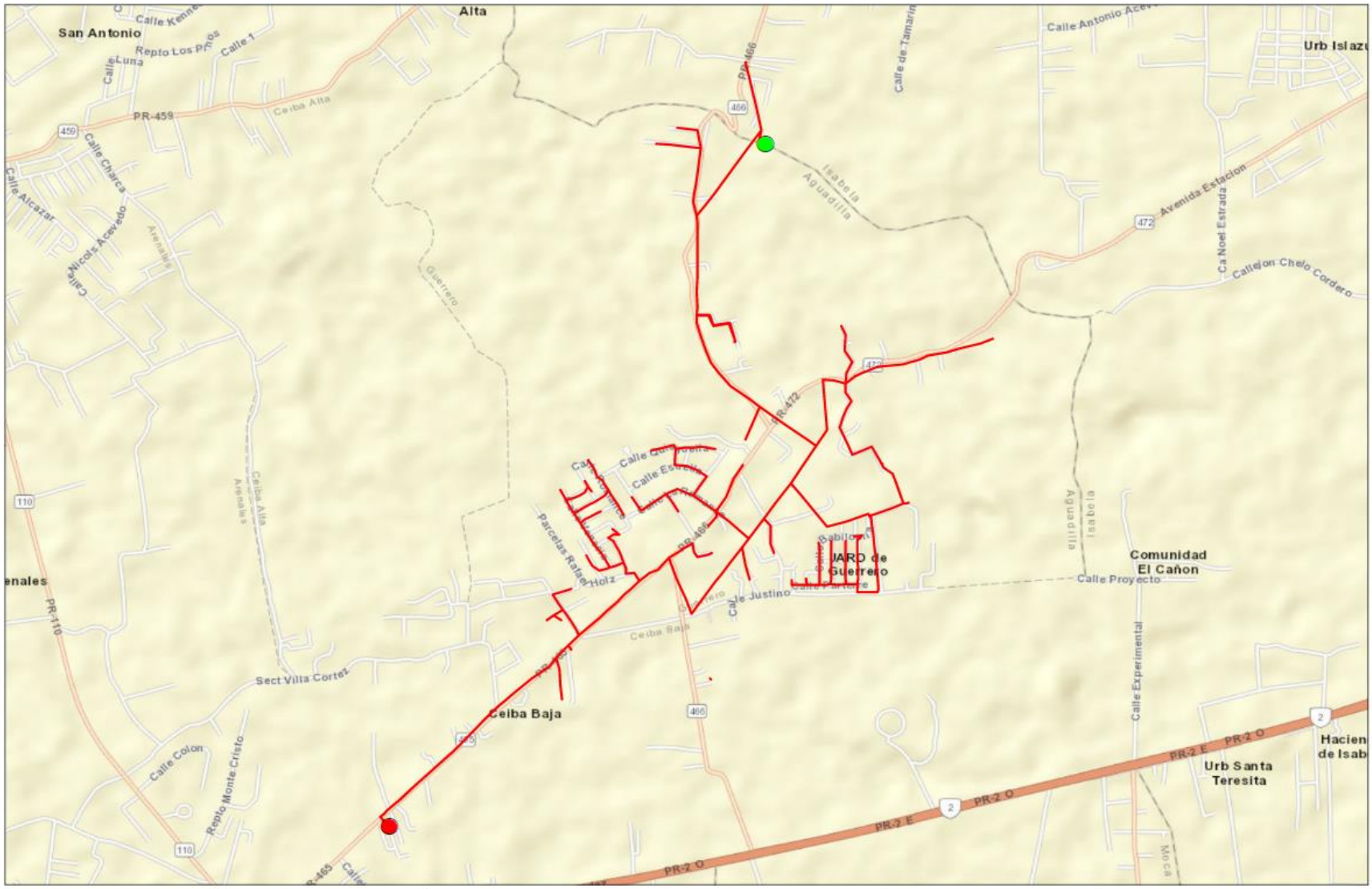
Environmental & Historic Preservation Requirements

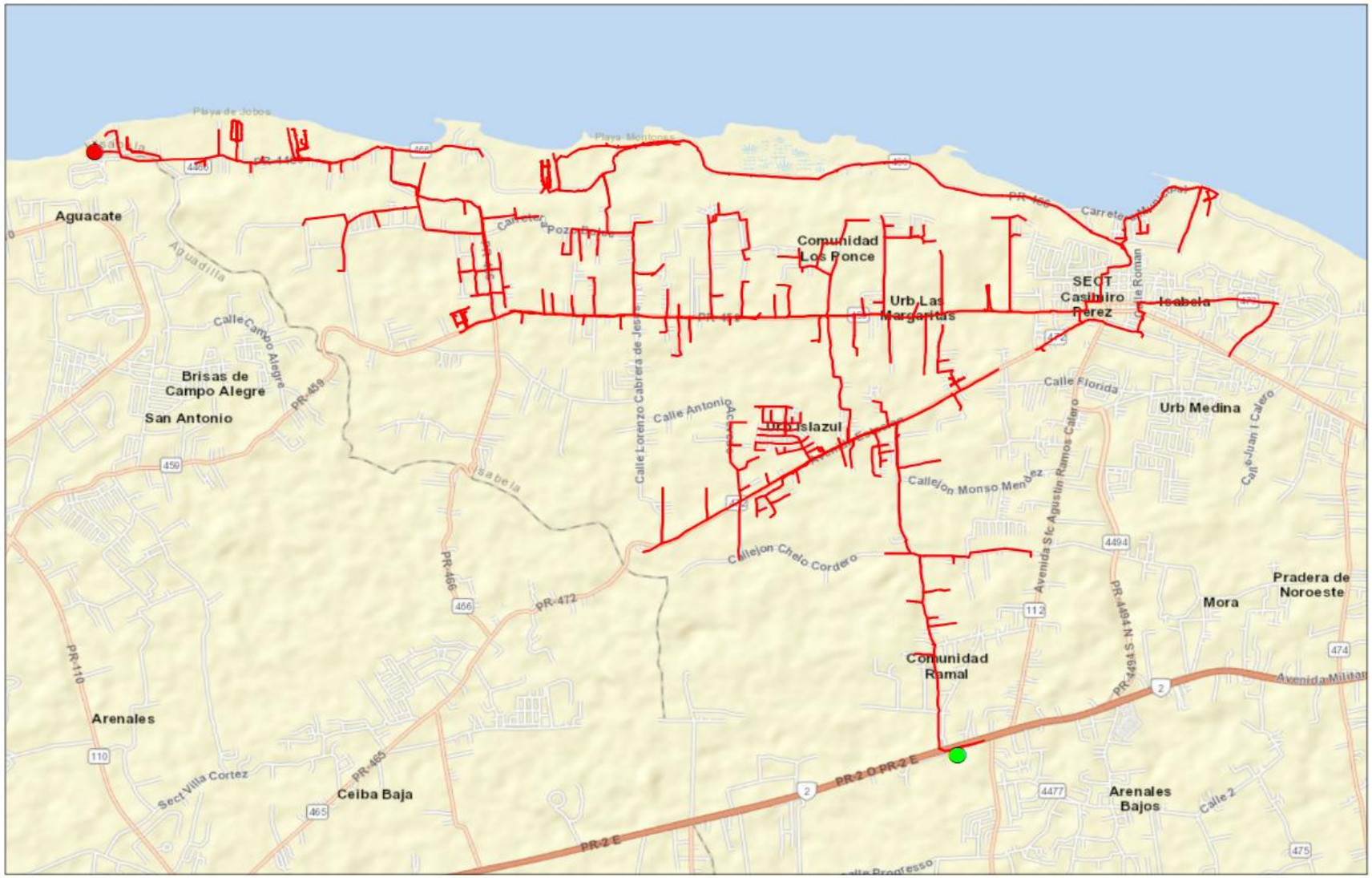
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 8 Location Maps	Location Maps and Site Picture


Urb Manuel Corchado
PARC La Mayor
REPTO Jerusalen
Urb Las 3T
Urb Medina
MANS del Atlantico
EST del Paraiso
REPTO Apolonio Velez Ramos
Villa Coral
Vista del Atlantico
PARC El Coto
SECT Cascajo
SECT La Pra
SECT San Antonio de la Tuna
Pradera de Noroeste
Mora
Comunidad Guanabano
Comunidad Sonuco
Calle Violeta
Calle Trinitaria
Calle Magnolia
Calle Laurel
Calle Girasol
Calle Canela
Calle Sonuco
PR-2 O
PR-2 E
PR-446
PR-474
Legend
Start Point
End Point
Circuit
1:24,170
1
of 1
N
LUMA
Circuit 7503-05


San Antonio
Alta
Urb Islazu
Calle Kennedy
Repto Los Pinos
Calle 1
Calle Luna
PR-459
Ceiba Alta
Calle Chacra
Calle Alcazar
Nicols Acevedo
Arenales
Guerrero
PR-466
Calle de Tamarindo
Calle Antonio Acevedo
Isabela Aguadilla
Avenida Estacion
Ca Noel Estrada
Callejon Chelo Cordero
PR-472
Calle Guayabita
Calle Esperanza
Parcelas Rafael Holz
Barrio Sabana
JARD de Guerrero
Comunidad El Cañon
Calle Proyecto
Calle Justino
Ceiba Baja
Sect Villa Cortez
PR-110
Calle Colon
Repto Monte Cristo
Calle Experimental
Urb Santa Teresita
PR-2 E
PR-2 O
Hacien de Isab
Legend
Start Point
End Point
Circuit
1:22,070
0
1
of 1
N
LUMA
Circuit 7504-01



Legend

- Start Point
- End Point
- Circuit

1:39,970

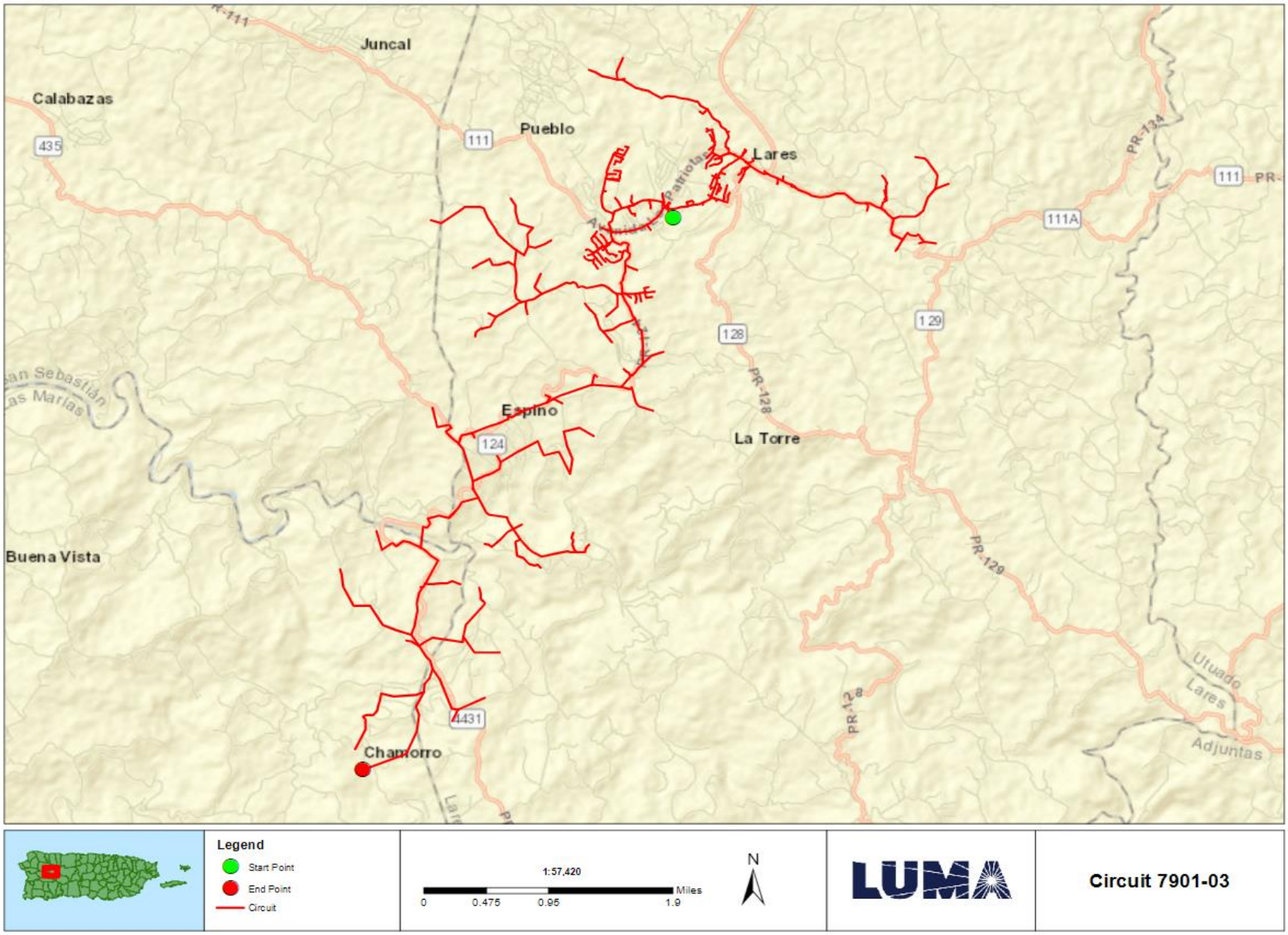
0

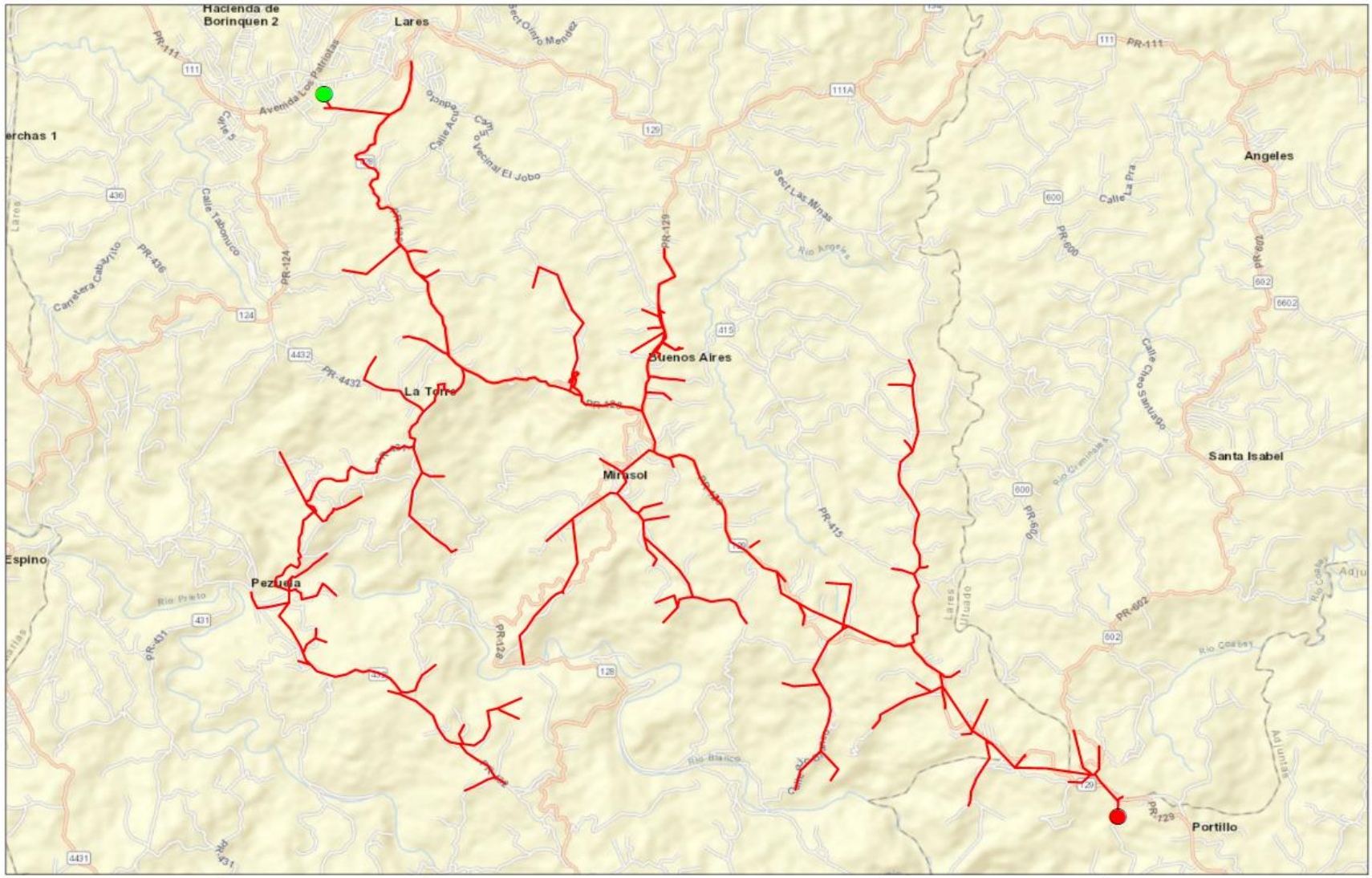
1 of 1

N

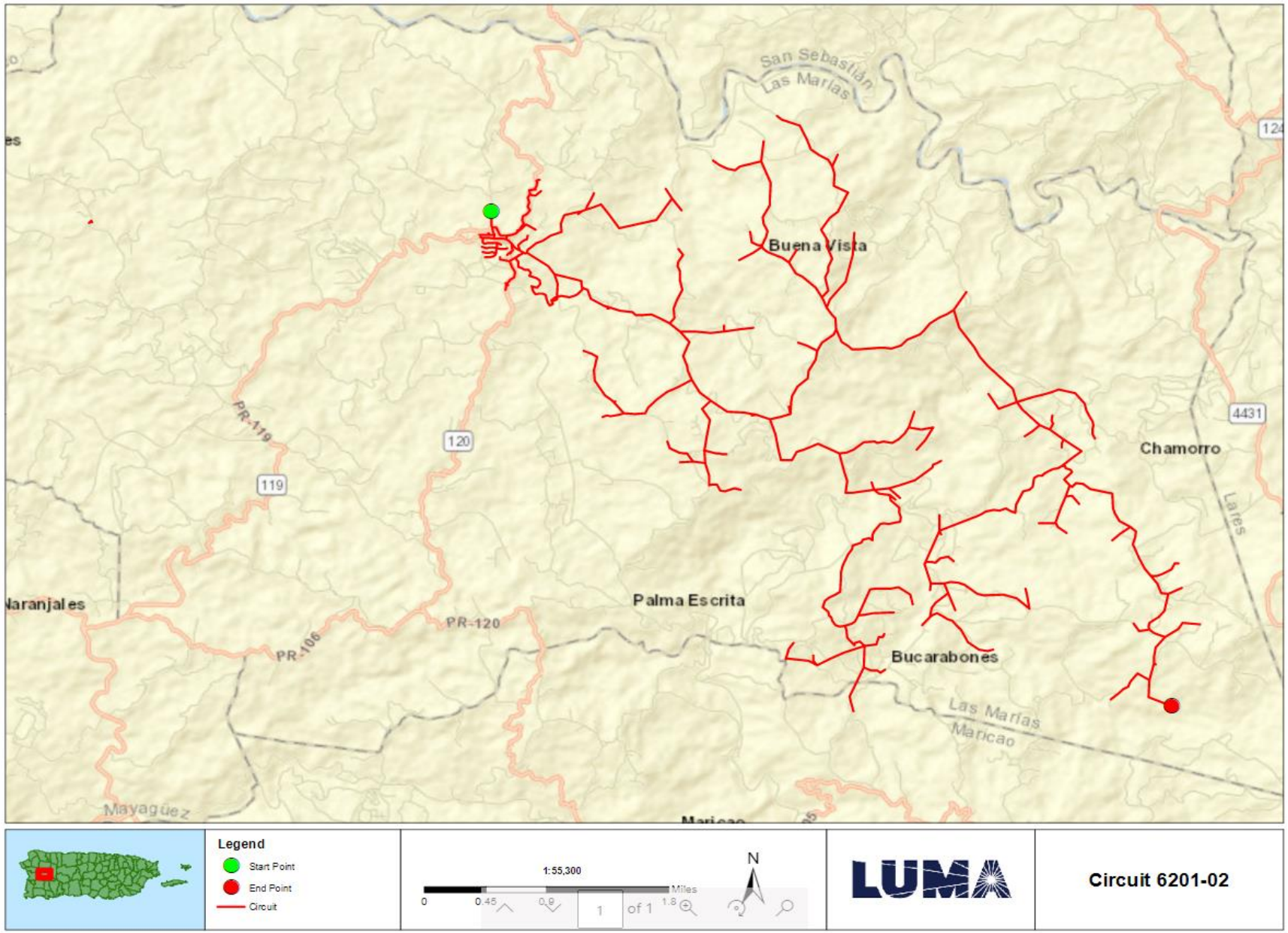
LUMA

Circuit 7505-05


Juncal
Calabazas
435
111
Pueblo
Lares
Patriota
111A
PR-134
111
PR-
128
129
PR-128
Espino
124
La Torre
Buena Vista
PR-129
Utuado
Lares
Adjuntas
PR-12
4431
Chamorro
Legend
Start Point
End Point
Circuit
1:57,420
Miles
0
0.475
0.95
1.9
N
LUMA
Circuit 7901-03



Circuit 7901-04


San Sebastián
Las Marías
Buena Vista
PR-119
119
120
4431
Chamorro
Lares
Naranjales
Palma Escrita
PR-120
PR-106
Bucarabones
Las Marías
Maricao
Mayagüez
Legend
Start Point
End Point
Circuit
1:55,300
Miles
0
0.45
0.9
1.8
1
of 1
N
LUMA
Circuit 6201-02

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 9

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 9
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
MOCA	7101-03			4.16
CAPA	7103-01			4.16
CAPA	7103-04			4.16
MOCA II	7104-06			4.16
SAN SEBASTIAN 1	7801-01			4.16
SAN SEBASTIAN 1	7801-03			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are; poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.41M**
Estimated Budget for Procurement & Construction:	**$24.18M**
Estimated Overall Budget for the Project:	**$26.60M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

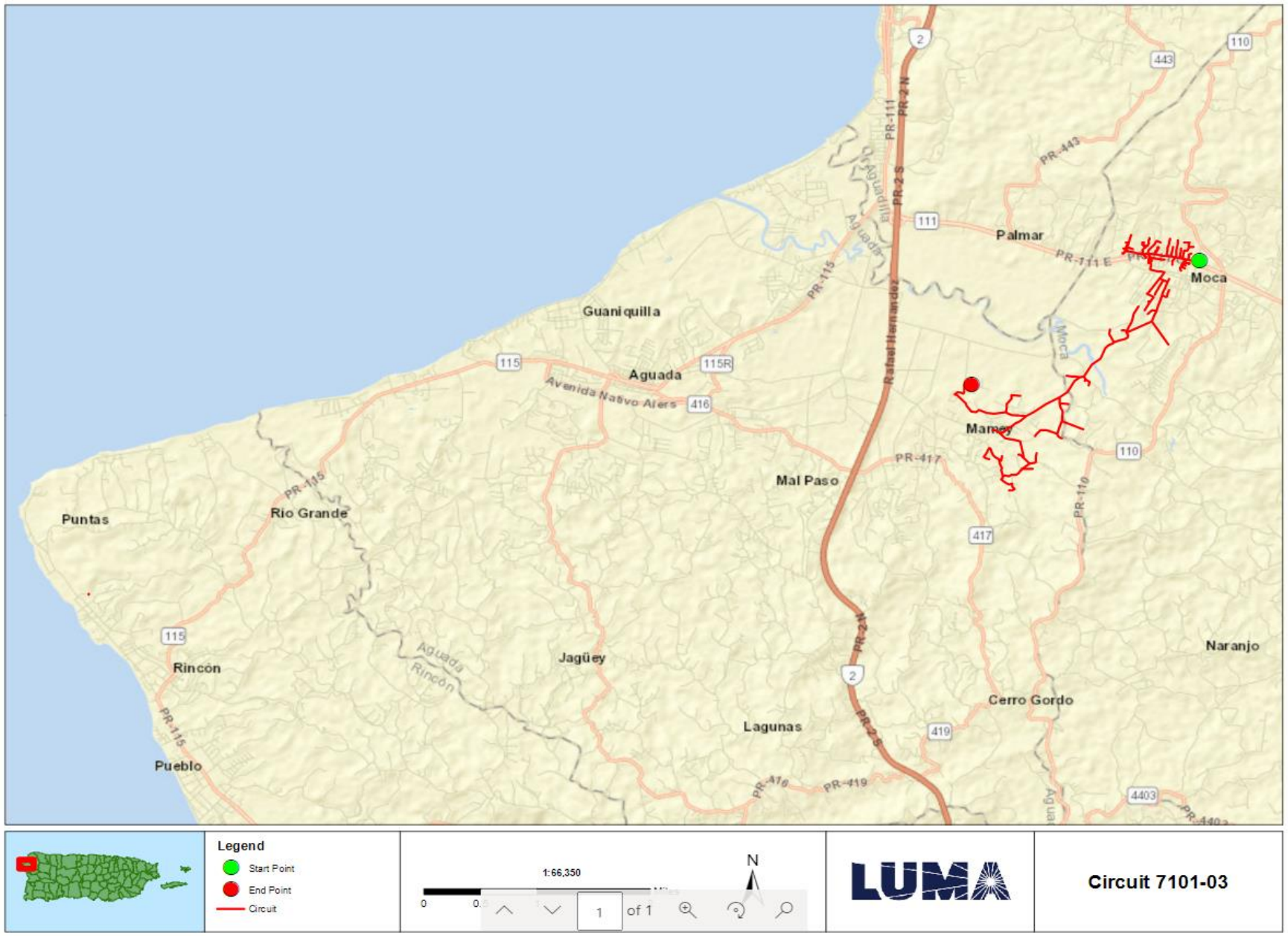
Note: If available, detailed engineering cost estimates will be included as an attachment.

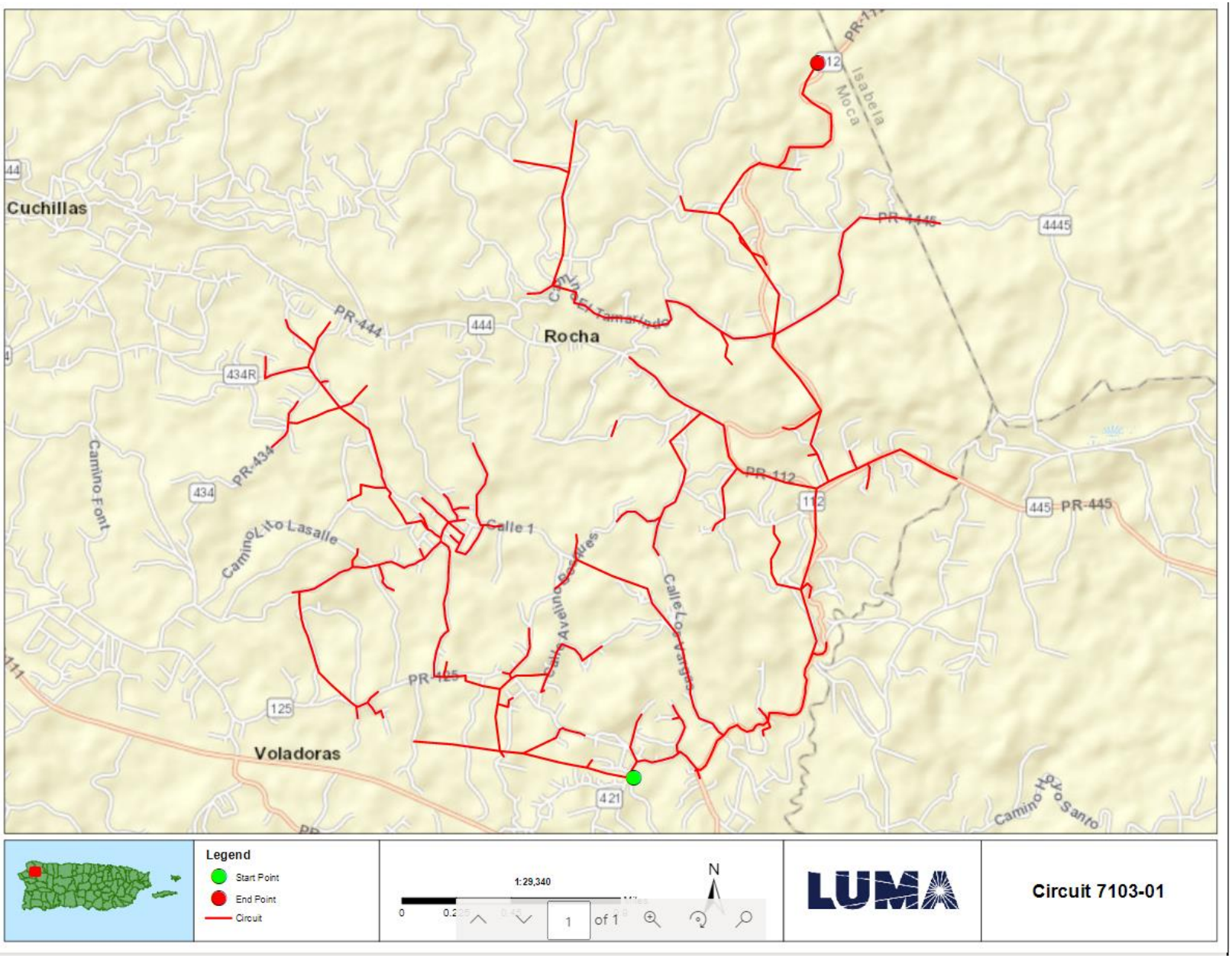
Environmental & Historic Preservation Requirements

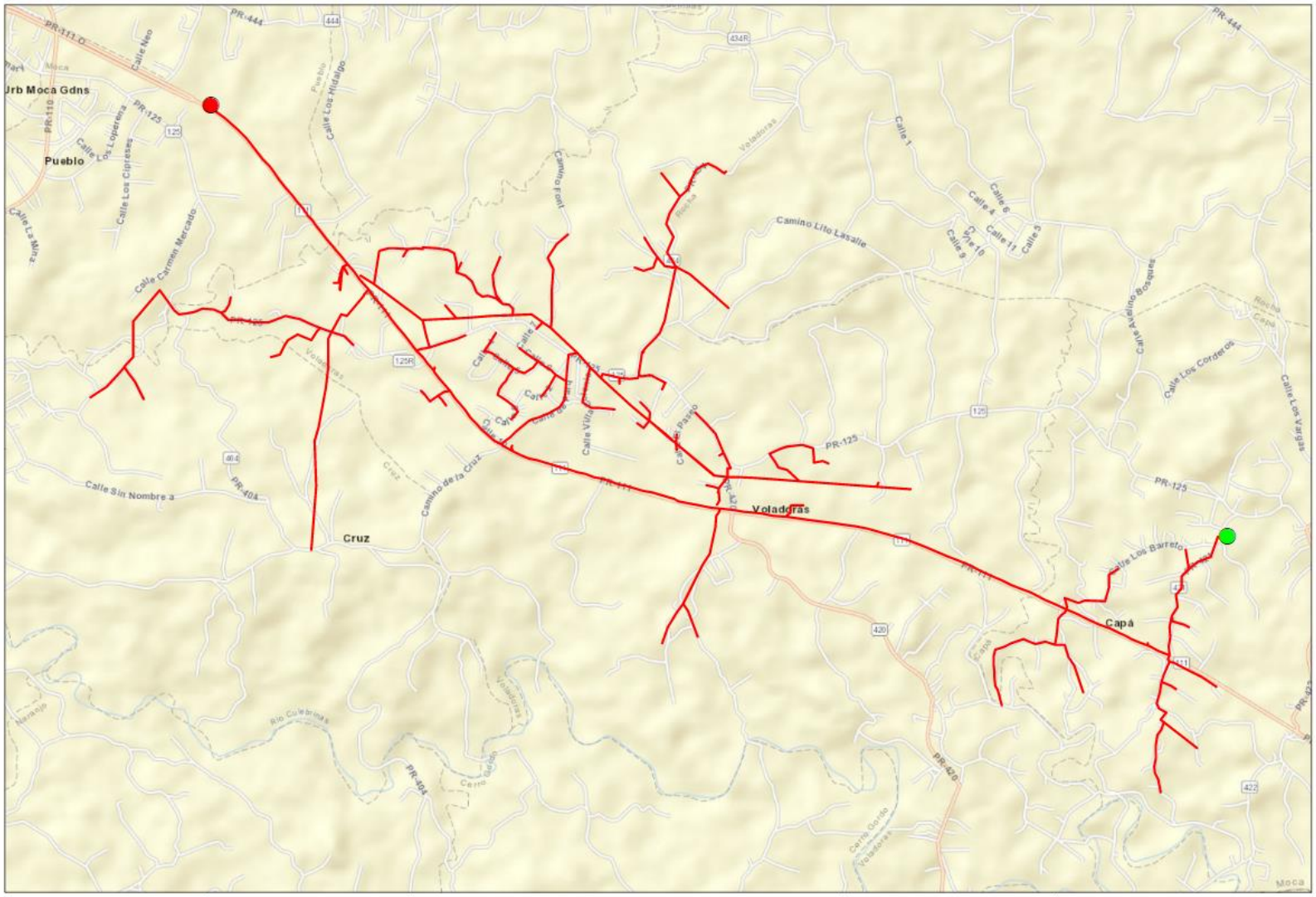
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

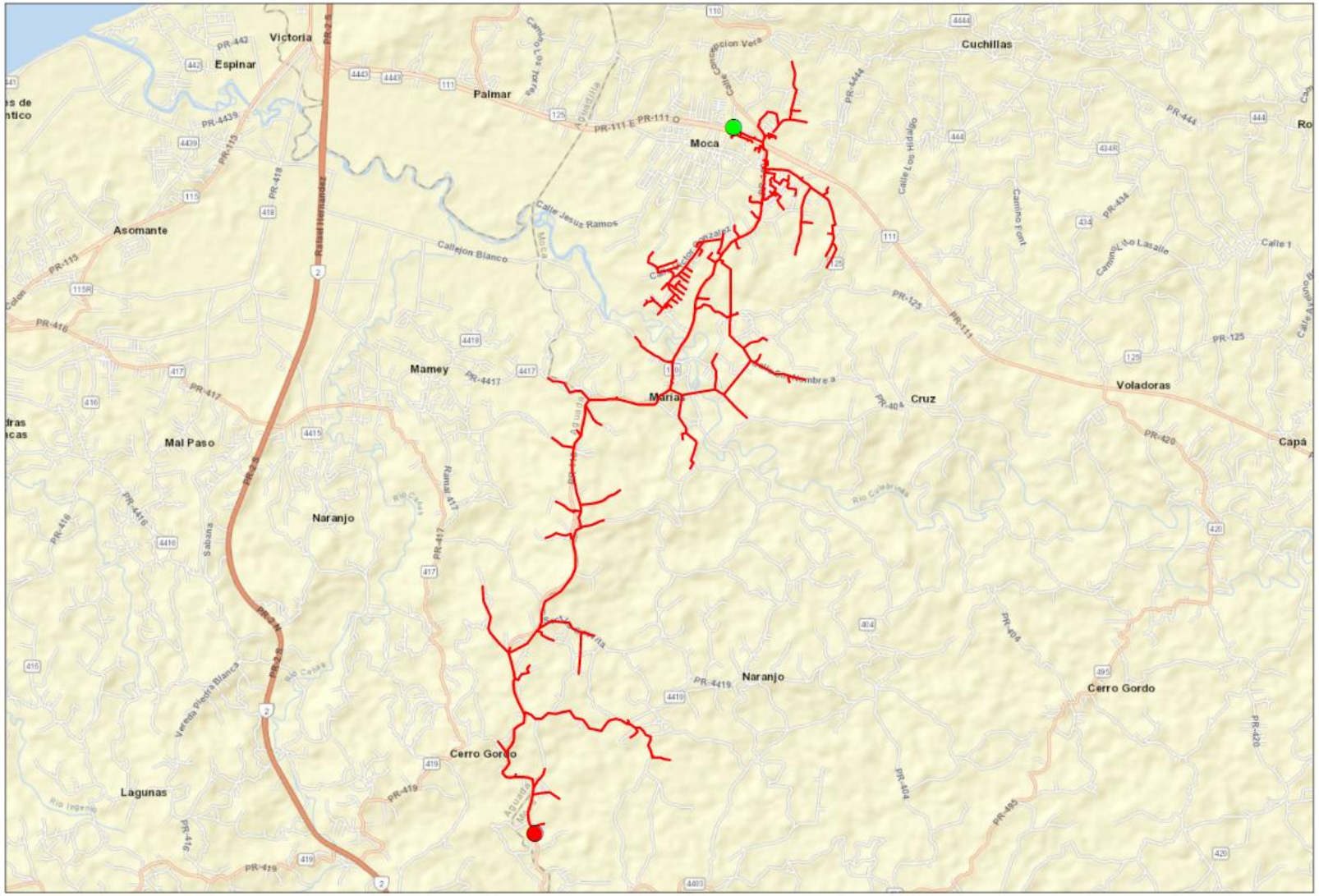
Attachments

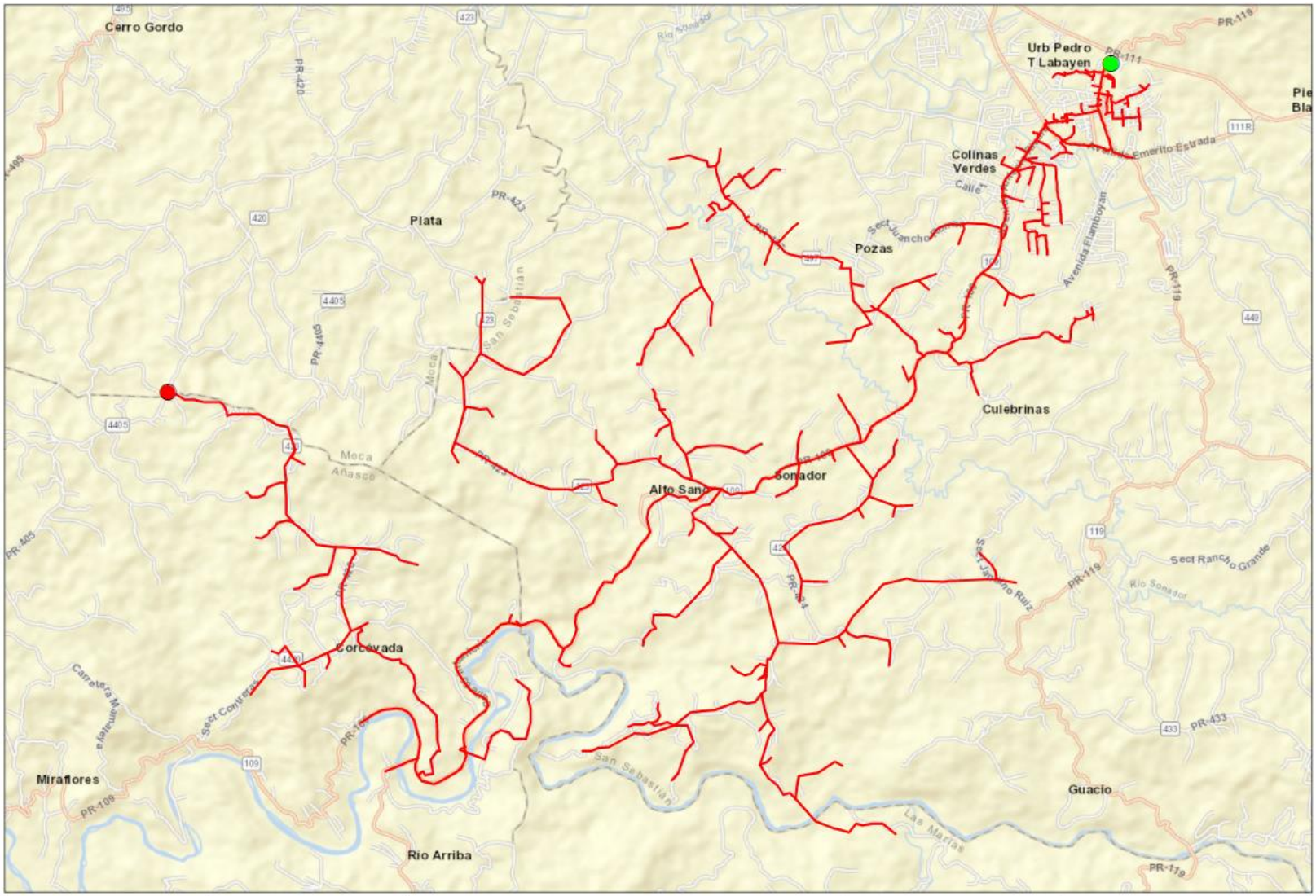
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 9 Location Maps	Location Maps and Site Picture

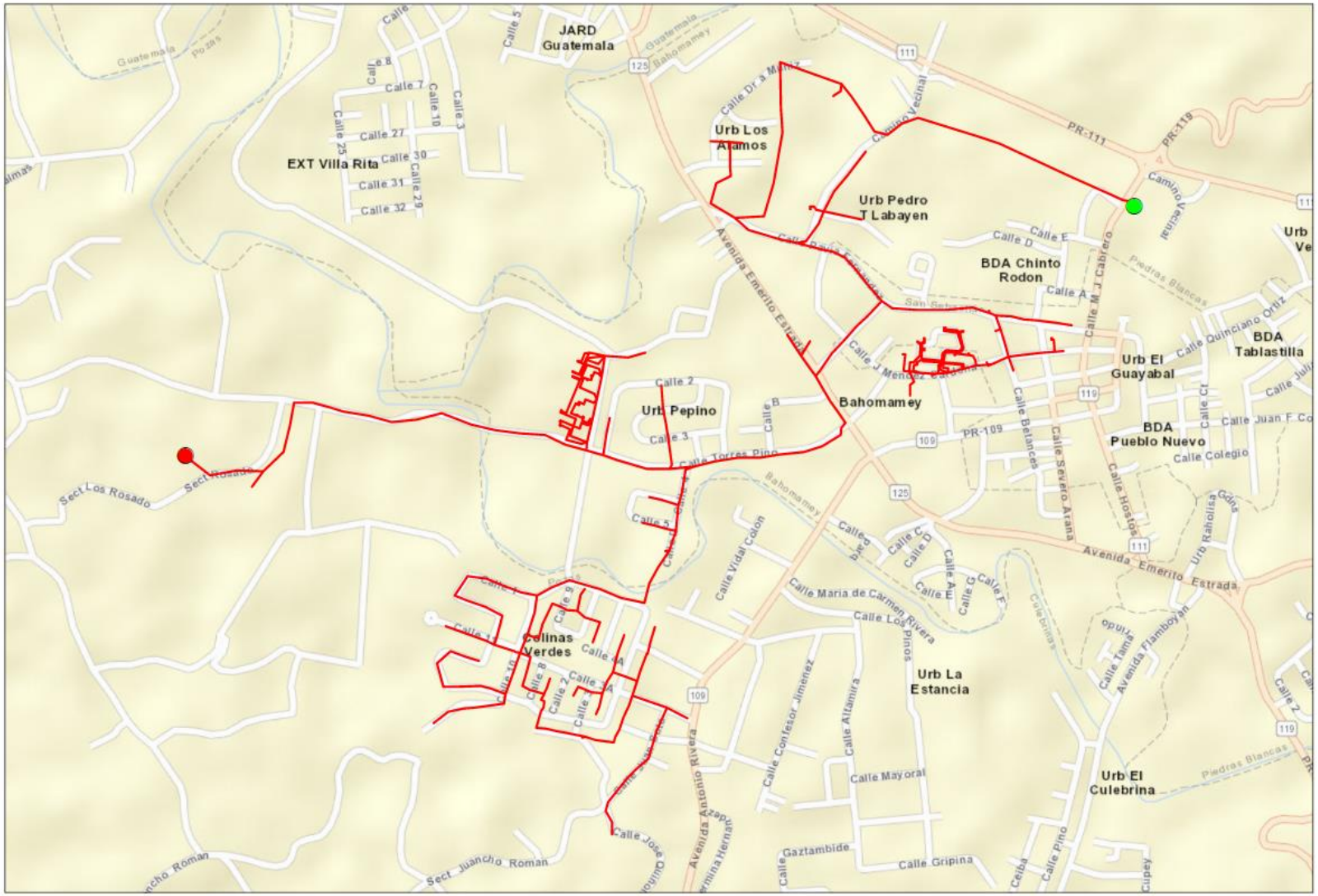

Legend
Start Point
End Point
Circuit
1:66,350
0
0
1
of 1
N
LUMA
Circuit 7101-03
Guaniquilla
Aguada
Avenida Nativo Alers
Rio Grande
Puntas
Rincón
Aguada Rincón
Jagüey
Pueblo
Lagunas
Mal Paso
Rafael Hernandez
Aguadilla
Aguada
Palmar
Moca
Mamey
Cerro Gordo
Naranjo
PR-115
PR-111
PR-2 N
PR-2 S
PR-443
PR-111 E
PR-417
PR-110
PR-416
PR-419
PR-2
115
115R
416
111
443
110
417
419
4403


Cuchillas
Rocha
Voladoras
PR-444
PR-434
PR-112
PR-445
PR-125
Isabela
Moca
Camino Font
Camino Hato Santo
Calle 1
Legend
Start Point
End Point
Circuit
1:29,340
1 of 1
N
LUMA
Circuit 7103-01


Urb Moca Gdns
Pueblo
Cruz
Voladoras
Capá
Camino Lito Lasalle
Calle Sin Nombre 3
Legend
Start Point
End Point
Circuit
1:25,380
Miles
0
0.2
0.4
0.8
1
of 1
N
LUMA
Circuit 7103-04


Victoria
Espinar
Palmar
Cuchillas
Moca
Asomante
Callejon Blanco
Calle Jesus Ramos
Mamey
Maria
Cruz
Voladoras
Capá
Mal Paso
Naranjo
Naranjo
Cerro Gordo
Cerro Gordo
Lagunas
PR-111 E PR-111 O
Rafael Hernandez
Legend
Start Point
End Point
Circuit
1:50,630
1 of 1
N
LUMA
Circuit 7104-06


Cerro Gordo
Urb Pedro T Labayen
Colinas Verdes
Pozas
Plata
Culebrinas
Alto Sano
Sonador
Corcovada
Miraflores
Rio Arriba
Guacio
Sect Rancho Grande
Sect Contreras
Moca Arriba
Rio Sonador
San Sebastian
Las Marias
PR-119
PR-111
PR-420
PR-423
PR-405
PR-109
PR-433
PR-434
Avenida Emerito Estrada
Avenida Flamboyan
Carretera Municipal
Legend
Start Point
End Point
Circuit
1:43,690
0
0.35
0.7
1.4
Miles
1
of 1
N
LUMA
Circuit 7801-01


JARD Guatemala
Urb Los Alamos
EXT Villa Rita
Urb Pedro T Labayen
BDA Chinto Rodon
Urb El Guayabal
BDA Tablastilla
Urb Pepino
Bahomamey
BDA Pueblo Nuevo
Sect Los Rosado
Colinas Verdes
Urb La Estancia
Urb El Culebrina
Sect Juancho Roman
Calle Vidal Colon
Calle Maria de Carmen Rivera
Calle Mayoral
Calle Gaztambide
Calle Gripina
Avenida Emerito Estrada
Avenida Antonio Rivera
Calle Confesor Jimenez
Calle Altamira
Calle Torres Pino
Calle Betances
Calle Severo Arana
Calle Colegio
Calle Quinciano Ortiz
Calle Juan F Co
Calle Hostos
Calle Los Robles
Avenida Flamboyan
Calle Tania
Piedras Blancas
PR-111
PR-119
PR-109
Camino Vecinal
Guatemala
Pozas
Legend
Start Point
End Point
Circuit
1:10,630
N
1
of 1
LUMA
Circuit 7801-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Mayagüez Short Term Group 10

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Mayagüez Short Term Group 10
Project Type:	Restoration to Codes/Standards
Region:	Mayagüez
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Mayagüez Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Mayagüez Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
AÑASCO	6101-02			4.16
AÑASCO	6101-04			4.16
AÑASCO	6101-05			4.16
BOQUERON	6702-04			7.2
SAN SEBASTIAN 2	7802-01			4.16
SAN SEBASTIAN 2	7802-03			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.88M**
Estimated Budget for Procurement & Construction:	**$28.82M**
Estimated Overall Budget for the Project:	**$31.70M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

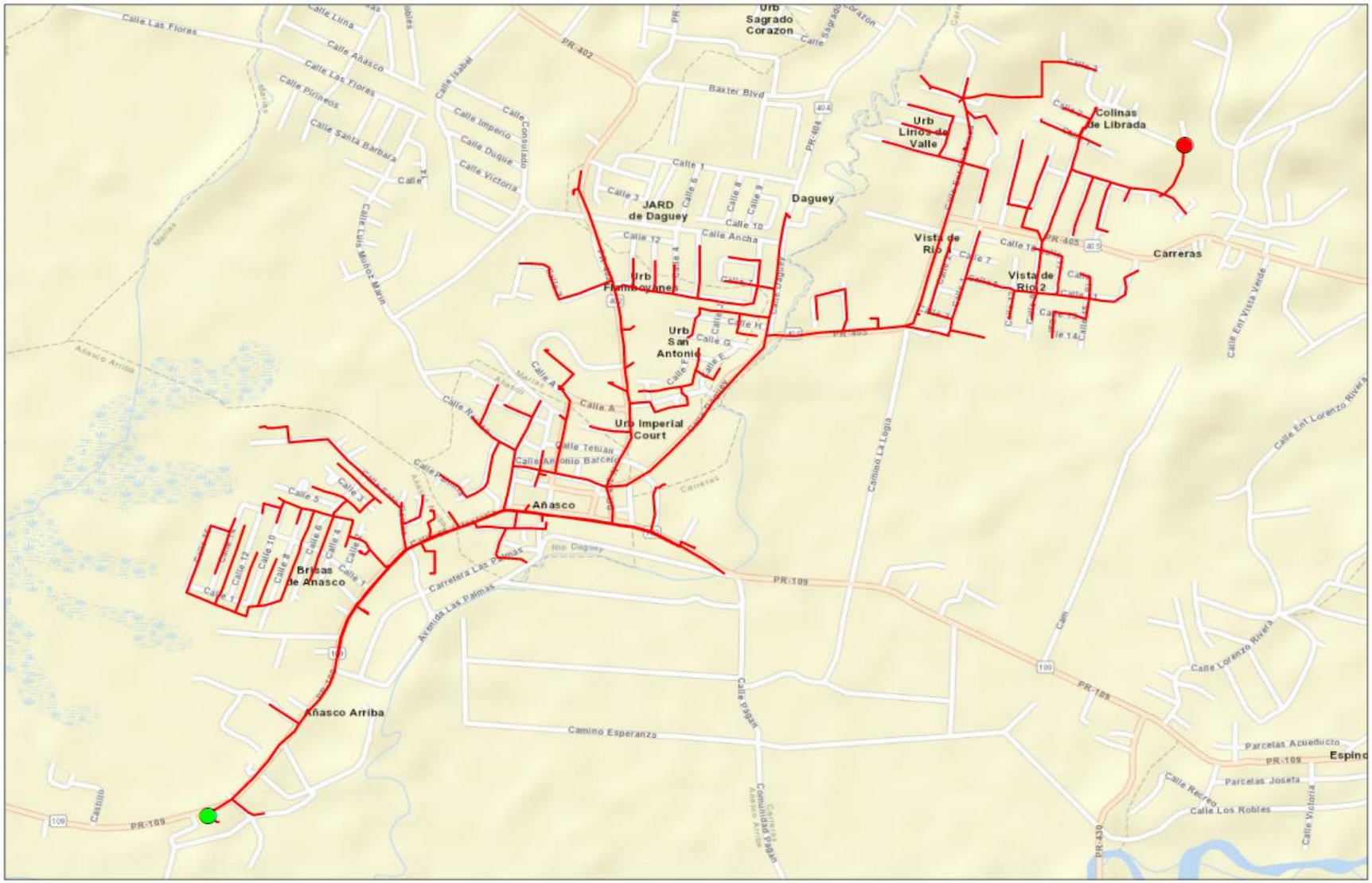
Note: If available, detailed engineering cost estimates will be included as an attachment.

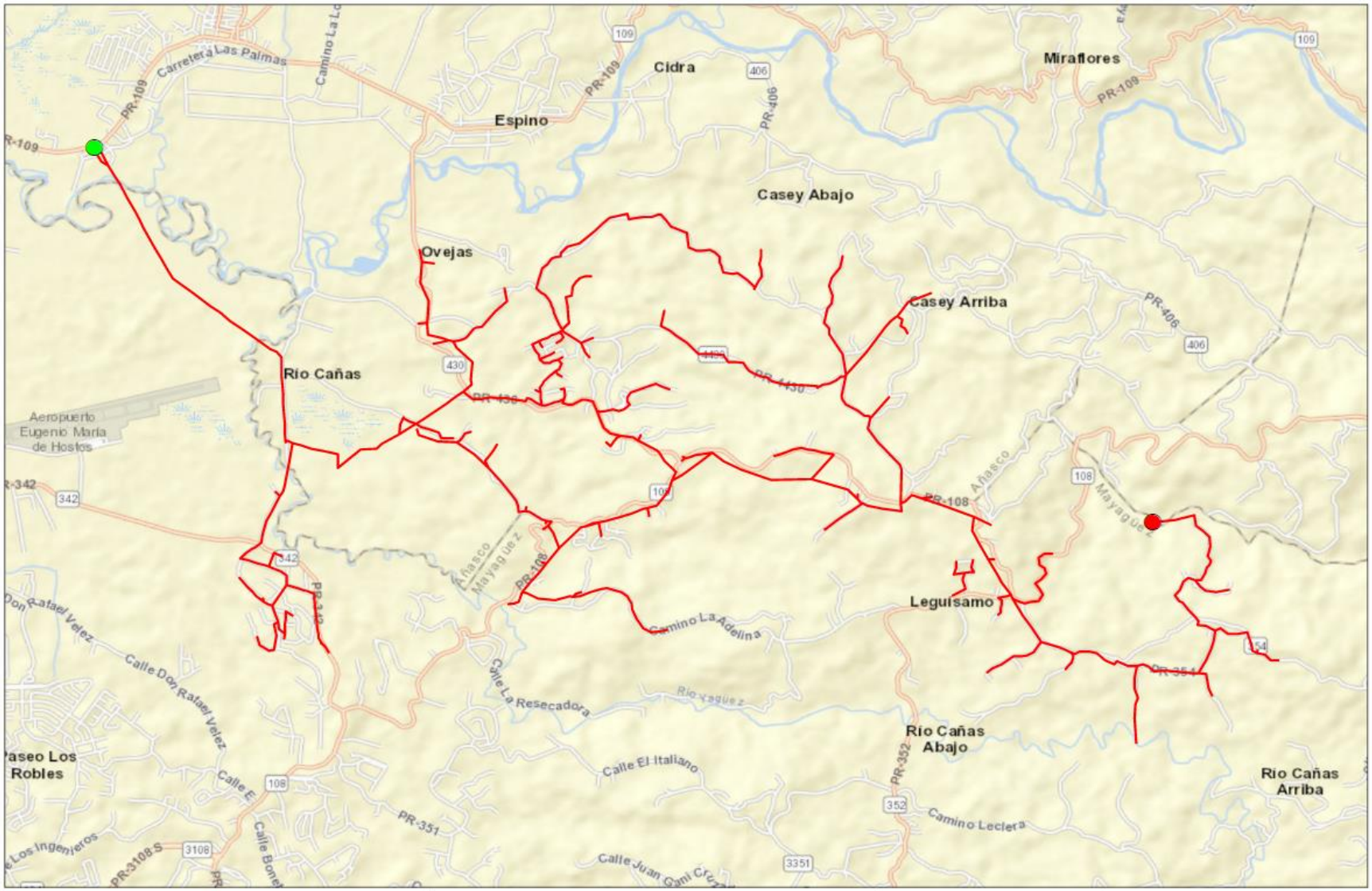
Environmental & Historic Preservation Requirements

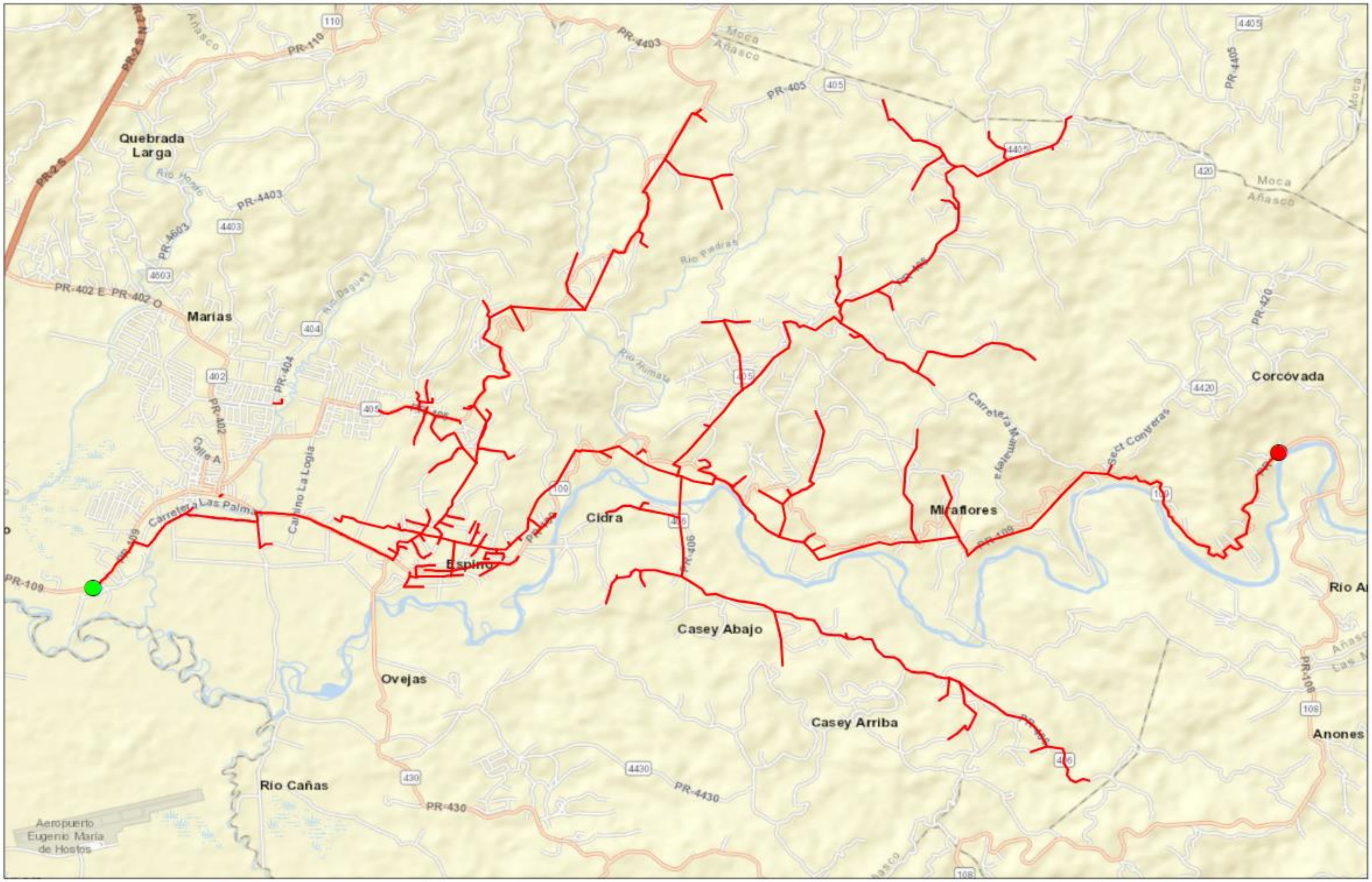
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Mayagüez Short Term Group 10 Location Maps	Location Maps and Site Picture


Urb Sagrado Corazon
Baxter Blvd
Urb Lirios de Valle
Colinas de Librada
Daguey
JARD de Daguey
Calle Ancha
Vista de Rio 1
Vista de Rio 2
Carreras
Urb Flamboyanes
Urb San Antonio
Urb Imperial Court
Añasco
Brisas de Añasco
Añasco Arriba
Carretera Las Palmas
Avenida Las Palmas
Camino Esperanza
Parcelas Acueducto
Parcelas Joseta
Calle Los Robles
PR-109
PR-402
PR-404
PR-405
PR-430
Legend
Start Point
End Point
Circuit
1:13,310
0 0.1 0.2 0.4 Miles
N
LUMA
Circuit 6101-02


Carretera Las Palmas
PR-109
Espino
Cidra
Miraflores
Casey Abajo
Ovejas
Casey Arriba
Río Cañas
PR-406
PR-1430
PR-156
Aeropuerto
Eugenio María
de Hostos
PR-108
Añasco
Mayaguez
Leguisamo
Camino La Adelina
Calle La Resecadora
Río Yaguez
Río Cañas
Abajo
Río Cañas
Arriba
Paseo Los
Robles
Calle Don Rafael Velez
Calle El Italiano
PR-352
PR-351
Camino Leclera
Calle Juan Cani
PR-3108 S
Legend
Start Point
End Point
Circuit
1:37,300
Miles
0
0.3
0.6
1.2
1
of 1
N
LUMA
Circuit 6101-04



Legend

- ● Start Point
- ● End Point
- — Circuit

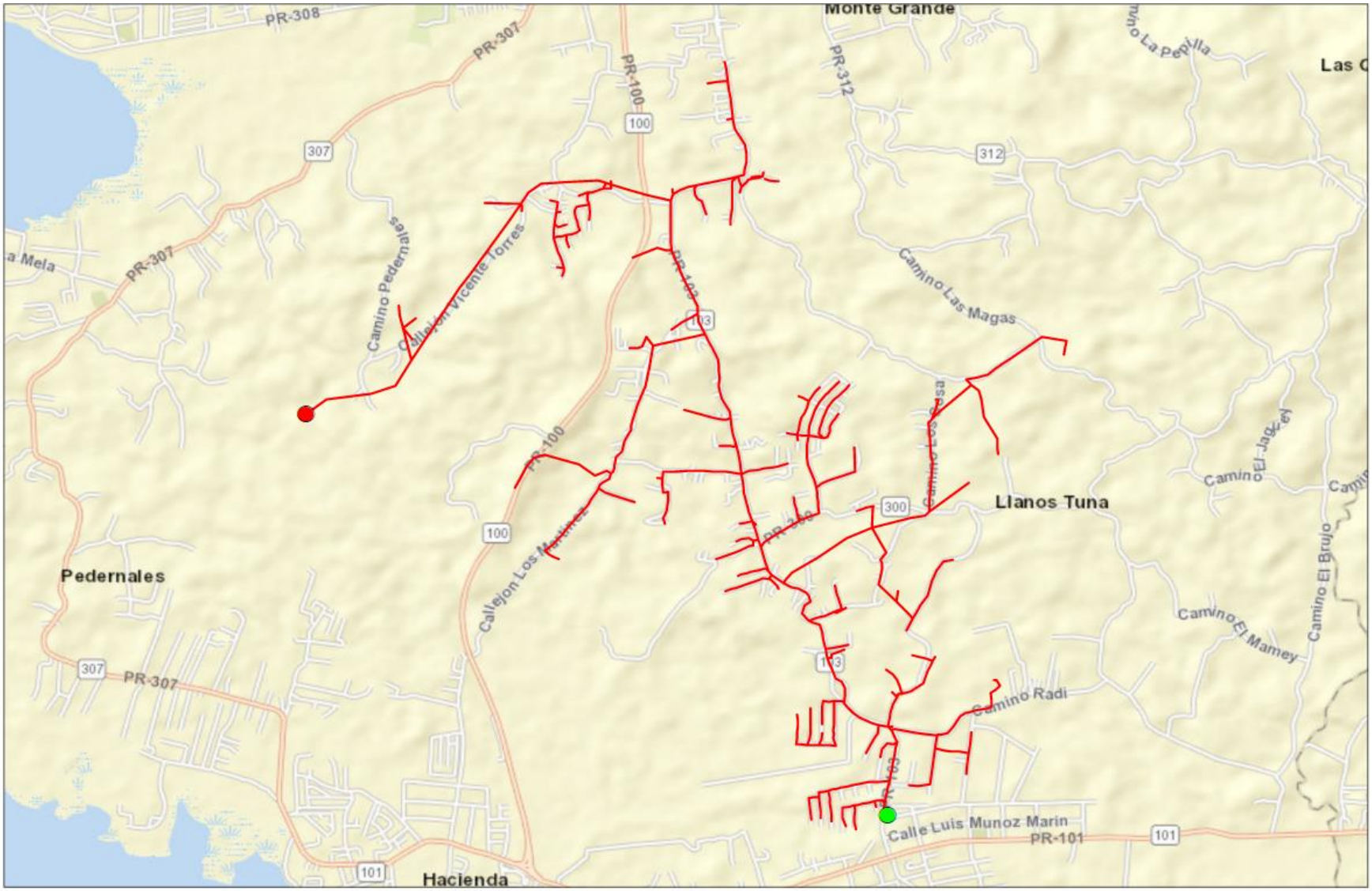
1:42,330

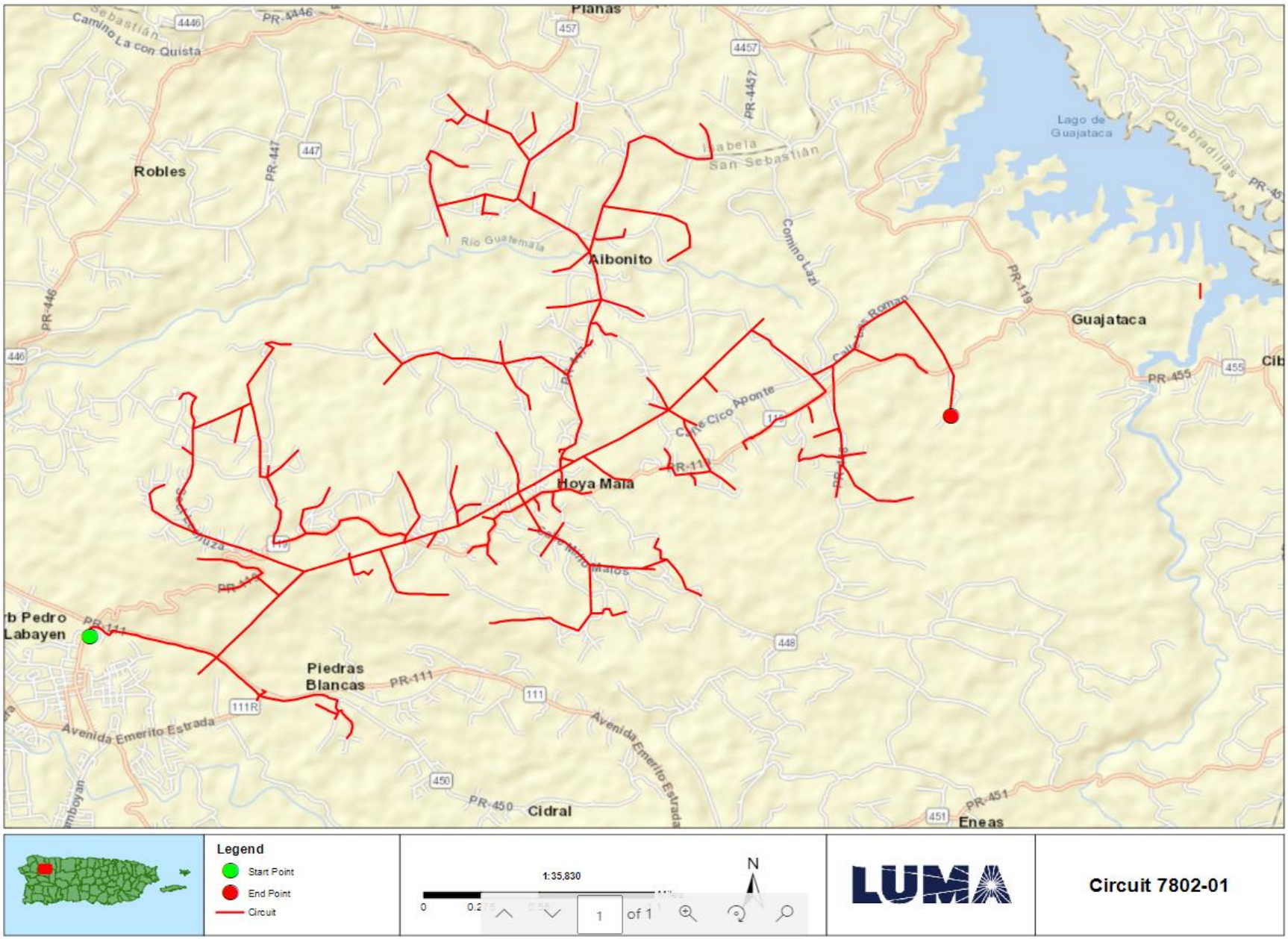
0 0.35 0.7 1.4 Miles

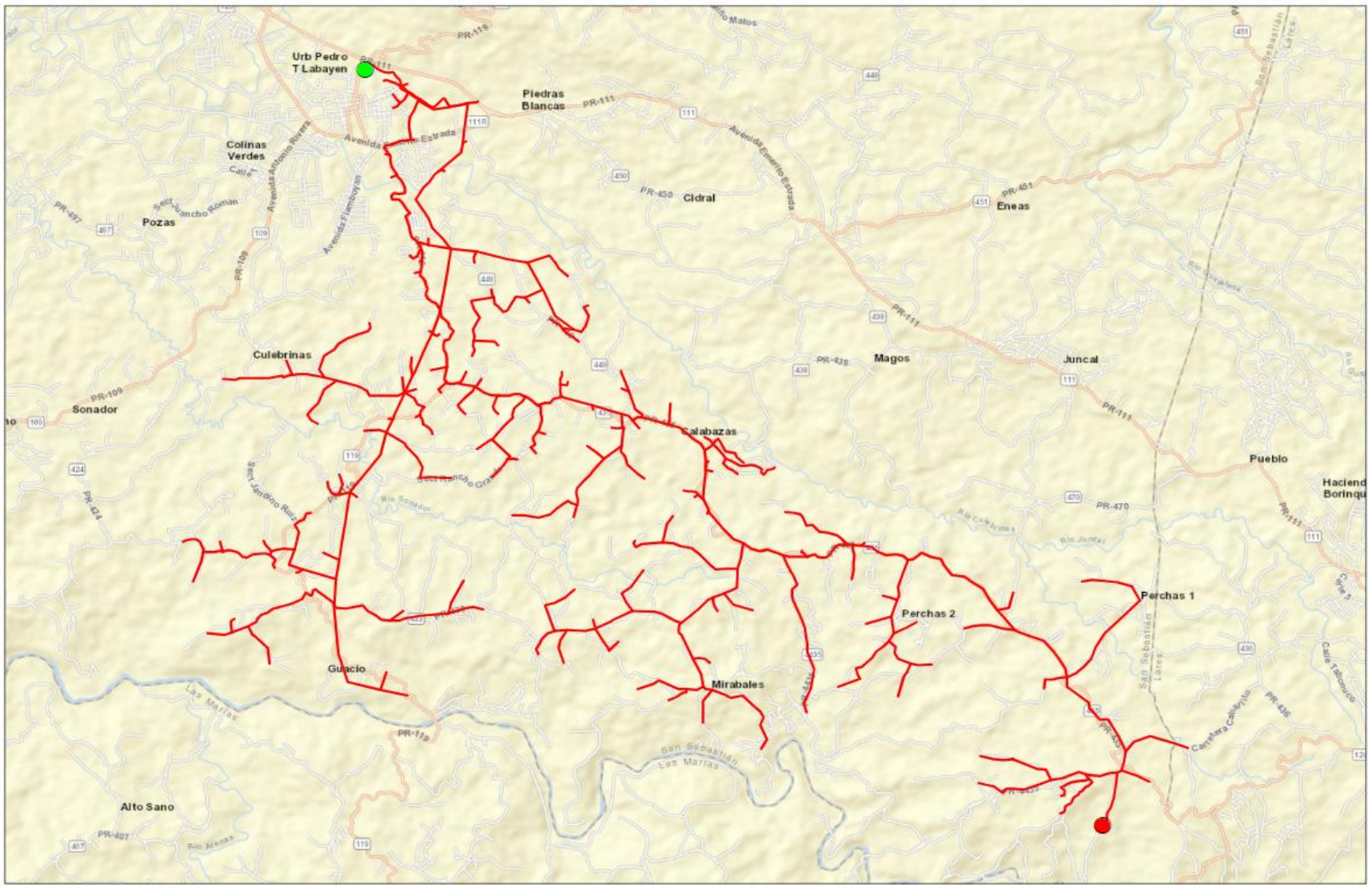
N

LUMA

Circuit 6101-05


Monte Grande
Las C
PR-308
PR-307
PR-100
PR-312
307
100
312
Camino Las Magas
Camino Pedernales
Callejon Vicente Torres
PR-307
a Mela
PR-100
103
Callejon Los Martinez
Llanos Tuna
300
Camino El Jagüey
Camino El Brujo
Pedernales
Camino El Mamey
307
PR-307
Camino Radi
Calle Luis Munoz Marin
PR-101
101
Hacienda
Legend
Start Point
End Point
Circuit
1:30,850
0
1
of 1
N
LUMA
Circuit 6702-04


Planas
Robles
Albonito
Hoya Mala
Guajataca
Lago de Guajataca
Piedras Blancas
Cidral
Eneas
Avenida Emerito Estrada
PR-111
PR-446
PR-447
PR-4457
PR-119
PR-455
PR-450
PR-451
Río Guatemala
Camino Lazi
Legend
Start Point
End Point
Circuit
1:35,830
N
1
of 1
LUMA
Circuit 7802-01


Urb Pedro T Labayen
Piedras Blancas
Colinas Verdes
Pozas
Cidral
Eneas
Culebrinas
Sonador
Magos
Juncal
Calabazas
Pueblo
Perchas 1
Perchas 2
Guacio
Mirabales
Alto Sano
Legend
Start Point
End Point
Circuit
1:52,370
1
of 1
N
LUMA
Circuit 7802-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 7

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 7
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
MONACILLOS 13KV	1346-06	[redacted]		13.2
VENEZUELA 13KV	1348-07			13.2
FAJARDO PUEBLO	2002-03			7.2
FAJARDO PDS	2005-09			13.2
MARINA PUERTO DEL REY	2006-03			13.2
LUQUILLO	2201-01			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.39M**
Estimated Budget for Procurement & Construction:	**$23.98M**
Estimated Overall Budget for the Project:	**$26.37M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

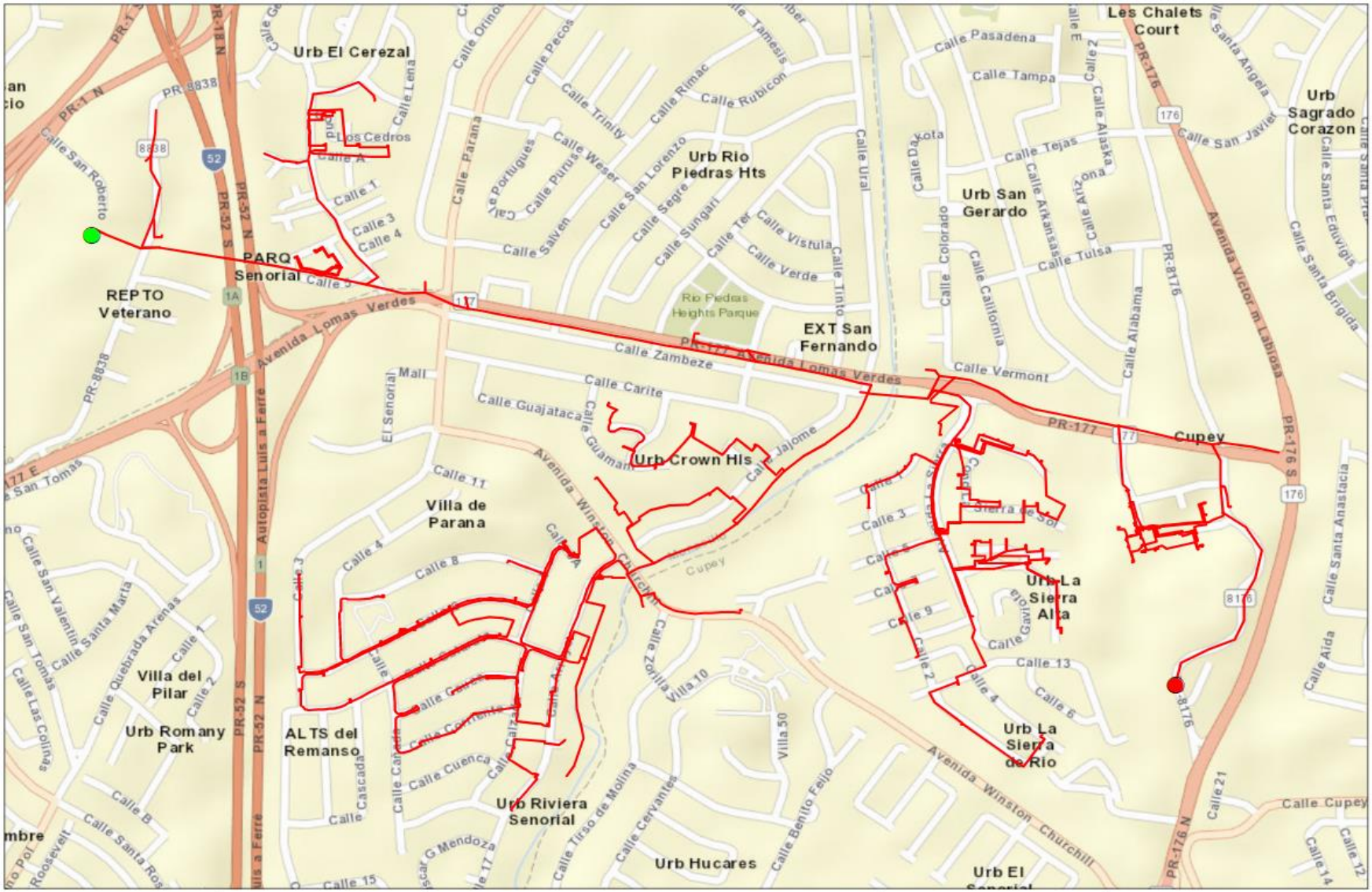
Note: If available, detailed engineering cost estimates will be included as an attachment.

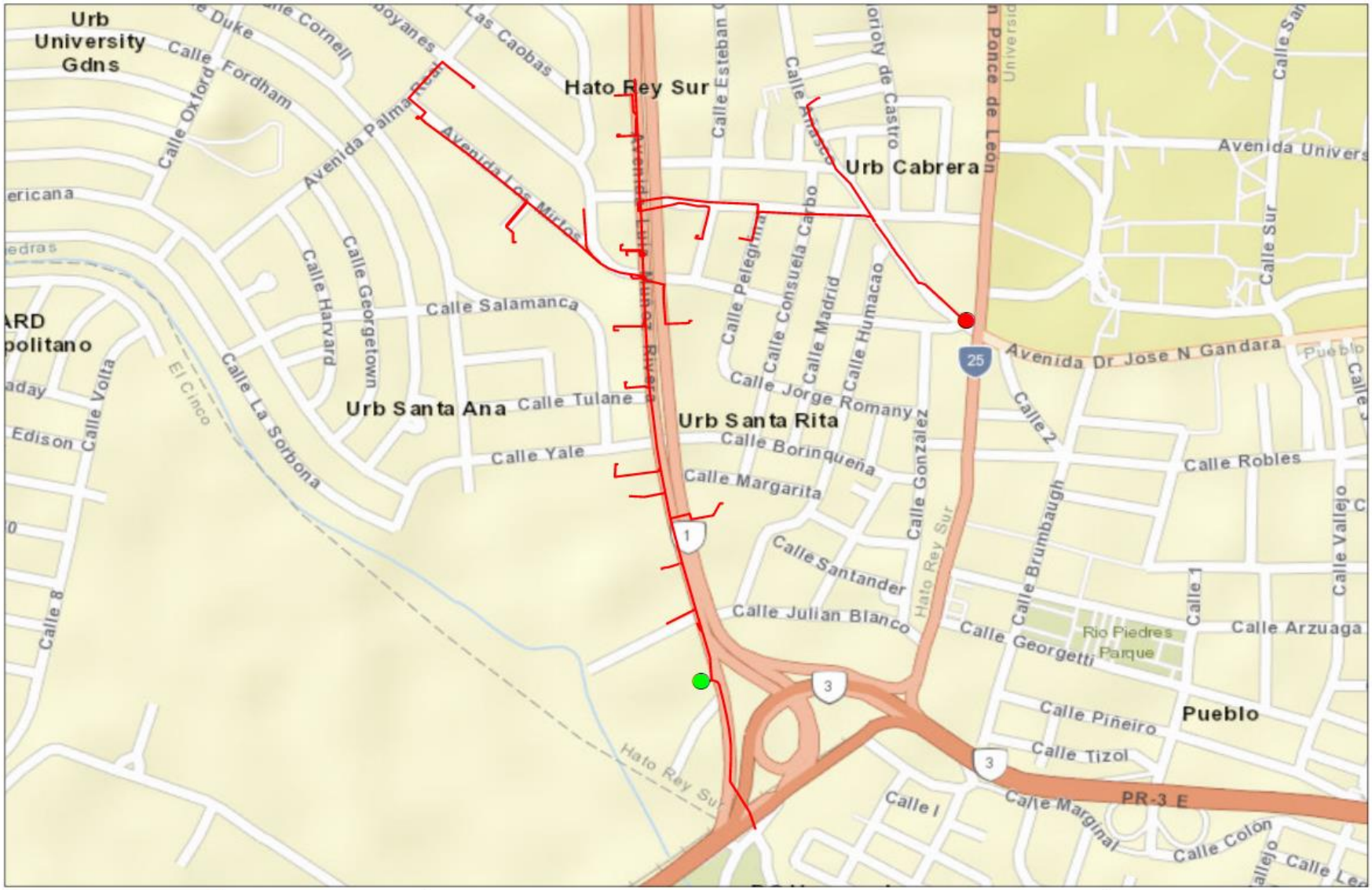
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 7 Location Maps	Location Maps and Site Picture


Urb El Cerezal
Los Cedros
Calle A
Calle 1
Calle 3
Calle 4
Calle 5
PARQ Senorial
REPTO Veterano
Avenida Lomas Verdes
Mall
El Senorial
Urb Rio Piedras Hts
Rio Piedras Heights Parque
EXT San Fernando
Calle Zambeze
Calle Carite
Calle Guajataca
Calle Guamani
Urb Crown Hls
Calle Jajome
Villa de Parana
Calle 11
Calle 8
Avenida Winston Churchill
Cupey
Urb La Sierra Alta
Sierra de Sol
Urb La Sierra de Rio
Les Chalets Court
Urb Sagrado Corazon
Urb San Gerardo
Calle Pasadena
Calle Tampa
Calle Tejas
Calle San Javier
Calle Tulsa
Calle Vermont
Avenida Victor M Labiosa
PR-177
PR-176
PR-8838
PR-52
PR-1
Autopista Luis a Ferre
Villa del Pilar
Urb Romany Park
ALTS del Remanso
Urb Riviera Senorial
Urb Hucares
Calle Cuenca
Calle Cascada
Calle Cervantes
Calle Tirso de Molina
Calle Benito Feijo
Villa 50
Villa 10
Calle 13
Calle 21
Calle Cupey
Calle Santa Anastacia
Calle Aida
Calle Santa Brigida
Calle Santa Eduvigis
Calle Quebrada Arenas
Calle Santa Marta
Calle San Valentin
Calle San Tomas
Calle Las Colinas
Calle San Roberto
Legend
Start Point
End Point
Circuit
1:9,240
0
0.075
0.15
0.3
Miles
N
LUMA
Circuit 1346-06



Legend

- Start Point
- End Point
- Circuit

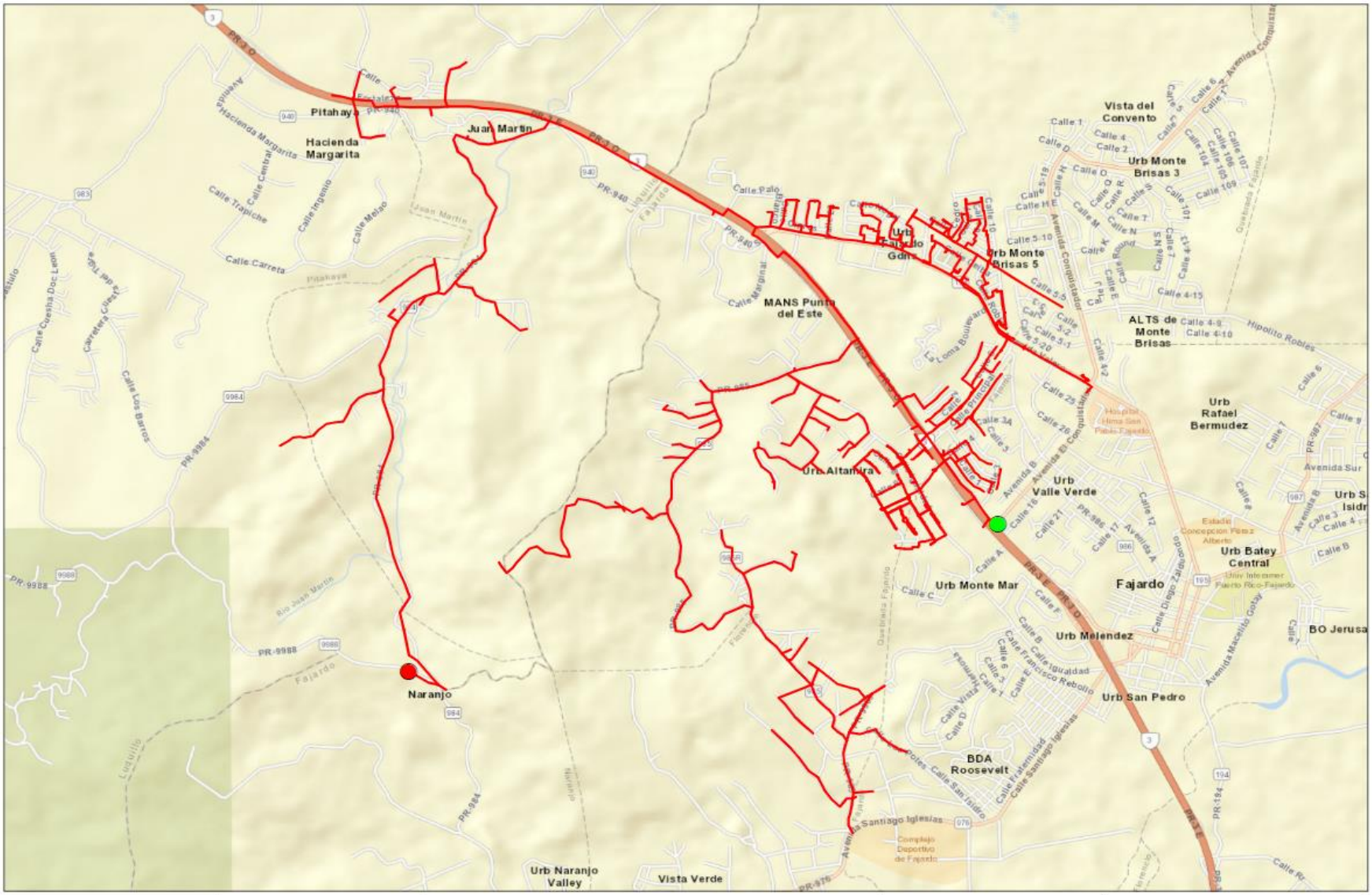
1:6,780

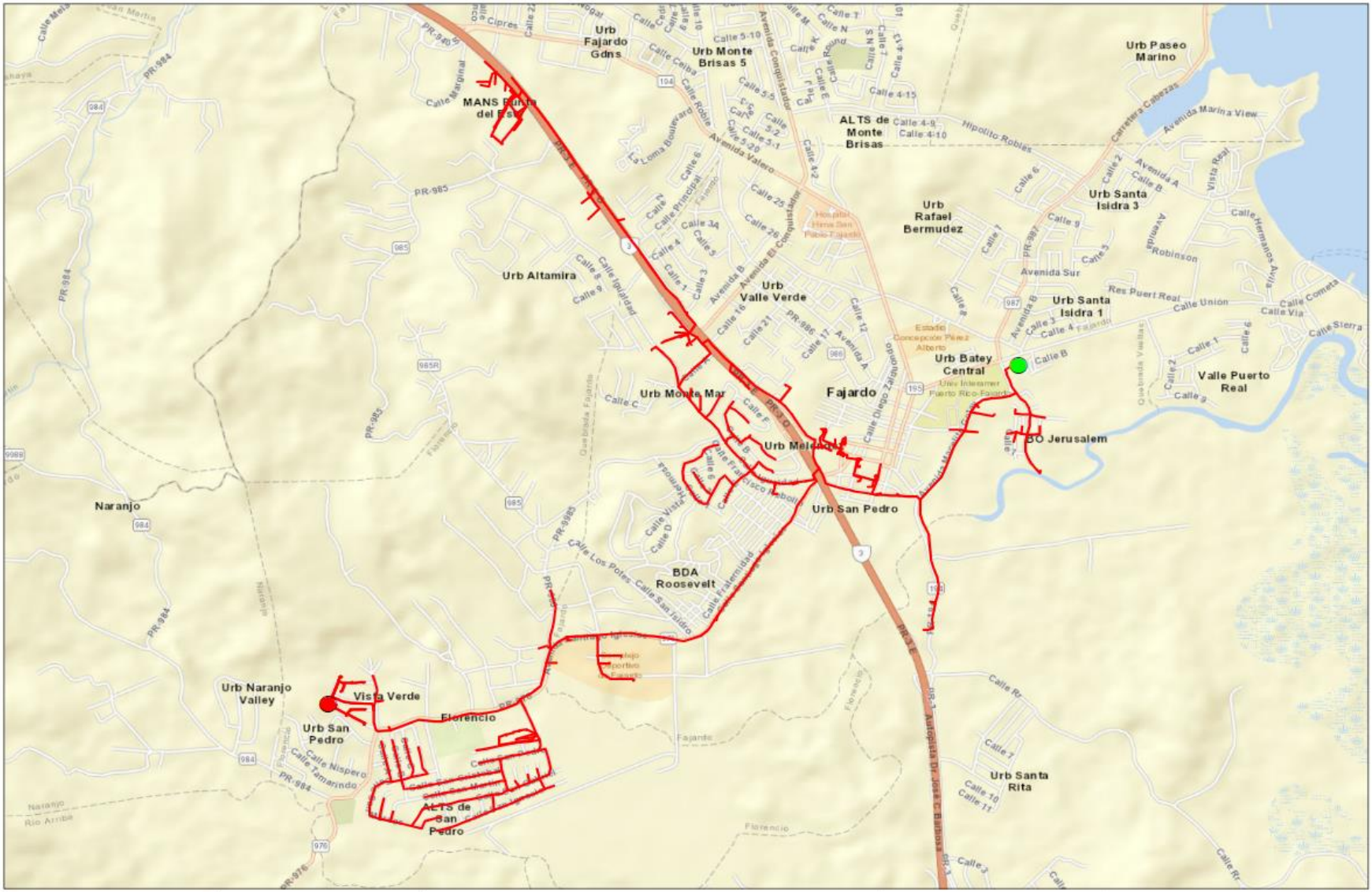
0 0.05 0.1 0.2 Miles

N

LUMA

Circuit 1348-07


Pitahaya
Hacienda Margarita
Juan Martin
Vista del Convento
Urb Monte Brisas 3
Urb Monte Brisas 5
MANS Punta del Este
ALTS de Monte Brisas
Urb Rafael Bermudez
Urb Altamira
Urb Valle Verde
Urb Batey Central
Fajardo
Urb Monte Mar
Urb Melendez
Urb San Pedro
BDA Roosevelt
Naranjo
Urb Naranjo Valley
Vista Verde
Legend
Start Point
End Point
Circuit
1:26,470
0 0.2 0.4 0.8 Miles
N
LUMA
Circuit 2002-03


Urb Fajardo Gdns
Urb Monte Brisas 5
Urb Paseo Marino
ALTS de Monte Brisas
Urb Santa Isidra 3
Urb Rafael Bermudez
Urb Altamira
Urb Valle Verde
Urb Santa Isidra 1
Urb Batey Central
Valle Puerto Real
Urb Monte Mar
Fajardo
BO Jerusalem
Urb Melida
Urb San Pedro
Naranjo
BDA Roosevelt
Urb Naranjo Valley
Vista Verde
Florencio
Urb San Pedro
ALTS de San Pedro
Urb Santa Rita
Legend
Start Point
End Point
Circuit
1:25,630
0 0.2 0.4 0.8 Miles
N
LUMA
Circuit 2005-09

Legend

- Start Point
- End Point
- Circuit

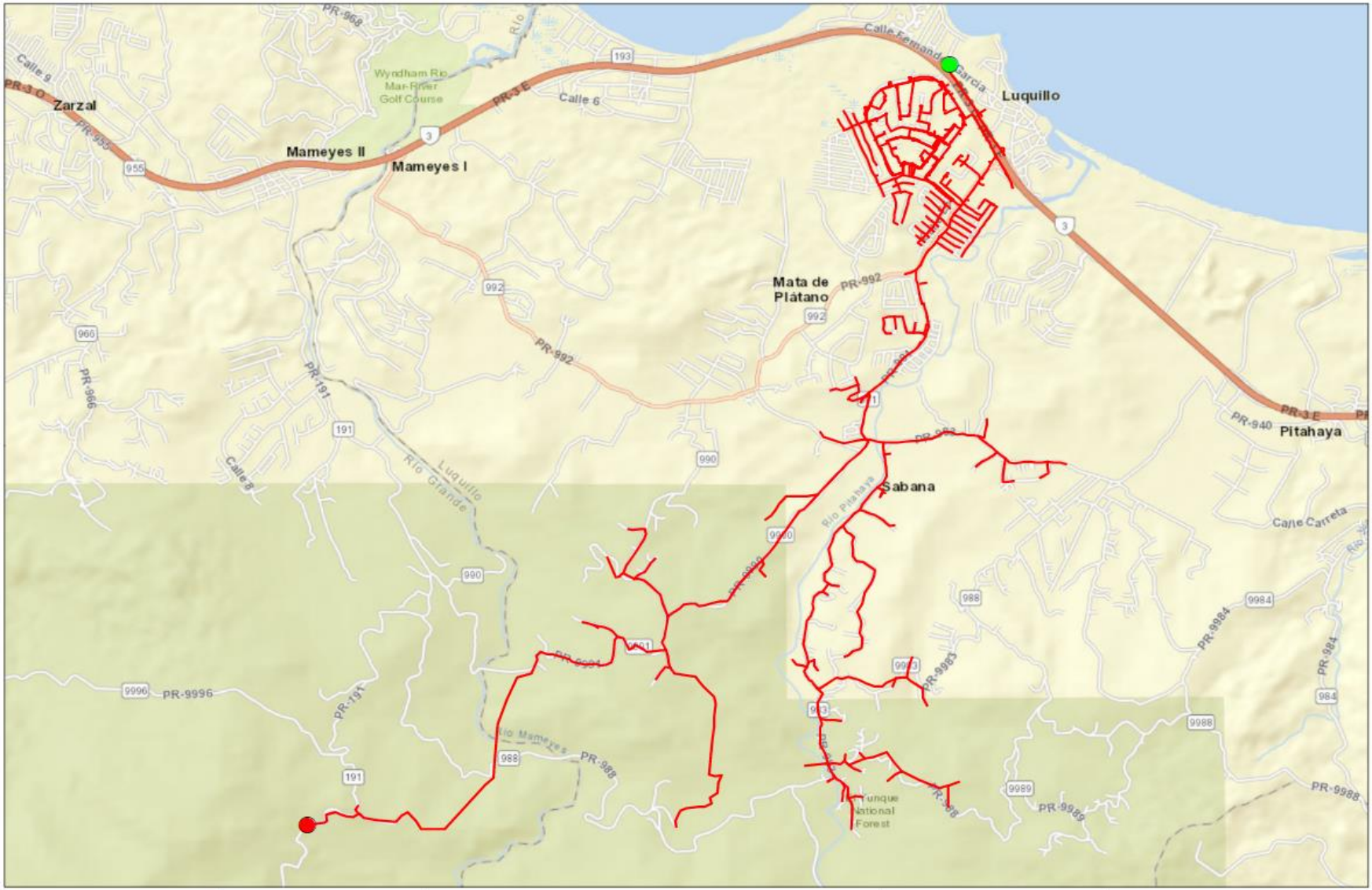
1:34,210

0 0.275 0.55 1.1 Miles

N

LUMA

Circuit 2006-03


Zarzal
Mameyes II
Mameyes I
Luquillo
Mata de Plátano
Pitahaya
Sabana
Río Grande
Río Mameyes
Río Pitahaya
Calle Carreta
Calle 6
Calle 8
Calle 9
Wyndham Rio Mar River Golf Course
PR-968
PR-955
PR-3 O
PR-3 E
PR-992
PR-191
PR-966
PR-940
PR-9996
PR-9984
PR-9983
PR-9988
PR-9989
PR-988
PR-984
Legend
Start Point
End Point
Circuit
1:39,810
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 2201-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 8

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 8
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
VENEZUELA 13KV	1348-08	[redacted]		13.2
HATO REY GIS 13KV	1404-07			13.2
TRES MONJITAS	1414-04			4.16
BALDRICH 13KV	1424-06			13.2
LAS LOMAS	1525-04			4.16
LAS LOMAS	1525-05			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$1.60M**
Estimated Budget for Procurement & Construction:	**$16.03M**
Estimated Overall Budget for the Project:	**$17.63M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

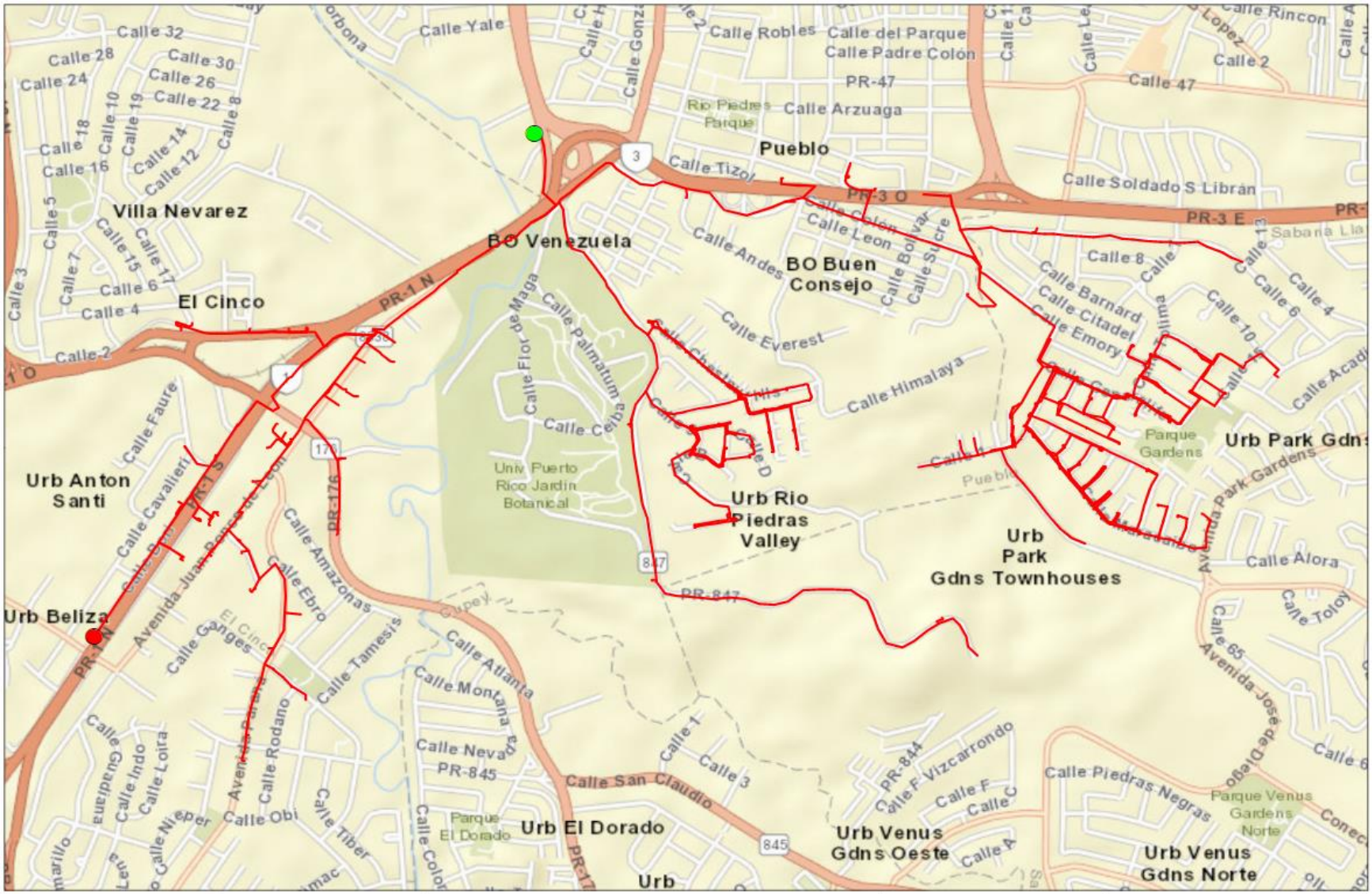
Note: If available, detailed engineering cost estimates will be included as an attachment.

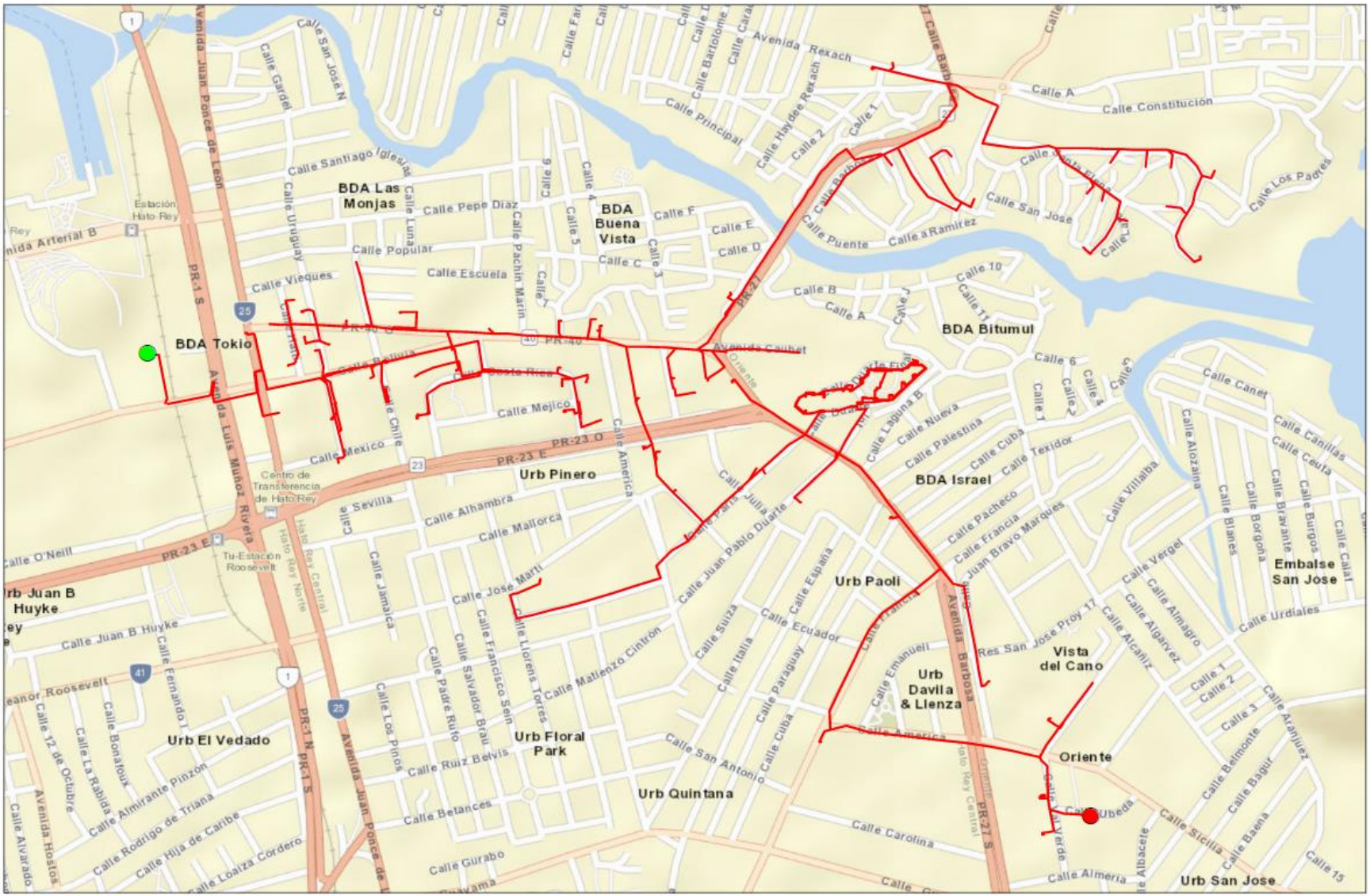
Environmental & Historic Preservation Requirements

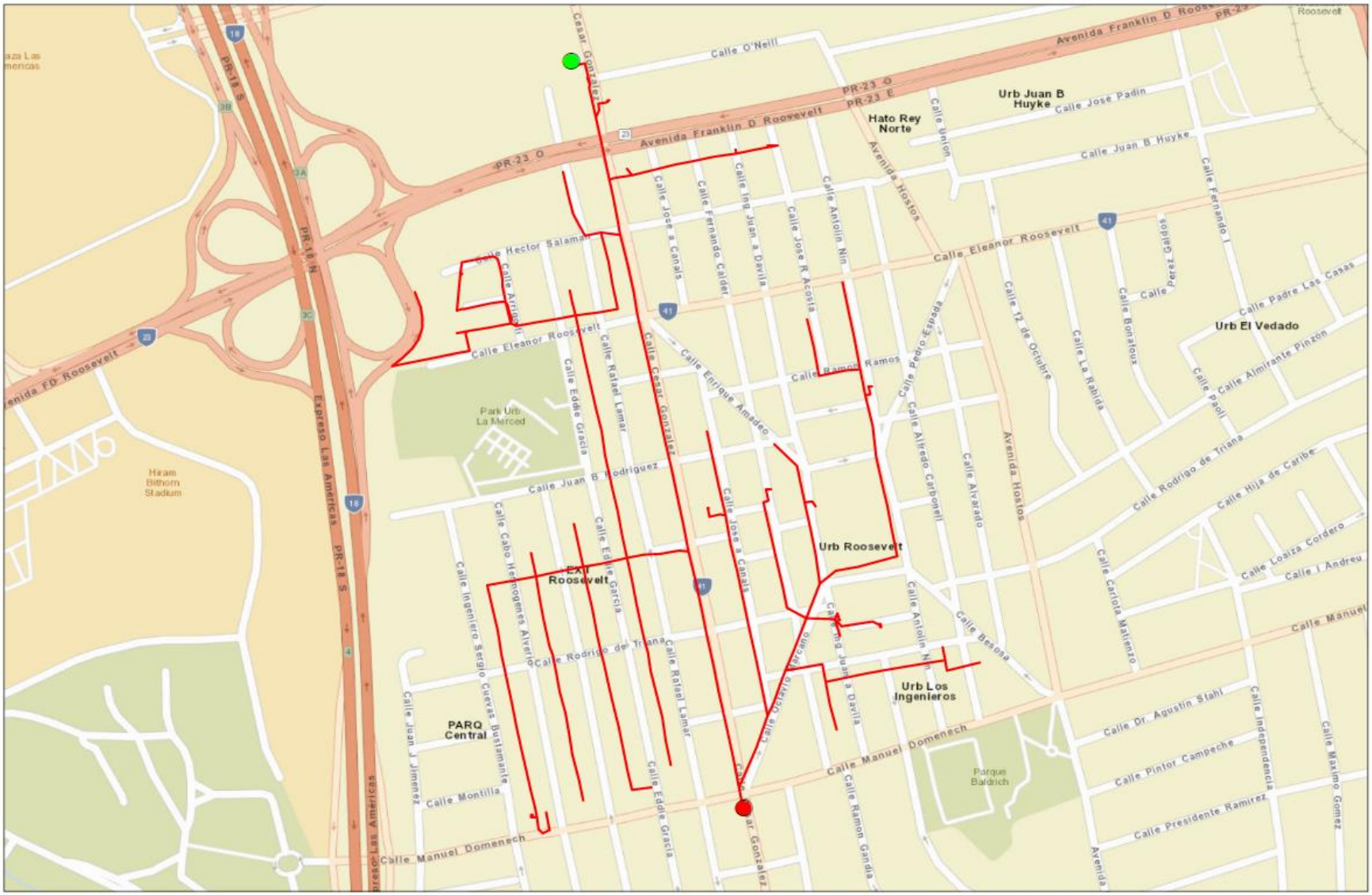
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

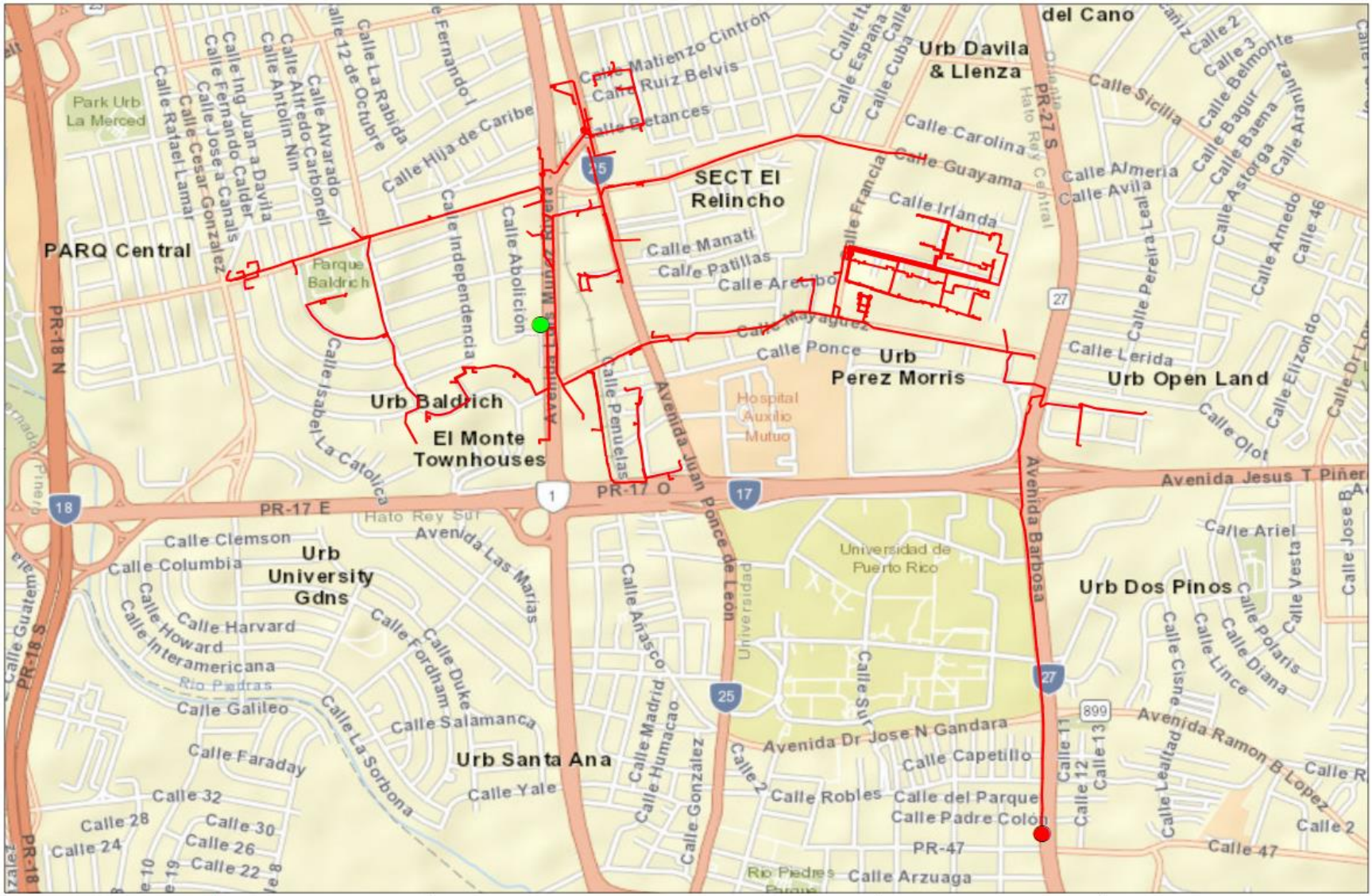
Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 8 Location Maps	Location Maps and Site Picture


Villa Nevarez
BO Venezuela
El Cinco
Pueblo
BO Buen Consejo
Urb Anton Santi
Urb Beliza
Urb Rio Piedras Valley
Urb Park Gdns Townhouses
Urb Park Gdns
Urb El Dorado
Urb Venus Gdns Oeste
Urb Venus Gdns Norte
Univ Puerto Rico Jardin Botanical
Parque Gardens
Parque El Dorado
Parque Venus Gardens Norte
Calle Yale
Calle Robles
Calle del Parque
Calle Padre Colon
Calle Arzuaga
Calle Tizol
Calle Soldado S Libran
Calle Andes
Calle Everest
Calle Himalaya
Calle Ceiba
Calle Palmatum
Calle Flor de Maga
Calle Barnard
Calle Citadel
Calle Emory
Calle Faure
Calle Cavalieri
Calle Amazonas
Calle Ebro
Calle Ganges
Calle Tamesis
Calle Atlanta
Calle Montana
Calle Nevada
Calle San Claudio
Calle Piedras Negras
Calle Alora
Calle Toloy
Avenida Park Gardens
Avenida Jose de Diego
Calle F Vizcarrondo
Calle Rodano
Calle Obi
Calle Tiber
Calle Nieper
Calle Indo
Calle Loira
Calle Guadiana
PR-1 N
PR-1 S
PR-176
PR-47
PR-847
PR-845
PR-844
PR-3 O
PR-3 E
Rio Piedras
Sabana Lla
Legend
Start Point
End Point
Circuit
1:14,640
0 0.1 0.2 0.4 Miles
N
LUMA
Circuit 1348-08


BDA Tokio
BDA Las Monjas
BDA Buena Vista
BDA Bitumul
BDA Israel
Urb Pinero
Urb Paoli
Urb Davila & Llenza
Vista del Cano
Urb Floral Park
Urb Quintana
Urb El Vedado
Urb Juan B Huyke
Oriente
Urb San Jose
Embalse San Jose
Centro de Transferencia de Hato Rey
Tu-Estación Roosevelt
Estación Hato Rey
Avenida Juan Ponce de Leon
Avenida Luis Muñoz Rivera
Avenida Barbosa
Avenida Rexach
Avenida Caribe
Calle Principal
Calle Constitución
Calle San Jose
Calle Puente
Calle Ramirez
Calle Los Padres
Calle Santiago Iglesias
Calle Garden
Calle San Jose N
Calle Uruguay
Calle Vieques
Calle Popular
Calle Pepe Diaz
Calle Escuela
Calle Pachin Marin
Calle Luna
Calle Mejico
Calle Mexico
Calle Chile
Calle Costa Rica
Calle Sevilla
Calle Alhambra
Calle Mallorca
Calle America
Calle Jose Marti
Calle Juan Pablo Duarte
Calle Paris
Calle Laguna B
Calle Nueva
Calle Palestina
Calle Cuba
Calle Texidor
Calle Pacheco
Calle Francia
Calle Juan Bravo Marques
Calle Vergel
Calle Almagro
Calle Algarvez
Calle Alcaniz
Calle Urdiales
Calle Canet
Calle Canillas
Calle Ceuta
Calle Bravante
Calle Burgos
Calle Borgoña
Calle Blanes
Calle Alozaina
Calle Villalba
Calle Emanuel
Calle Ecuador
Calle Suiza
Calle Italia
Calle Paraguay
Calle España
Calle Francisco Sein
Calle Salvador Brau
Calle Padre Rufo
Calle Los Pinos
Calle Ruiz Belvis
Calle Llorens Torres
Calle Matienzo Cintron
Calle San Antonio
Calle Betances
Calle Gurabo
Calle Carolina
Calle Almeria
Calle Albacete
Calle Sicilia
Calle Baena
Calle Baguir
Calle Belmonte
Calle Aranjuez
Calle Ubeda
Calle Alverde
Calle Jaime Drew
Calle Fernando I
Calle Juan B Huyke
Calle O'Neill
Calle Eleanor Roosevelt
Calle 12 de Octubre
Calle La Rabida
Calle Bonafoux
Calle Almirante Pinzon
Calle Rodrigo de Triana
Calle Hija de Caribe
Calle Loaiza Cordero
Avenida Hostos
Calle Alvarado
Hato Rey Central
Hato Rey Norte
PR-1 S
PR-1 N
PR-21
PR-40
PR-23 E
PR-23 O
PR-27 S
Legend
Start Point
End Point
Circuit
1:10,480
0 0.075 0.15 0.3 Miles
N
LUMA
Circuit 1404-07


Avenida Franklin D Roosevelt
PR-23 O
PR-23 E
Calle O'Neill
Urb Juan B Huyke
Hato Rey Norte
Calle Jose Padin
Calle Juan B Huyke
Calle Eleanor Roosevelt
Urb El Vedado
Calle Padre Las Casas
Calle Almirante Pinzon
Calle Rodrigo de Triana
Calle Hija de Caribe
Calle Loaiza Cordero
Calle I Andreu
Calle Manuel Domenech
Urb Roosevelt
EXT Roosevelt
Urb Los Ingenieros
PARQ Central
Park Urb La Merced
Hiram Bithorn Stadium
Parque Baldrich
Calle Dr Agustin Stahl
Calle Pintor Campeche
Calle Presidente Ramirez
Calle Independencia
Calle Maximo Gomez
Calle Montilla
Calle Ingeniero Sergio Cuevas Bustamante
Calle Cabo Hernogenes Alverio
Calle Juan J Jimenez
Calle Rafael Lamar
Calle Eddie Garcia
Calle Cesar Gonzalez
Calle Enrique Amadeo
Calle Ramon Ramos
Calle Jose a Canals
Calle Jose R Acosta
Calle Antolin Nin
Calle Alvarado
Calle Besosa
Calle Carlota Malenzo
Calle Ramon Gandia
Calle Fernando Calder
Calle Ing Juan a Davila
Calle Union
Avenida Hostos
Calle Pedro Espada
Calle Alfredo Carbonell
Calle 12 de Octubre
Calle La Rabida
Calle Bonaluz
Calle Perez Gatos
Calle Fernando I
Calle Arrimoll
Calle Hector Salamanca
Calle Juan B Rodriguez
Calle Eddie Gracia
Calle Octavio Marseno
Expreso Las Americas PR-18 S
PR-18 N
PR-18 S
Legend
Start Point
End Point
Circuit
1:6,360
0
0.05
0.1
0.2
Miles
N
LUMA
Circuit 1414-04


PARQ Central
Park Urb La Merced
Parque Baldrich
SECT El Relincho
Urb Davila & Llenza
del Cano
Urb Perez Morris
Urb Open Land
Urb Baldrich
El Monte Townhouses
Hospital Auxilio Mutuo
Urb University Gdns
Urb Santa Ana
Urb Dos Pinos
Universidad de Puerto Rico
Hato Rey Sur
Rio Piedras
Calle Independencia
Calle Abolicion
Calle Ponce
Calle Manati
Calle Patillas
Calle Arecibo
Calle Irlanda
Calle Carolina
Calle Guayama
Calle Sicilia
Calle Lerida
Calle Olot
Calle Ariel
Calle Harvard
Calle Howard
Calle Interamericana
Calle Galileo
Calle Faraday
Calle Salamanca
Calle Fordham
Calle Duke
Calle La Sorbona
Calle Yale
Calle Anasco
Calle Madrid
Calle Humacao
Calle Gonzalez
Calle Robles
Calle del Parque
Calle Padre Colon
Calle Capetillo
Avenida Dr Jose N Gandara
Avenida Ramon B Lopez
Avenida Barbosa
Avenida Juan Ponce de Leon
Avenida Las Marias
Avenida Jesus T Piñero
PR-17 E
PR-17 O
PR-18 N
PR-18 S
PR-27 S
PR-47
Calle Arzuaga
Legend
Start Point
End Point
Circuit
1:14,030
0 0.1 0.2 0.4 Miles
N
LUMA
Circuit 1424-06

Legend

- Start Point
- End Point
- Circuit

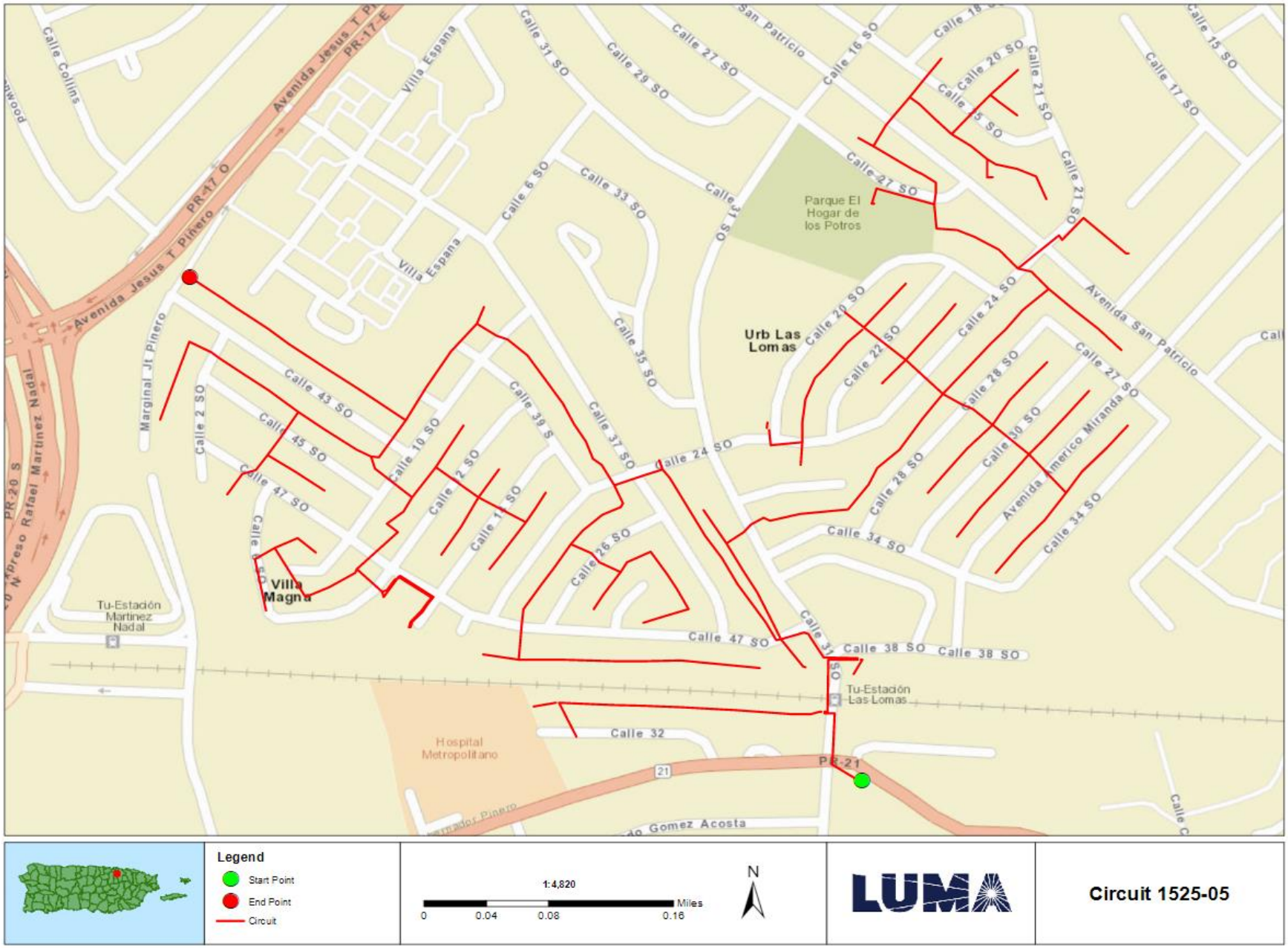
1:6,930

0 0.05 0.1 0.2 Miles

N

LUMA

Circuit 1525-04


Avenida Jesus T Pinero
PR-17 O
PR-17 E
Calle Collins
Villa Espana
Calle 31 SO
Calle 29 SO
Calle 27 SO
San Patricio
Calle 16 SO
Calle 20 SO
Calle 21 SO
Calle 17 SO
Calle 15 SO
Parque El Hogar de los Potros
Calle 6 SO
Calle 33 SO
Calle 31 SO
Marginal Jt Pinero
Urb Las Lomas
Calle 20 SO
Calle 24 SO
Avenida San Patricio
Calle 22 SO
Calle 28 SO
Calle 30 SO
Avenida Americo Miranda
Calle 34 SO
Calle 43 SO
Calle 45 SO
Calle 47 SO
Calle 2 SO
Calle 10 SO
Calle 39 S
Calle 37 SO
Calle 35 SO
Calle 24 SO
Calle 26 SO
Villa Magna
Tu-Estación Martinez Nadal
Calle 38 SO
Tu-Estación Las Lomas
Hospital Metropolitano
Calle 32
PR-21
21
Gomez Acosta
PR-20 S
Presidente Rafael Martinez Nadal
Legend
Start Point
End Point
Circuit
1:4,820
0
0.04
0.08
0.16
Miles
N
LUMA
Circuit 1525-05

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 9

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 9
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CACHETE 13KV	1529-12	[redacted]		13.2
CACHETE 13KV	1529-13			13.2
CACHETE 4KV	1530-09			4.16
BUEN PASTOR	1908-03			4.16
MARTIN PEÑA GIS I	1111-01			13.2
MINILLAS	1114-01			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.21M**
Estimated Budget for Procurement & Construction:	**$22.13M**
Estimated Overall Budget for the Project:	**$24.34M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

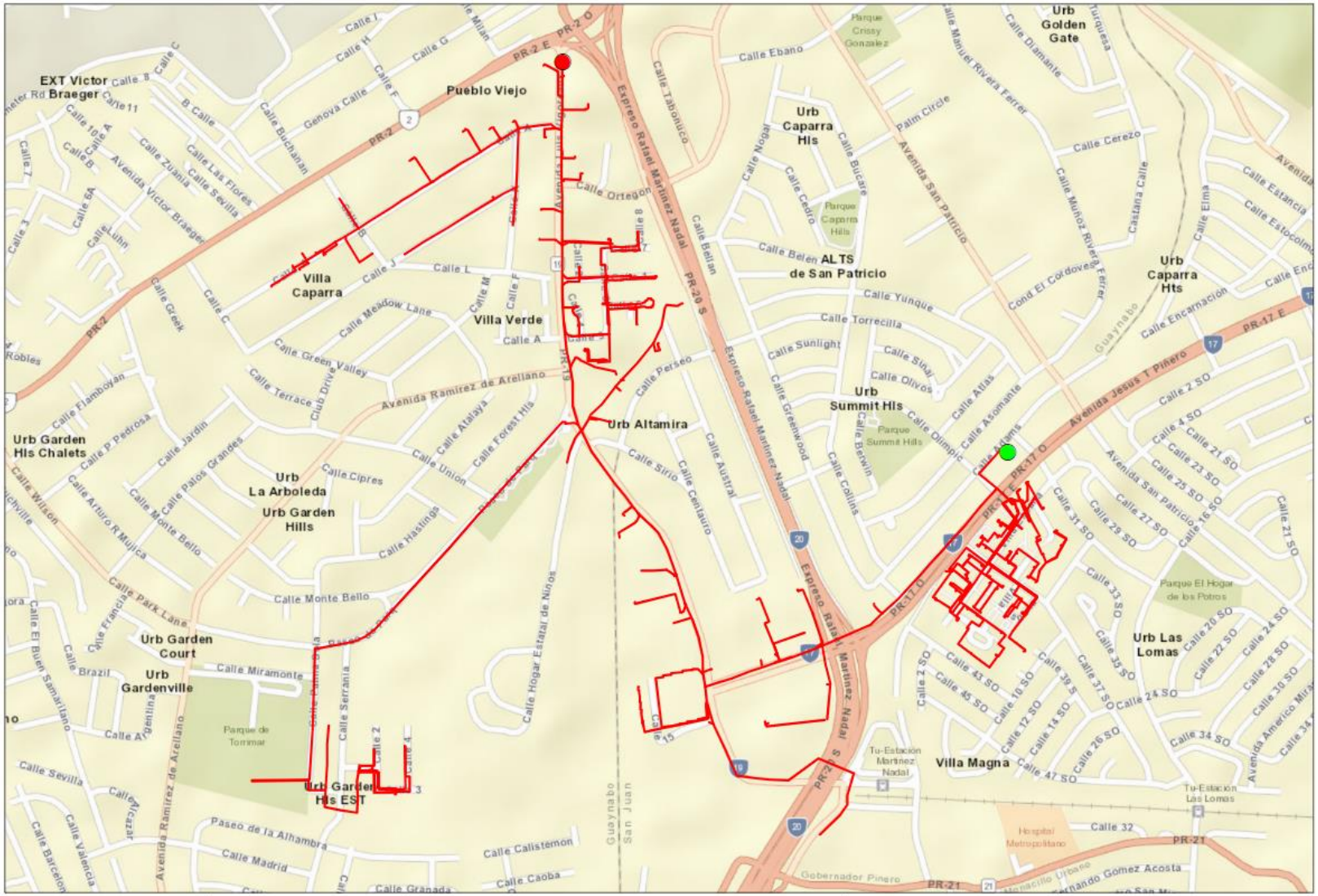
Note: If available, detailed engineering cost estimates will be included as an attachment.

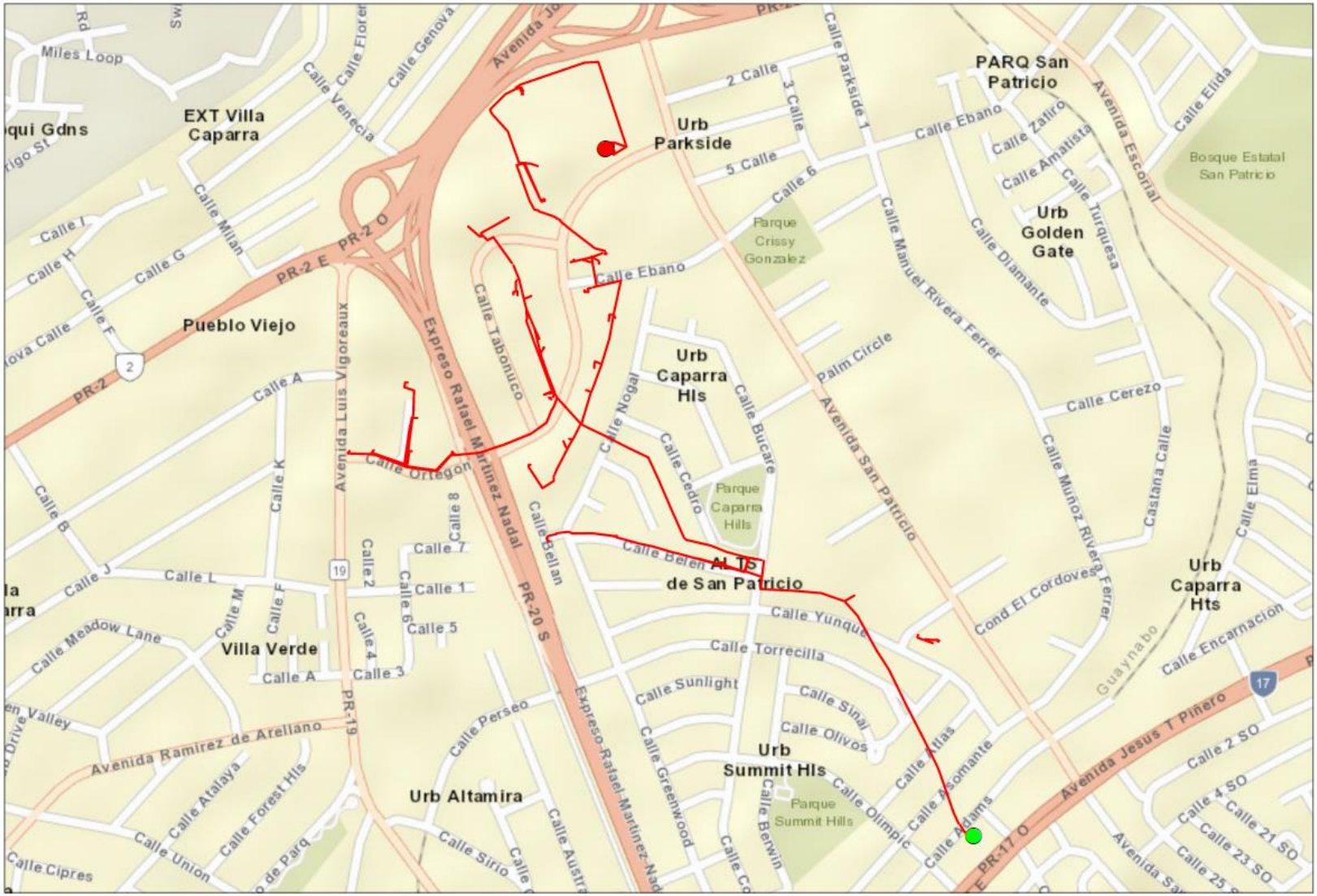
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 9 Location Maps	Location Maps and Site Picture


EXT Victor Braeger
Pueblo Viejo
Villa Caparra
Villa Verde
Urb Altamira
Urb Caparra Hls
ALTS de San Patricio
Urb Golden Gate
Urb Caparra Hts
Urb Summit Hls
Urb Garden Hls Chalets
Urb La Arboleda
Urb Garden Hills
Urb Garden Court
Urb Gardenville
Urb Garden Hls EST
Urb Las Lomas
Villa Magna
Expreso Rafael Martinez Nadal
Avenida Jesus T Pinero
Calle Ortegon
Calle Monte Bello
Calle Miramonte
Paseo de la Alhambra
Calle Madrid
Calle Granada
Calle Caoba
Calle Callistemon
Guaynabo
San Juan
Gobernador Pinero
PR-2
PR-17
PR-21
Legend
Start Point
End Point
Circuit
1:11,280
0 0.075 0.15 0.3
Miles
N
LUMA
Circuit 1529-12



Legend

- Start Point
- End Point
- Circuit

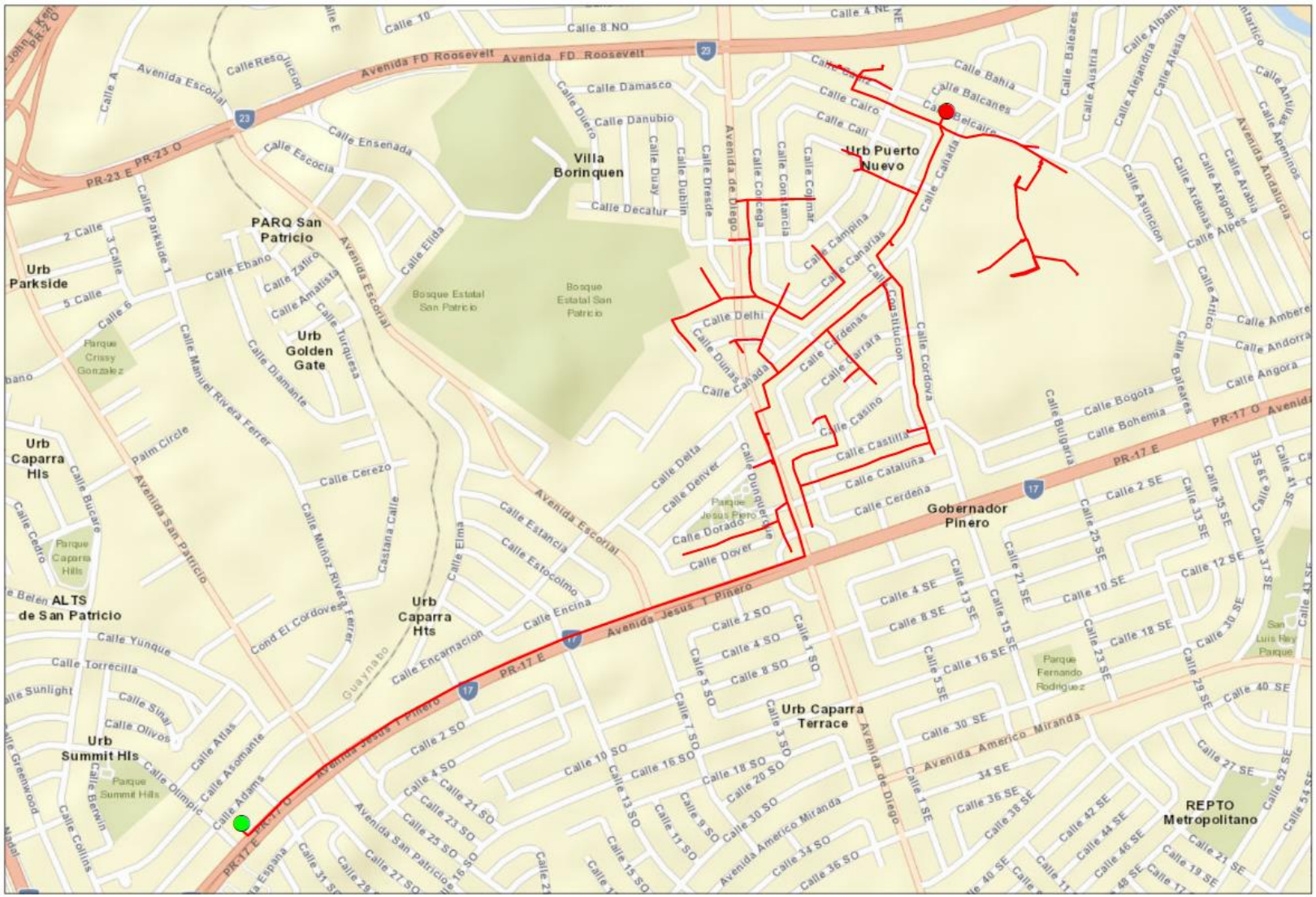
1:8,000

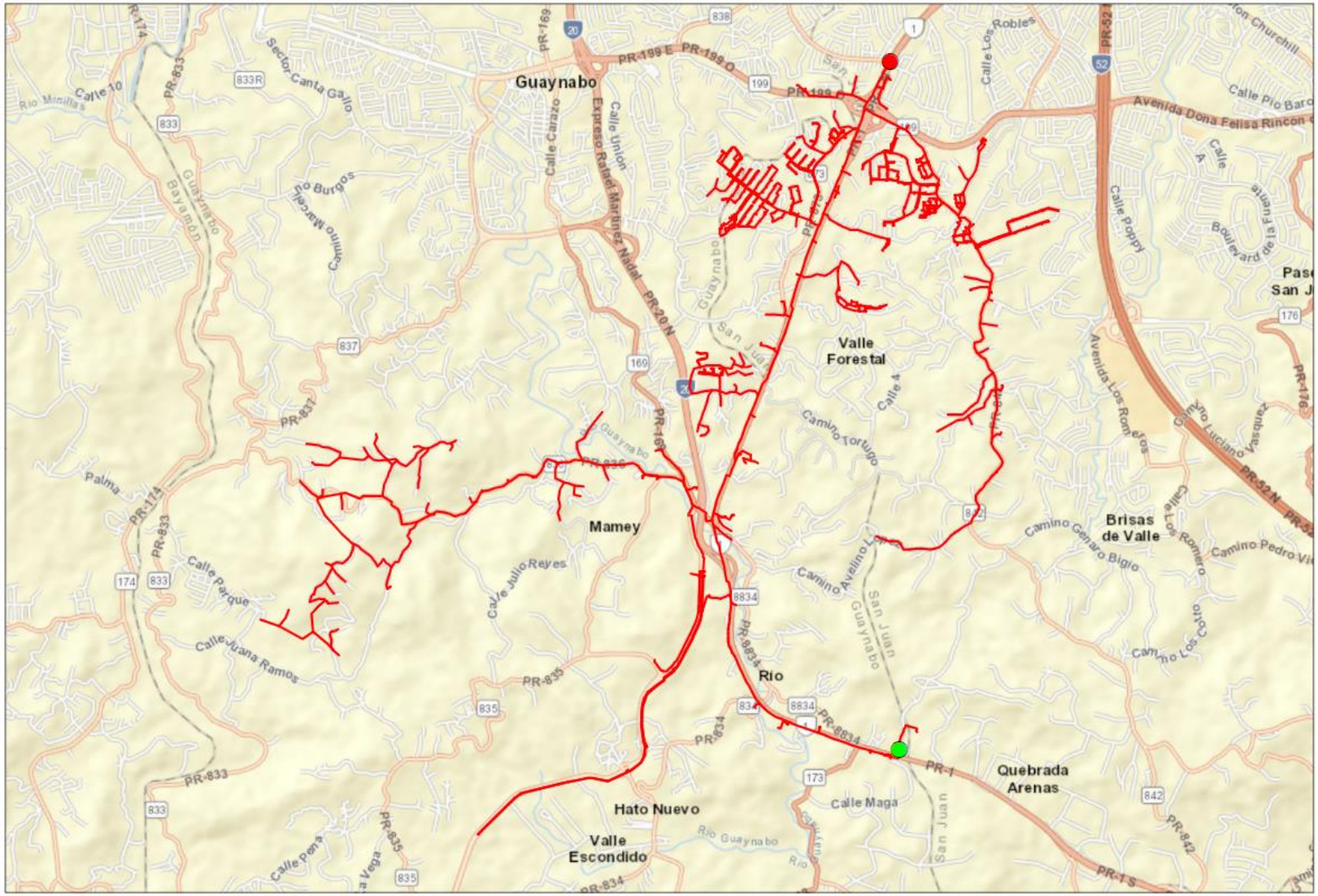
0 0.05 0.1 0.2 Miles

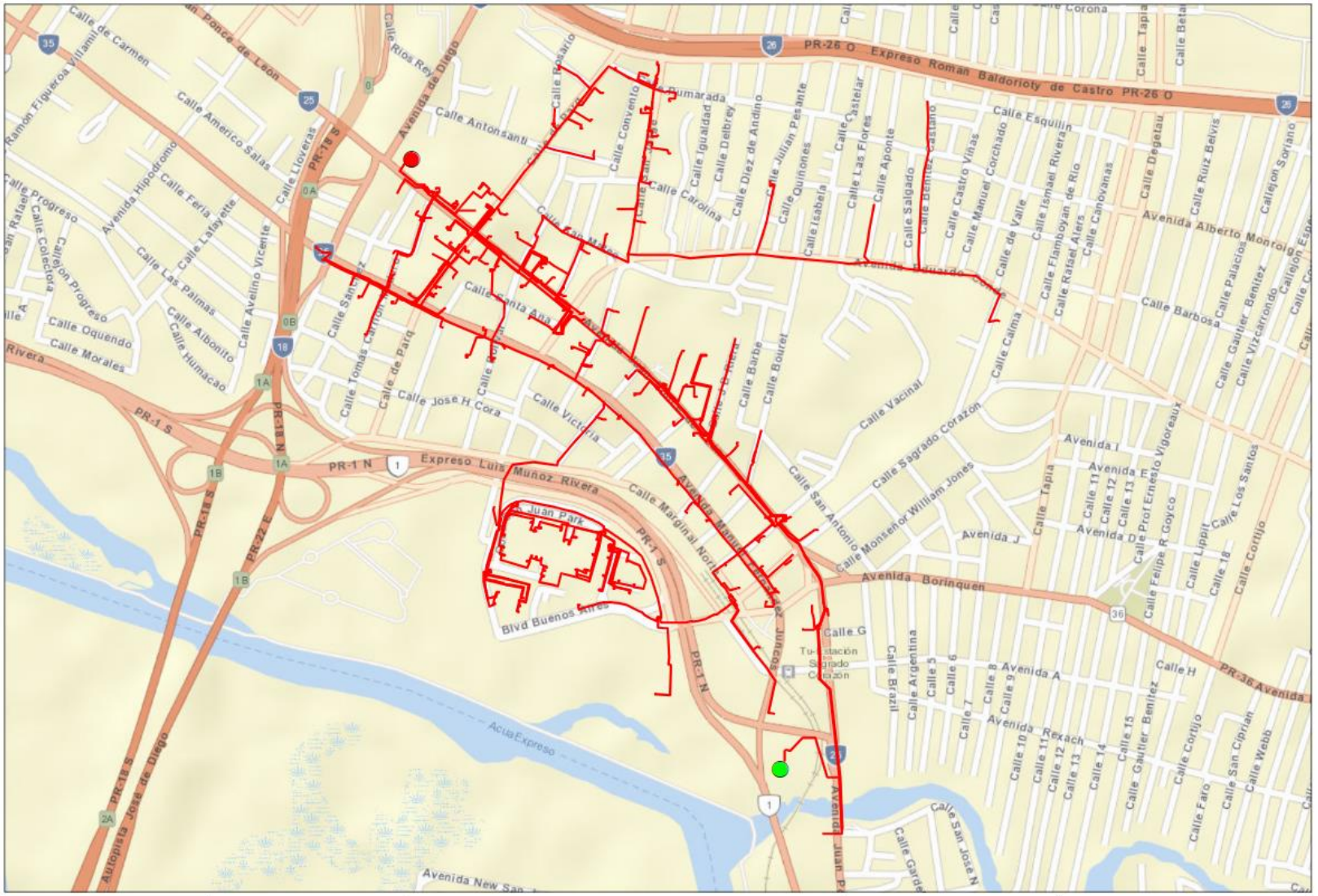
N

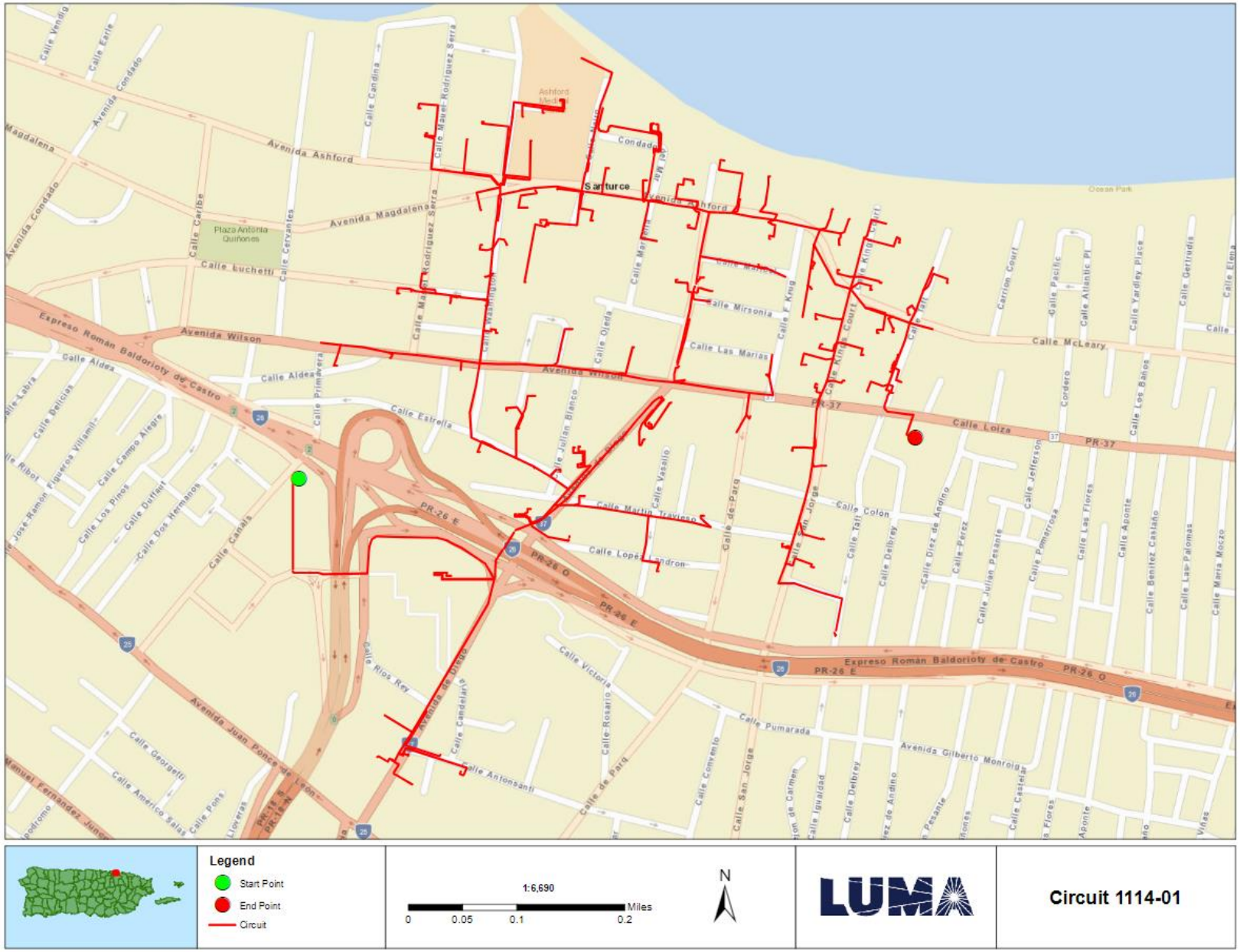
LUMA

Circuit 1529-13


Avenida FD Roosevelt
PR-23 E
PR-23 O
Villa Borinquen
PARQ San Patricio
Urb Parkside
Urb Golden Gate
Urb Puerto Nuevo
Urb Caparra Hts
Urb Caparra Hls
ALTS de San Patricio
Urb Summit Hls
Urb Caparra Terrace
Gobernador Pinero
REPTO Metropolitano
Avenida Escorial
Avenida Jesus T Pinero
PR-17 E
PR-17 O
Avenida Americo Miranda
Bosque Estatal San Patricio
Legend
Start Point
End Point
Circuit
1:10,610
0 0.075 0.15 0.3 Miles
N
LUMA
Circuit 1530-09


Guaynabo
Valle Forestal
Mamey
Río
Hato Nuevo
Valle Escondido
Quebrada Arenas
Brisas de Valle
Legend
Start Point
End Point
Circuit
1:37,090
0
0.3
0.6
1.2
Miles
N
LUMA
Circuit 1908-03


PR-26 O Expreso Roman Baldorioty de Castro PR-26 O
PR-1 N Expreso Luis Muñoz Rivera
PR-1 S
PR-18 S
PR-22 E
Avenida de Diego
Calle Antonsanti
Calle Americo Salas
Calle Lloveras
Calle Ponce de Leon
Calle Rosario
Calle Convento
Calle Dumarada
Calle Igualdad
Calle Delbrey
Calle Diez de Andino
Calle Julian Pesante
Calle Quinones
Calle Isabela
Calle Castelar
Calle Las Flores
Calle Aponte
Calle Salgado
Calle Esquilin
Calle Manuel Corchado
Calle Ismael Rivera
Calle Rafael Alers
Calle Canovanas
Calle Degetau
Calle Ruiz Belvis
Avenida Alberto Monroig
Calle Barbosa
Calle Palacios
Calle Gautier Benitez
Calle Vizcarrondo
Callejon Soriano
Calle de Valle
Calle Flamboyan de Rio
Calle Calma
Calle Vacinal
Calle Sagrado Corazon
Calle San Antonio
Calle Monsenor William Jones
Avenida I
Avenida M
Avenida J
Avenida D
Calle Tapia
Calle Prof Ernesto Vigoreaux
Calle Felipe R. Goyco
Calle Lippit
Calle Los Santos
Calle Cortijo
Avenida Borinquen
PR-36 Avenida
Calle G
Calle H
Avenida A
Avenida Rexach
Calle Argentina
Calle Brazil
Calle Faro
Calle San Ciprian
Calle Webb
Calle San Jose N
Avenida Juan P
Calle Santa Ana
Calle Victoria
Calle Jose H Cora
Calle de Para
Calle Tomas Carrion
Calle Avelino Vicente
Calle Las Palmas
Calle Alboinito
Calle Humacao
Calle Oquendo
Calle Morales
Calle Progreso
Calle Coleccion
Callejon Progreso
Avenida Hipodromo
Calle Feria
Calle Lafayette
Calle Rios Rey
Calle Barbe
Calle Bouret
Calle Corona
Calle Tapia
Calle Beta
Calle Ramon Figueroa Villamil de Carmen
Rivera
Juan Park
Blvd Buenos Aires
Calle Marginal Norte
Acua Expreso
Autopista Jose de Diego
Avenida New San
Legend
Start Point
End Point
Circuit
1:10,300
0 0.075 0.15 0.3 Miles
N
LUMA
Circuit 1111-01


Avenida Ashford
Avenida Magdalena
Avenida Wilson
Calle Loiza
PR-37
Expreso Román Baldorioty de Castro
PR-26 E
PR-26 O
Avenida Juan Ponce de León
Calle Colon
Calle Las Marías
Calle Mirsonia
Calle Estrella
Calle Aldea
Calle Luchetti
Calle Lopez Landron
Calle Pumarada
Avenida Gilberto Monroig
Calle Antonsanti
Calle Victoria
Calle Rosario
Calle Convento
Calle San Jorge
Calle Delbrey
Calle Pérez
Calle Díez de Andino
Calle Jefferson
Calle Tait
Calle Vasallo
Calle Julian Blanco
Calle Olida
Calle Cervantes
Calle Caribe
Calle Candina
Calle Condado
Calle Magdalena
Calle Ramel Rodriguez Serra
Calle Primavera
Calle Delicias
Calle Campo Alegre
Calle Los Pinos
Calle Duffaut
Calle Dos Hermanos
Calle Canals
Calle Georgetti
Calle América Salas
Calle Pons
Calle Rios Rey
Avenida de Diego
Calle Candelaria
Calle de Parq
Calle Martin Travieso
Calle Jose Ramon Figueras Villamil
Calle Aldea
Calle Ribot
Calle Labra
Calle Manuel Fernandez Junco
Plaza Antonia Quiñones
Santurce
Ashford Medical
Ocean Park
Calle McLeary
Calle Los Baños
Calle Yardley Place
Calle Gertrudis
Calle Atlantic Pl
Calle Pacific
Carrion Court
Calle Kings Court
Calle F King
Calle Mirsonia
Calle Las Marías
Calle Olida
Calle Washington
Calle Mariani
Calle Mayor
Calle Condado
Calle Vendig
Calle Earle
Avenida Condado
Calle Maria Rodriguez Serra
Calle Cervantes
Calle Caribe
Calle Luchetti
Calle Aldea
Calle Primavera
Calle Estrella
Calle Julian Blanco
Calle Vasallo
Calle de Parq
Calle Martin Travieso
Calle Lopez Landron
Calle Colon
Calle Tait
Calle Delbrey
Calle Pérez
Calle Díez de Andino
Calle Jefferson
Calle Pumarada
Calle Las Flores
Calle Aponte
Calle Benitez Castaño
Calle Las Palomas
Calle Maria Moczo
Calle Victoria
Calle Rosario
Calle Convento
Calle San Jorge
Calle Igualdad
Calle Delbrey
Calle Castelar
Calle Antonsanti
Calle de Parq
Calle Candelaria
Avenida de Diego
Calle Rios Rey
Calle Canals
Calle Dos Hermanos
Calle Duffaut
Calle Los Pinos
Calle Campo Alegre
Calle Delicias
Calle Jose Ramon Figueras Villamil
Calle Aldea
Calle Ribot
Calle Labra
Calle Manuel Fernandez Junco
Calle América Salas
Calle Georgetti
Calle Pons
Legend
Start Point
End Point
Circuit
1:6,690
0
0.05
0.1
0.2
Miles
N
LUMA
Circuit 1114-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 10

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 10
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
VIADUCTO 13KV	1115-04	[redacted]		13.2
LLORENS TORRES 13KV	1118-08			13.2
LLORENS TORRES 13KV	1118-09			13.2
ISLA GRANDE GIS I	1119-04			13.2
VILLA BETINA	1303-03			13.2
FALU	1334-01			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$1.49M**
Estimated Budget for Procurement & Construction:	**$14.90M**
Estimated Overall Budget for the Project:	**$16.39M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

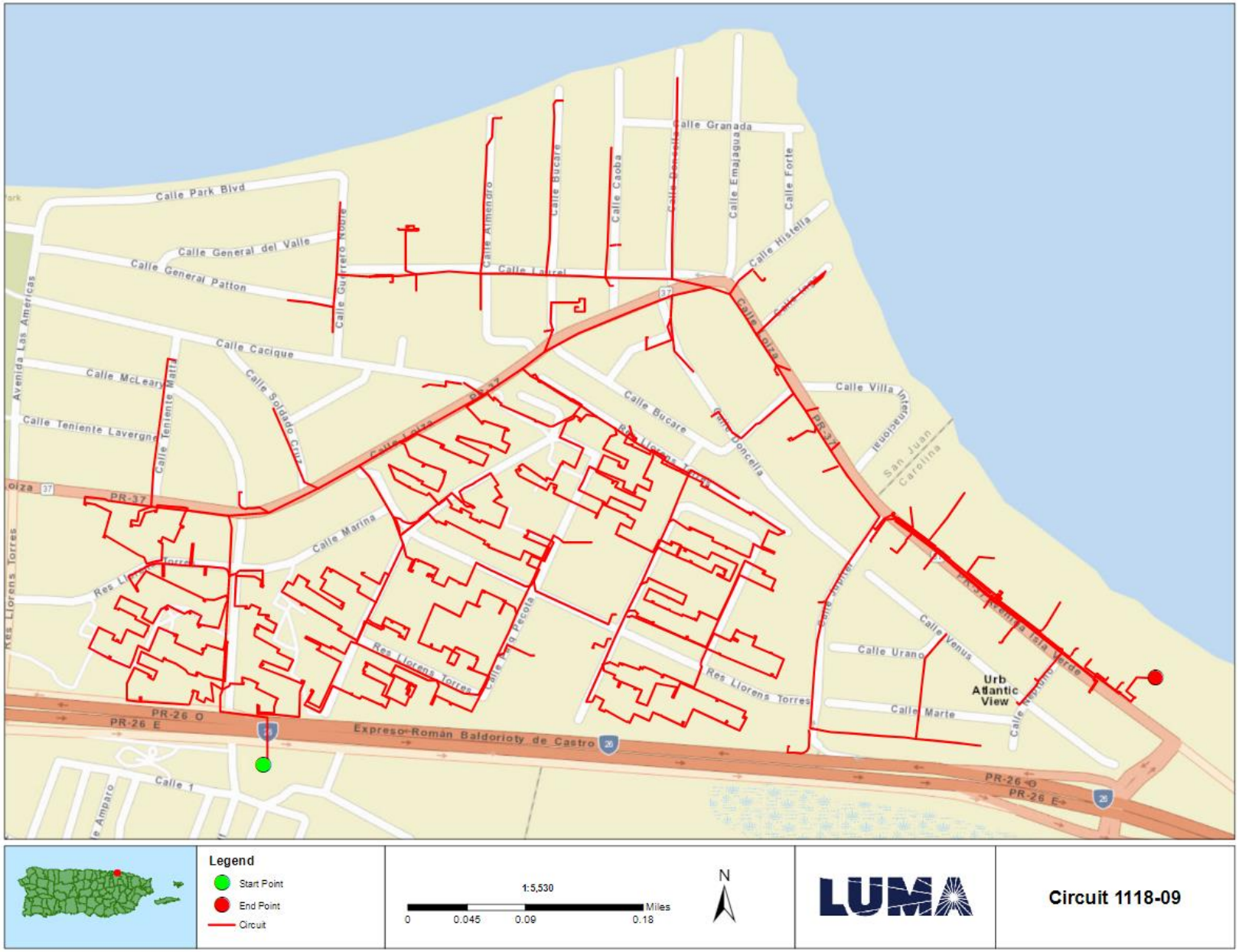
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

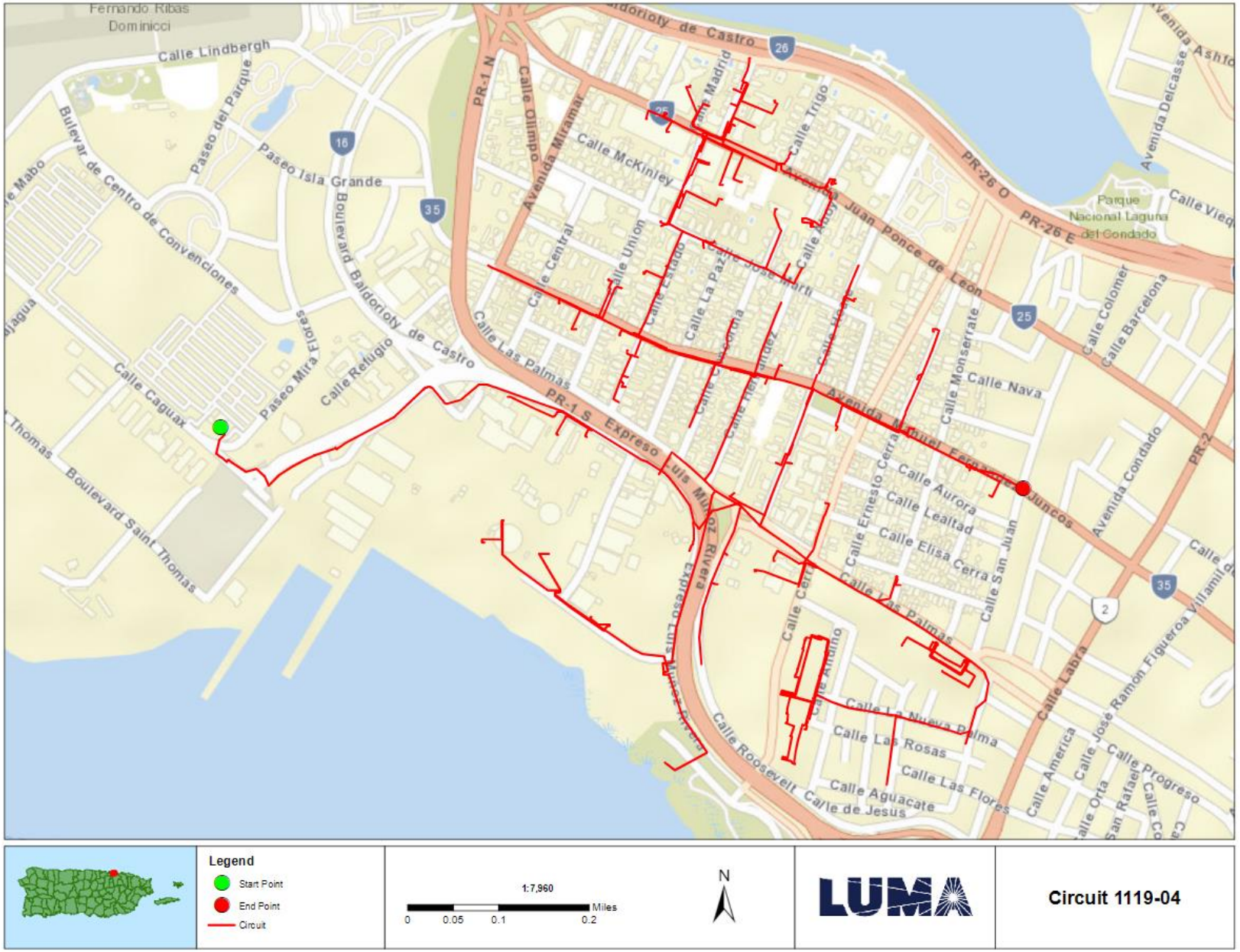
Attachments

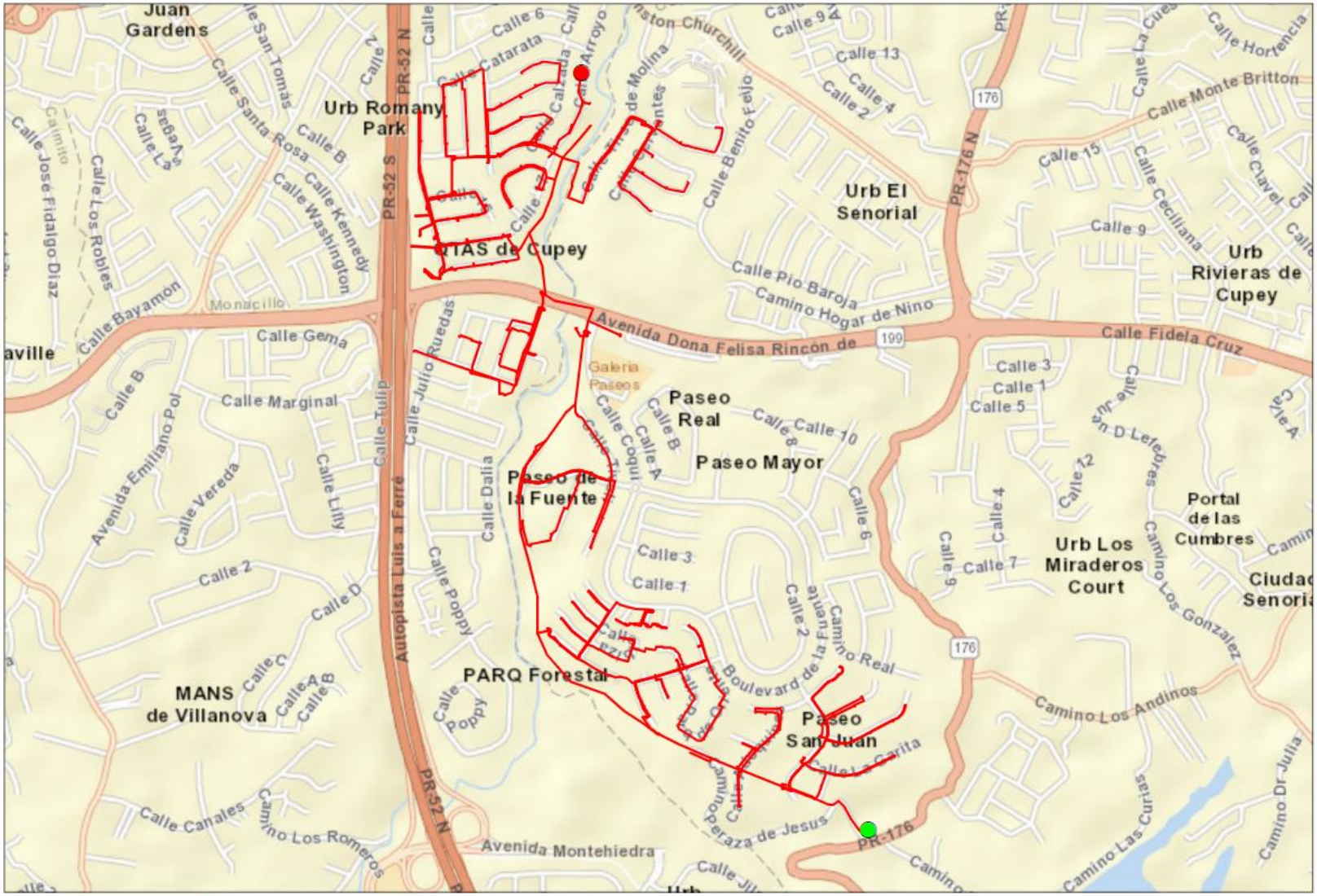
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 10 Location Maps	Location Maps and Site Picture


Expreso Roman Baldorioty de Castro
Avenida Wilson
Calle Aldea
Calle Estrella
Avenida de Diego
PR-26 E
PR-26 O
Avenida Manuel Fernandez Juncos
Calle de Carmen
Calle Labra
Calle Canals
Calle Rios Rey
Calle Victoria
Calle Antonsanti
Calle Georgetti
Calle Progreso
Avenida Las Palmas
Avenida Hipodromo
Calle Feria
Calle Lafayette
Calle Roosevelt
Calle Bolivar
Calle Fuerte
Calle San Mateo
Calle Saldana
Calle Dr. Manuel Fernandez Pavia
Calle Lloveras
Calle Pons
Calle Americo Salas
Calle Jose Ramon Figueroa Villamil
Calle Victor Figueroa
Calle Corchado
Avenida Condado
Calle Ribot
Calle Los Pinos
Calle Dos Hermanos
Calle Campo Alegre
Calle Delicias
Calle Valencia
Calle Barcelona
Calle Colomer
Calle Monserrate
Calle Nava
Calle Martin
Calle Lopez
Calle Julian Blanco
Calle Primavera
Calle Ojeda
Calle Washington
Calle Candelaria
Calle Rosario
Calle de Parq
Calle Beisval
Calle Las Flores
Calle America
Calle Orta
Calle San Rafael
Calle Blanca
Calle Colectora
Legend
Start Point
End Point
Circuit
1:5,820
0
0.0475
0.095
0.19
Miles
N
LUMA
Circuit 1115-04


Ocean Park
Parque Barbosa
Calle Loíza
Calle Colón
Calle Toft
Calle Pérez
Calle Pomarrosa
Calle Las Palomas
Calle María Moczo
Castro Viñas
Calle Santa Elena
Calle Gertrudis
Calle Pacific
Calle España
Calle Cacique
Calle McLeary
Calle Tapia
Calle Corona
Calle Betances
Avenida Las Américas
Calle Park Blvd
Calle General Patton
Calle Laurel
Calle Almendro
Calle Bucare
Calle Caoba
Calle Emajagua
Calle Hostelia
Calle Inga
PR-37
Res Llorens Torres
Calle Doncella
Calle Jupiter
Calle Uranio
PR-26 O Expreso Roman Baldorioty de Castro
Calle Esquilín
Calle Degetau
Calle Ruiz Belvis
Calle Henna
Calle 1
Calle Unión
Avenida Alberto Monroig
Avenida Eduardo Conde
Calle Barbosa
Calle Fajardo
Calle Juncos
Calle Nuñez Prieto
Calle Cotton
Calle Pellín Rodríguez
Calle Manuel Corchado
Calle Ismael Rivera
Calle Rafael Alers
Calle Canovanas
Calle de Valle
Calle Benítez Castaño
Calle Saligado
Calle Aponte
Calle Las Flores
Calle Castelar
Calle Isabela
Calle Quiñones
Calle Julián Pesante
Calle Díez de Andino
Calle Delbrey
Carolina
San Juan
Legend
Start Point
End Point
Circuit
1:9,700
0
0.075
0.15
0.3
Miles
N
LUMA
Circuit 1118-08


Calle Park Blvd
Calle General del Valle
Calle General Patton
Calle Cacique
Calle McLeary
Calle Teniente Matta
Calle Teniente Lavergne
Calle Soldado Cruz
Calle Guerrero Rivera
Calle Almendro
Calle Bucare
Calle Caoba
Calle Granada
Calle Emajaguada
Calle Forte
Calle Hiatella
Calle Laurel
Calle Loiza
PR-37
Calle Bucare
Calle Villa Internacional
San Juan
Carolina
Calle Marina
Res Llorens Torres
Calle Pera Pecoia
Calle Doncella
Calle Jupiter
Calle Venus
Calle Urano
Calle Marte
Urb Atlantic View
PR-26 O
PR-26 E
Expreso Román Baldorioty de Castro
Calle 1
Avenida Las Américas
Legend
Start Point
End Point
Circuit
1:5,530
Miles
0
0.045
0.09
0.18
N
LUMA
Circuit 1118-09


Fernando Ribas Dominicci
Calle Lindbergh
Paseo del Parque
Paseo Isla Grande
Boulevard Baldorioty de Castro
Calle Caguax
Paseo Mira Flores
Calle Refugio
Boulevard Saint Thomas
PR-1 N
Calle Olimpo
Avenida Miramar
Calle McKinley
Calle Central
Calle Unión
Calle Estado
Calle La Paz
Calle Trigo
Avenida Juan Ponce de León
PR-26 O
PR-26 E
Parque Nacional Laguna del Condado
Calle Las Palmas
PR-1 S Expreso Luis Muñoz Rivera
Calle Monserrate
Calle Nava
Calle Aurora
Calle Lealtad
Calle Elisa Cerra
Calle San Juan
Avenida Condado
Calle Labra
Calle Amalino
Calle La Nueva Palma
Calle Las Rosas
Calle Las Flores
Calle Aguacate
Calle Roosevelt
Calle de Jesús
Calle América
Calle José Ramón Figueroa Villamil
Calle Progreso
Legend
Start Point
End Point
Circuit
1:7,960
0 0.05 0.1 0.2 Miles
N
LUMA
Circuit 1119-04



Legend

- Start Point
- End Point
- Circuit

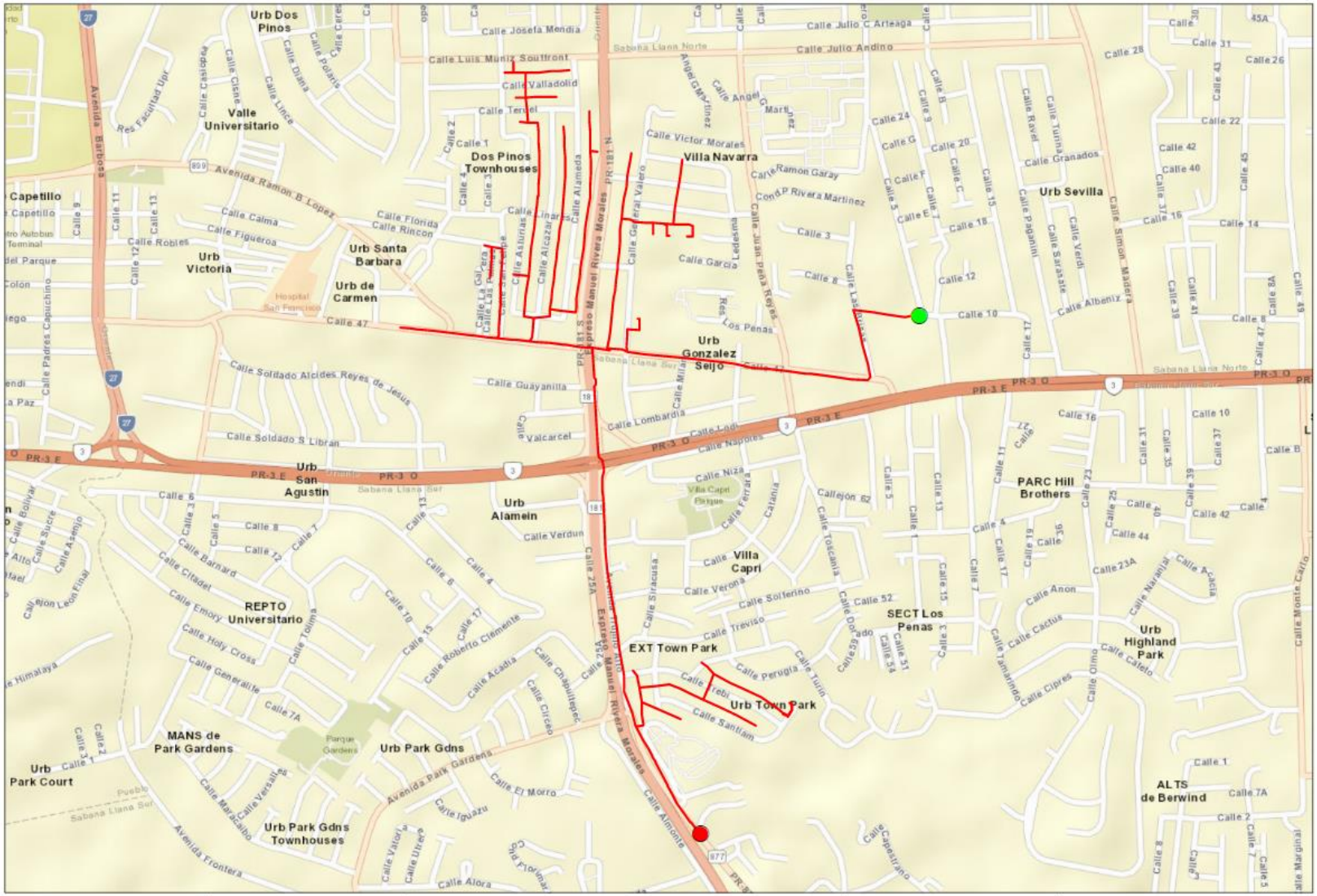
1:14,570

0 0.1 0.2 0.4 Miles

N

LUMA

Circuit 1303-03


Urb Dos Pinos
Valle Universitario
Dos Pinos Townhouses
Villa Navarra
Urb Sevilla
Capetillo
Urb Victoria
Urb Santa Barbara
Urb de Carmen
Urb Gonzalez Seijo
Urb San Agustin
Urb Alamein
PARC Hill Brothers
Villa Capri
REPTO Universitario
SECT Los Penas
EXT Town Park
Urb Town Park
Urb Highland Park
MANS de Park Gardens
Urb Park Gdns
Urb Park Court
Urb Park Gdns Townhouses
ALTS de Berwind
Avenida Barbosa
Avenida Ramon B Lopez
Avenida Park Gardens
Avenida Frontera
PR-3 E
PR-3 O
PR-181 N
PR-181 S
Sabana Llana Norte
Sabana Llana Sur
Calle Julio Andino
Calle Julio C Arteaga
Calle Josefa Mendia
Calle Luis Muniz Souffront
Calle Valladolid
Calle Tenerife
Calle Victor Morales
Calle Ramon Garay
Calle Garcia Ledesma
Calle Soldado Alcides Reyes de Jesus
Calle Soldado S Libran
Calle Guayanilla
Calle Lombardia
Calle Napoles
Calle Verdun
Calle Siracusa
Calle Verona
Calle Solferino
Calle Treviso
Calle Perugia
Calle Turin
Calle Santiam
Calle Rebi
Calle Almonte
Calle Alora
Calle Capestrano
Calle Monte Carlo
Calle Anon
Calle Cactus
Calle Cipres
Calle Olmo
Calle Tamarindo
Calle Callelo
Calle Naranjal
Calle Acacia
Calle Toscania
Calle Ferrara
Calle Niza
Calle Dorado
Calle Roberto Clemente
Calle Acadia
Calle Circeo
Calle Chabultepec
Calle Iguazu
Calle El Morro
Calle Marcalbo
Calle Versailles
Calle Barnard
Calle Citadel
Calle Emory
Calle Holy Cross
Calle Generalife
Calle Toluca
Calle Himalaya
Calle Bolivar
Calle Sucre
Calle Alejo
Calle Padres Capuchino
Calle Robles
Calle Figueroa
Calle Calma
Calle Florida
Calle Rincon
Calle Asturias
Calle Alcazar
Calle Alameda
Calle Linares
Calle Las Penas
Calle Los Penas
Calle Albenix
Calle Paganini
Calle Ravel
Calle Granados
Calle Simon Madera
Calle Verdi
Calle Sarasate
Calle Lasalle
Calle Milan
Calle Lodi
Calle Valcarcel
Calle Urbieta
Calle Valoria
Calle Pontevedra
Calle Lugo
Calle Orense
Calle Lerida
Calle Tarragona
Calle Gerona
Calle Barcelona
Calle Cadiz
Calle Sevilla
Calle Malaga
Calle Granada
Calle Cordoba
Calle Jaen
Calle Almeria
Calle Huelva
Calle Zaragoza
Calle Teruel
Calle Leon
Calle Navarra
Calle Alava
Calle Guipuzcoa
Calle Vizcaya
Calle Burgos
Calle Salamanca
Calle Avila
Calle Segovia
Calle Soria
Calle Palencia
Calle Zamora
Calle Leonor
Calle Isabel
Calle Fernando
Calle Alfonso
Calle Pedro
Calle Juan
Calle Carlos
Calle Enrique
Calle Ramon
Calle Jose
Calle Luis
Calle Manuel
Calle Miguel
Calle Angel
Calle Victor
Calle Ramon Garay
Calle Garcia Ledesma
Calle Callejon 62
Calle Callejon Leon Final
Calle Callejon Final
Calle Callejon Final
Hospital San Francisco
Parque Gardens
Villa Capri Parque
Res Facultad Upr
Res Los Penas
Con&P Rivera Martinez
Terminal Autobus
Terminal del Parque
Colon
Paz
Pueblo
Legend
Start Point
End Point
Circuit
1:12,400
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 1334-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 11

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 11
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
BERWIND 13KV	1336-07	[redacted]		13.2
LA MUDA	1343-01			4.16
LA MUDA	1343-05			4.16
MONACILLOS 13KV	1346-03			13.2
MONACILLOS 13KV	1346-04			13.2
MONACILLOS 13KV	1346-05			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.15M**
Estimated Budget for Procurement & Construction:	**$21.53M**
Estimated Overall Budget for the Project:	**$23.68M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

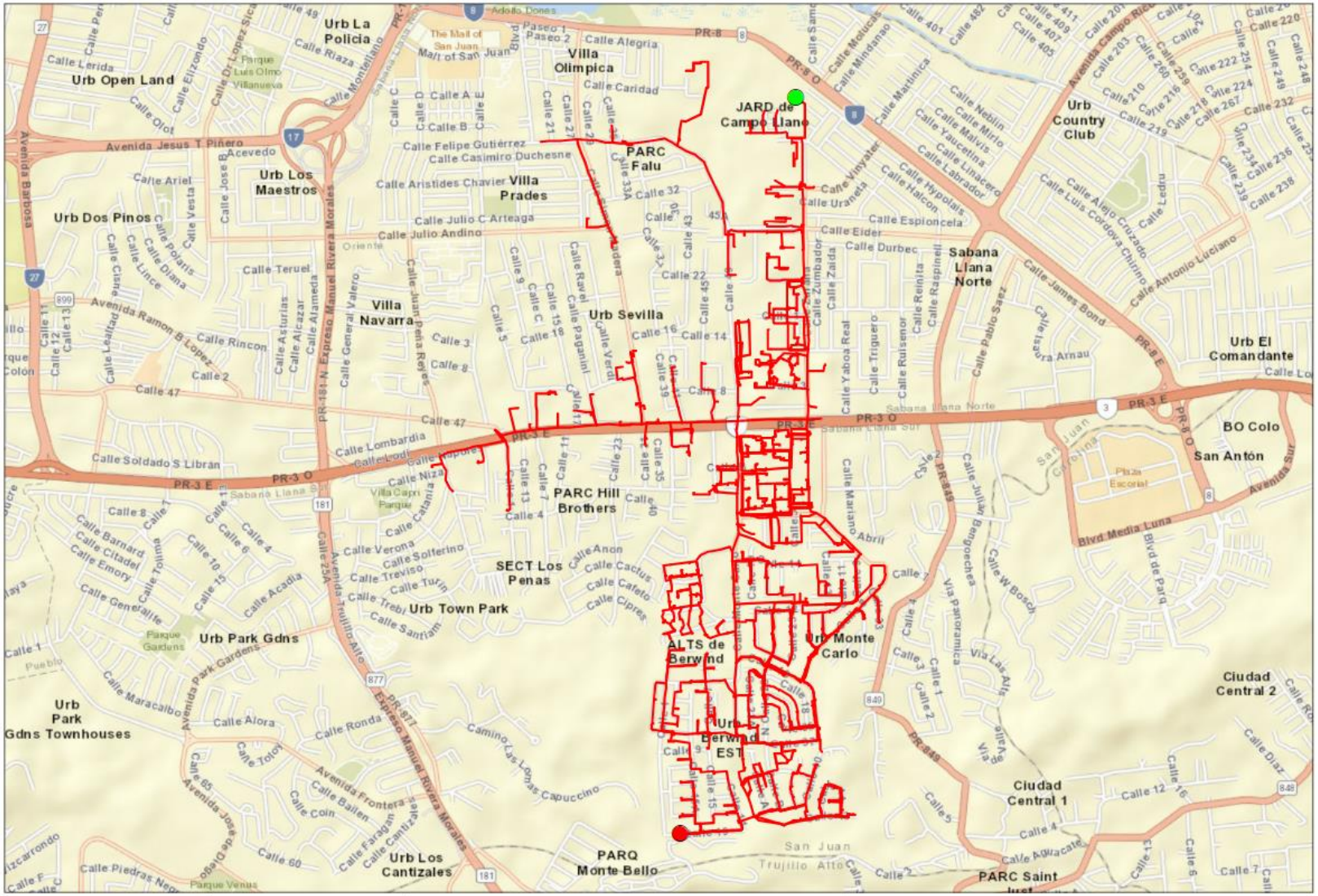
Note: If available, detailed engineering cost estimates will be included as an attachment.

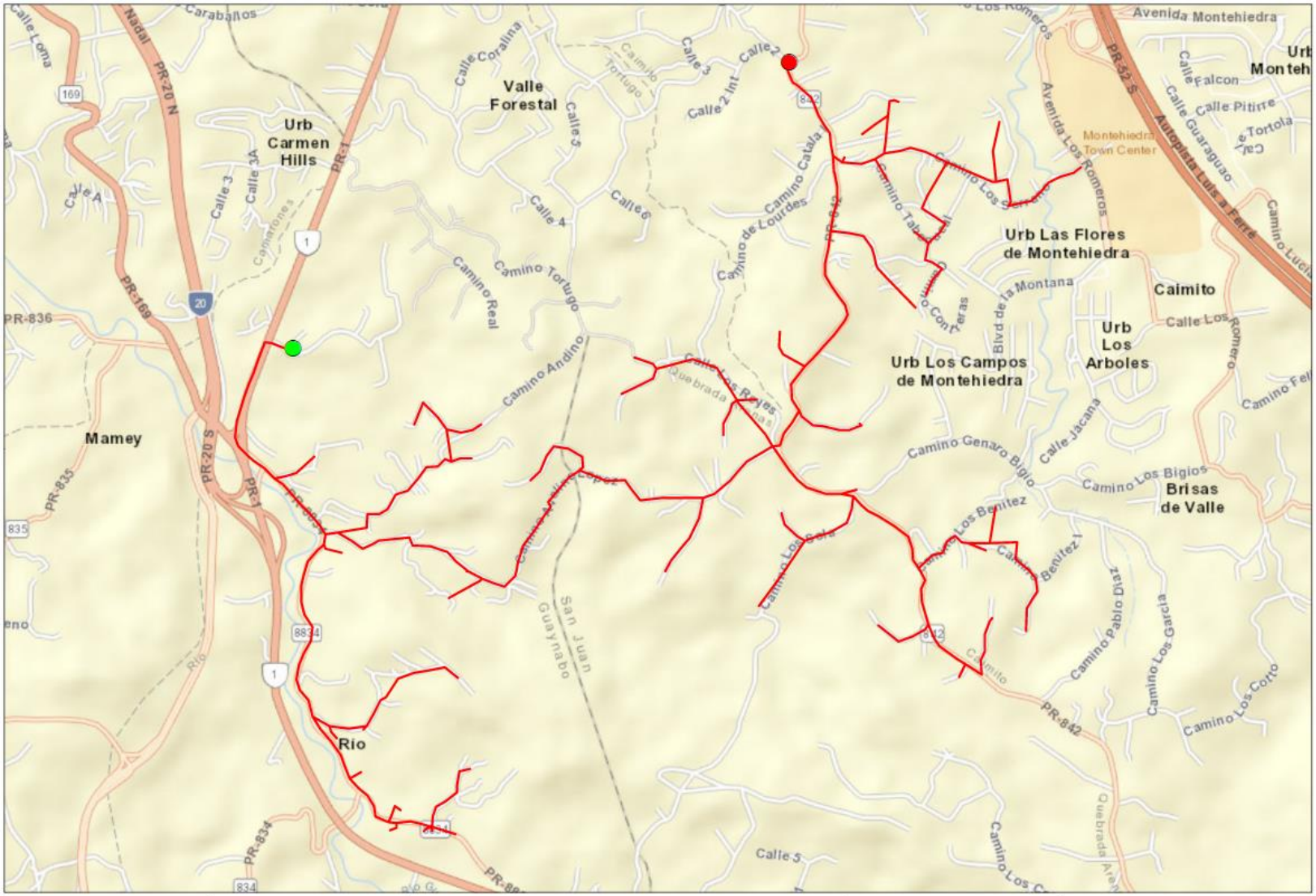
Environmental & Historic Preservation Requirements

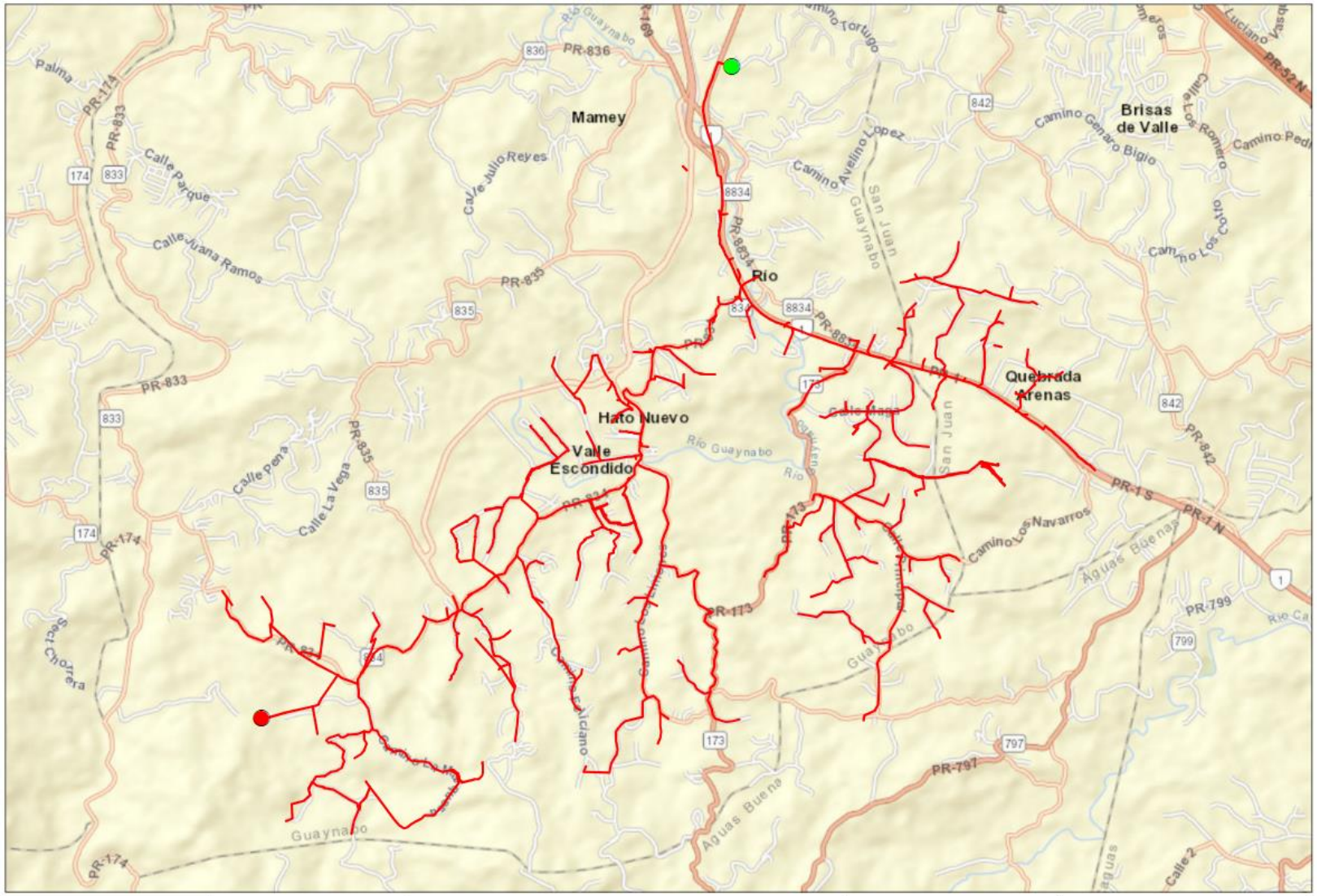
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

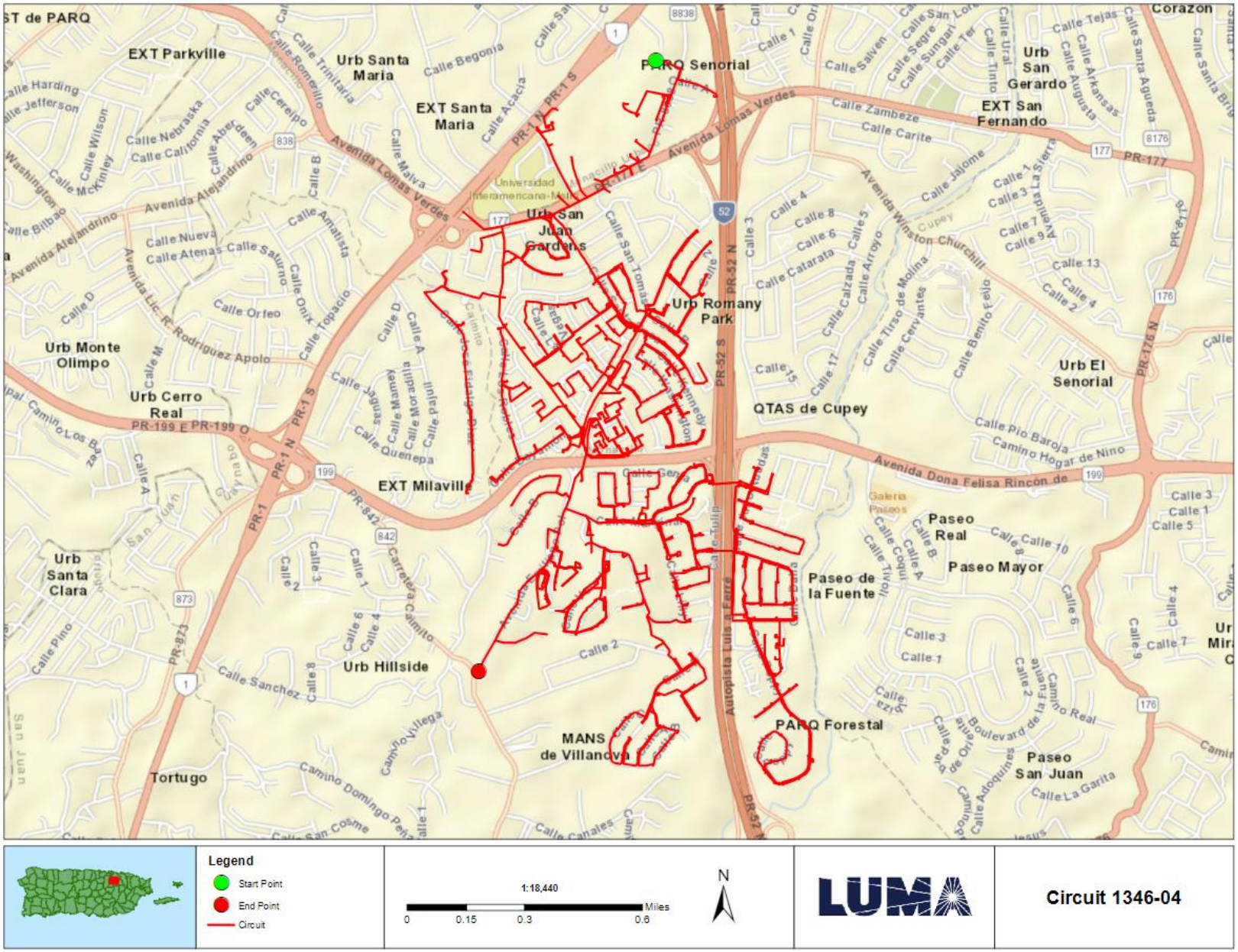
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 11 Location Maps	Location Maps and Site Picture

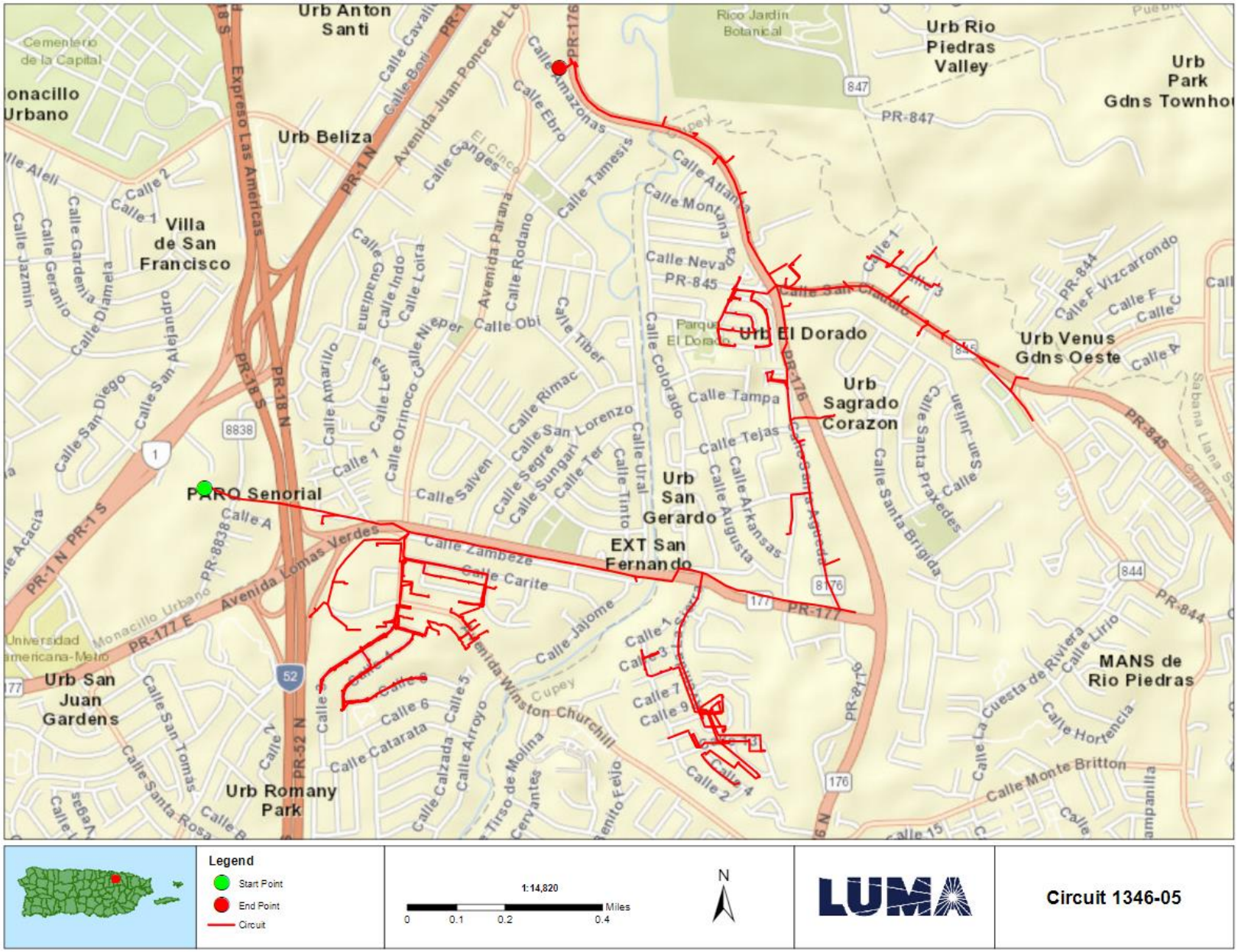

Urb La Policia
Urb Open Land
Villa Olimpica
JARD de Campo Llano
Urb Country Club
PARC Falu
Urb Los Maestros
Villa Prades
Urb Dos Pinos
Sabana Llana Norte
Villa Navarra
Urb Sevilla
Urb El Comandante
PARC Hill Brothers
BO Colo
San Antón
SECT Los Penas
Urb Town Park
Urb Park Gdns
ALTS de Berwind
Urb Monte Carlo
Ciudad Central 2
Urb Park Gdns Townhouses
Urb Berwind EST
Ciudad Central 1
Urb Los Cantizales
PARQ Monte Bello
PARC Saint
Legend
Start Point
End Point
Circuit
1:21,220
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 1336-07


Valle Forestal
Urb Carmen Hills
Urb Las Flores de Montehiedra
Caimito
Urb Los Arboles
Urb Los Campos de Montehiedra
Brisas de Valle
Mamey
Rio
Avenida Montehiedra
Montehiedra Town Center
Autopista Luis a Ferre
Camino Real
Camino Tortugo
Camino Andino
Camino Catala
Camino de Lourdes
Camino Genaro Biglo
Camino Los Bigios
Camino Los Benitez
Camino Pablo Diaz
Camino Los Garcia
Camino Los Corto
Calle Los Romeros
Calle Jacana
Calle Falcon
Calle Guaraguao
Calle Pitirre
Calle Tortola
Blvd de la Montana
Calle 2
Calle 2 Int
Calle 3
Calle 3A
Calle 4
Calle 5
Calle 6
Calle A
Calle Coralina
Calle Los Reyes
Quebrada Arenas
San Juan
Guaynabo
PR-20 N
PR-20 S
PR-1
PR-169
PR-836
PR-835
PR-834
PR-842
PR-52 S
Nadal
Carabanos
Camiones
Rio
Legend
Start Point
End Point
Circuit
1:17,540
0
0.125
0.25
0.5
Miles
N
LUMA
Circuit 1343-01


Mamey
Río
Brisas de Valle
Quebrada Arenas
Hato Nuevo
Valle Escondido
Río Guaynabo
Aguas Buenas
Guaynabo
Palma
Calle Julio Reyes
Calle Parque
Calle Juana Ramos
Calle Pena
Calle La Vega
Camino Avelino Lopez
Camino Genaro Bigio
Camino Los Navarros
PR-836
PR-833
PR-835
PR-174
PR-173
PR-842
PR-1 S
PR-1 N
PR-799
PR-797
PR-32 N
8834
836
833
835
174
842
173
799
797
1
Legend
Start Point
End Point
Circuit
1:34,840
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 1343-05


Urb San Ignacio
REPTO Veterano
Urb Santa Maria
EXT Parkville
ALTS de Santa Maria
Urb Mallorca
EXT Santa Maria
Urb San Juan Gardens
MANS de Caldas
Urb Apolo
Urb Bucare
Urb Alto Apolo States
Urb Monte Olimpo
Urb Cerro Real
Urb Monte Apolo EST
Urb Garcia
Urb La Cumbre
Urb Milaville
Universidad Interamericana-Metro
Avenida Lomas Verdes
PR-177 O
PR-177 E
PR-1 N
PR-1 S
PR-199 E PR-199 O
Legend
Start Point
End Point
Circuit
1:10,370
0 0.075 0.15 0.3 Miles
N
LUMA
Circuit 1346-03


EXT Parkville
Urb Santa Maria
EXT Santa Maria
PARQ Senorial
Urb San Gerardo
EXT San Fernando
Urb San Juan Gardens
Urb Romany Park
Urb Monte Olimpo
Urb Cerro Real
QTAS de Cupey
Urb El Senorial
EXT Milaville
Paseo Real
Paseo Mayor
Paseo de la Fuente
Urb Santa Clara
Urb Hillside
PARQ Forestal
MANS de Villanova
Paseo San Juan
Tortugo
Avenida Lomas Verdes
Avenida Alejandrino
Avenida Dona Felisa Rincon de
Calle Zambeze
Calle Carite
Calle Begonia
Calle Acacia
Calle Malva
Calle Nueva
Calle Atenas
Calle Orfeo
Calle Jaguas
Calle Quenepa
Calle Tulipan
Calle Sanchez
Calle Pino
Calle Pio Baroja
Camino Hogar de Nino
Calle Jajome
Calle Catarata
Calle Arroyo
Calle Tirso de Molina
Calle Cervantes
Calle Benito Feijo
Calle Salven
Calle Tejas
Calle Arkansas
Calle Augusta
Calle Agueda
Calle Segre
Calle Sungari
Calle Tinto
Calle Ural
Calle Harding
Calle Jefferson
Calle Wilson
Calle McKinley
Calle Nebraska
Calle California
Calle Aberdeen
Calle Cerelpo
Calle Trinitaria
Calle Romerillo
Calle Amatista
Calle Topacio
Calle Onix
Calle Saturno
Calle Bilbao
Calle Washington
Calle Lic. R. Rodriguez Apolo
Calle Paralelo
Calle Morandia
Calle Jennifer
Calle Kennedy
Calle Winston Churchill
Calle La Sierra
Calle Camino Real
Calle La Garita
Calle Adoquines
Calle Canales
Calle San Cosme
Camino Domingo Pena
Camino Villega
Carretera Calimito
Autopista Luis A Ferre
PR-1
PR-1 N
PR-1 S
PR-199 E
PR-199 O
PR-842
PR-873
PR-52 N
PR-52 S
PR-177
PR-176 N
PR-8177
Universidad Interamericana
Cupey
Galeria Paseos
Legend
Start Point
End Point
Circuit
1:18,440
0
0.15
0.3
0.6
Miles
N
LUMA
Circuit 1346-04


Urb Anton Santi
Cementerio de la Capital
Urb Beliza
Villa de San Francisco
Urb Rio Piedras Valley
Rico Jardin Botanical
Urb Park Gdns Townhou
Urb El Dorado
Urb Venus Gdns Oeste
Urb Sagrado Corazon
Urb San Gerardo
EXT San Fernando
PARQ Senorial
Urb San Juan Gardens
Urb Romany Park
MANS de Rio Piedras
Universidad Americana-Metro
Monacillo Urbano
Expreso Las Americas
Avenida Juan Ponce de Leon
Avenida Lomas Verdes
Avenida Winston Churchill
Calle Amazonas
Calle Ebro
Calle Tamesis
Calle Atlanta
Calle Montana
Calle Nevado
Calle Colorado
Calle Tampa
Calle Tejas
Calle Arkansas
Calle Augusta
Calle Santa Brigida
Calle Santa Praxedes
Calle Rimac
Calle San Lorenzo
Calle Segre
Calle Sungari
Calle Ter
Calle Ural
Calle Tinto
Calle Salven
Calle Zambeze
Calle Carite
Calle Jajome
Calle Catarata
Calle Arroyo
Calle Calzada
Calle Tiber
Calle Obi
Calle Orinoco
Calle Loira
Calle Indo
Calle Rodano
Avenida Parana
Calle Amarillo
Calle Jazmin
Calle Geranio
Calle Gardenia
Calle Diamela
Calle San Alejandro
Calle San Diego
Calle Acacia
Calle Hortencia
Calle Lirio
Calle La Cuesta de Riviera
Calle Monte Britton
Calle Santa Rosa
Calle San Tomas
PR-1 N
PR-1 S
PR-18 N
PR-18 S
PR-52 N
PR-52 S
PR-176
PR-177
PR-177 E
PR-847
PR-845
PR-844
PR-8838
8838
847
845
844
8876
177
176
52
1
Legend
Start Point
End Point
Circuit
1:14,820
0 0.1 0.2 0.4
Miles
N
LUMA
Circuit 1346-05

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 12

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 12
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
QUEBRADA NEGRITOS	1205-02	[redacted]		4.16
QUEBRADA NEGRITOS	1205-03			4.16
ENCANTADA	1206-03			13.2
ENCANTADA	1206-04			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$1.88M**
Estimated Budget for Procurement & Construction:	**$18.74M**
Estimated Overall Budget for the Project:	**$20.62M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

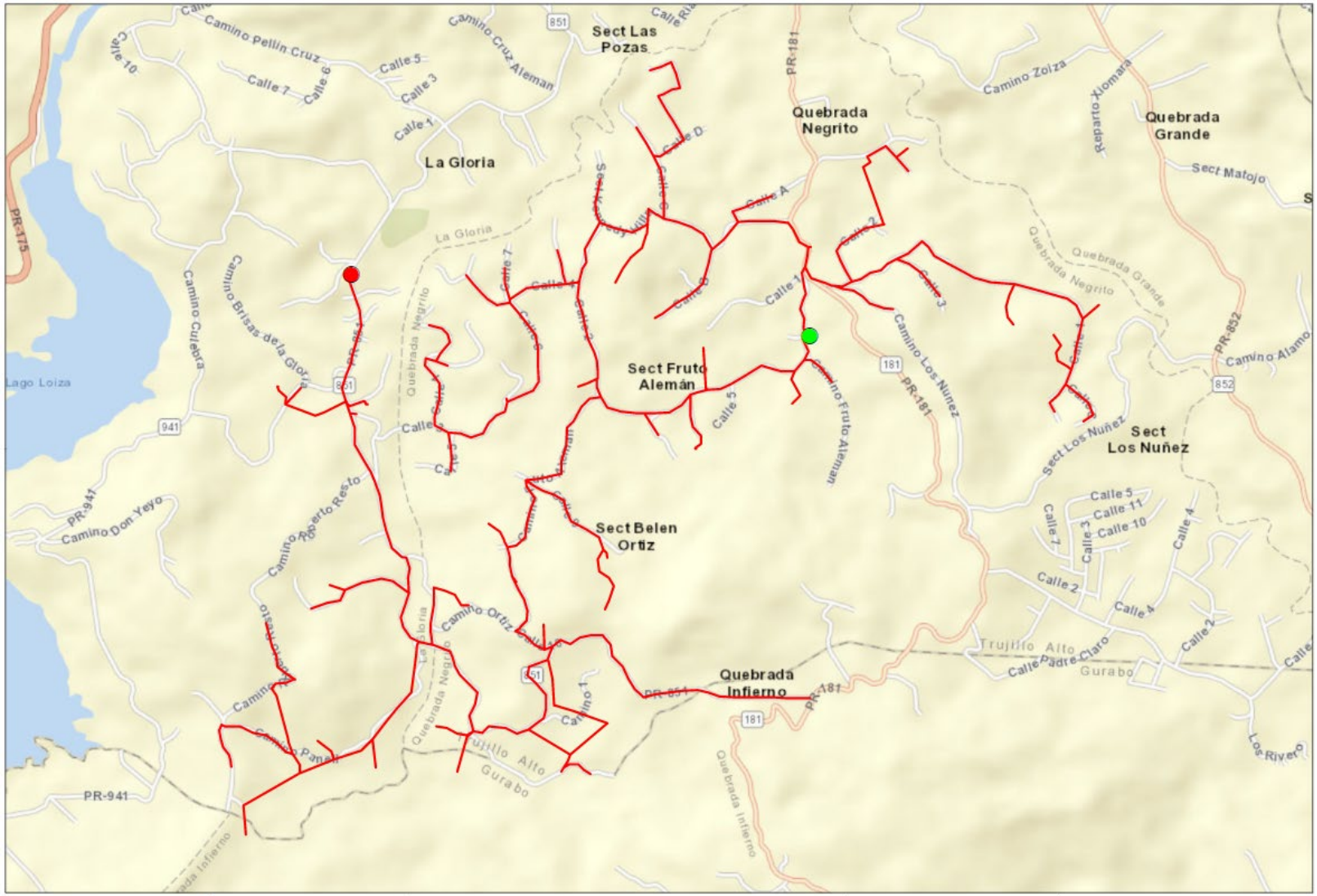
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 12 Location Maps	Location Maps and Site Picture



Legend

- Start Point
- End Point
- Circuit

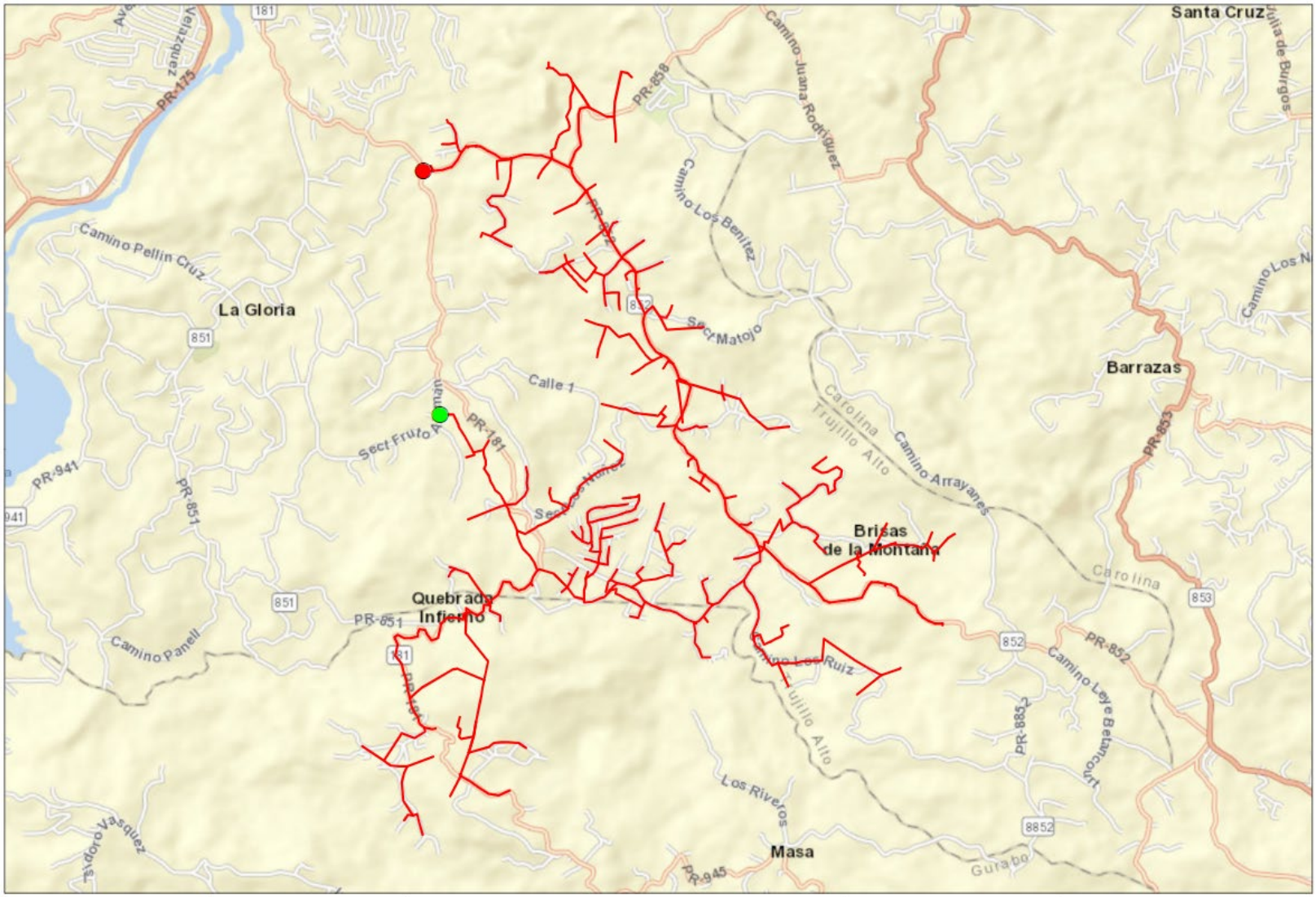
1:18,730

0 0.15 0.3 0.6 Miles

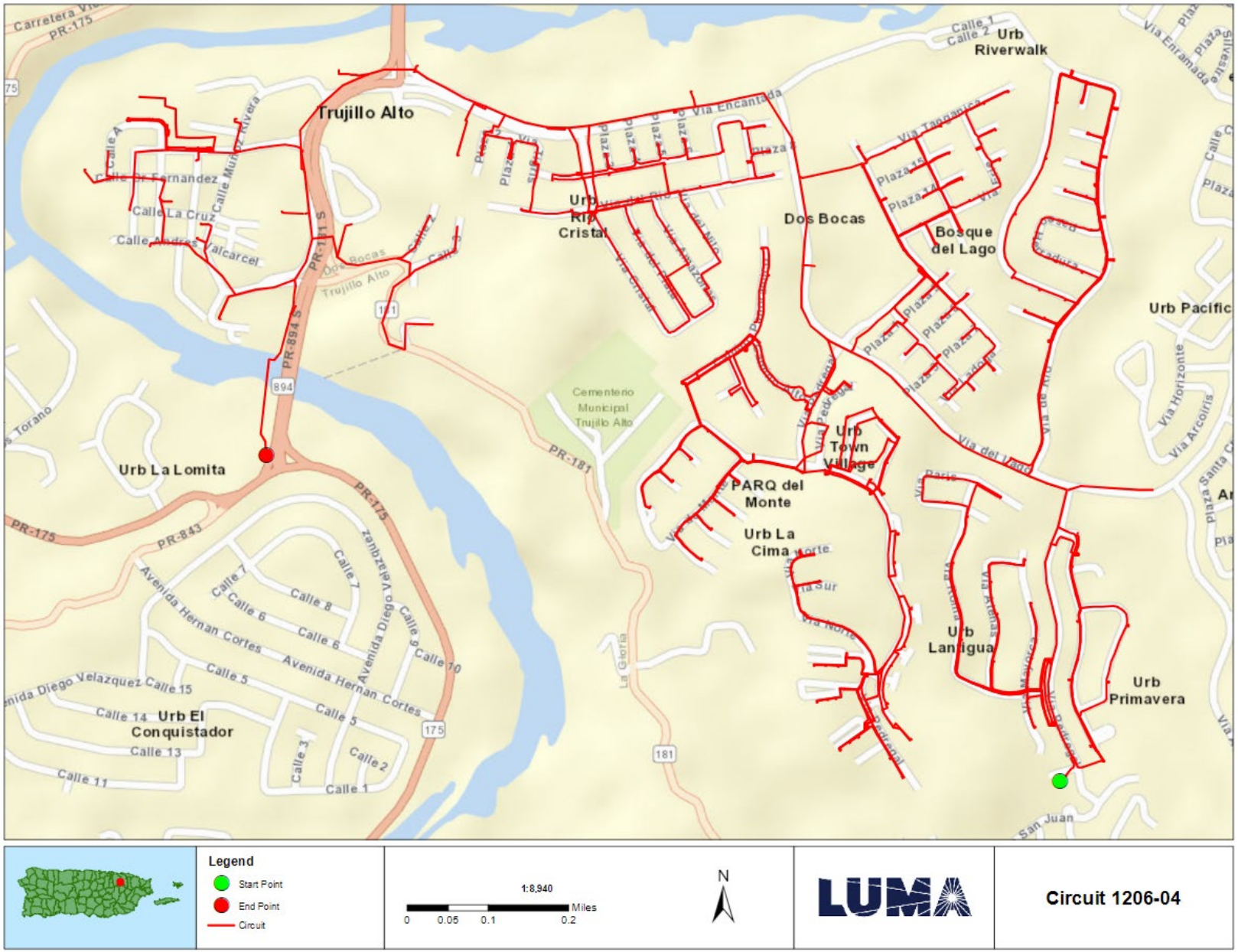
N

LUMA

Circuit 1205-02


Santa Cruz
Camino Juana Rodriguez
PR-858
Camino Los Benitez
Camino Pellin Cruz
La Gloria
851
Sect Matojo
Barrazas
Calle 1
Sect Fruto R
PR-181
Carolina
Trujillo Alto
Camino Arrayanes
PR-853
PR-941
PR-851
Brisas
de la Montana
Quebrada
Infierno
PR-851
Camino Panell
Camino Los Ruiz
Carolina
853
852
PR-852
Camino Ley e Betancourt
PR-8852
Trujillo Alto
Los Riveros
8852
Masa
PR-945
Gurabo
Isidoro Vasquez
Legend
Start Point
End Point
Circuit
1:32,440
0
0.25
0.5
1
Miles
N
LUMA
Circuit 1205-03


Ciudad Central 1
PARC Loma Alta
PARC Saint Just
Saint Just
Villa El Diamantino
Loma Alta
Urb Los Cantizales
PARQ Monte Bello
Urb Venus Gdns Norte
Urb Round Court
Urb Ciudad Universitaria
Urb Wonderville
TERR de Cupey
JARD de Trujillo
Urb Lago Alto
Urb Metropolis
BDA Gonzalez 3
Urb Monte Atenas
Colinas de Fairview
Lomas de Santa Marta
Lomas de Trujillo Alto
Trujillo Alto
Urb Riverwalk
Urb Rincon Espanol
Urb Rio Cristal
Bosque del Lago
ALTS de Fairview
Brisas de Carraizo
EST de Bosque
Carraizo
Urb La Lomita
PARQ del Monte
Urb El Conquistador
Urb Primavera
Valle San Juan
Legend
Start Point
End Point
Circuit
1:25,450
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 1206-03


Trujillo Alto
Urb Riverwalk
Urb Rio Cristal
Dos Bocas
Bosque del Lago
Urb Pacific
Urb La Lomita
Cementerio Municipal Trujillo Alto
Urb Town Village
PARQ del Monte
Urb La Cima
Urb Lanigua
Urb Primavera
Urb El Conquistador
PR-175
PR-843
PR-894
PR-181
Legend
Start Point
End Point
Circuit
1:8,940
0 0.05 0.1 0.2 Miles
N
LUMA
Circuit 1206-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 10

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	13JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 10
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
GUANICA TC	5602-01	[redacted]		13.2
GUANICA TC	5602-03			13.2
GUAYANILLA PUEBLO	5501-01			4.16
GUAYANILLA PUEBLO	5501-02			4.16
GUAYANILLA PUEBLO	5501-03			4.16
LAJAS	6601-01			7.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.15M**
Estimated Budget for Procurement & Construction:	**$21.52M**
Estimated Overall Budget for the Project:	**$23.67M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

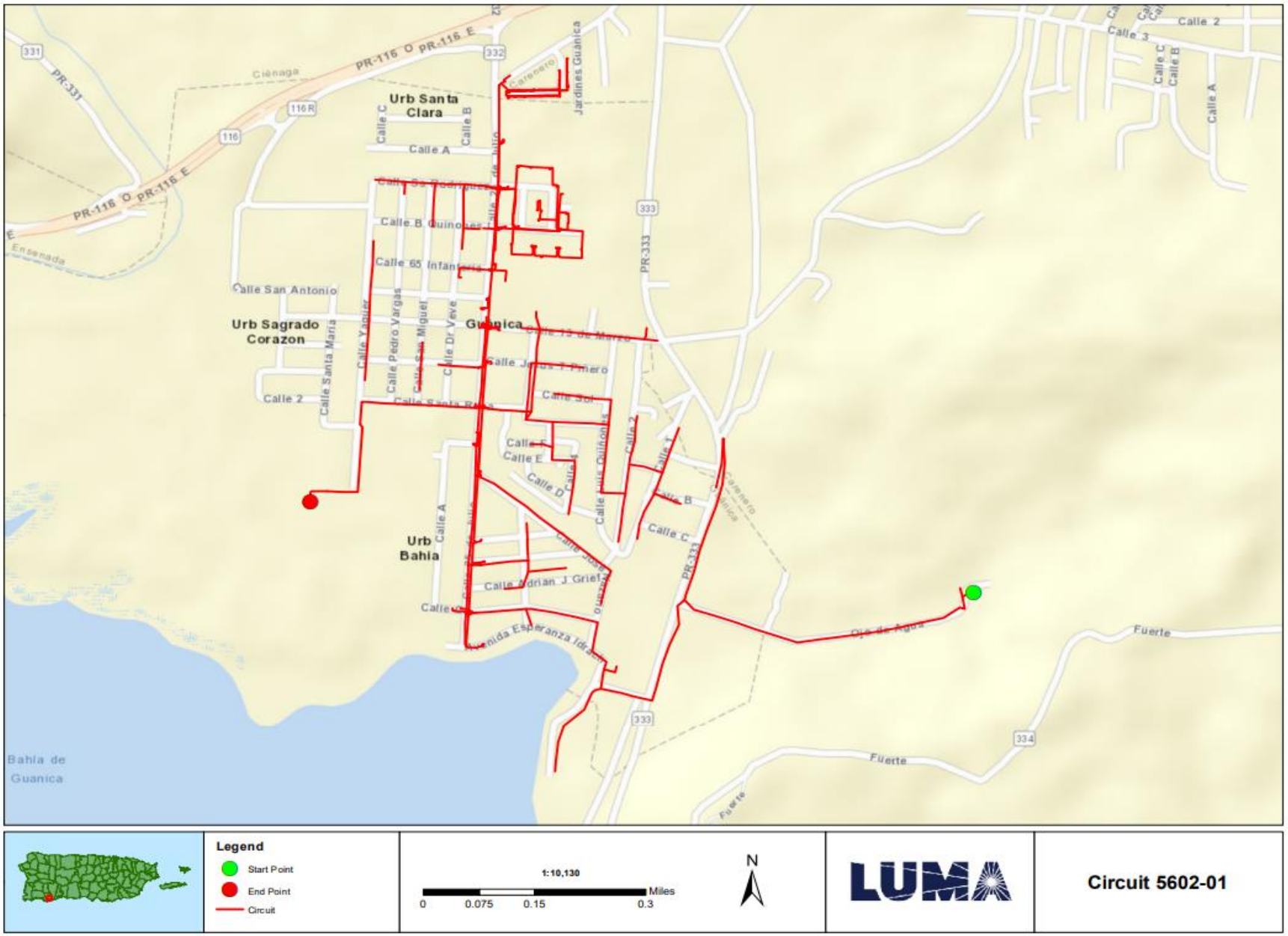
Note: If available, detailed engineering cost estimates will be included as an attachment.

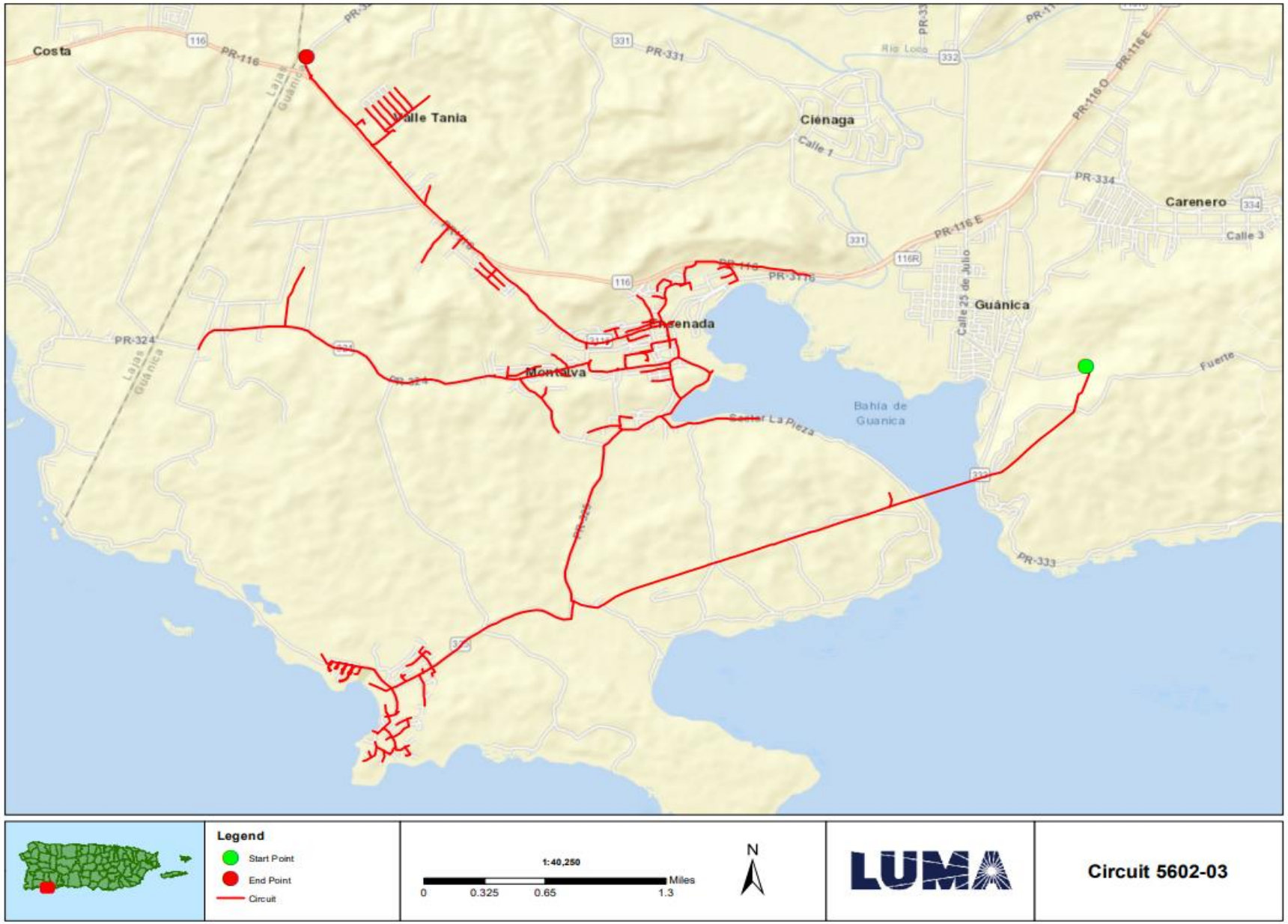
Environmental & Historic Preservation Requirements

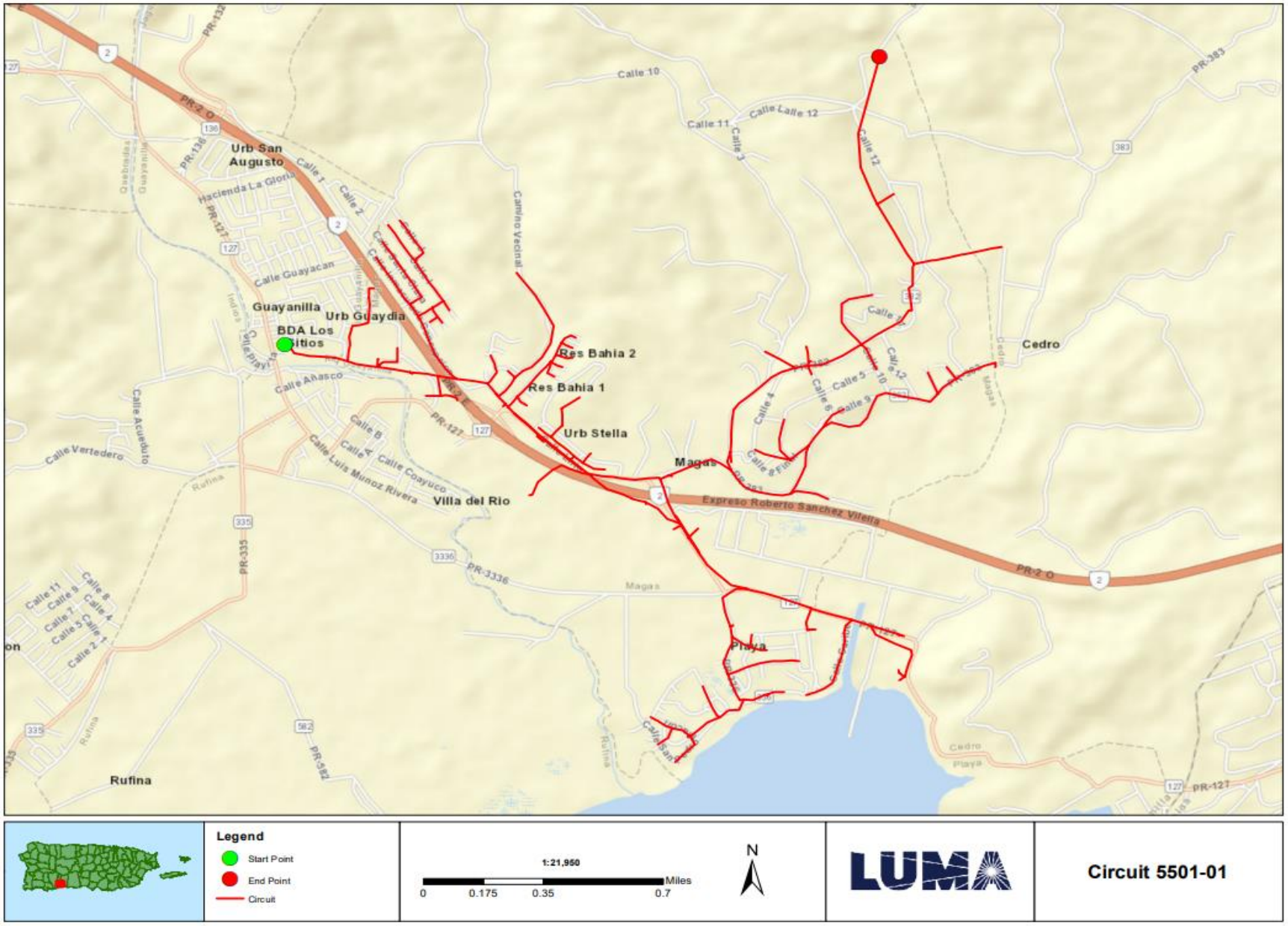
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

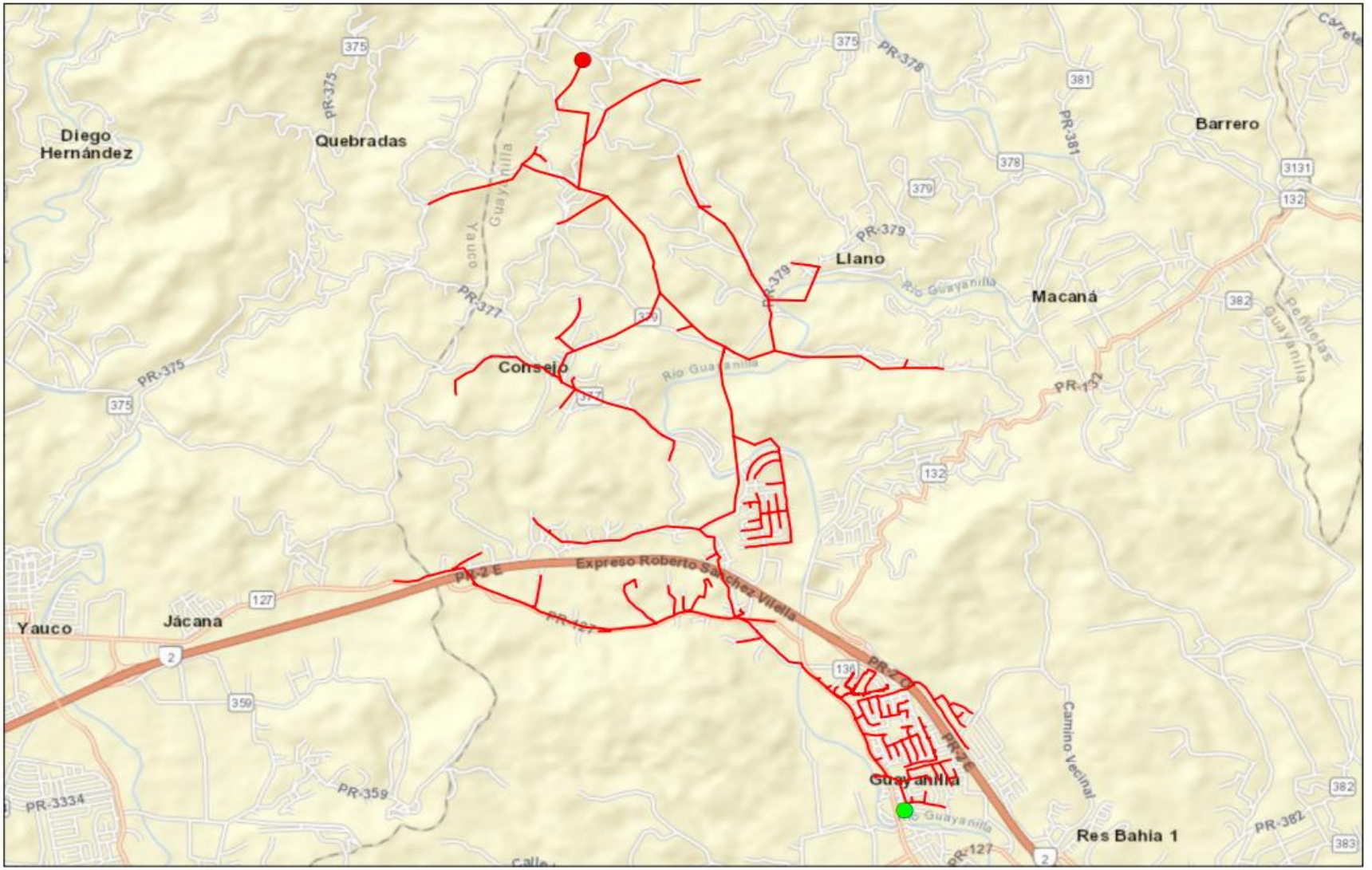
Attachments

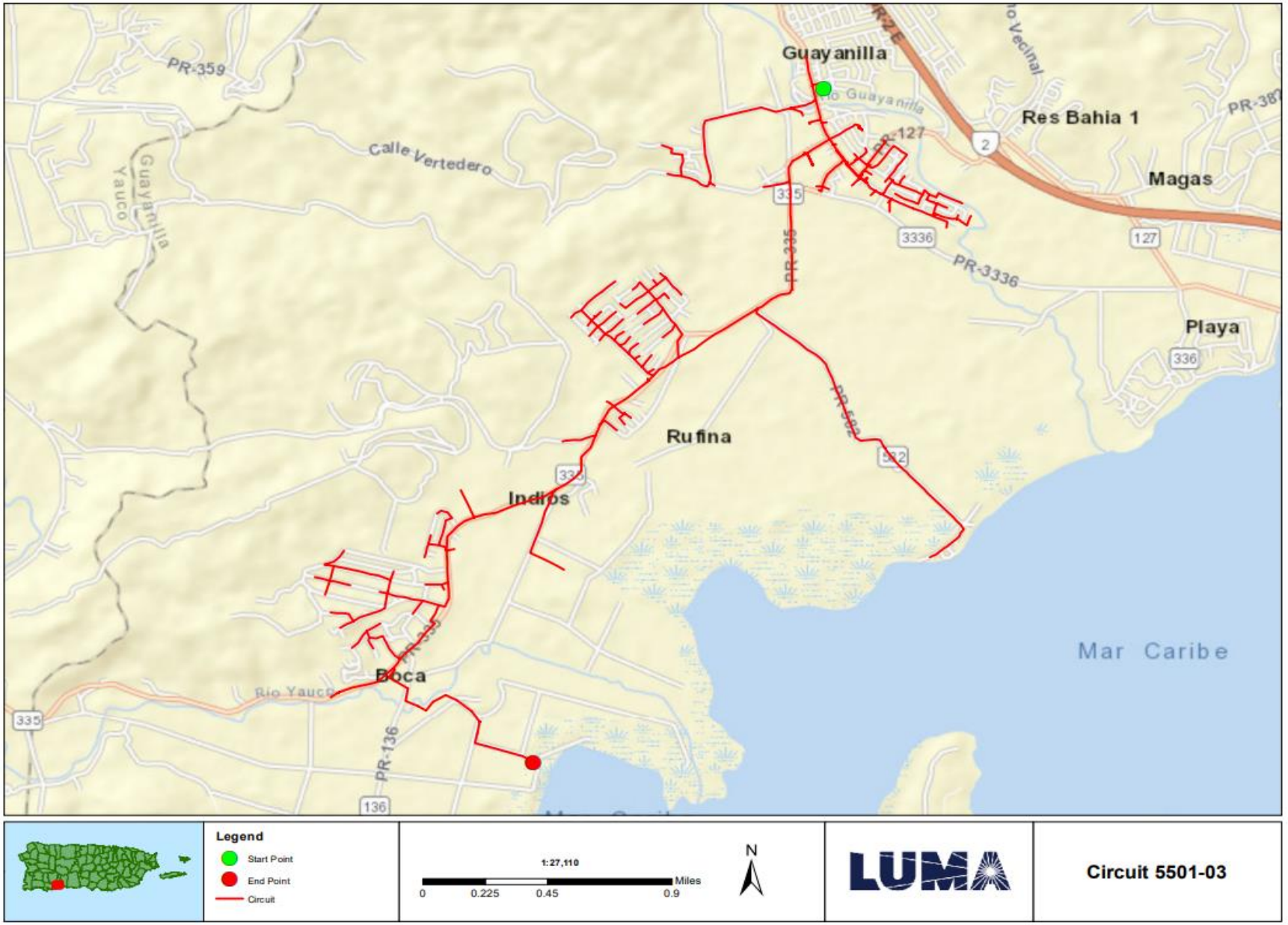
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 10 Location Maps	Location Maps and Site Picture

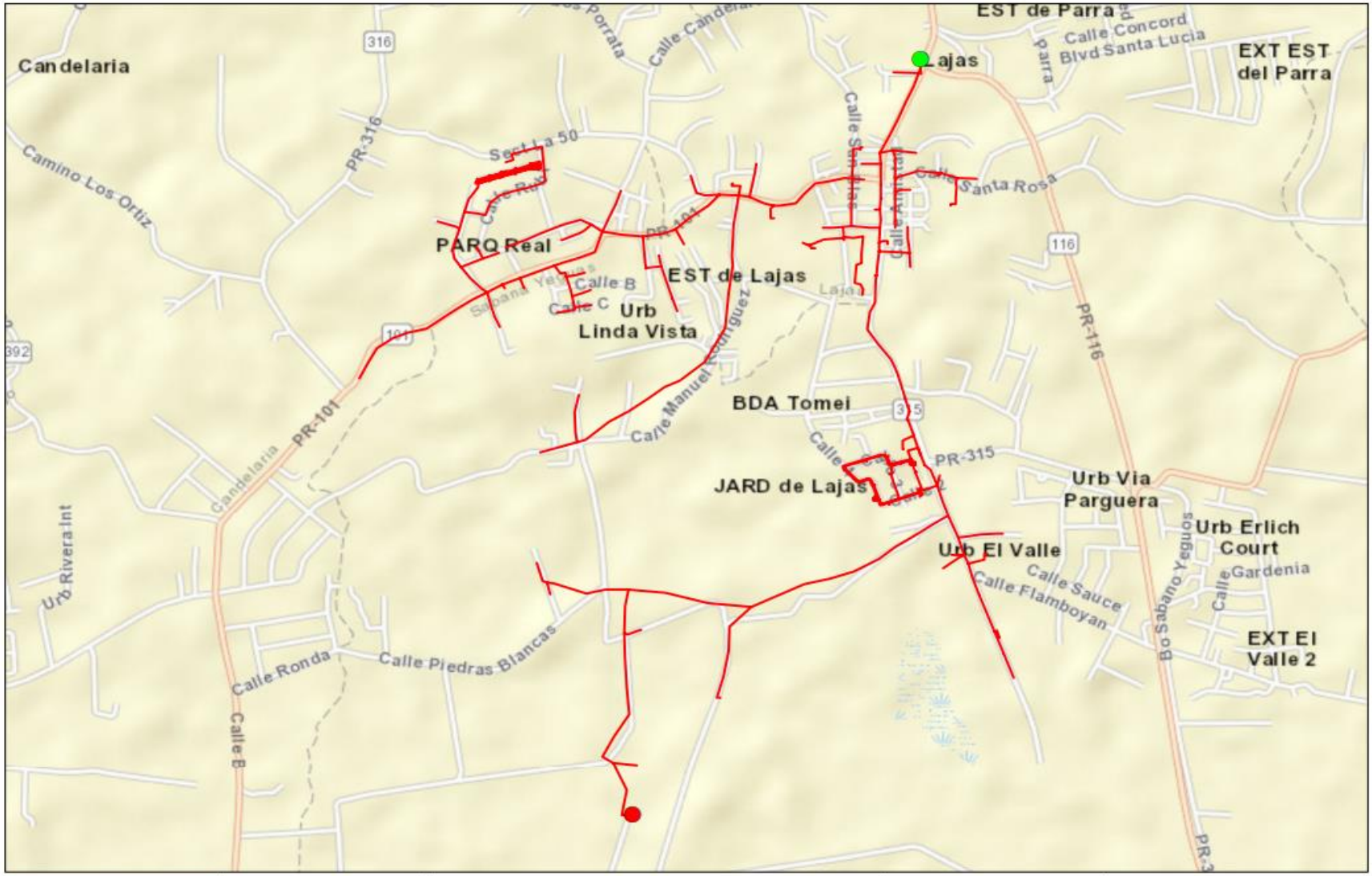

Urb Santa Clara
Urb Sagrado Corazon
Guanica
Urb Bahia
Calle A
Calle 65 Infantería
Calle San Antonio
Calle 2
Calle 3
Calle 4
Calle 5
Calle 6
Calle 7
Calle 8
Calle 9
Calle 10
Calle 11
Calle 12
Calle 13
Calle 14
Calle 15
Calle 16
Calle 17
Calle 18
Calle 19
Calle 20
Calle 21
Calle 22
Calle 23
Calle 24
Calle 25
Calle 26
Calle 27
Calle 28
Calle 29
Calle 30
Calle 31
Calle 32
Calle 33
Calle 34
Calle 35
Calle 36
Calle 37
Calle 38
Calle 39
Calle 40
Calle 41
Calle 42
Calle 43
Calle 44
Calle 45
Calle 46
Calle 47
Calle 48
Calle 49
Calle 50
Calle 51
Calle 52
Calle 53
Calle 54
Calle 55
Calle 56
Calle 57
Calle 58
Calle 59
Calle 60
Calle 61
Calle 62
Calle 63
Calle 64
Calle 65
Calle 66
Calle 67
Calle 68
Calle 69
Calle 70
Calle 71
Calle 72
Calle 73
Calle 74
Calle 75
Calle 76
Calle 77
Calle 78
Calle 79
Calle 80
Calle 81
Calle 82
Calle 83
Calle 84
Calle 85
Calle 86
Calle 87
Calle 88
Calle 89
Calle 90
Calle 91
Calle 92
Calle 93
Calle 94
Calle 95
Calle 96
Calle 97
Calle 98
Calle 99
Calle 100
Calle 101
Calle 102
Calle 103
Calle 104
Calle 105
Calle 106
Calle 107
Calle 108
Calle 109
Calle 110
Calle 111
Calle 112
Calle 113
Calle 114
Calle 115
Calle 116
Calle 117
Calle 118
Calle 119
Calle 120
Calle 121
Calle 122
Calle 123
Calle 124
Calle 125
Calle 126
Calle 127
Calle 128
Calle 129
Calle 130
Calle 131
Calle 132
Calle 133
Calle 134
Calle 135
Calle 136
Calle 137
Calle 138
Calle 139
Calle 140
Calle 141
Calle 142
Calle 143
Calle 144
Calle 145
Calle 146
Calle 147
Calle 148
Calle 149
Calle 150
Calle 151
Calle 152
Calle 153
Calle 154
Calle 155
Calle 156
Calle 157
Calle 158
Calle 159
Calle 160
Calle 161
Calle 162
Calle 163
Calle 164
Calle 165
Calle 166
Calle 167
Calle 168
Calle 169
Calle 170
Calle 171
Calle 172
Calle 173
Calle 174
Calle 175
Calle 176
Calle 177
Calle 178
Calle 179
Calle 180
Calle 181
Calle 182
Calle 183
Calle 184
Calle 185
Calle 186
Calle 187
Calle 188
Calle 189
Calle 190
Calle 191
Calle 192
Calle 193
Calle 194
Calle 195
Calle 196
Calle 197
Calle 198
Calle 199
Calle 200
Calle 201
Calle 202
Calle 203
Calle 204
Calle 205
Calle 206
Calle 207
Calle 208
Calle 209
Calle 210
Calle 211
Calle 212
Calle 213
Calle 214
Calle 215
Calle 216
Calle 217
Calle 218
Calle 219
Calle 220
Calle 221
Calle 222
Calle 223
Calle 224
Calle 225
Calle 226
Calle 227
Calle 228
Calle 229
Calle 230
Calle 231
Calle 232
Calle 233
Calle 234
Calle 235
Calle 236
Calle 237
Calle 238
Calle 239
Calle 240
Calle 241
Calle 242
Calle 243
Calle 244
Calle 245
Calle 246
Calle 247
Calle 248
Calle 249
Calle 250
Calle 251
Calle 252
Calle 253
Calle 254
Calle 255
Calle 256
Calle 257
Calle 258
Calle 259
Calle 260
Calle 261
Calle 262
Calle 263
Calle 264
Calle 265
Calle 266
Calle 267
Calle 268
Calle 269
Calle 270
Calle 271
Calle 272
Calle 273
Calle 274
Calle 275
Calle 276
Calle 277
Calle 278
Calle 279
Calle 280
Calle 281
Calle 282
Calle 283
Calle 284
Calle 285
Calle 286
Calle 287
Calle 288
Calle 289
Calle 290
Calle 291
Calle 292
Calle 293
Calle 294
Calle 295
Calle 296
Calle 297
Calle 298
Calle 299
Calle 300
Calle 301
Calle 302
Calle 303
Calle 304
Calle 305
Calle 306
Calle 307
Calle 308
Calle 309
Calle 310
Calle 311
Calle 312
Calle 313
Calle 314
Calle 315
Calle 316
Calle 317
Calle 318
Calle 319
Calle 320
Calle 321
Calle 322
Calle 323
Calle 324
Calle 325
Calle 326
Calle 327
Calle 328
Calle 329
Calle 330
Calle 331
Calle 332
Calle 333
Calle 334
Calle 335
Calle 336
Calle 337
Calle 338
Calle 339
Calle 340
Calle 341
Calle 342
Calle 343
Calle 344
Calle 345
Calle 346
Calle 347
Calle 348
Calle 349
Calle 350
Calle 351
Calle 352
Calle 353
Calle 354
Calle 355
Calle 356
Calle 357
Calle 358
Calle 359
Calle 360
Calle 361
Calle 362
Calle 363
Calle 364
Calle 365
Calle 366
Calle 367
Calle 368
Calle 369
Calle 370
Calle 371
Calle 372
Calle 373
Calle 374
Calle 375
Calle 376
Calle 377
Calle 378
Calle 379
Calle 380
Calle 381
Calle 382
Calle 383
Calle 384
Calle 385
Calle 386
Calle 387
Calle 388
Calle 389
Calle 390
Calle 391
Calle 392
Calle 393
Calle 394
Calle 395
Calle 396
Calle 397
Calle 398
Calle 399
Calle 400
Calle 401
Calle 402
Calle 403
Calle 404
Calle 405
Calle 406
Calle 407
Calle 408
Calle 409
Calle 410
Calle 411
Calle 412
Calle 413
Calle 414
Calle 415
Calle 416
Calle 417
Calle 418
Calle 419
Calle 420
Calle 421
Calle 422
Calle 423
Calle 424
Calle 425
Calle 426
Calle 427
Calle 428
Calle 429
Calle 430
Calle 431
Calle 432
Calle 433
Calle 434
Calle 435
Calle 436
Calle 437
Calle 438
Calle 439
Calle 440
Calle 441
Calle 442
Calle 443
Calle 444
Calle 445
Calle 446
Calle 447
Calle 448
Calle 449
Calle 450
Calle 451
Calle 452
Calle 453
Calle 454
Calle 455
Calle 456
Calle 457
Calle 458
Calle 459
Calle 460
Calle 461
Calle 462
Calle 463
Calle 464
Calle 465
Calle 466
Calle 467
Calle 468
Calle 469
Calle 470
Calle 471
Calle 472
Calle 473
Calle 474
Calle 475
Calle 476
Calle 477
Calle 478
Calle 479
Calle 480
Calle 481
Calle 482
Calle 483
Calle 484
Calle 485
Calle 486
Calle 487
Calle 488
Calle 489
Calle 490
Calle 491
Calle 492
Calle 493
Calle 494
Calle 495
Calle 496
Calle 497
Calle 498
Calle 499
Calle 500
Calle 501
Calle 502
Calle 503
Calle 504
Calle 505
Calle 506
Calle 507
Calle 508
Calle 509
Calle 510
Calle 511
Calle 512
Calle 513
Calle 514
Calle 515
Calle 516
Calle 517
Calle 518
Calle 519
Calle 520
Calle 521
Calle 522
Calle 523
Calle 524
Calle 525
Calle 526
Calle 527
Calle 528
Calle 529
Calle 530
Calle 531
Calle 532
Calle 533
Calle 534
Calle 535
Calle 536
Calle 537
Calle 538
Calle 539
Calle 540
Calle 541
Calle 542
Calle 543
Calle 544
Calle 545
Calle 546
Calle 547
Calle 548
Calle 549
Calle 550
Calle 551
Calle 552
Calle 553
Calle 554
Calle 555
Calle 556
Calle 557
Calle 558
Calle 559
Calle 560
Calle 561
Calle 562
Calle 563
Calle 564
Calle 565
Calle 566
Calle 567
Calle 568
Calle 569
Calle 570
Calle 571
Calle 572
Calle 573
Calle 574
Calle 575
Calle 576
Calle 577
Calle 578
Calle 579
Calle 580
Calle 581
Calle 582
Calle 583
Calle 584
Calle 585
Calle 586
Calle 587
Calle 588
Calle 589
Calle 590
Calle 591
Calle 592
Calle 593
Calle 594
Calle 595
Calle 596
Calle 597
Calle 598
Calle 599
Calle 600
Calle 601
Calle 602
Calle 603
Calle 604
Calle 605
Calle 606
Calle 607
Calle 608
Calle 609
Calle 610
Calle 611
Calle 612
Calle 613
Calle 614
Calle 615
Calle 616
Calle 617
Calle 618
Calle 619
Calle 620
Calle 621
Calle 622
Calle 623
Calle 624
Calle 625
Calle 626
Calle 627
Calle 628
Calle 629
Calle 630
Calle 631
Calle 632
Calle 633
Calle 634
Calle 635
Calle 636
Calle 637
Calle 638
Calle 639
Calle 640
Calle 641
Calle 642
Calle 643
Calle 644
Calle 645
Calle 646
Calle 647
Calle 648
Calle 649
Calle 650
Calle 651
Calle 652
Calle 653
Calle 654
Calle 655
Calle 656
Calle 657
Calle 658
Calle 659
Calle 660
Calle 661
Calle 662
Calle 663
Calle 664
Calle 665
Calle 666
Calle 667
Calle 668
Calle 669
Calle 670
Calle 671
Calle 672
Calle 673
Calle 674
Calle 675
Calle 676
Calle 677
Calle 678
Calle 679
Calle 680
Calle 681
Calle 682
Calle 683
Calle 684
Calle 685
Calle 686
Calle 687
Calle 688
Calle 689
Calle 690
Calle 691
Calle 692
Calle 693
Calle 694
Calle 695
Calle 696
Calle 697
Calle 698
Calle 699
Calle 700
Calle 701
Calle 702
Calle 703
Calle 704
Calle 705
Calle 706
Calle 707
Calle 708
Calle 709
Calle 710
Calle 711
Calle 712
Calle 713
Calle 714
Calle 715
Calle 716
Calle 717
Calle 718
Calle 719
Calle 720
Calle 721
Calle 722
Calle 723
Calle 724
Calle 725
Calle 726
Calle 727
Calle 728
Calle 729
Calle 730
Calle 731
Calle 732
Calle 733
Calle 734
Calle 735
Calle 736
Calle 737
Calle 738
Calle 739
Calle 740
Calle 741
Calle 742
Calle 743
Calle 744
Calle 745
Calle 746
Calle 747
Calle 748
Calle 749
Calle 750
Calle 751
Calle 752
Calle 753
Calle 754
Calle 755
Calle 756
Calle 757
Calle 758
Calle 759
Calle 760
Calle 761
Calle 762
Calle 763
Calle 764
Calle 765
Calle 766
Calle 767
Calle 768
Calle 769
Calle 770
Calle 771
Calle 772
Calle 773
Calle 774
Calle 775
Calle 776
Calle 777
Calle 778
Calle 779
Calle 780
Calle 781
Calle 782
Calle 783
Calle 784
Calle 785
Calle 786
Calle 787
Calle 788
Calle 789
Calle 790
Calle 791
Calle 792
Calle 793
Calle 794
Calle 795
Calle 796
Calle 797
Calle 798
Calle 799
Calle 800
Calle 801
Calle 802
Calle 803
Calle 804
Calle 805
Calle 806
Calle 807
Calle 808
Calle 809
Calle 810
Calle 811
Calle 812
Calle 813
Calle 814
Calle 815
Calle 816
Calle 817
Calle 818
Calle 819
Calle 820
Calle 821
Calle 822
Calle 823
Calle 824
Calle 825
Calle 826
Calle 827
Calle 828
Calle 829
Calle 830
Calle 831
Calle 832
Calle 833
Calle 834
Calle 835
Calle 836
Calle 837
Calle 838
Calle 839
Calle 840
Calle 841
Calle 842
Calle 843
Calle 844
Calle 845
Calle 846
Calle 847
Calle 848
Calle 849
Calle 850
Calle 851
Calle 852
Calle 853
Calle 854
Calle 855
Calle 856
Calle 857
Calle 858
Calle 859
Calle 860
Calle 861
Calle 862
Calle 863
Calle 864
Calle 865
Calle 866
Calle 867
Calle 868
Calle 869
Calle 870
Calle 871
Calle 872
Calle 873
Calle 874
Calle 875
Calle 876
Calle 877
Calle 878
Calle 879
Calle 880
Calle 881
Calle 882
Calle 883
Calle 884
Calle 885
Calle 886
Calle 887
Calle 888
Calle 889
Calle 890
Calle 891
Calle 892
Calle 893
Calle 894
Calle 895
Calle 896
Calle 897
Calle 898
Calle 899
Calle 900
Calle 901
Calle 902
Calle 903
Calle 904
Calle 905
Calle 906
Calle 907
Calle 908
Calle 909
Calle 910
Calle 911
Calle 912
Calle 913
Calle 914
Calle 915
Calle 916
Calle 917
Calle 918
Calle 919
Calle 920
Calle 921
Calle 922
Calle 923
Calle 924
Calle 925
Calle 926
Calle 927
Calle 928
Calle 929
Calle 930
Calle 931
Calle 932
Calle 933
Calle 934
Calle 935
Calle 936
Calle 937
Calle 938
Calle 939
Calle 940
Calle 941
Calle 942
Calle 943
Calle 944
Calle 945
Calle 946
Calle 947
Calle 948
Calle 949
Calle 950
Calle 951
Calle 952
Calle 953
Calle 954
Calle 955
Calle 956
Calle 957
Calle 958
Calle 959
Calle 960
Calle 961
Calle 962
Calle 963
Calle 964
Calle 965
Calle 966
Calle 967
Calle 968
Calle 969
Calle 970
Calle 971
Calle 972
Calle 973
Calle 974
Calle 975
Calle 976
Calle 977
Calle 978
Calle 979
Calle 980
Calle 981
Calle 982
Calle 983
Calle 984
Calle 985
Calle 986
Calle 987
Calle 988
Calle 989
Calle 990
Calle 991
Calle 992
Calle 993
Calle 994
Calle 995
Calle 996
Calle 997
Calle 998
Calle 999
Calle 1000
Bahia de Guanica
Fuerte
Ojo de Agua
PR-116 O PR-116 E
PR-331
PR-333
Ciénaga
Ensenada
Jardines Guánica
Legend
Start Point
End Point
Circuit
1:10,130
Miles
0
0.075
0.15
0.3
N
LUMA
Circuit 5602-01


Costa
PR-116
Laja de Guánica
Valle Tania
PR-331
Ciénaga
Río Loco
PR-116 O
PR-116 E
PR-334
Carenero
Calle 3
Calle 1
Guánica
Calle 25 de Julio
PR-3116
PR-324
Laja de Guánica
Montalva
Bahía de Guanica
Sector La Pieza
Fuerte
PR-333
Legend
Start Point
End Point
Circuit
1:40,250
0
0.325
0.65
1.3
Miles
N
LUMA
Circuit 5602-03


Urb San Augusto
Hacienda La Gloria
Guayanilla
Urb Guaydia
BDA Los Sitios
Res Bahia 2
Res Bahia 1
Urb Stella
Villa del Rio
Magas
Playa
Cedro
Rufina
Expreso Roberto Sanchez Vilella
PR-2 O
PR-127
PR-335
PR-3336
PR-582
Calle 10
Calle 11
Calle Lalle 12
Calle 12
Calle Guayacan
Calle Añasco
Calle Vertedero
Calle Acueducto
Calle Luis Munoz Rivera
Calle Conyuco
Legend
Start Point
End Point
Circuit
1:21,950
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 5501-01


Diego Hernández
Quebradas
Barrero
Llano
Macaná
Consejo
Yauco
Jácana
Guayanilla
Res Bahia 1
Expreso Roberto Sánchez Vilella
PR-2 E
PR-127
PR-375
PR-377
PR-378
PR-379
PR-381
PR-359
PR-3334
PR-382
Río Guayanilla
Camino Vecinal
Legend
Start Point
End Point
Circuit
1:33,340
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 5501-02


Guayanilla
Res Bahia 1
Magas
Playa
Rufina
Indios
Boca
Mar Caribe
Calle Vertedero
PR-359
PR-3336
PR-335
PR-127
PR-136
335
3336
127
336
2
136
Legend
Start Point
End Point
Circuit
1:27,110
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 5501-03


EST de Parra
Lajas
Calle Concord
Blvd Santa Lucia
EXT EST
del Parra
Candelaria
316
Camino Los Ortiz
PR-316
Sect La 50
Calle Ruiz
PARQ Real
PR-101
Calle Santa Rosa
116
EST de Lajas
Calle B
Calle C
Urb
Linda Vista
Lajas
PR-116
392
101
Carle Manuel Rodriguez
BDA Tomei
315
PR-315
JARD de Lajas
Urb Via
Parguera
Urb Erlich
Court
Urb El Valle
Calle Sauce
Calle Flamboyan
Calle Gardenia
Bo Sabano Yeguos
EXT El
Valle 2
Urb Rivera Int
Gandelaria
Calle Ronda
Calle Piedras Blancas
Calle B
Legend
Start Point
End Point
Circuit
1:14,230
0
0.1
0.2
0.4
Miles
N
LUMA
Circuit 6601-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 11

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	14JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 11
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects In the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
LAJAS	6601-04	[redacted]		7.2
PEÑUELAS PUEBLO	5401-01			4.16
PEÑUELAS PUEBLO	5401-02			4.16
PEÑUELAS PUEBLO	5401-03			4.16
PEÑUELAS PUEBLO	5401-04			4.16
SABANA GRANDE	6501-01			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.22M**
Estimated Budget for Procurement & Construction:	**$22.21M**
Estimated Overall Budget for the Project:	**$24.43M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

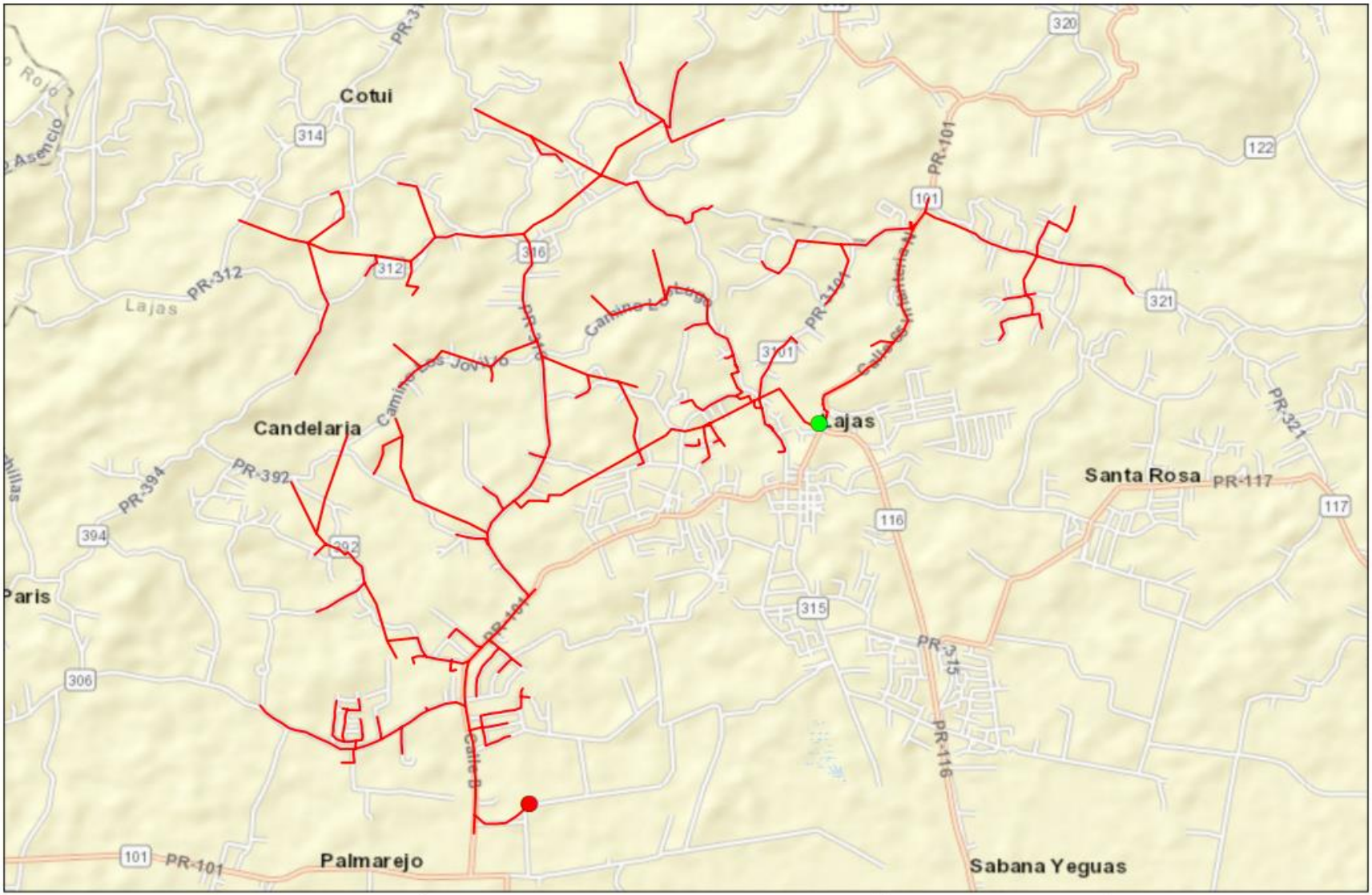
Note: If available, detailed engineering cost estimates will be included as an attachment.

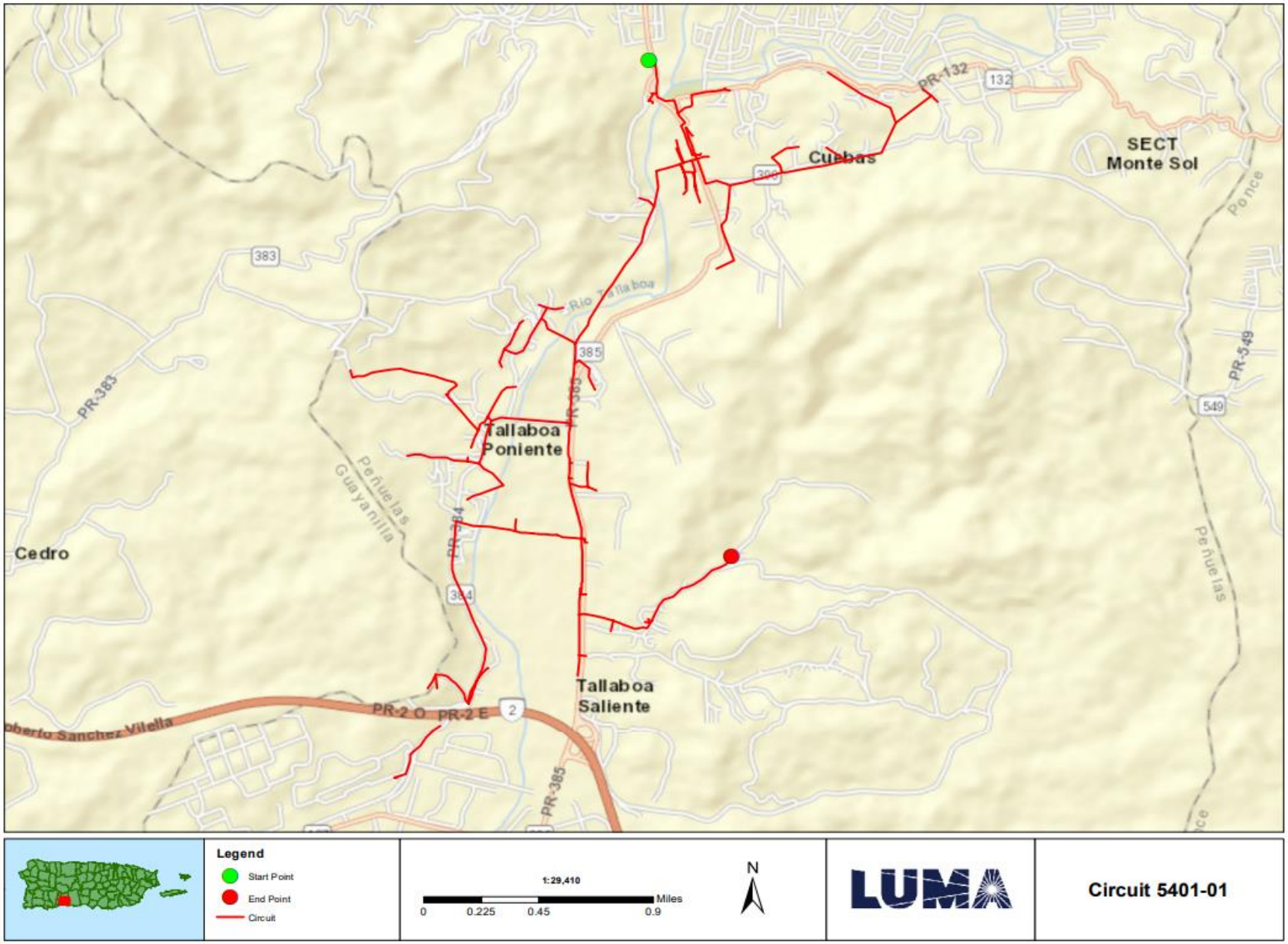
Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 11 Location Maps	Location Maps and Site Picture


Cotui
Candelaria
Lajas
Santa Rosa
Palmarejo
Sabana Yeguas
Paris
PR-101
PR-312
PR-394
PR-392
PR-1101
PR-315
PR-116
PR-321
PR-117
314
312
316
320
122
321
394
392
306
315
116
117
Legend
Start Point
End Point
Circuit
1:28,220
0
0.225
0.45
0.9
Miles
N
LUMA
Circuit 6601-04



Legend

- Start Point
- End Point
- Circuit

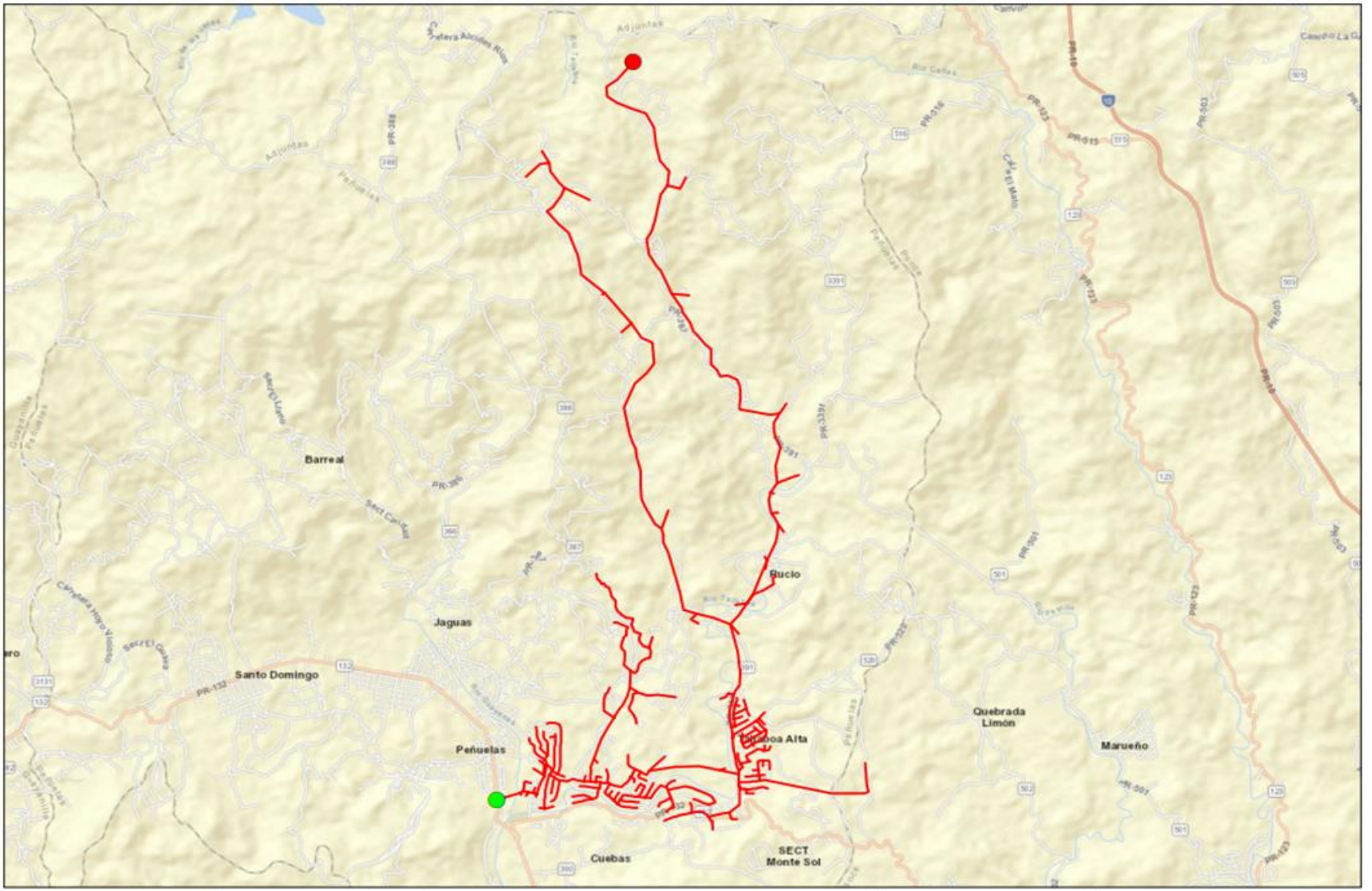
1:29,410

0 0.225 0.45 0.9 Miles

N

LUMA

Circuit 5401-01



Legend

- Start Point
- End Point
- Circuit

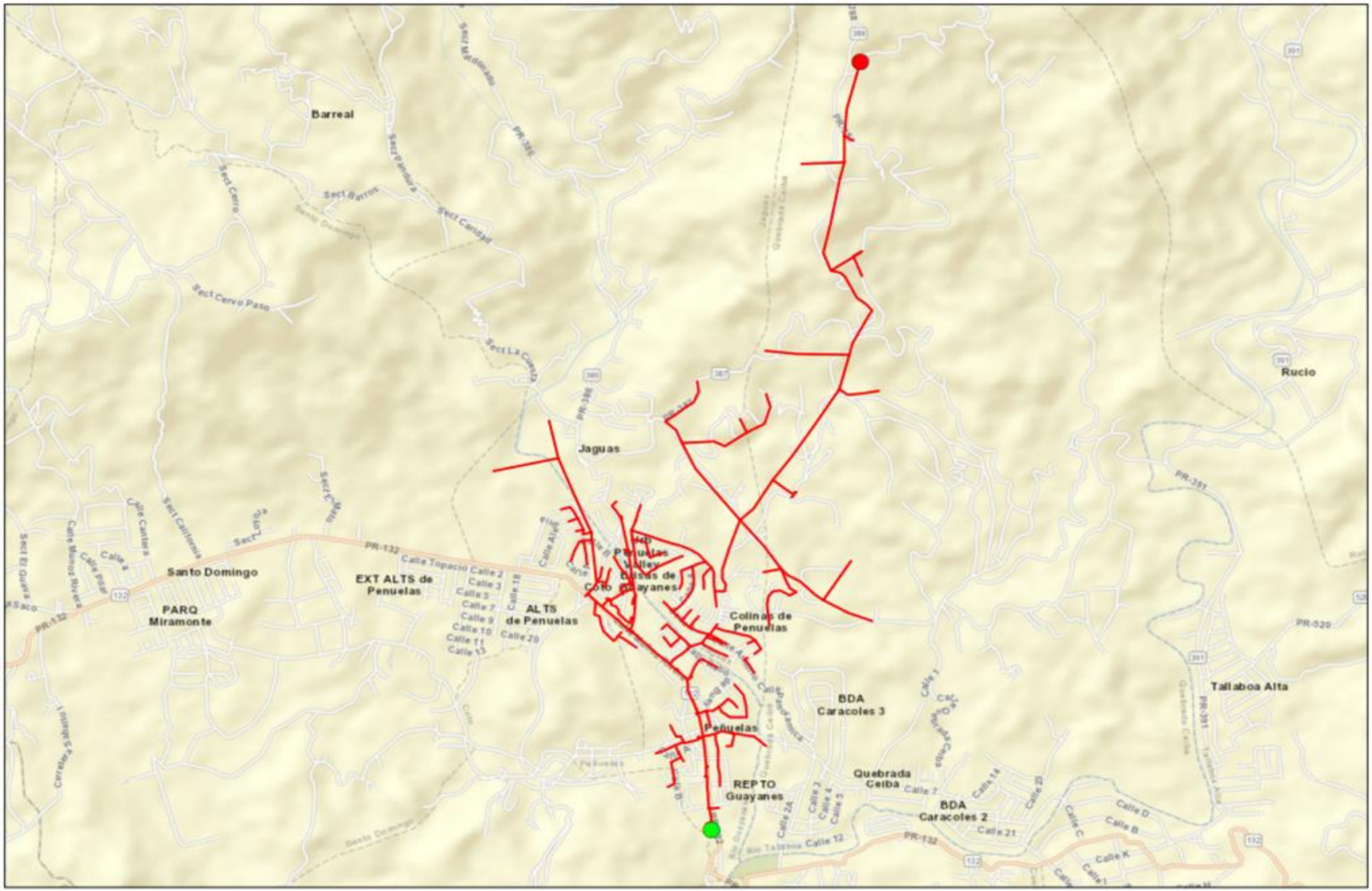
1:52,860

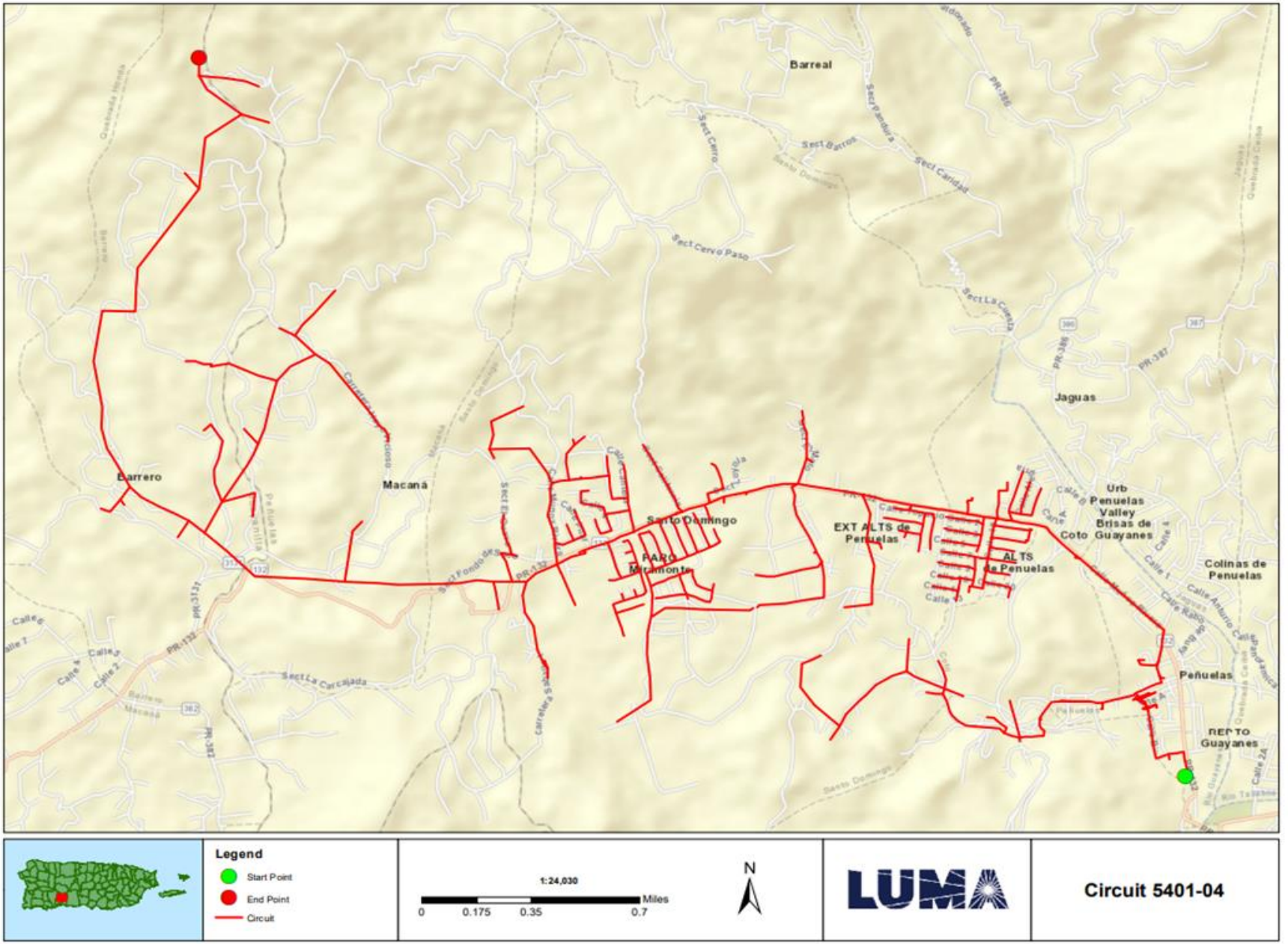
0 0.425 0.85 1.7 Miles

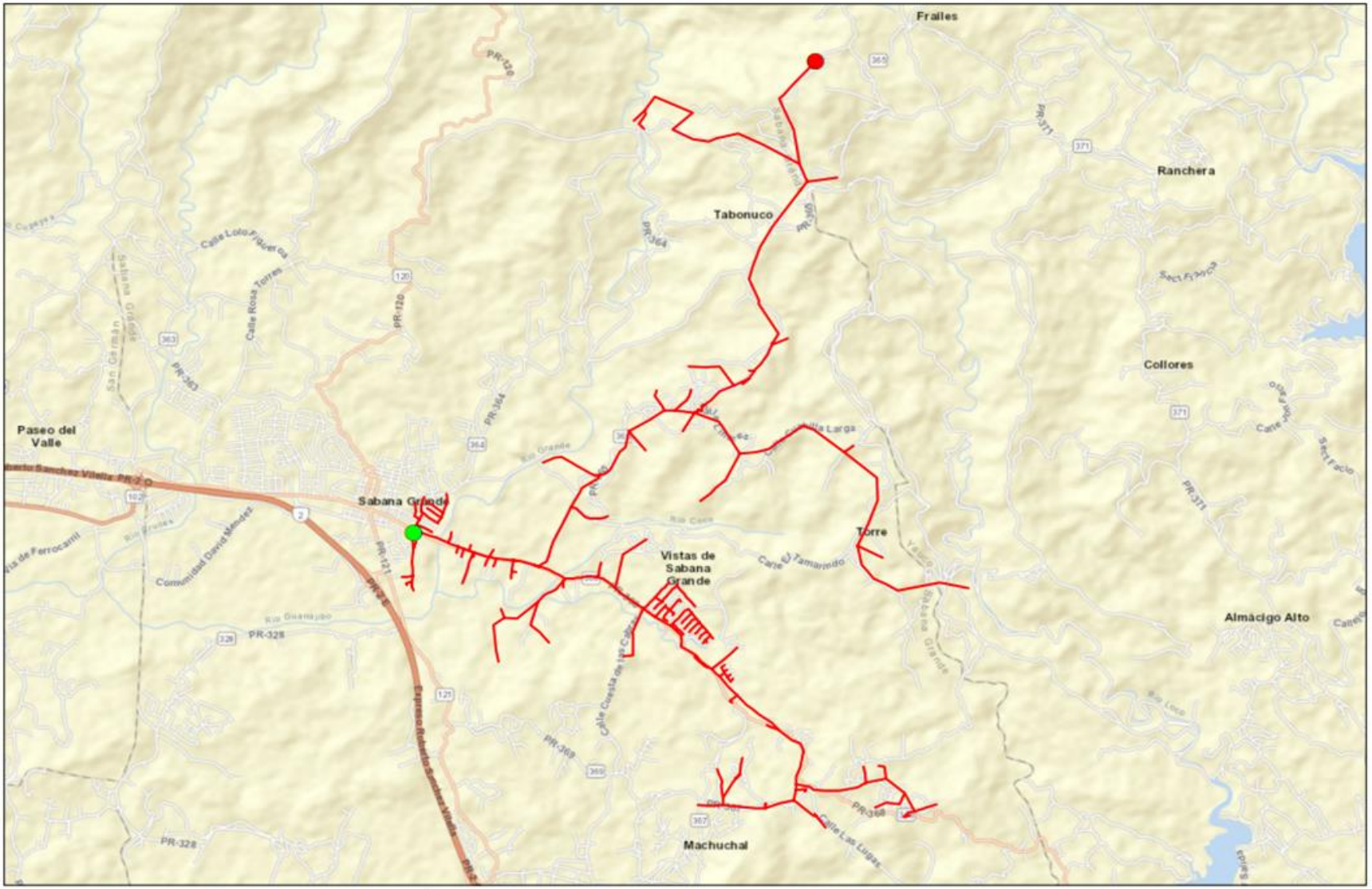
N

LUMA

Circuit 5401-02


Barreal
Jaguas
Rucio
Santo Domingo
PARQ
Miramonte
EXT ALTS de
Penuelas
ALTS
de Penuelas
Penuelas
Valley
Colinas de
Guayanes
Colinas de
Penuelas
BDA
Caracoles 3
Peñuelas
REPTO
Guayanes
Quebrada
Ceiba
BDA
Caracoles 2
Tallaboa Alta
PR-132
PR-391
PR-520
Legend
Start Point
End Point
Circuit
1:25,470
0
0.2
0.4
0.8
Miles
N
LUMA
Circuit 5401-03


Barreal
Jaguas
Barrero
Macaná
Santo Domingo
FARO Miramonte
EXT ALTS de Peñuelas
ALTS de Peñuelas
Urb Peñuelas Valley
Brisas de Coto Guayanes
Colinas de Peñuelas
Peñuelas
Guayanes
Sect Cerro
Sect Barros
Sect Candelaria
Sect Cerro Paso
Sect La Cuesta
Sect Fondo de Saco
Sect La Carcajada
PR-387
PR-3131
PR-132
Legend
Start Point
End Point
Circuit
1:24,030
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 5401-04


Frailes
Ranchera
Tabonuco
Collores
Paseo del Valle
Sabana Grande
Vistas de Sabana Grande
Torre
Almácigo Alto
Machuchal
PR-328
PR-120
PR-121
PR-364
PR-365
PR-371
PR-363
PR-369
PR-368
Río Grande
Río Guanajibo
Río Loco
Expreso Roberto Sánchez Vilella
Legend
Start Point
End Point
Circuit
1:47,560
0
0.375
0.75
1.5
Miles
N
LUMA
Circuit 6501-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 12

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	14JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 12
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
SABANA GRANDE	6501-02	[redacted]		4.16
SABANA GRANDE	6501-03			4.16
SABANA GRANDE	6501-04			4.16
YAUCO HIDRO 1	5301-01			4.16
YAUCO PUEBLO 1	5302-01			4.16
YAUCO PUEBLO 1	5302-04			4.16

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.77M**
Estimated Budget for Procurement & Construction:	**$27.70M**
Estimated Overall Budget for the Project:	**$30.47M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

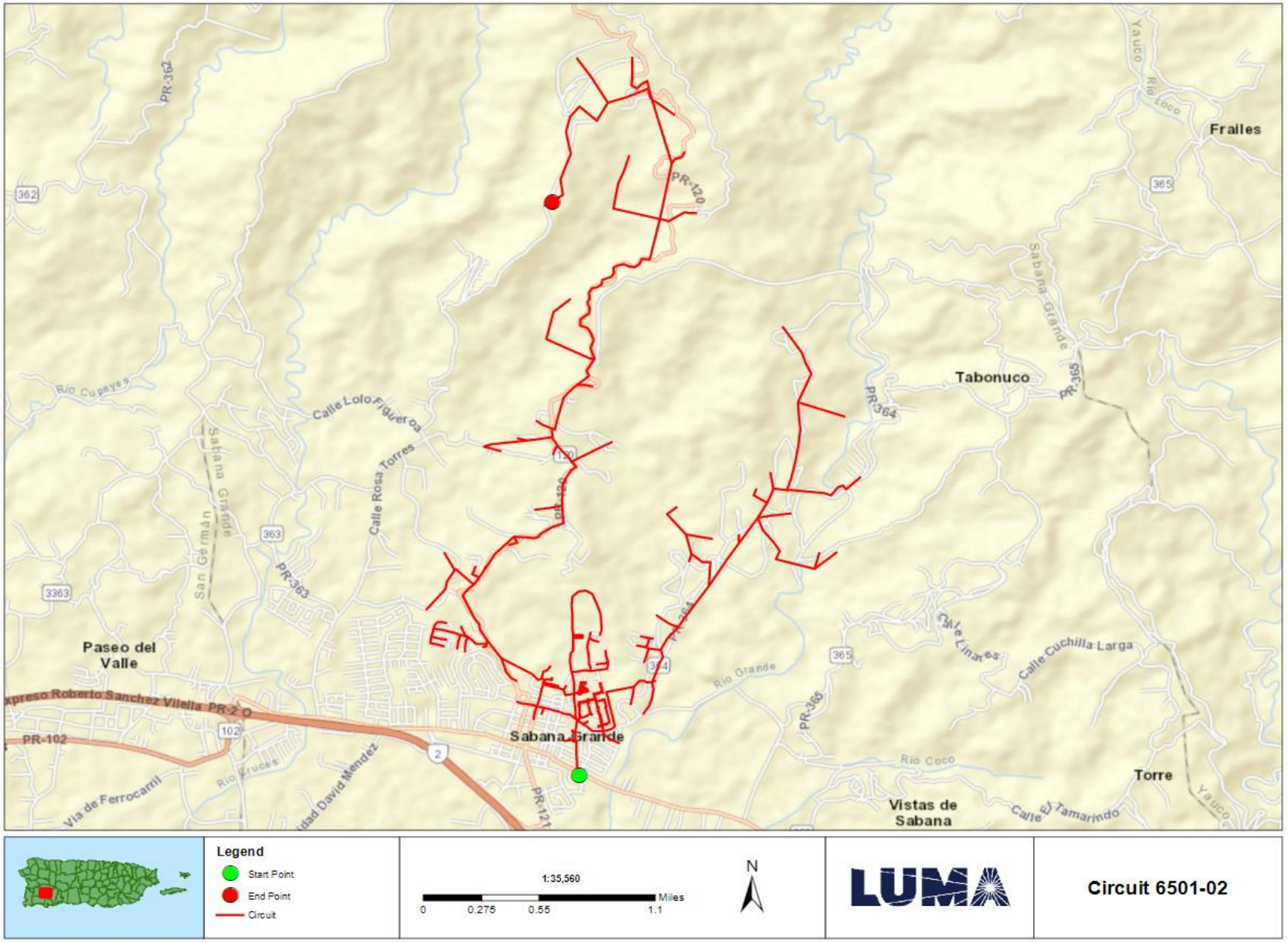
Note: If available, detailed engineering cost estimates will be included as an attachment.

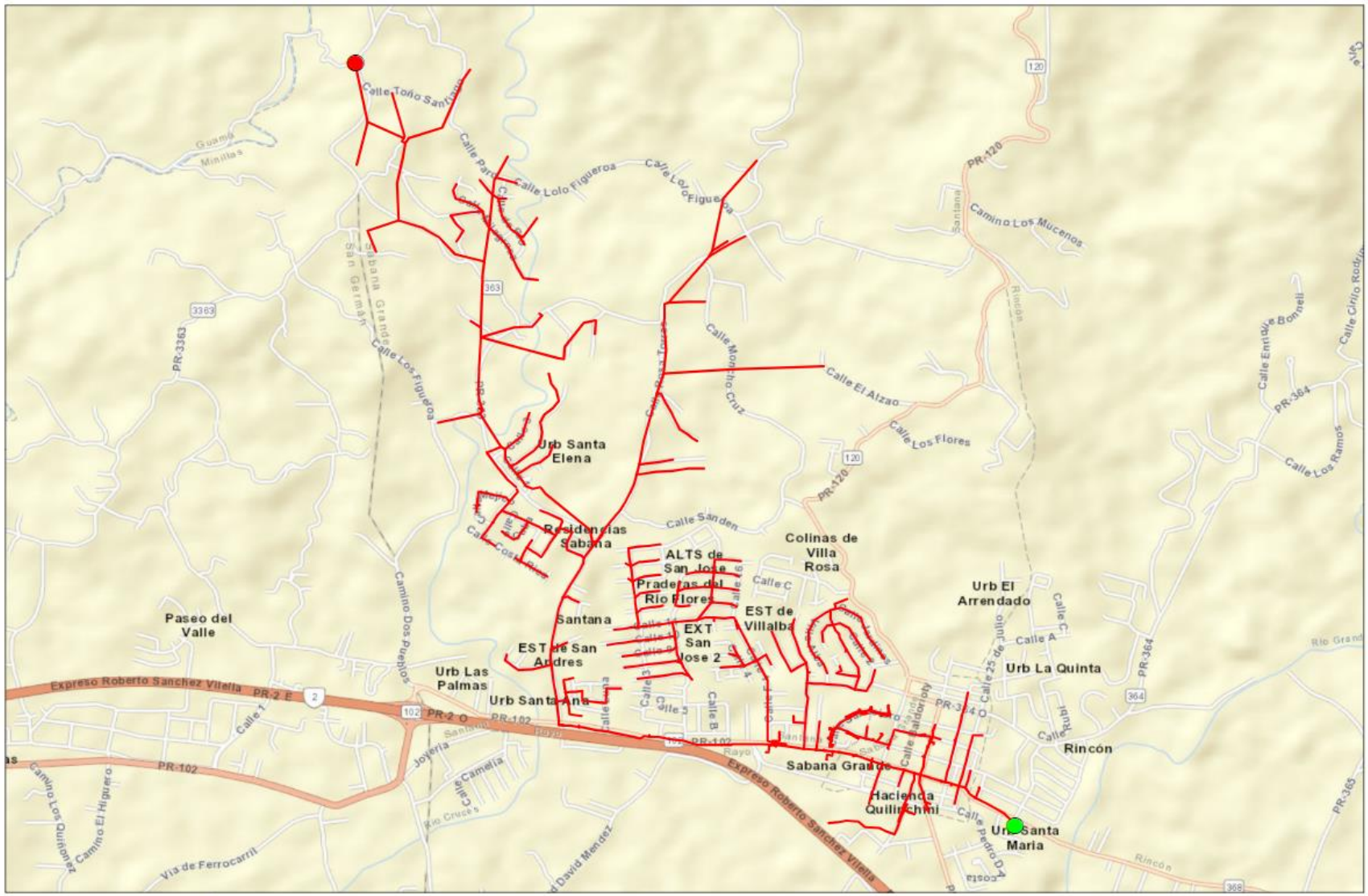
Environmental & Historic Preservation Requirements

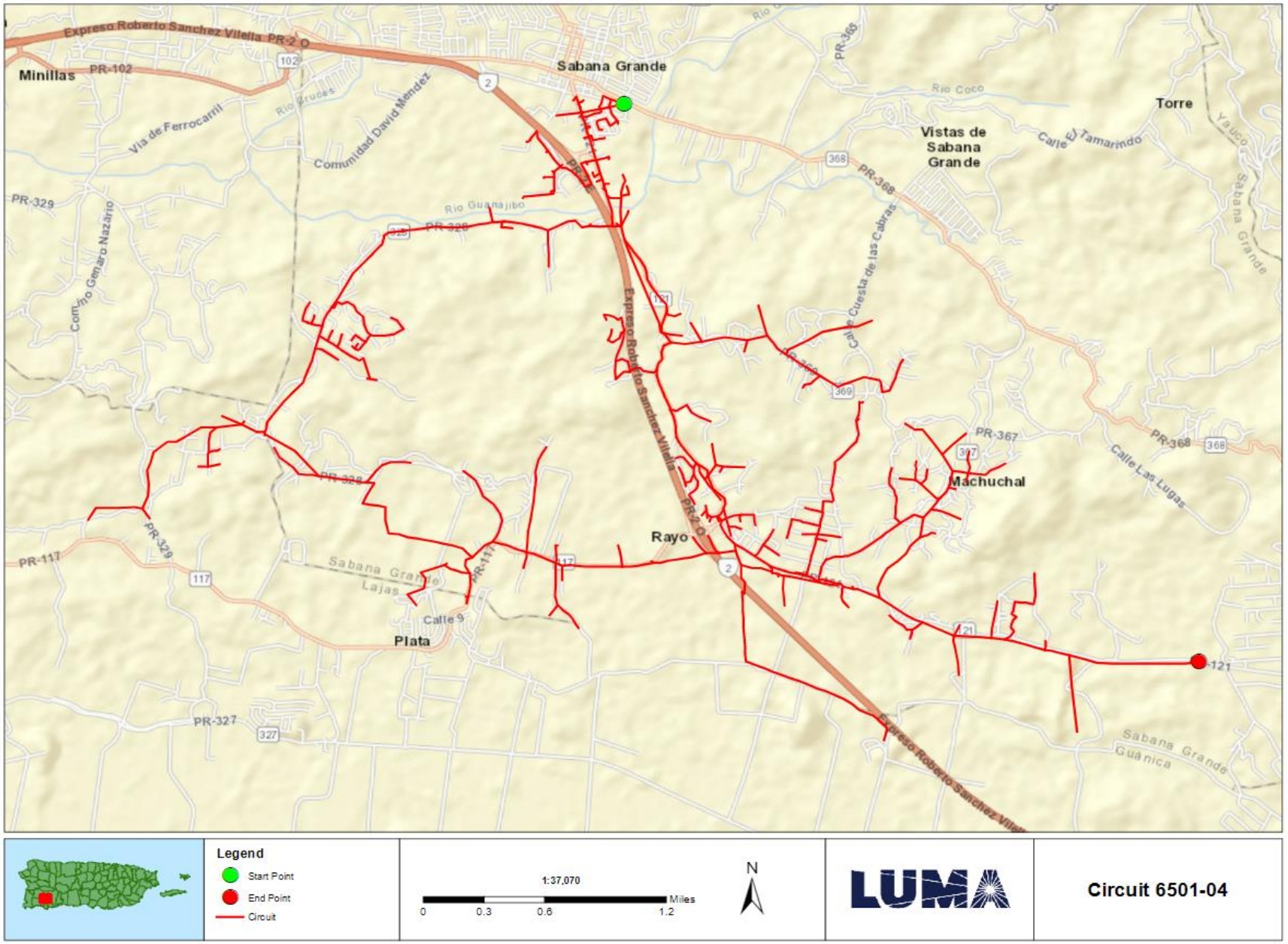
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 12 Location Maps	Location Maps and Site Picture


Sabana Grande
Paseo del Valle
Tabonuco
Frailes
Vistas de Sabana
Torre
PR-120
PR-364
PR-365
PR-363
PR-362
PR-102
PR-2
PR-121
Calle Lolo Figueroa
Calle Rosa Torres
Calle Linares
Calle Cuchilla Larga
Calle El Tamarindo
Río Grande
Río Coco
Río Cupeyes
Río Yauco
Río Loco
Río Cruces
Vía de Ferrocarril
Expreso Roberto Sánchez Vilella
Legend
Start Point
End Point
Circuit
1:35,560
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 6501-02


Urb Santa Elena
Residencias Sabana
ALTS de San Jose
Praderas del Rio Flores
Santana
EST de San Andres
EXT San Jose 2
EST de Villalba
Colinas de Villa Rosa
Urb El Arrendado
Urb La Quinta
Rincón
Sabana Grande
Hacienda Quilinchini
Urb Santa Maria
Paseo del Valle
Urb Las Palmas
Urb Santa Ana
Expreso Roberto Sanchez Vilella
PR-102
PR-120
PR-364
PR-3363
Calle Lolo Figueroa
Calle El Alzao
Calle Los Flores
Calle Sanden
Camino Los Mucenos
Camino Dos Pueblos
Calle 25 de Julio
Calle A
Calle C
Calle 1
Calle 3
Calle B
Calle Camelia
Joyeria
Via de Ferrocarril
Camino Los Quinonez
Camino El Higuero
Legend
Start Point
End Point
Circuit
1:21,710
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 6501-03



Legend

- Start Point
- End Point
- Circuit

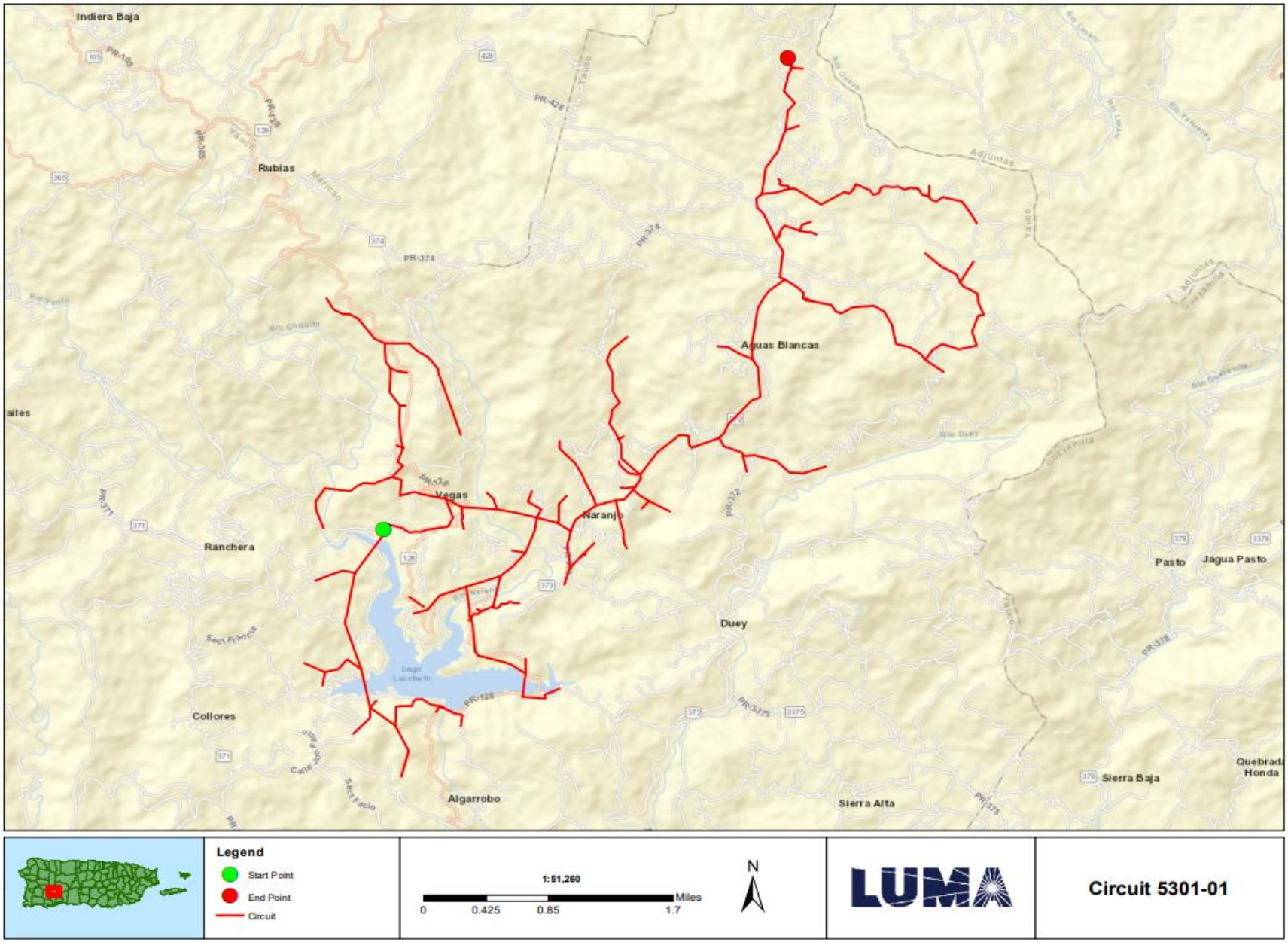
1:37,070

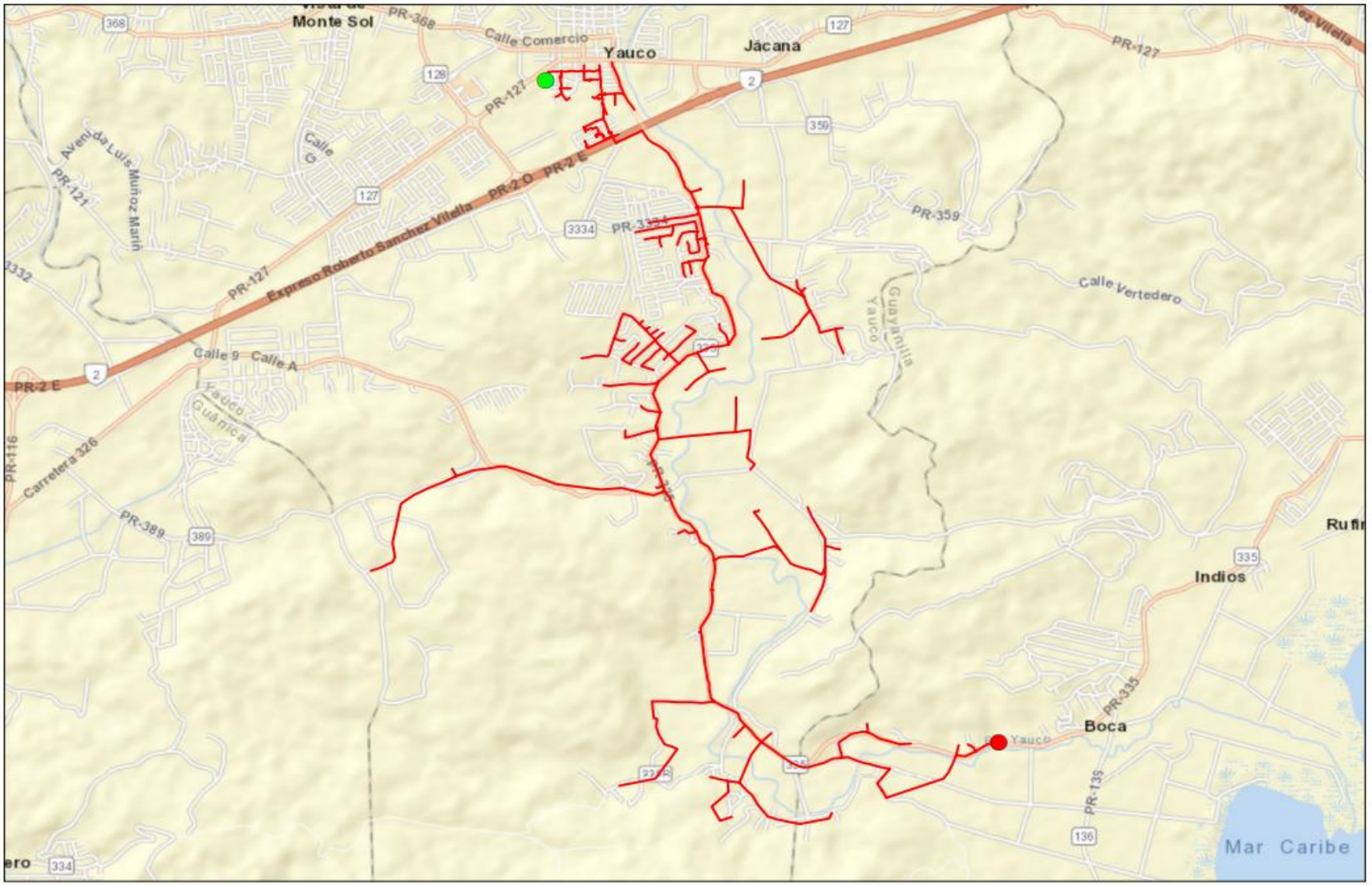
0 0.3 0.6 1.2 Miles

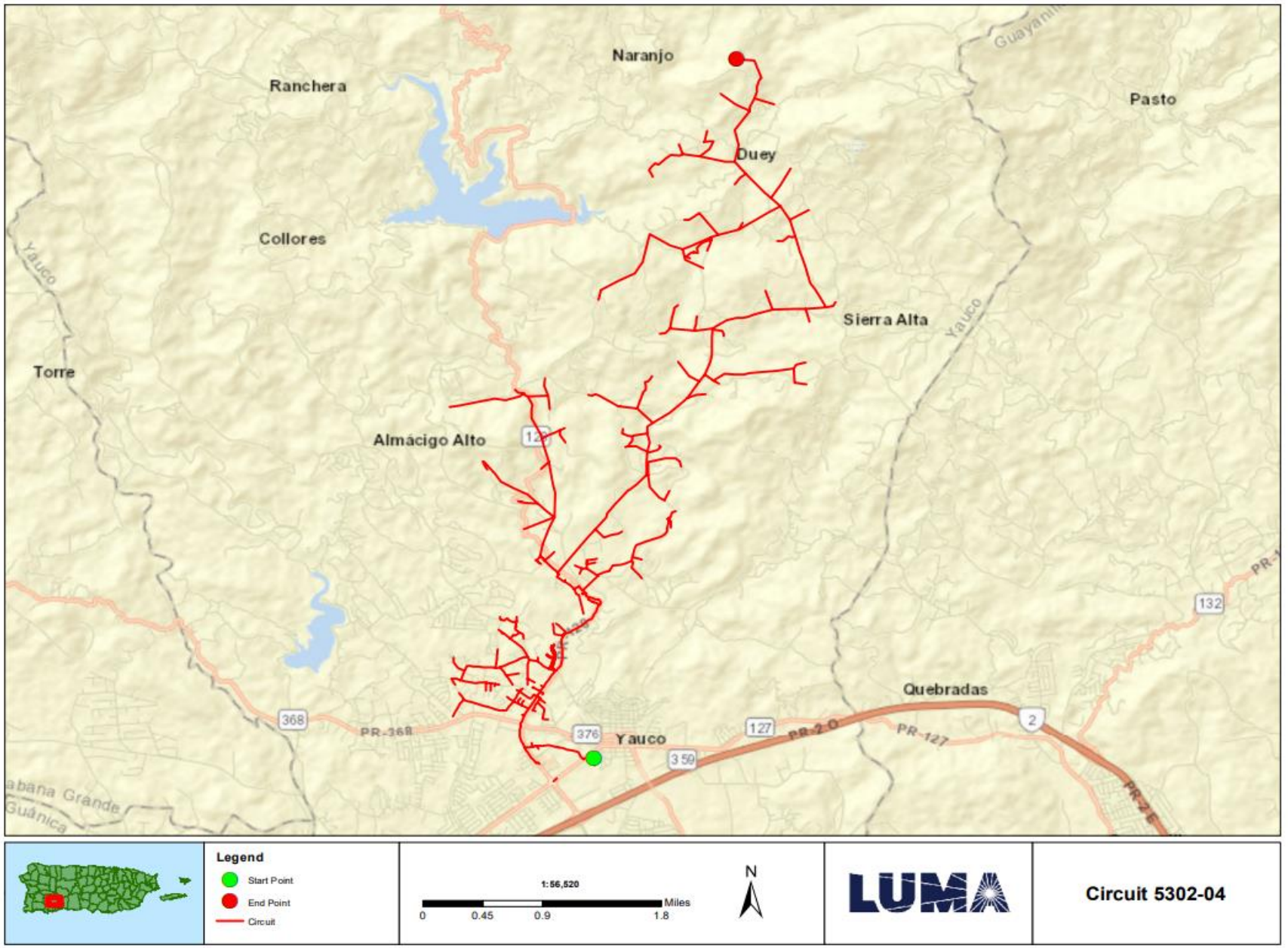
N

LUMA

Circuit 6501-04


Indiera Baja
Rubias
Aguas Blancas
Vegas
Naranjo
Ranchera
Duey
Pasto
Jagua Pasto
Collores
Algarrobo
Sierra Alta
Sierra Baja
Quebrada Honda
Legend
Start Point
End Point
Circuit
1:51,260
0
0.425
0.85
1.7
Miles
N
LUMA
Circuit 5301-01


Monte Sol
Yauco
Jácana
Calle Comercio
PR-368
PR-127
PR-2 E
PR-2 O
Expreso Roberto Sánchez Vilella
Avenida Luis Muñoz Marín
PR-121
Calle G
Calle 9
Calle A
Carretera 326
PR-389
PR-116
PR-359
Calle Vertedero
Guayanilla
Yauco
Guánica
Indios
Boca
PR-335
PR-135
Mar Caribe
Legend
Start Point
End Point
Circuit
1:34,750
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 5302-01


Naranjo
Ranchera
Pasto
Duey
Collores
Yauco
Sierra Alta
Torre
Almácigo Alto
Quebradas
Yauco
368
PR-368
376
127
PR-2
PR-127
2
359
132
Legend
Start Point
End Point
Circuit
1:56,520
0
0.45
0.9
1.8
Miles
N
LUMA
Circuit 5302-04

FEMA Project Scope of Work

Project Name:

Distribution Feeders - Ponce Short Term Group 13

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	14JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - Ponce Short Term Group 13
Project Type:	Restoration to Codes/Standards
Region:	Ponce
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the Ponce Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - Ponce Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
YAUCO PUEBLO II	5304-01	[redacted]	[redacted]	4.16
YAUCO PUEBLO II	5304-02			4.16
YAUCO PUEBLO II	5304-03			4.16
YAUCO PUEBLO II	5304-05			4.16
YAUCO PLAZA PDS	5305-03			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$1.90M**
Estimated Budget for Procurement & Construction:	**$18.99M**
Estimated Overall Budget for the Project:	**$20.89M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

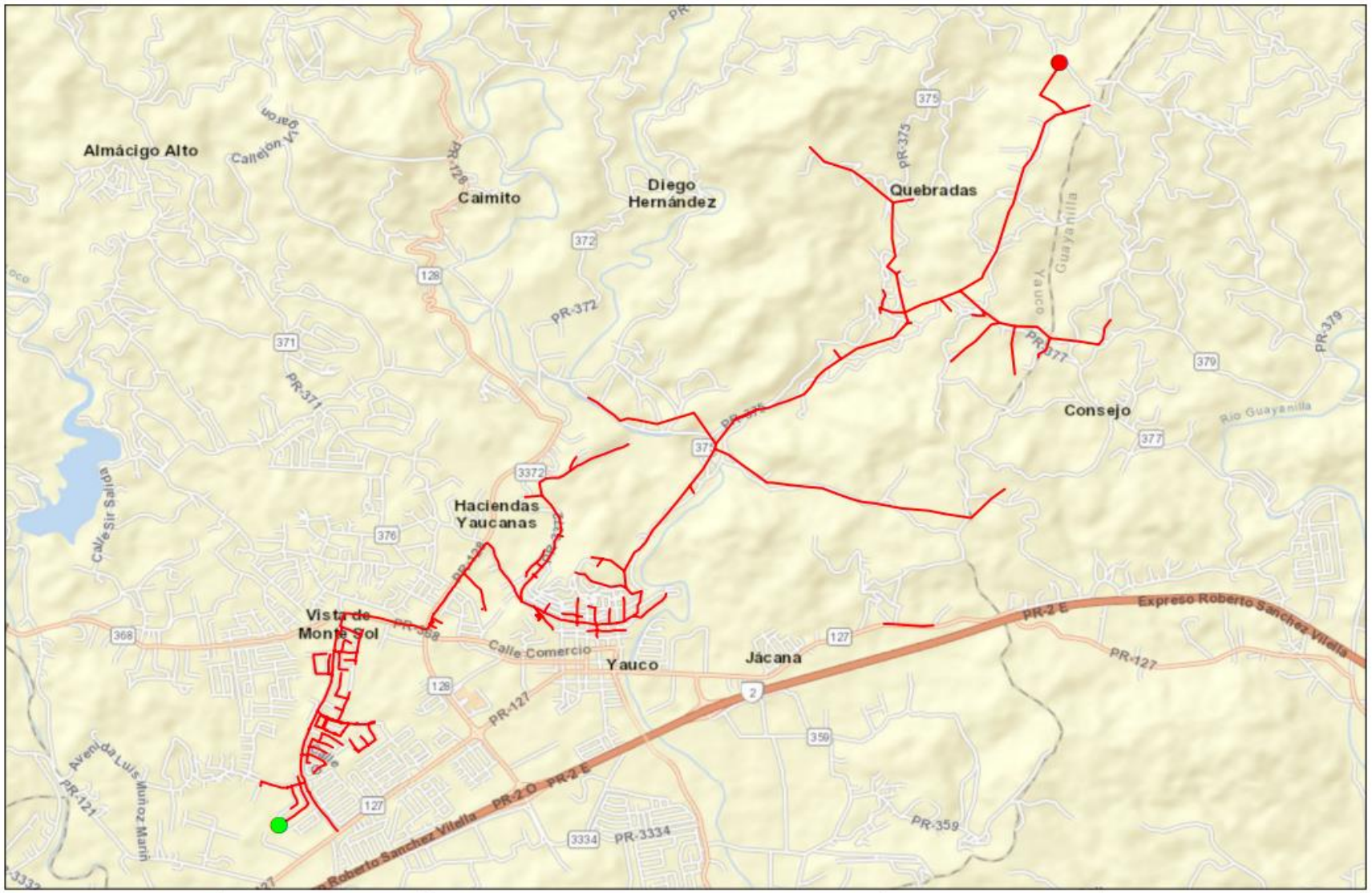
Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

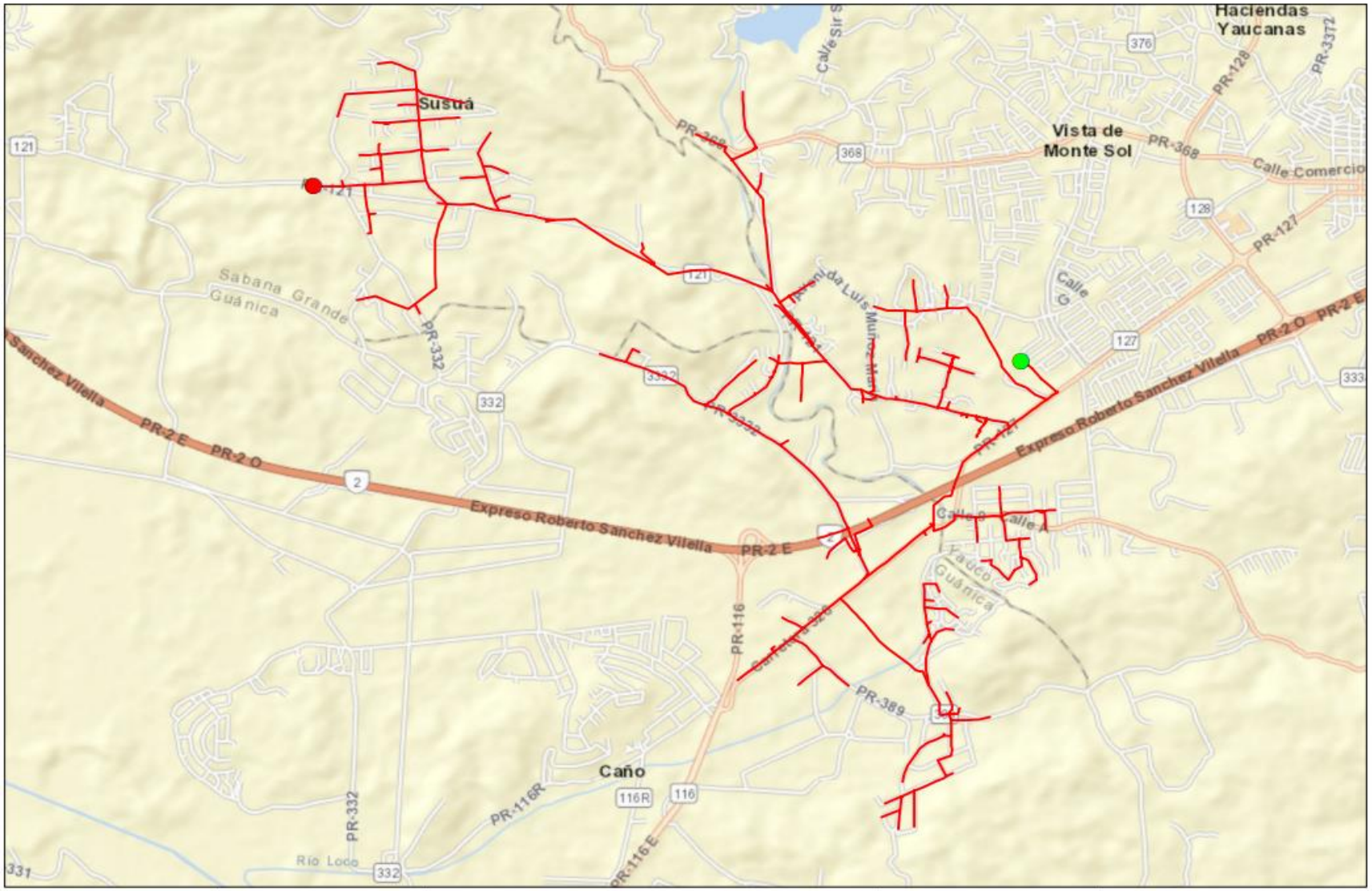
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

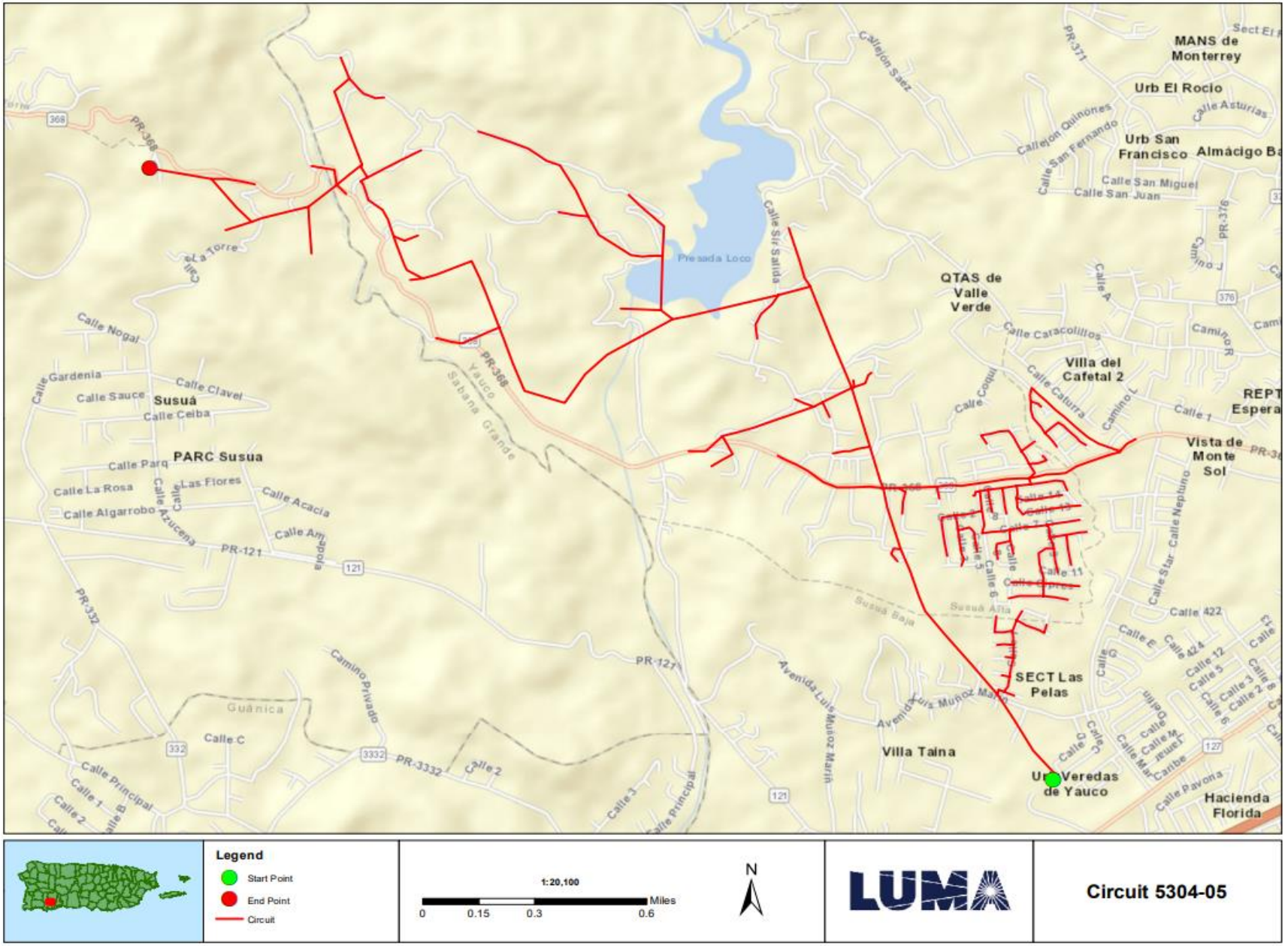
Attachments

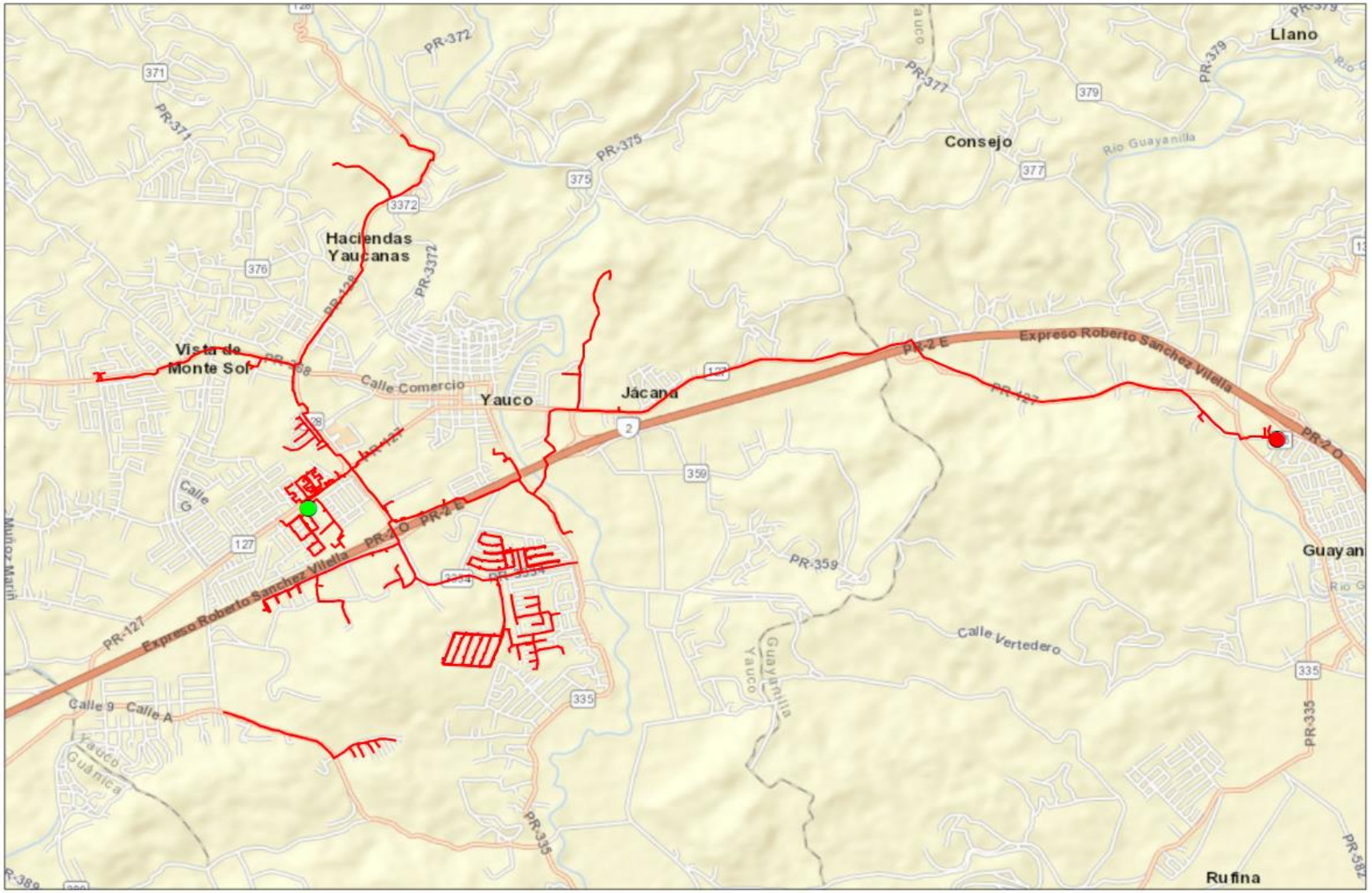
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
Ponce Short Term Group 13 Location Maps	Location Maps and Site Picture


Almácigo Alto
Caimito
Diego Hernández
Quebradas
Consejo
Haciendas Yaucanas
Vista de Monte Sol
Yauco
Jácana
Calle Comercio
Expreso Roberto Sánchez Vilella
PR-2 E
PR-2 O
PR-127
PR-372
PR-375
PR-377
PR-379
PR-359
PR-3334
Río Guayanilla
Avenida Luis Muñoz Marín
Calle Sir Salipia
Legend
Start Point
End Point
Circuit
1:35,100
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 5304-01


EST
de Yodimar
Colinas de
Yauco
Hospital
Metropolitano
Calle 11
Calle Cipres
Calle Flamboyan
Calle Jupiter
Calle 422
Calle Star
Calle Padro
PR-127
Vista del
Palmar
Calle E
Urb Mifedo
Calle 423
Susuá Baja
Calle G
Calle H
Calle I
Res Santa Catalina
Calle 13
Calle 12
Calle 7
Calle 8
Calle 5
Calle 4
Calle 3
Calle 2
Calle 1
Calle Prof. 25 de Julio
Urb El
Rosario
Calle 4
Calle 2
Calle 1
Calle 9
Calle 7
Calle 5
Calle 6
PR-128
Yauco
CT Las
Pelas
Calle Palmar
Calle Velero
Calle Brisas de
Calle Mirámar
Calle Azucenas
Calle Nardos
Urb Los
Pinos
Villa
Milagros
Calle A
Calle D
Calle C
Calle Mar Caribe
PR-127
Urb Veredas
de Yauco
Pavona
Calle Tamaima
Calle Magnolia
Hacienda
Florida
Calle 5
Expreso Roberto San
198
PR-2 E
Calle Pascua
Calle Geranio
Calle Aleli
Expreso Roberto Sanchez Vilella
2
Vista Real
Legend
Start Point
End Point
Circuit
1:7,040
0
0.05
0.1
0.2
Miles
N
LUMA
Circuit 5304-02


Haciendas Yaucanas
Sustrá
Vista de Monte Sol
Sabana Grande
Guánica
Expreso Roberto Sanchez Vilella
PR-2 E
PR-2 O
Caño
Río Loco
PR-116
PR-116R
PR-116E
PR-332
PR-368
PR-127
PR-389
Calle Comercio
Calle G
Yauco
Guánica
Legend
Start Point
End Point
Circuit
1:31,970
0
0.25
0.5
1
Miles
N
LUMA
Circuit 5304-03


MANS de Monterrey
Urb El Rocio
Urb San Francisco
Almácigo Ba
QTAS de Valle Verde
Villa del Cafetal 2
Vista de Monte Sol
REPT Espera
PARC Susua
Susuá
SECT Las Pelas
Villa Taina
Veredas de Yauco
Hacienda Florida
Presada Loco
Yauco
Sabana Grande
Guánica
Susuá Baja
Susuá Alta
PR-368
PR-121
PR-332
PR-3332
PR-371
PR-376
Calle Nogal
Calle Gardenia
Calle Sauce
Calle Ceiba
Calle Clavel
Calle Parq
Calle La Rosa
Calle Algarrobo
Calle Azucena
Las Flores
Calle Acacia
Calle Amapola
Calle Caracolillos
Calle Caturra
Calle Star
Calle Neptuno
Calle 422
Calle 424
Calle 11
Calle 12
Calle 1
Calle 2
Calle 3
Calle 5
Calle 6
Calle C
Calle Principal
Camino Privado
Avenida Luis Muñoz Marín
Calle Asturias
Calle San Miguel
Calle San Juan
Calle Sin Salida
Callejon Saez
Callejon Quinones
Calle San Fernando
Calle Pavona
Calle Caribe
Legend
Start Point
End Point
Circuit
1:20,100
0 0.15 0.3 0.6 Miles
N
LUMA
Circuit 5304-05


Llano
Consejo
Haciendas Yaucanas
Vista de Monte Sol
Yauco
Jácana
Guayan
Rufina
Calle Comercio
Expreso Roberto Sanchez Vilella
PR-2 E
PR-2 O
PR-127
PR-359
PR-335
PR-372
PR-371
PR-375
PR-377
PR-379
Calle Vertedero
Calle 9
Calle A
Yauco Guánica
Río Guayanilla
Muñoz Marín
Calle G
371
372
375
376
377
379
335
359
127
2
Legend
Start Point
End Point
Circuit
1:34,570
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 5305-03

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 4

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
[redacted]		
Program Brief Owner	**Signature**	**Date**
[redacted]		

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 4
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CANOVANAS T.C. #2	2404-05	[redacted]		13.2
CANOVANAS T.C. #2	2404-07			13.2
CANOVANAS T.C. #2	2404-08			13.2
BARRAZAS 2	1607-01			4.16
BARRAZAS 2	1607-03			4.16
CERAMICA 13KV	1619-01			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.99M**
Estimated Budget for Procurement & Construction:	**$29.97M**
Estimated Overall Budget for the Project:	**$32.96M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

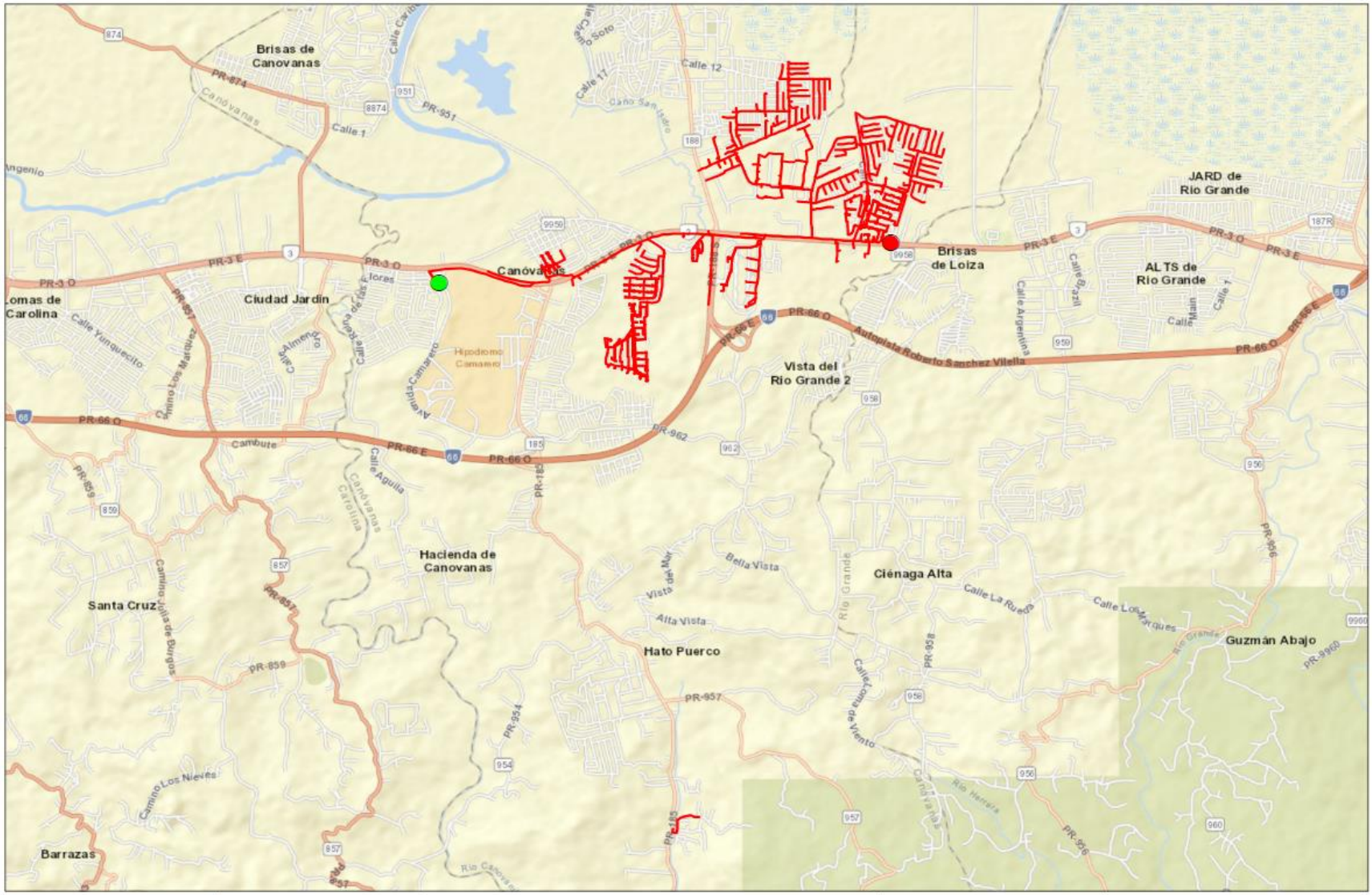
Note: If available, detailed engineering cost estimates will be included as an attachment.

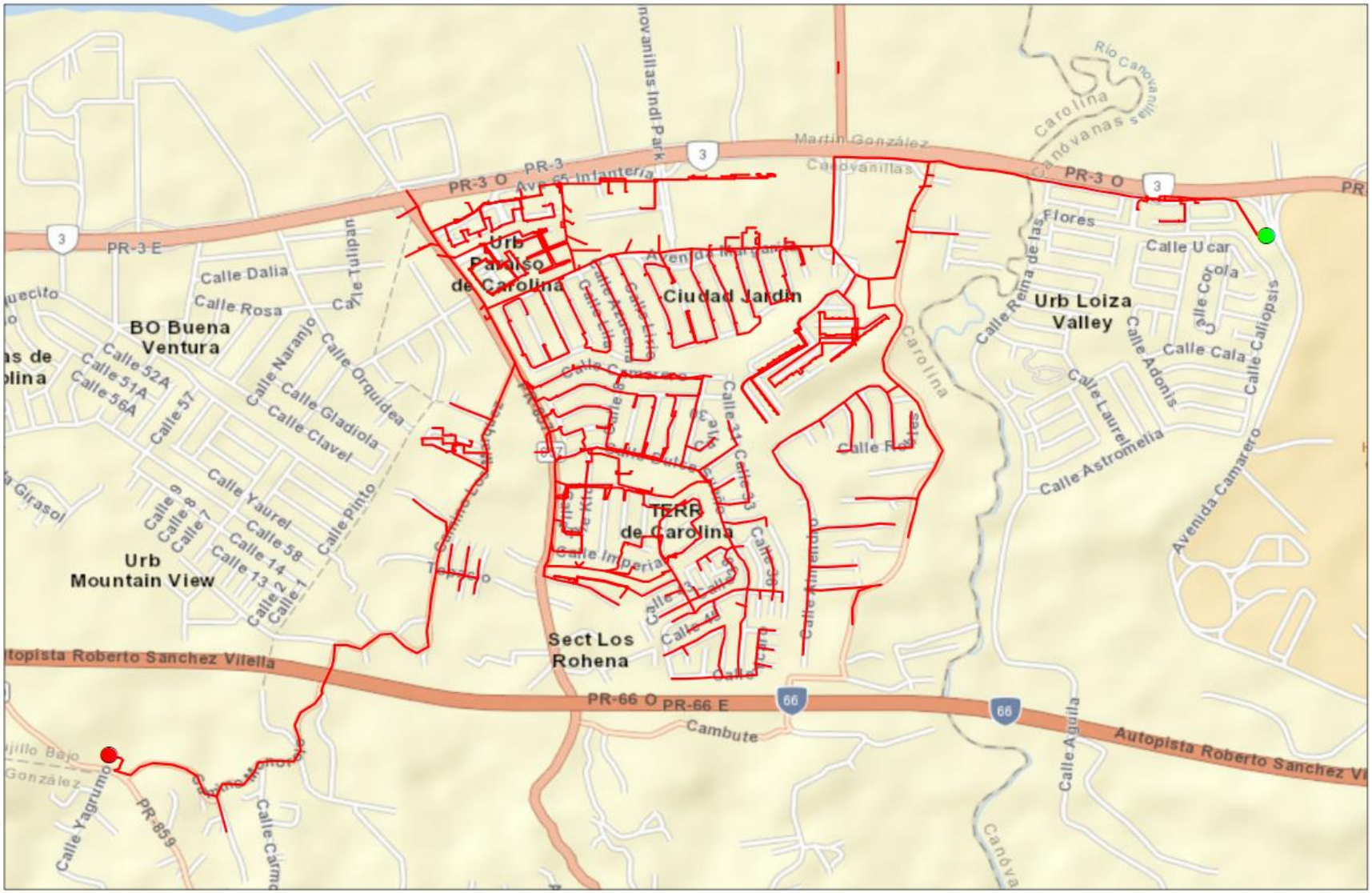
Environmental & Historic Preservation Requirements

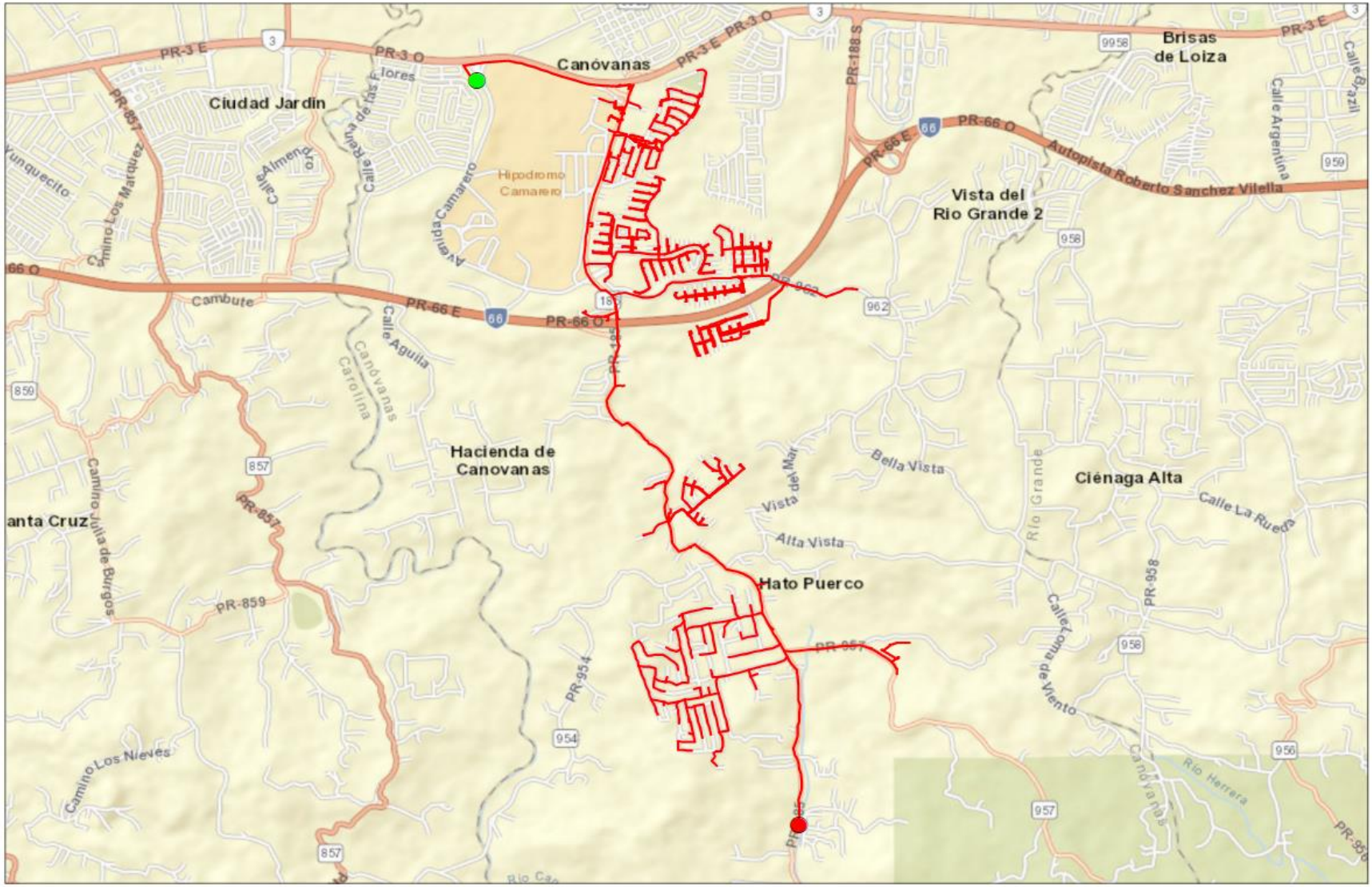
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

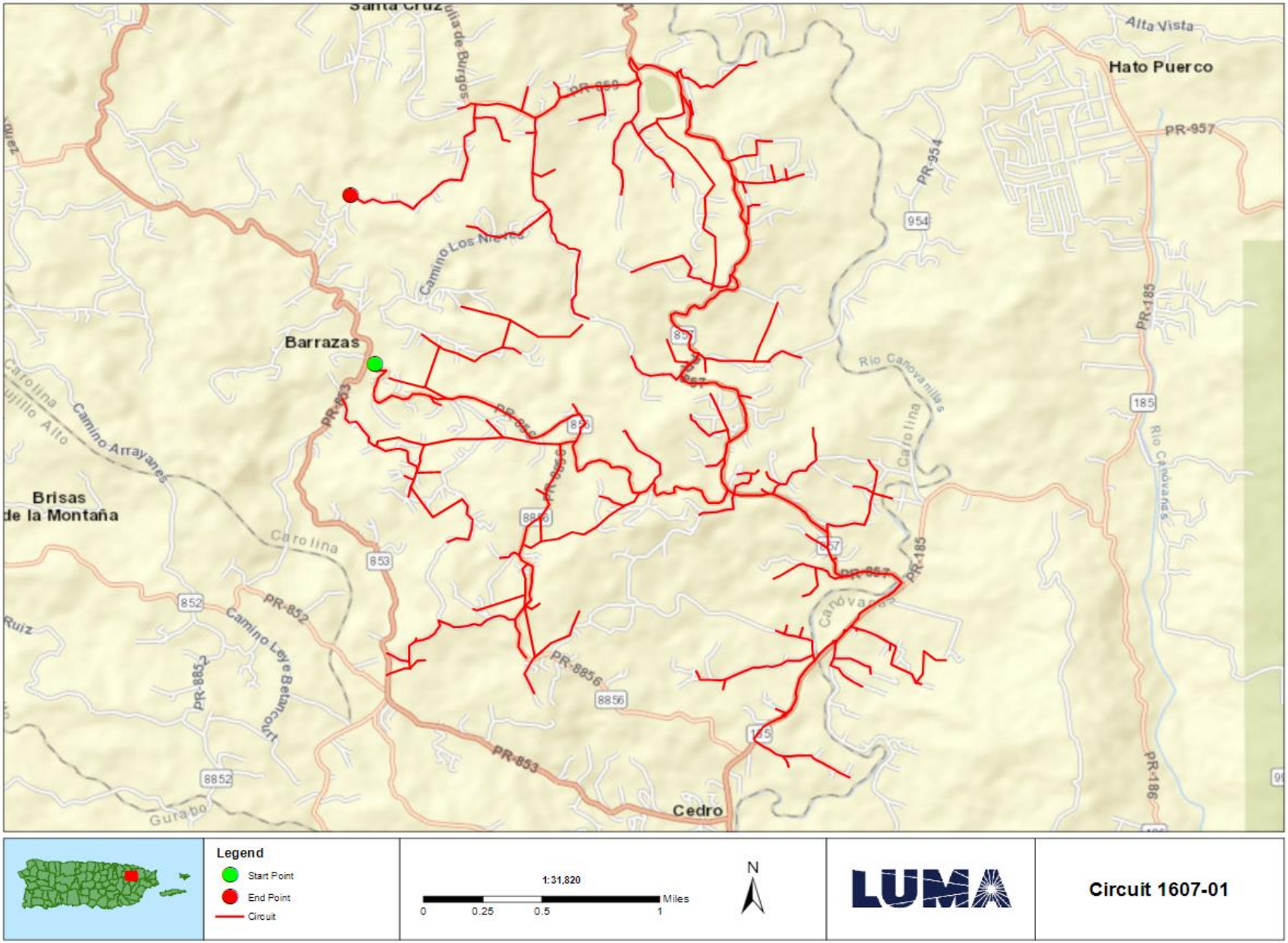
Attachments

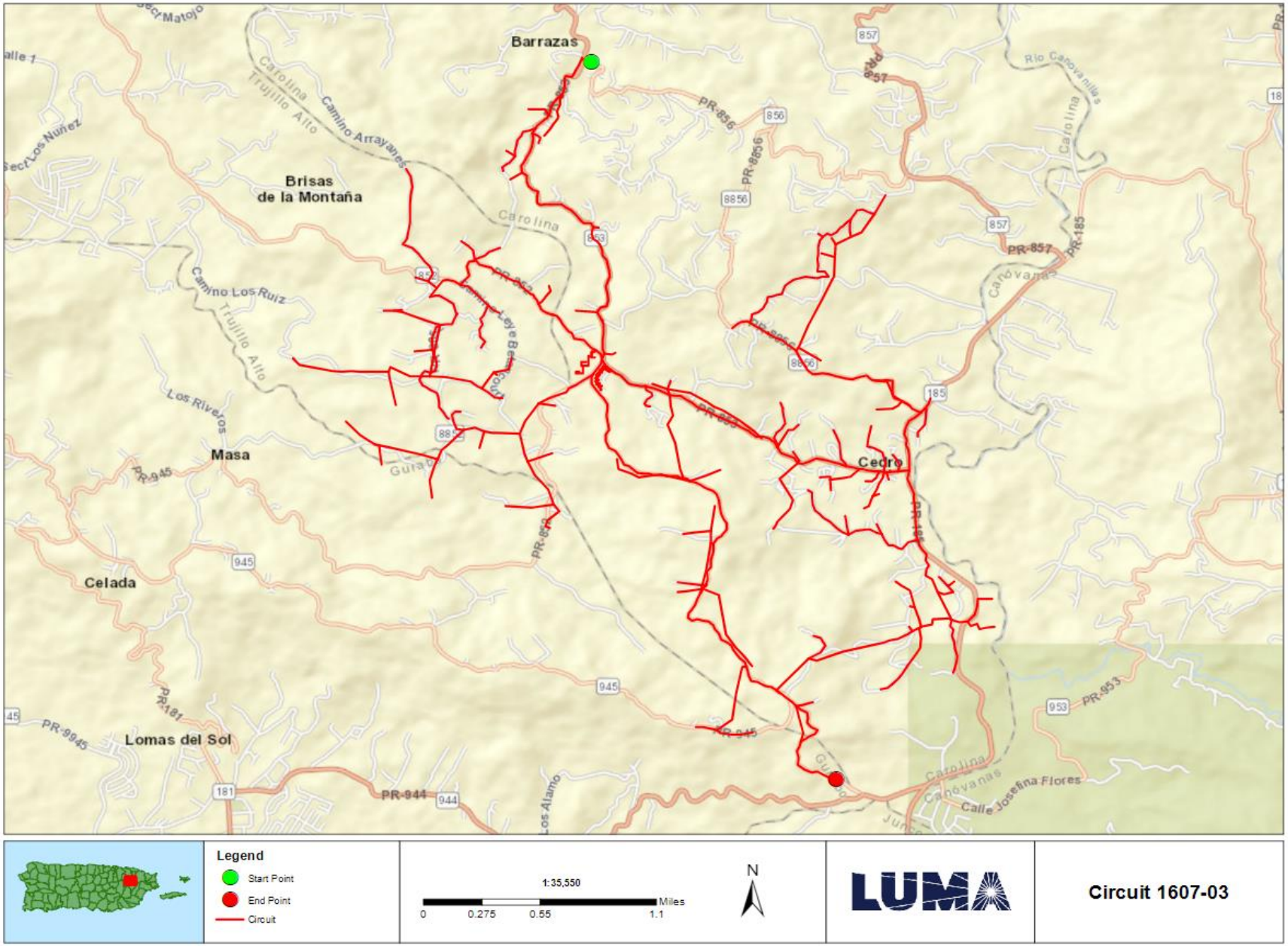
Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 4 Location Maps	Location Maps and Site Picture

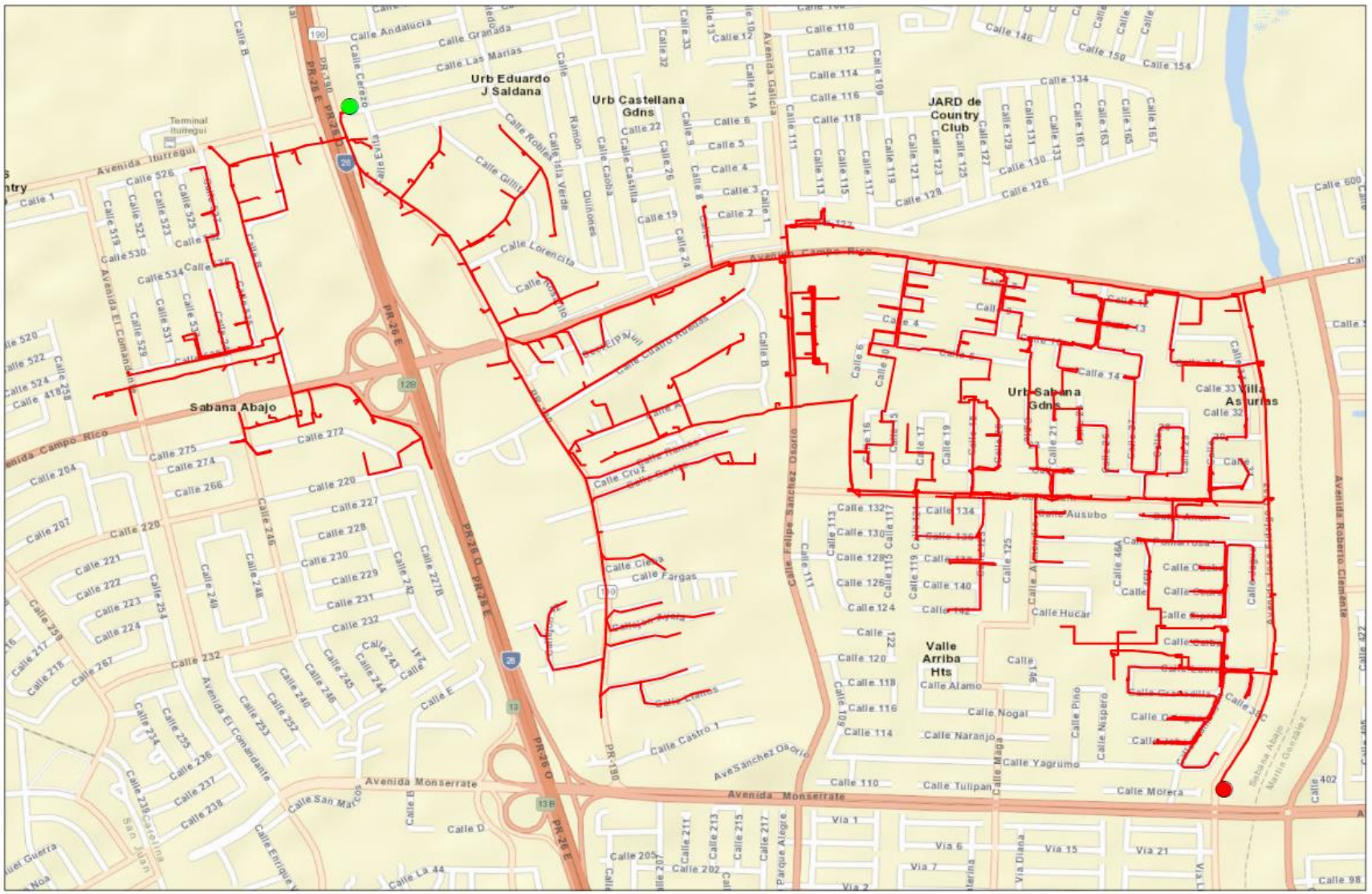

Brisas de Canovanas
Canóvanas
Brisas de Loiza
JARD de Rio Grande
ALTS de Rio Grande
Vista del Rio Grande 2
Ciudad Jardín
Lomas de Carolina
Hacienda de Canovanas
Santa Cruz
Hato Puerto
Ciénaga Alta
Guzmán Abajo
Barrazas
Autopista Roberto Sanchez Vilella
Hipódromo Camarero
PR-3 O
PR-3 E
PR-66 O
PR-66 E
PR-962
PR-951
PR-874
PR-857
PR-859
PR-957
PR-958
PR-954
Legend
Start Point
End Point
Circuit
1:46,280
0
0.375
0.75
1.5
Miles
N
LUMA
Circuit 2404-05


Urb Paraiso de Carolina
Ciudad Jardin
BO Buena Ventura
Urb Mountain View
Urb Loiza Valley
TERR de Carolina
Sect Los Rohena
Martin González
Carolina
Canóvanas
Río Canóvanas
Canovanillas Indl Park
Avenida Infantería
Avenida Camarero
Autopista Roberto Sanchez Vilella
Cambute
PR-3 O
PR-3 E
PR-66 O
PR-66 E
PR-859
Calle Dalia
Calle Rosa
Calle Naranjo
Calle Orquidea
Calle Gladiola
Calle Clavel
Calle Yaurel
Calle Pinto
Calle Flores
Calle Ucar
Calle Cala
Calle Adonis
Calle Laurelmelia
Calle Astromelia
Calle Caliopsis
Calle Aguila
Calle Yagrumo
Legend
Start Point
End Point
Circuit
1:14,970
Miles
0
0.1
0.2
0.4
N
LUMA
Circuit 2404-07


Canóvanas
Ciudad Jardin
Brisas de Loiza
Vista del Rio Grande 2
Hacienda de Canovanas
Ciénaga Alta
Hato Puerco
Hipodromo Camarero
Cambute
Bella Vista
Alta Vista
Vista del Mar
Río Grande
Río Herrera
PR-3 E
PR-3 O
PR-66 E
PR-66 O
PR-857
PR-859
PR-954
PR-958
PR-188 S
Autopista Roberto Sanchez Vilella
Calle Aguila
Calle La Rueda
Camino Los Nieves
Camino Julia de Burgos
Legend
Start Point
End Point
Circuit
1:33,650
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 2404-08


Barrazas
Brisas
de la Montaña
Cedro
Hato Puerco
Alta Vista
PR-953
PR-852
PR-853
PR-8856
PR-957
PR-954
PR-185
PR-186
Camino Los Nieves
Camino Arrayanes
Camino Ley e Betancourt
Río Canóvanas
Carolina
Canóvanas
Ruiz
Guraboo
Legend
Start Point
End Point
Circuit
1:31,820
0
0.25
0.5
1
Miles
N
LUMA
Circuit 1607-01


Barrazas
Brisas
de la Montaña
Masa
Celada
Lomas del Sol
Cedro
Carolina
Trujillo Alto
Camino Arrayanes
Camino Los Ruiz
Los Riveros
Río Canóvanas
Canóvanas
Calle Josefina Flores
PR-856
PR-857
PR-185
PR-945
PR-9945
PR-181
PR-944
PR-953
Legend
Start Point
End Point
Circuit
1:35,550
0
0.275
0.55
1.1
Miles
N
LUMA
Circuit 1607-03


Urb Eduardo J Saldana
Urb Castellana Gdns
JARD de Country Club
Sabana Abajo
Urb Sabana Gdns
Calle 33 Villa Asturias
Valle Arriba Hts
Avenida Monserrate
Avenida Campo Rico
Avenida Iturregui
Terminal Iturregui
PR-26 E
PR-26 O
PR-190
Avenida Galicia
Calle Andalucia
Calle Granada
Calle Las Marias
Calle Cerezo
Calle Gilito
Calle Lorencita
Calle Robelo
Calle Cuatro Hermanas
Calle Cruz
Calle Cleza
Calle Fargas
Calle Castro 1
Calle Alamo
Calle Nogal
Calle Naranjo
Calle Yagrumo
Calle Tulipan
Calle Morera
Calle Hucar
Calle Ausubo
Calle Felipe Sanchez Osorio
Avenida Roberto Clemente
Calle San Marcos
Calle Enrique
Calle Santa Catalina
Calle La 44
Calle 205
Calle 202
Parque Alegre
Via 1
Via 6
Via 7
Via 15
Via 21
Via Diana
Legend
Start Point
End Point
Circuit
1:12,000
0 0.075 0.15 0.3 Miles
N
LUMA
Circuit 1619-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 5

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 5
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
CERAMICA 13KV	1619-03	[redacted]		13.2
SABANA LLANA 13KV #1	1646-01			13.2
SABANA LLANA 13KV #1	1646-03			13.2
SABANA LLANA 13KV #1	1646-05			13.2
VILLAMAR	1657-03			13.2
RIO GRANDE 8KV	2301-01			8.32

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.40M**
Estimated Budget for Procurement & Construction:	**$23.99M**
Estimated Overall Budget for the Project:	**$26.39M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

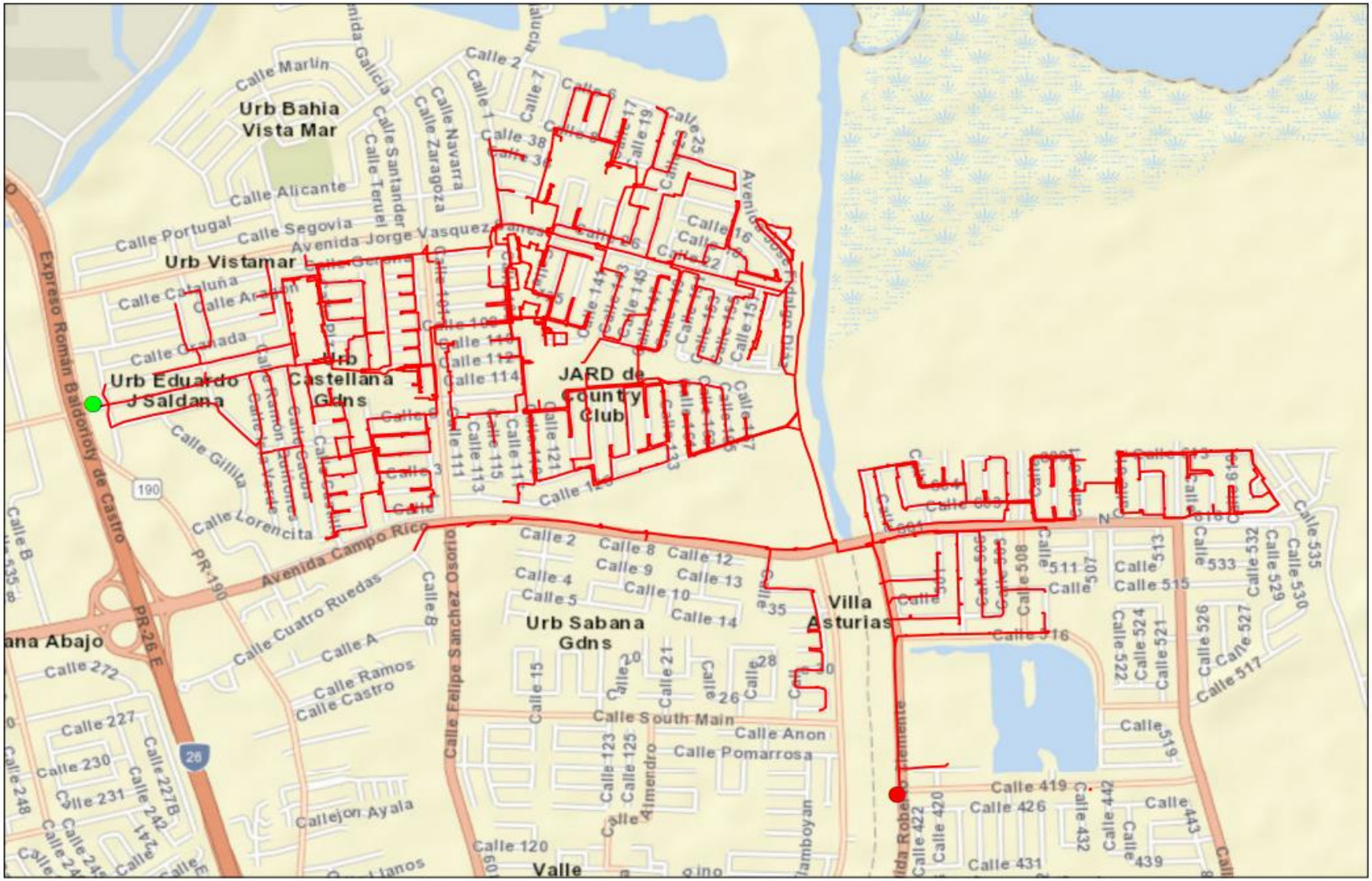
Note: If available, detailed engineering cost estimates will be included as an attachment.

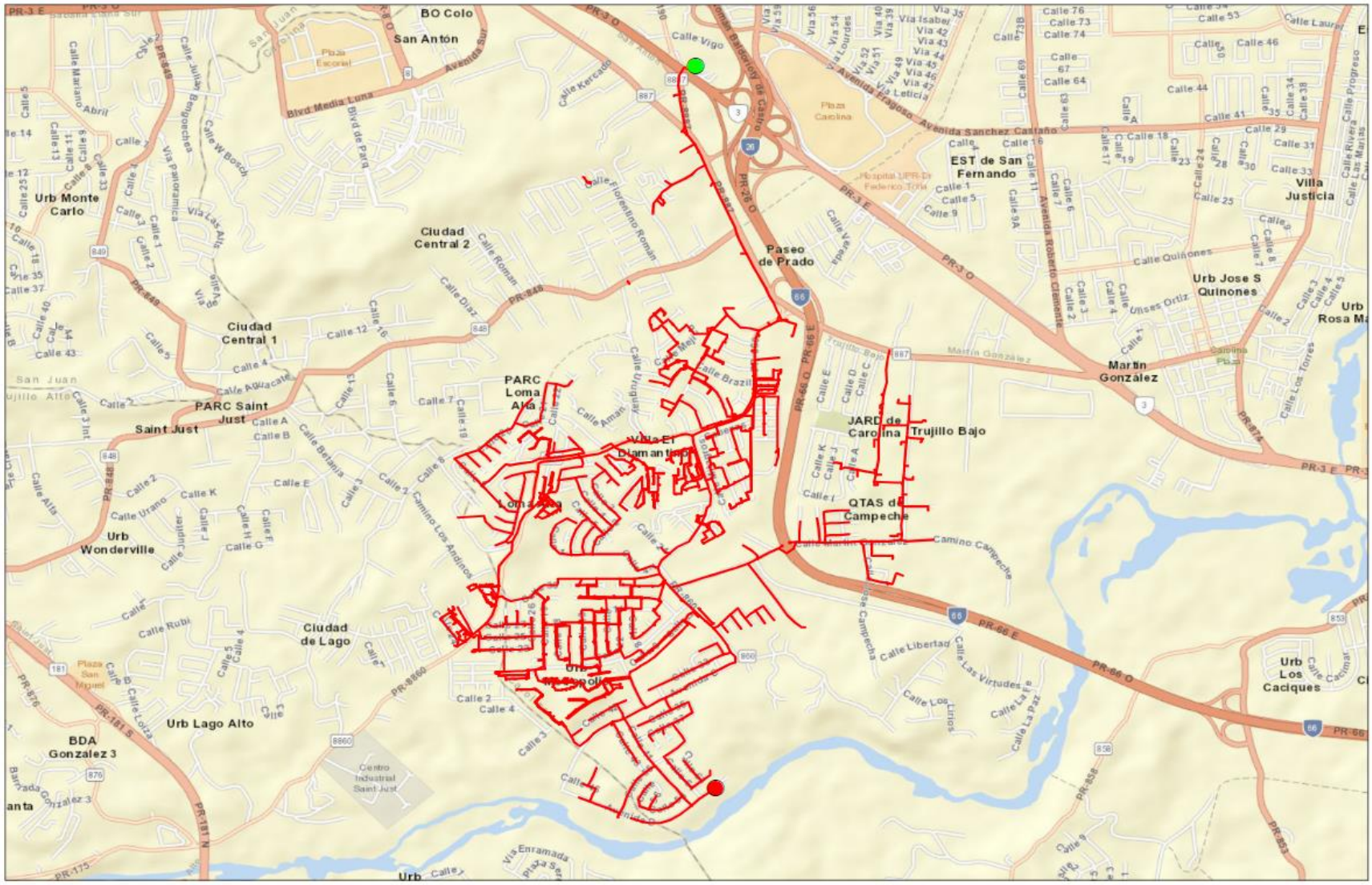
Environmental & Historic Preservation Requirements

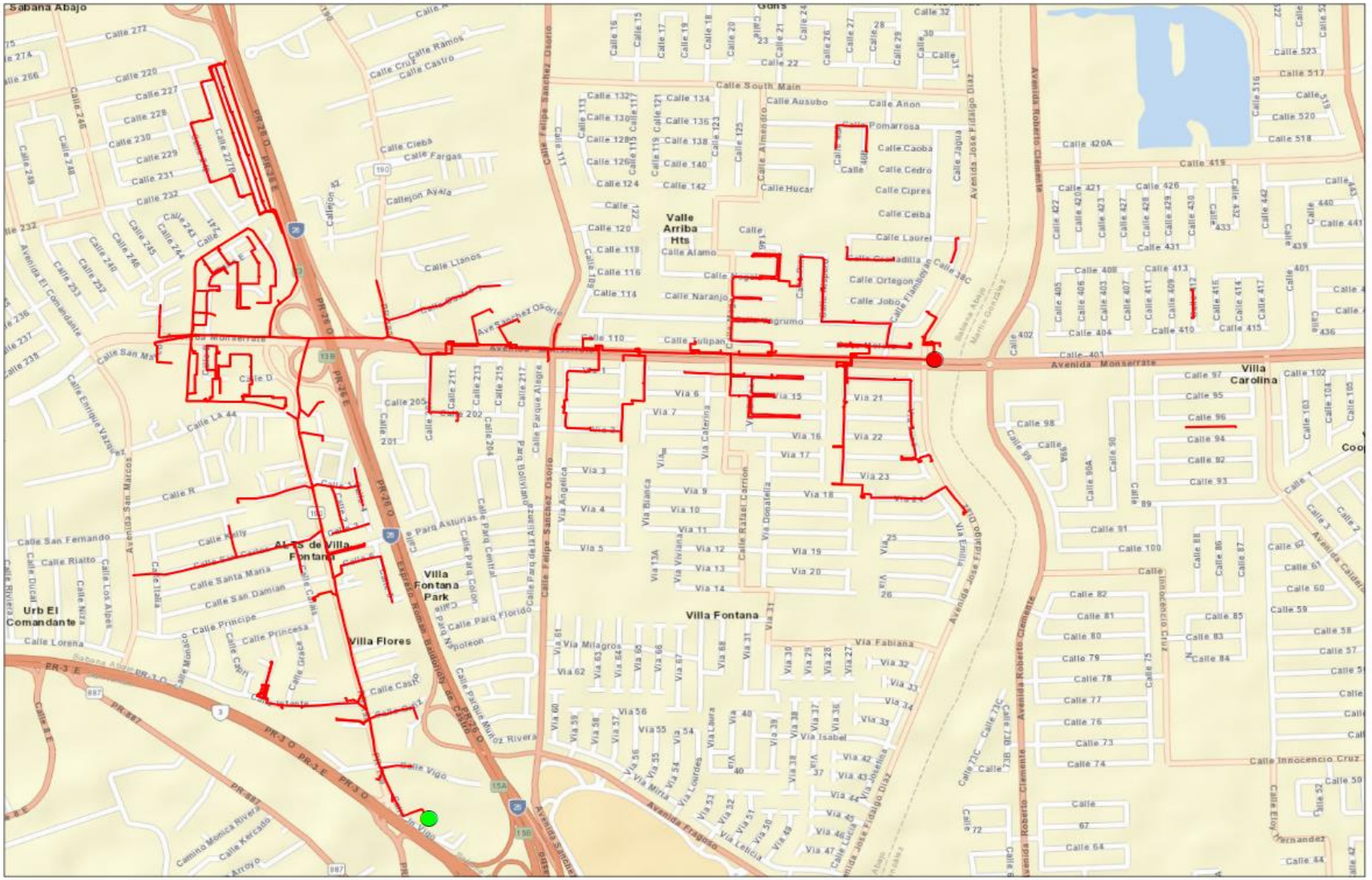
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

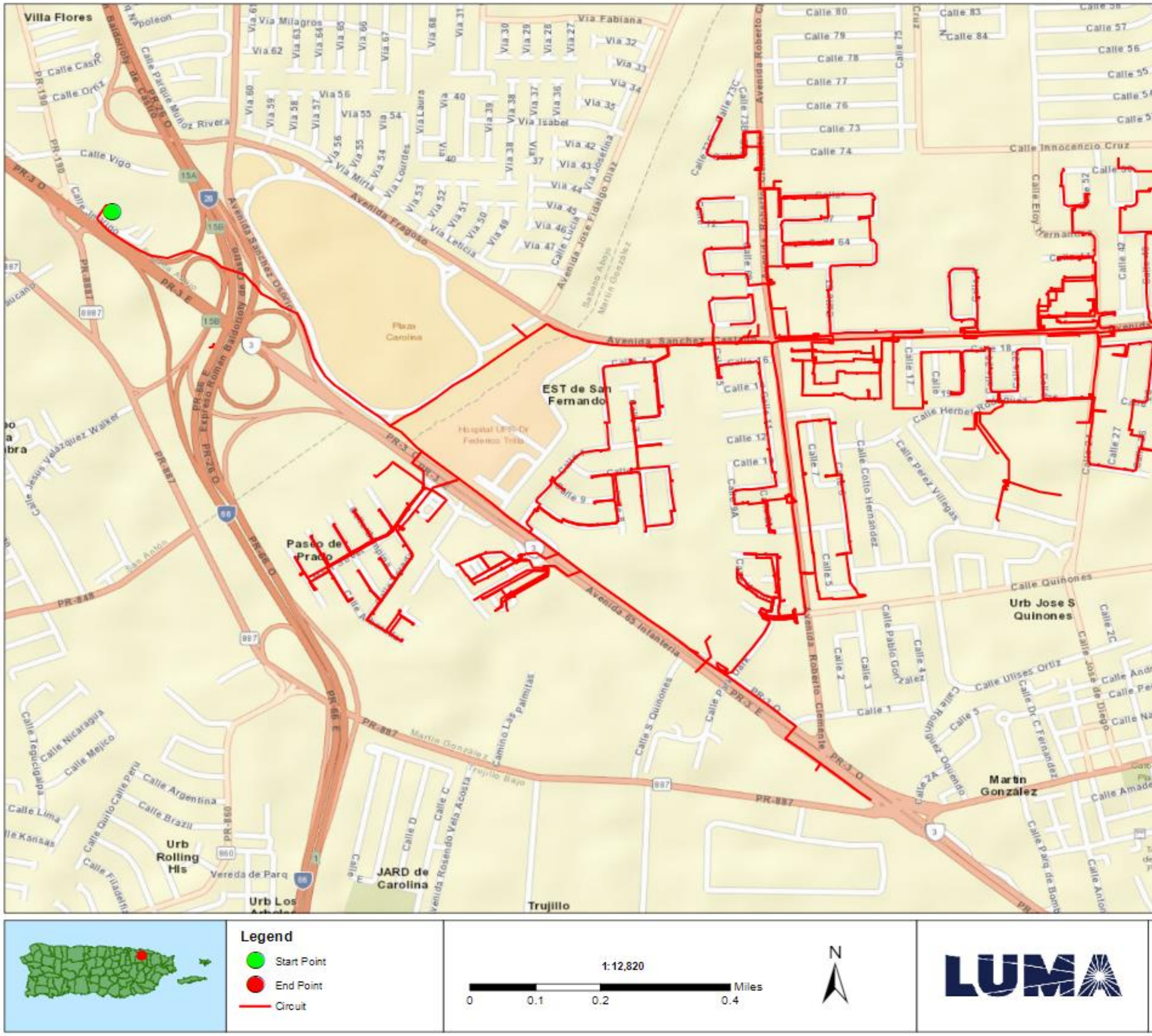
Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 5 Location Maps	Location Maps and Site Picture


Urb Bahia Vista Mar
Urb Vistamar
Urb Eduardo J Saldana
Urb Castellana Gdns
JARD de Country Club
Urb Sabana Gdns
Villa Asturias
Valle
Expreso Román Baldorioty de Castro
PR-190
PR-26 E
Avenida Campo Rico
Calle Marlin
Calle Alicante
Calle Portugal
Calle Segovia
Avenida Jorge Vasquez
Calle Cataluña
Calle Aragón
Calle Granada
Calle Gillita
Calle Lorencita
Calle Cuatro Ruedas
Calle A
Calle Ramos
Calle Castro
Calle Felipe Sanchez Osorio
Calle South Main
Calle Anon
Calle Pomarrosa
Callejon Ayala
Calle Almendro
Calle Santander
Calle Teruel
Calle Zaragoza
Calle Navarra
Calle Galicia
Calle Ramon Ramirez Verde
Calle Cadiz
Calle Salvador
Calle Lamboyan
Calle Roberto Clemente
Legend
Start Point
End Point
Circuit
1:14,780
0 0.1 0.2 0.4 Miles
N
LUMA
Circuit 1619-03

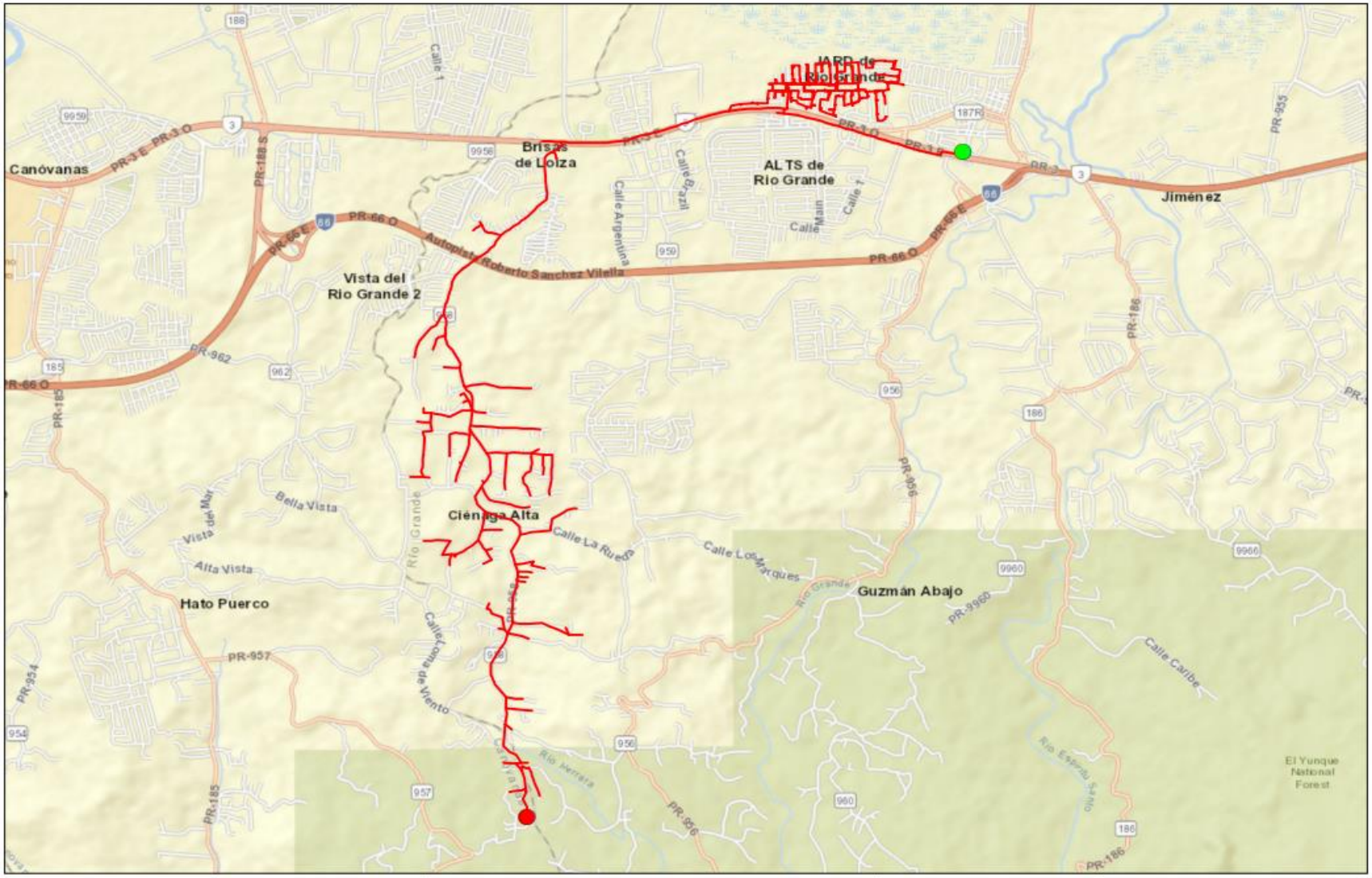

BO Colo
San Antón
Urb Monte Carlo
Ciudad Central 2
Paseo de Prado
EST de San Fernando
Villa Justicia
Urb Jose S Quinones
Ciudad Central 1
PARC Saint Just
Saint Just
PARC Loma Alta
Vista El Diamante
JARD de Carolina
Trujillo Bajo
Martin González
QTAS de Campeche
Urb Wonderville
Ciudad de Lago
Urb Lago Alto
BDA Gonzalez 3
Urb Los Caciques
Legend
Start Point
End Point
Circuit
1:23,950
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 1646-01


Sabana Abajo
Valle Arriba Hts
Villa Fontana Park
Villa Fontana
Villa Flores
Urb El Comandante
Villa Carolina
Avenida Monserrate
Avenida Jose Fidalgo Diaz
Avenida Roberto Clemente
Calle Felipe Sanchez Osorio
Calle South Main
Calle Ausubo
Calle Anon
Calle Pomarrosa
Calle Caoba
Calle Cedro
Calle Cipres
Calle Ceiba
Calle Laurel
Calle Ortegon
Calle Jobo
Calle Naranjo
Calle Tulipan
Calle Hucar
Calle Almendro
Calle Jagua
Calle Alamo
Calle Llanos
Calle Fargas
Calle Cleba
Calle Ramos
Calle Castro
Calle Callejon Ayala
Calle Parque Alegre
Calle Parque de la Alianza
Calle Parque Florido
Calle Parque Munoz Rivera
Calle Parque Asturias
Calle Rafael Carrion
Calle Vigo
Calle Santa Maria
Calle San Damian
Calle Principe
Calle Princesa
Calle Lorena
Calle San Fernando
Calle Rialto
Calle Monaco
Calle Los Alpes
Calle Nizza
Calle Ducal
Calle Kelly
Calle La 44
Calle R
Calle D
Avenida San Marcos
Avenida El Comandante
Calle Enrique Vazquez
Calle Monserrate
Calle San Mateo
Camino Monica Rivera
Calle Kercado
Arroyo
Via 1
Via 2
Via 3
Via 4
Via 5
Via 6
Via 7
Via 8
Via 9
Via 10
Via 11
Via 12
Via 13
Via 14
Via 15
Via 16
Via 17
Via 18
Via 19
Via 20
Via 21
Via 22
Via 23
Via 24
Via 25
Via 26
Via 27
Via 28
Via 29
Via 30
Via 31
Via 32
Via 33
Via 34
Via 35
Via 36
Via 37
Via 38
Via 39
Via 40
Via 41
Via 42
Via 43
Via 44
Via 45
Via 46
Via 47
Via 48
Via 49
Via 50
Via 51
Via 52
Via 53
Via 54
Via 55
Via 56
Via 57
Via 58
Via 59
Via 60
Via 61
Via 62
Via 63
Via 64
Via 65
Via 66
Via 67
Via 68
Via Angelica
Via Blanca
Via Calerina
Via Donatella
Via Emilia
Via Fabiana
Via Isabel
Via Laura
Via Lourdes
Via Milagros
Via Mina
Via Lebioa
Via Vivianna
PR-28 O
PR-28 E
PR-3 O
PR-3 E
PR-887
PR-3 O PR-3 E
Legend
Start Point
End Point
Circuit
1:13,440
0 0.1 0.2 0.4
Miles
N
LUMA
Circuit 1646-03



Circuit 1646-05


Playa
Isla
Verde
Carolina
Urb Palmar
Norte
Avenida Isla Verde
37
Calle Tartak
El San
Juan Hotel
& Casino
Isla Verde
Expreso Román Baldorioty de Castro
PR-26-E
Calle Delta
Urb
Palmar
Sur
Villa del
Palmar Sur
26
Embassy
Suites
Casino
Astralis
Calle Diaz Way
Avenida Los Governadores
187
PR-26 O
PR-26 E
Legend
Start Point
End Point
Circuit
1:4,070
0
0.0325
0.065
0.13
Miles
N
LUMA
Circuit 1657-03



Legend

- Start Point
- End Point
- Circuit

1:39,790

0 0.325 0.65 1.3 Miles

N

LUMA

Circuit 2301-01

FEMA Project Scope of Work

Project Name:

Distribution Feeders - San Juan Short Term Group 6

Revision: 0

Date: 20JUN2022

APPROVALS

The signatures below formally approve the FEMA Project Scope of Work Template.

Grant Manager's Name	Signature	Date
Program Brief Owner	**Signature**	**Date**

Document Change Control

This table contains a history of the revisions made to this document

Rev.	Date of Issue	Brief Description of Change
A	06JUN2022	Initial Draft
0	20JUN2022	Issued for Use

Contents

Overview

Project Name:	Distribution Feeders - San Juan Short Term Group 6
Project Type:	Restoration to Codes/Standards
Region:	San Juan
Damage Number:	250081
Damaged Inventory/Asset Category:	Island Wide Distribution
FEMA Project Number: *(formerly Project Worksheet)*	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

Facilities

Facilities List

The facilities listed below are part of the feeder system In the San Juan Region. These Interconnected and Interfunctional distribution feeders (sites) establish the electrical distribution system. The feeders all originated from a substation (start) and serve customers along the route to various locations (end). GPS Coordinates for the start and the end points of each electrical feeder project are noted in the table below and depicted on the attached feeder maps. These feeders are a subset of projects Identified in the Distribution Feeder - San Juan Short Term Projects in the PREPA 10 Year Infrastructure Plan.

Name	Number	GPS Start	GPS End	Voltage (kV)
DAGUAO	2101-01	[redacted]		8.32
FAJARDO PUEBLO	2002-01			8.32
ALTURAS DE RIO GRANDE 13KV	2302-01			13.2
ALTURAS DE RIO GRANDE 13KV	2302-02			13.2
ALTURAS DE RIO GRANDE 13KV	2302-03			13.2
PALMER TC	2305-04			13.2

Note: GPS coordinates are required for all facilities.

Facilities Description

The specific facilities included in this project are: poles and structures (including their foundations), framing and insulators, load break switches (manual and automated), capacitor banks, voltage regulators, transformers (including lightning arresters and fuse cut-outs), conductors, guy wires, anchoring, grounding assemblies, underground cable, underground cable systems, fault interrupting equipment (fuses, reclosers, and sectionalizers), and any other associated components.

Project Scope

Scope of Work Description (e.g., Plan for Repair)

Feeders will undergo comprehensive distribution modeling, analysis, and simulation to validate planning criteria such as: conductor loading, voltage parameters, power factor, reliability metrics, distribution automation device placement, and coordination of protective devices. The engineering team will perform assessments of overhead facilities and document damaged assets to be repaired or replaced. The results of these assessments will help define the scope of restoration to industry standards. Note that this project is based on a damage assessment sample that was extrapolated across the entire distribution system, therefore existing documentation of hurricane damage may not be available. For both overhead and underground facilities, the engineering team will conduct a route study to verify underground cable system routing, identify conflicts with foreign utilities, test subsurface conditions, research right-of-way and easement availability, identify environmental and cultural impact, and identify highway/rail/waterway crossings.

Structure foundations will be designed and engineered to confirm structural soundness and stability. Damaged structures/poles will be replaced with higher class (strength) structures/poles made of steel, concrete, or fiberglass composite. Damaged crossarms will be replaced with composite, galvanized, or stainless steel crossarms. Porcelain insulators and any other damaged insulator will be replaced with silicone rubber insulators.

Missing or damaged grounding assemblies will be replaced to fulfill system grounding integrity. Damaged conductor spans will be replaced between poles and re-sagged per codes and standards. Damaged structure guying elements will be repaired or replaced, such as slack guy wires or pulled anchors.

In order to comply with codes and standards and to allow for construction access, vegetation removal will be considered in the scope of work. The scope of vegetation removal will be defined during the preliminary engineering phase. The preliminary engineering phase may also find that soil boring or testing is needed to make sure conditions are suitable for installation of structures/poles or underground cable systems. When possible, facilities will remain along their existing route and within the existing right-of-way.

Type of Project

[Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)]

Choose One (Restoration, Improved or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.
Restoration to Codes/Standards
This work will be in compliance with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the results of the completed preliminary A&E work.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD) which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019).

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

Cost estimates to complete the work have been generated at a class 5 level, which is between -50% and +100% of the final project cost. The estimate includes materials, construction labor and equipment, engineering, management, and contingencies.

Estimated Budget for Architectural & Engineering Design:	**$2.98M**
Estimated Budget for Procurement & Construction:	**$29.81M**
Estimated Overall Budget for the Project:	**$32.79M**

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

During the preliminary design phase, LUMA will develop and propose 406 Hazard Mitigation proposals consistent with the damages. These proposals will be documented with BCAs.

406 Mitigation Opportunity Cost Estimate

Estimated Budget for Architectural & Engineering to Design:	**Unknown at this time**
Estimated Budget for Procurement:	**Unknown at this time**
Estimated Budget for Construction:	**Unknown at this time**
Estimated Overall Budget for the Project:	**Unknown at this time**

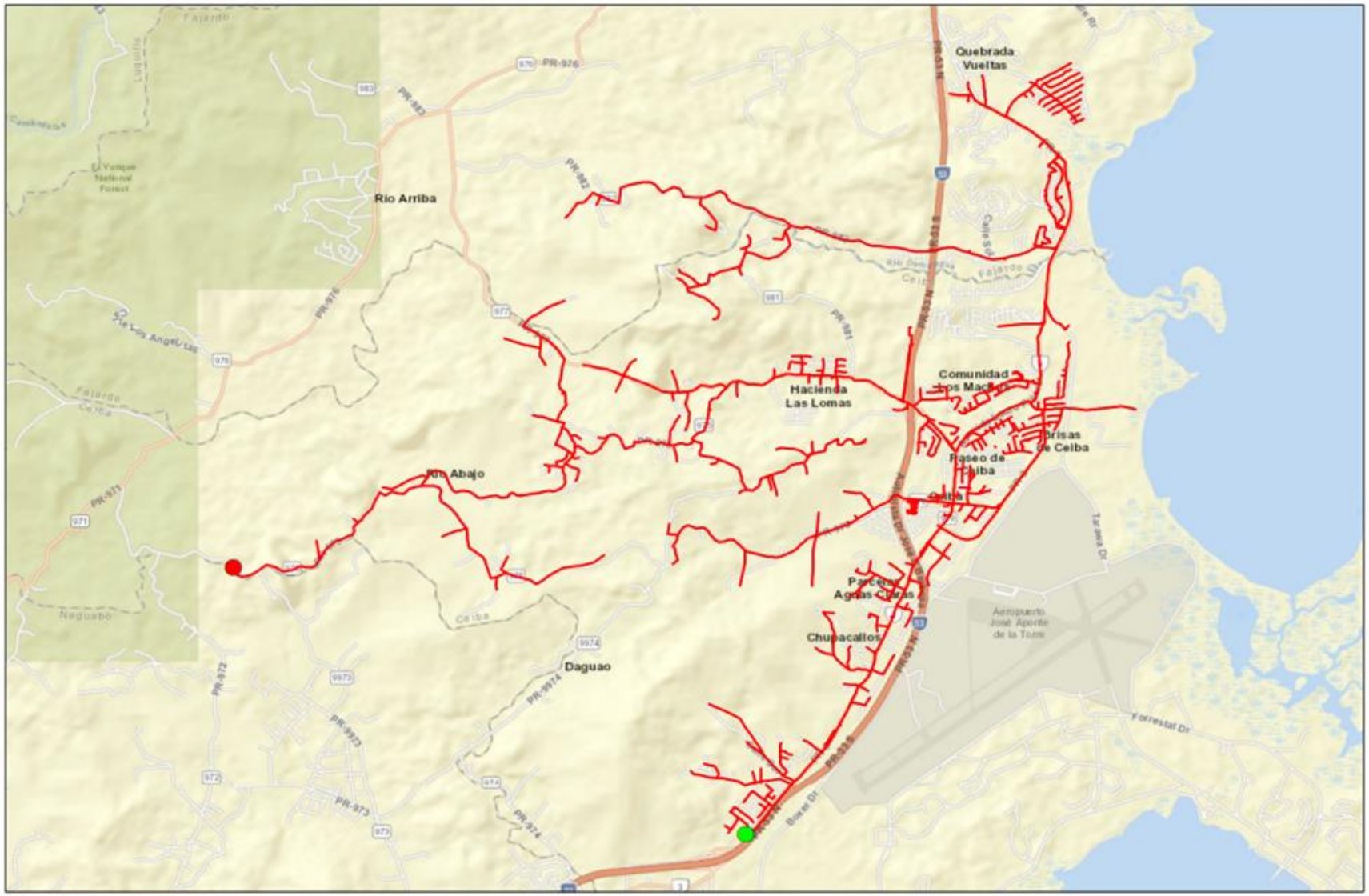
Note: If available, detailed engineering cost estimates will be included as an attachment.

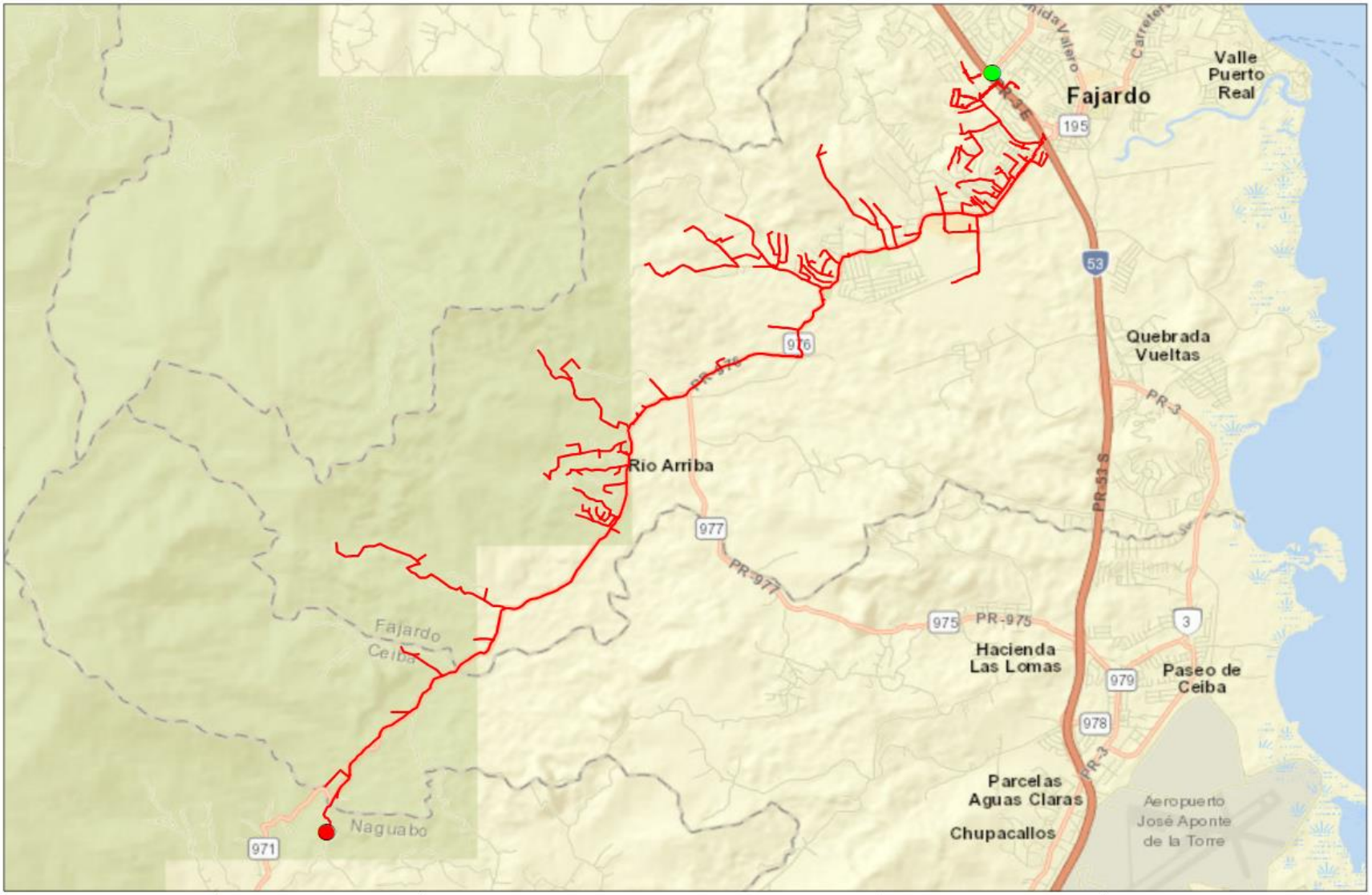
Environmental & Historic Preservation Requirements

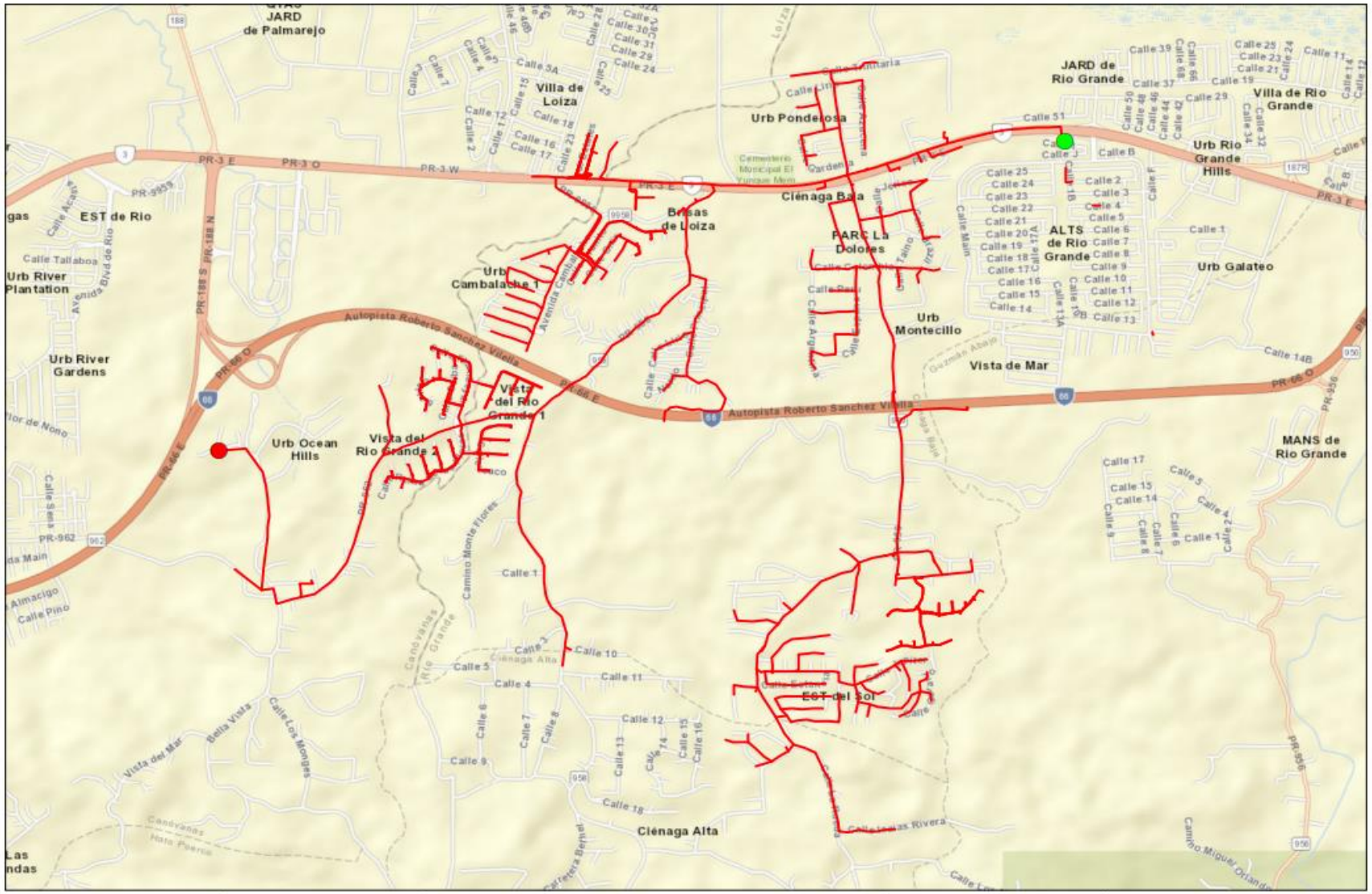
EHP considerations will be identified and evaluated during the preliminary design phase and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA prior to construction activities.

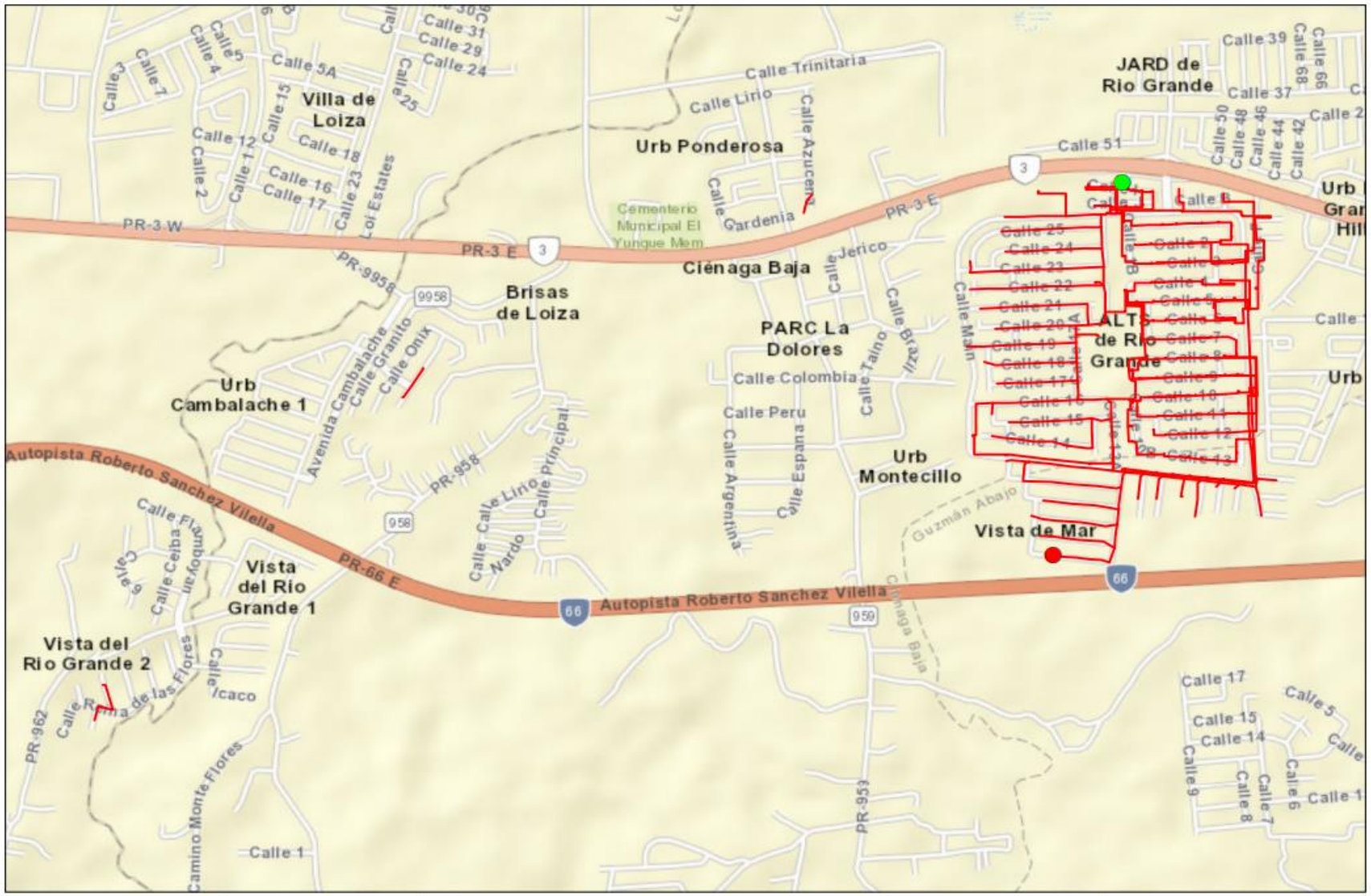
Attachments

Document Name	Description
<N/A>	Project Cost Estimates
<N/A>	Engineering Studies and Designs
San Juan Short Term Group 6 Location Maps	Location Maps and Site Picture


Quebrada Vueltas
Rio Arriba
Hacienda Las Lomas
Comunidad Los Machos
Brisas de Ceiba
Paseo de Ceiba
Rio Abajo
Parcelas Aguas Claras
Chupacallos
Daguao
Aeropuerto José Aponte de la Torre
Legend
Start Point
End Point
Circuit
1:47,280
0
0.375
0.75
1.5
Miles
N
LUMA
Circuit 2101-01


Fajardo
Valle Puerto Real
Quebrada Vueltas
Rio Arriba
Hacienda Las Lomas
Paseo de Ceiba
Parcelas Aguas Claras
Chupacallos
Aeropuerto José Aponte de la Torre
Naguabo
Fajardo Ceiba
PR-53
PR-53-S
PR-3
PR-975
PR-977
PR-976
195
976
977
975
979
978
971
3
Legend
Start Point
End Point
Circuit
1:56,040
0
0.45
0.9
1.8
Miles
N
LUMA
Circuit 2002-01


JARD de Palmarejo
Villa de Loiza
Urb Ponderosa
JARD de Rio Grande
Villa de Rio Grande
Urb Rio Grande Hills
Cienaga Baja
Brisas de Loiza
PARC La Dolores
ALTS de Rio Grande
Urb Galateo
EST de Rio
Urb River Plantation
Urb Cambalache 1
Urb Montecillo
Vista de Mar
Urb River Gardens
Autopista Roberto Sanchez Vilella
Vista del Rio Grande 1
Urb Ocean Hills
Vista del Rio Grande 2
MANS de Rio Grande
EST del Sol
Cienaga Alta
Las Ondas
PR-3 E
PR-3 O
PR-3 W
PR-66 O
PR-66 E
PR-188 S
PR-188 N
PR-962
PR-956
Legend
Start Point
End Point
Circuit
1:23,590
0
0.175
0.35
0.7
Miles
N
LUMA
Circuit 2302-01



Legend

- Start Point
- End Point
- Circuit

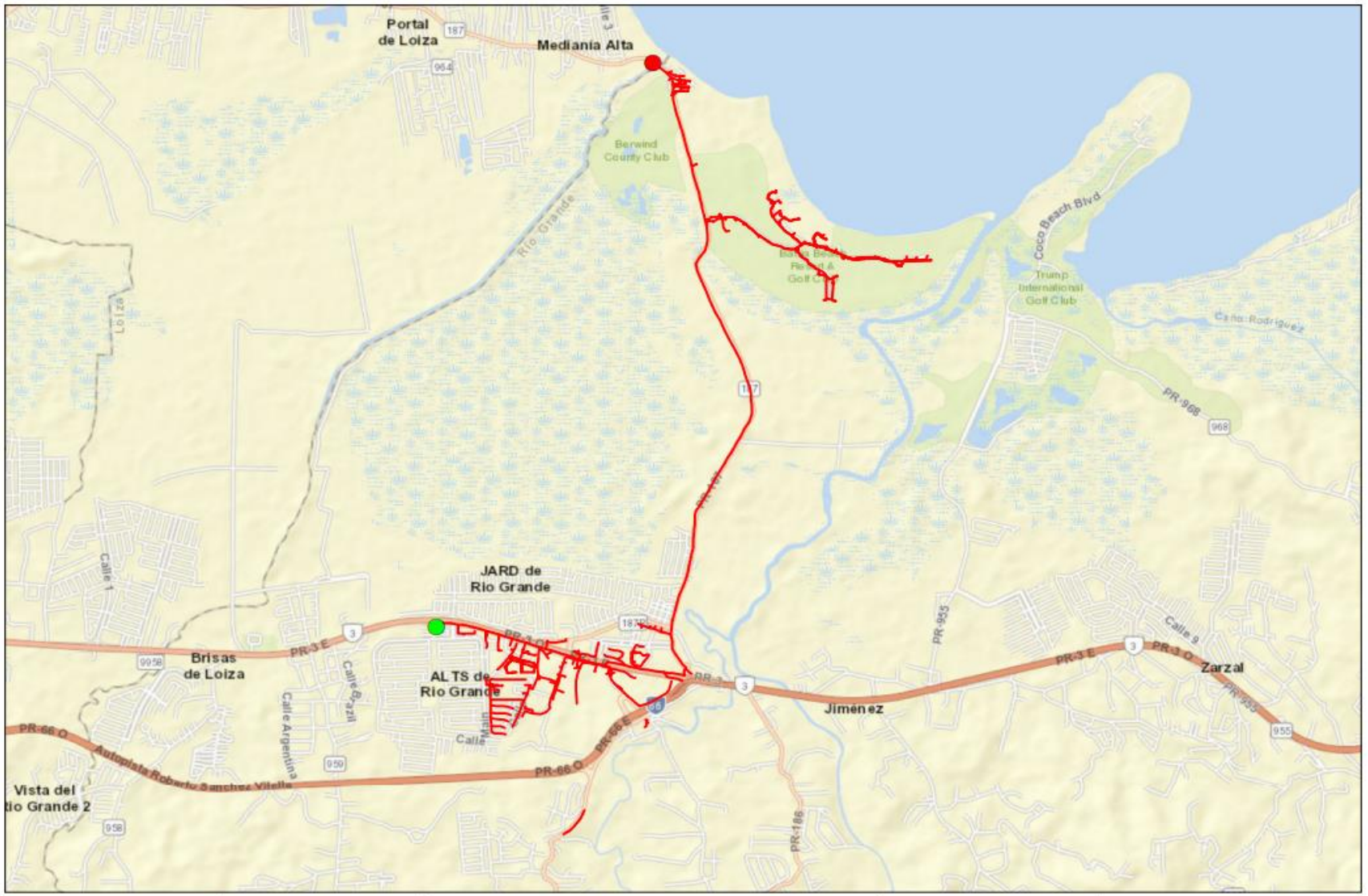
1:15,200

0 0.125 0.25 0.5 Miles

N

LUMA

Circuit 2302-02



Legend

- Start Point
- End Point
- Circuit

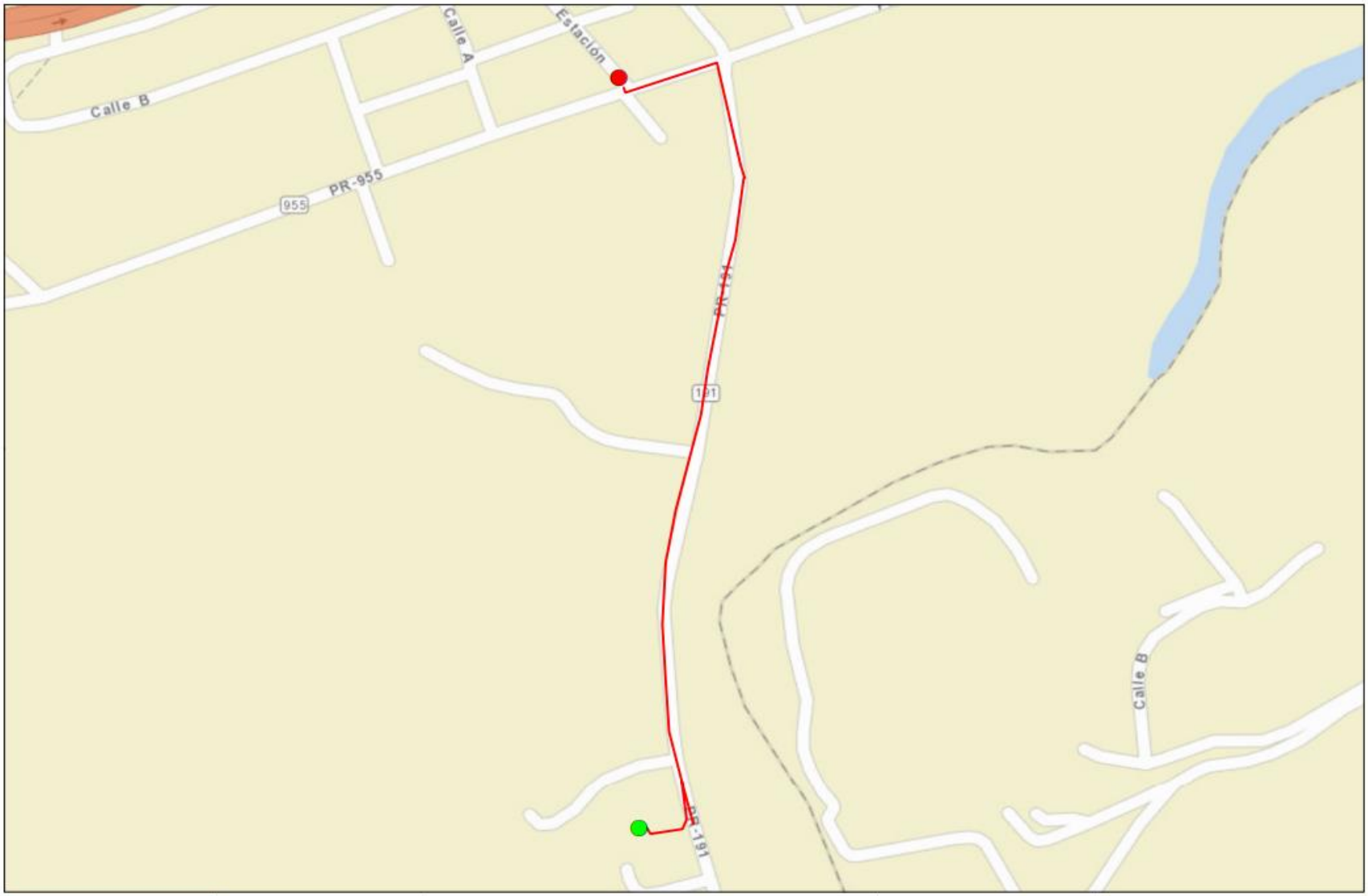
1:39,970

0 0.325 0.65 1.3 Miles

N

LUMA

Circuit 2302-03



Legend

- Start Point
- End Point
- Circuit

1:4,150

0 0.0325 0.065 0.13 Miles

N

LUMA

Circuit 2305-04

FEMA Project Scope of Work

Project Name:

Sabana Llana TC

Revision: 0

Date: 07NOV2022

Approvals

The signatures below formally approve the FEMA Project Scope of Work.

Grant Manager's Name	Signature	Date
REDACTED	REDACTED	REDACTED 2022.11.07 19:30:51 -04'00'
Program Brief Owner	**Signature**	**Date**
REDACTED	REDACTED	

Document Change Control

Rev.	Date of Issue	Brief Description of Change
A	2 SEP 2022	Issued for Review
0	7 NOV 2022	Issued for Signature

Contents

Overview

Project Name:	Sabana Llana TC
Region:	San Juan
Damage Number:	223189
Damaged Inventory/Asset Category:	Island Wide Substations
FEMA Project Number:	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. COR3 and FEMA will review the completed document to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities, including Section 406 hazard mitigation for a particular project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that is eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

Facilities

Facilities List

Name	Number	GPS Coordinates
Sabana Llana Transmission Center	N/A	REDACTED

Facilities Description

The Sabana Llana TC switchyard consists of facilities that operate at nominal voltages of 230 kV, 115 kV and 38 kV. It includes:

- Seven (7) 38 kV circuit breakers:
  - Four (4) oil circuit breakers (OCBs)
  - Three (3) gas circuit breakers (GCBs)
- Thirteen (13) 115 kV circuit breakers
  - Four (4) oil circuit breakers (OCBs)
  - Nine (9) gas circuit breakers (GCBs)
- Six (6) 230 kV gas circuit breakers (GCBs)
- One (1) 230/115 kV, 270/360/450/504 MVA autotransformer (Year 2001)
- One (1) out of service 230/115 kV, 547 MVA autotransformer at site
- One (1) 115/38 kV, 60/80/100/112 MVA autotransformer (Year 1995)
- Two (2) Capacitor Banks connected at 115 kV
- One (1) 115/13.2 kV, 24/44.8 MVA, step down transformer for substation 1647 Sabana Llana
- One (1) 115/13.2 kV, 24/44.8 MVA, step down transformer for substation 1646 Sabana Llana

There are also transmission lines emanating out of Sabana Llana TC that are considered important interconnections between nearby TCs in the San Juan region, including connections to and from other neighboring districts., and has experienced reliability issues with the existing metalclad and apparatus.

A NERC CIP-014 assessment identified the existing Sabana Llana TC substation as being NERC CIP-014-2 impactive, meaning it is proven to have very large, cascading impact on the Puerto Rico transmission network because of its size and the importance of the generators it connects to the grid. A catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts.

The proposed project will bring this station to LUMA Energy and industry standards, improve system resiliency and reliability, mitigate safety hazards, and address environmental concerns.

Project Scope

Scope of Work Description

The project scope includes engineering and construction to rebuild the 230kV, 115kV, and 38kV Transmission infrastructure on the Sabana Llana TC as follows:

- Rebuild 115kV switchyard with the following equipment and switchgear arrangement:
  - Fifteen (15) new circuit breakers in breaker-and-a-half (BAAH) configuration
  - Twelve (12) new circuit breakers in breaker-and-a-half (BAAH) configuration
- Rebuild and reconfigure 38kV switchyard with the following equipment and switchgear arrangement:

  - Fifteen (12) new circuit breakers in breaker-and-a-half (BAAH) configuration
  - Nine (9) new circuit breakers in breaker-and-a-half (BAAH) configuration
- Replace of service 230/115kV, 547 MVA autotransformer with 230/115 kV, 270/360/450/504 MVA
- Install a new, second 230/115kV, 270/360/450/504 MVA autotransformer
- Replace existing 115/38 kV 60/80/100/112 MVA transformer with new one since it is reaching end of its useful life.
- Install a new, second 115/38 kV 60/80/100/112 MVA transformer
- Evaluate and replace if necessary the following equipment in the existing 230kV switchyard:
  - Exiting Gas Circuit Breakers (GCBs)
  - Disconnect switches
  - Bus infrastructure
  - Surge arresters
  - Insulator
  - Voltage transformers
- Replace all lines switches with new motor operated disconnect (MOD) switches.
- Install a new control enclosure with protection, control, telecom and automation for 38, 115, 230Kv systems.

Other scopes including SCADA and RTU replacements, microwave point-to-point network, transport network, and field area network may be provided as part of separate projects in the future.

The detailed design for is estimated to be completed by Q1-2024, and construction work is estimated to be completed by 2027.

Type of Project

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements, including any:
   a. Other improvements not required by codes and standards
   b. Changes in facility size, capacity, dimension, or footprint

Alternate Project: Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved, or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, give the rationale for the recommendation.
Restoration to Codes and Standards
This work will comply with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the preliminary A&E work results.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD), which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019)
5. Transmission Reliability Standards and Criteria (TPL), NERC Critical Infrastructure Protection (CIP), and other relevant Industry standards

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

The class 5 estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies.

Architectural & Engineering Design:	$6.2MM
Construction & Procurement:	$62.5M
Total Estimate for the Project:	$68.7M

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

As part of the island wide grid restoration, LUMA proposes the reconfiguration of the Sabana Llana TC substation to improve the system resiliency against substation outages and render a more secure operation of the electrical grid. The rebuild of the substation to reconfigure its bus design is being proposed as a 406 Hazard Mitigation (HM) measure to facilitate the adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures making an island-wide outage less likely.

The Sabana Llana TC has been identified as being NERC CIP-014-2 impactive, meaning it is proven to have very large, cascading impact on the Puerto Rico transmission network because of its size and the importance of the generators it connects to the grid. A catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts. Furthermore, there are transmission lines emanating out of Sabana Llana TC that are considered important interconnections between nearby TCs in the San Juan region, including connections to and from other neighboring districts.

In the existing configuration, a bus fault or a failed breaker fault on the 115 kV side of Sabana Llana removes half of the 115 kV transmission from service. Similarly, a bus fault or failed breaker fault on the 38 kV side removes all 38 kV subtransmission from service. This causes numerous overloads and loss of load in the system. In the new proposed configuration, a bus or failed breaker fault causes, at most, 2 transmission elements to be removed from service, which resolves numerous overloads—the 115 kV Line 41200 between Canovanas and Sabana Llana, and several 38 kV lines. Therefore, the reconstruction and reconfiguration of the Sabana Llana TC bus design is considered a hazard mitigation measure that allows for more adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures that improves the system resilience against substation outages and renders a more secure operation of the electrical grid.

406 Mitigation Opportunity Cost Estimate

Architectural & Engineering to Design:	$6.2M
Procurement:	$39.1M
Construction:	$23.4M
Project Total Estimated:	$68.7M

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the base design phase and site selection and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA before construction activities.

Attachments

Attachments will be provided after High-Level Assessments (HLA) are completed.

Document Name	Description
N/A	Project Cost Estimates

N/A	Engineering Studies
N/A	Location Maps and Site Picture

FEMA Project Scope of Work

Project Name:

Guayanilla TC - New Substation

Revision: 0

Date: 07NOV2022

Approvals

The signatures below formally approve the FEMA Project Scope of Work.

Grant Manager's Name	Signature	Date
REDACTED	REDACTED	REDACTED 2022.11.07 19:26:52 -04'00'
Program Brief Owner	**Signature**	**Date**
REDACTED	REDACTED	

Document Change Control

Rev.	Date of Issue	Brief Description of Change
A	2 SEP 2022	Issued for Review
0	07 NOV 2022	Issued for Signature

Contents

Overview

Project Name:	Guayanilla TC - New Substation
Region:	Ponce
Damage Number:	223189
Damaged Inventory/Asset Category:	Island Wide Substations
FEMA Project Number:	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. COR3 and FEMA will review the completed document to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities, including Section 406 hazard mitigation for a particular project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that is eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

Facilities

Facilities List

Name	Number	GPS Coordinates
Guayanilla TC (New Substation)	TBD	REDACTED

Facilities Description

Construction of a new 230kV transmission center, to be named Guayanilla TC, as a hazard mitigation measure to allow for more adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures. The new transmission station will be built to effectively reconfigure the critical Costa Sur TC into two substations, enhancing the network interconnection among transmission centers, substations and transmission control centers.

A NERC CIP-014 assessment identifed the existing Costa Sur TC substation as being NERC CIP-014-2 impactive, meaning it is proven to have very large, cascading impact on the Puerto Rico transmission network because of its size and the importance of the generators it connects to the grid. A catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts. Once the new configuration is established, the EcoElectrica unit 5 and 6 connection will be physically isolated from the Costa Sur substation and will not be disconnected during a CIP event at the Costa Sur substation. In addition, the proposed configuration improves the generation to load balance mismatch post substation outage from 630 MW to 142 MW. Furthermore, there are transmission lines emanating out of Costa Sur TC that are currently considered overloaded and it is very likely there will be future utility-scale renewable facility interconnections that could be served by the new facility.

The construction of a new Guayanilla TC is proposed as a Hazard Mitigation measure that improves the system resiliency against substation outage and renders a more secure operation of the electrical grid.

Project Scope

Scope of Work Description

The scope of work includes the engineering, procurement of materials, acquisition of land, and construction of a new transmission center in Guayanilla, Puerto Rico. The new transmission center will consist of the following 230kV and 115kV infrastructure:

New Guayanilla TC 230kV Infrastructure:

- Twelve (12) circuit breakers in a breaker-and-a-half configuration with services for:
  - Line 50400 to Mayagüez TC
  - Line 50200 to Manatí TC
  - Line 51200 to Cambalache SP
  - Line 50200 to Costa Sur TC
  - Line 51200 to Costa Sur TC
  - Two (2) 230/115kV Transformers
  - New 4-breaker ring bus to provide services to EcoElectrica generation units 5 and 6
- Provide space for future bay expansions

New Guayanilla TC 115kV Infrastructure:

- Nine (9) circuit breakers in a breaker-and-a-half configuration with services for:
  - Line 37100 to Guánica
  - Line 39600 to PPG DEMACO
  - New Line from Costa Sur to New Guayanilla TC
  - Two (2) 230/115kV Transformers
  - One (1) spare service for future use
- Provide space for future bay expansion

Other scopes including SCADA and RTU replacements, microwave point-to-point network, transport network, and field area network may be provided as part of separate projects in the future.

The detailed design is estimated to be completed by Q4-2023, and construction work is estimated to be completed by 2026.
Notes:

1. This project's scope is independent of FAASt 169896 — COSTA SUR BKRS -P001 and FAASt 682834 - COSTA SUR TC PHASE 2
2. The land acquisition process is estimated to take 6-12 months to complete. Engineering design will not be able to be commenced until the land is acquired.

Type of Project

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements, including any:
   a. Other improvements not required by codes and standards
   b. Changes in facility size, capacity, dimension, or footprint

Alternate Project: Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved, or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, give the rationale for the recommendation.
Restoration to Codes/Standards
This work will comply with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the preliminary A&E work results.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD), which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019)
5. Transmission Reliability Standards and Criteria (TPL), NERC Critical Infrastructure Protection (CIP), and other relevant Industry standards

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

The class 5 estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies.

Architectural & Engineering Design:	$6.9M
Construction & Procurement:	$75.6M
Total Estimate for the Project:	$82.5M

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

As part of the island wide grid restoration, LUMA proposes the construction and integration of a new Guayanilla TC substation to improve the system resiliency against substation outages and render a more secure operation of the electrical grid. The construction of the new substation is being proposed as a 406 Hazard Mitigation (HM) measure to facilitate the adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures making an island-wide outage less likely.

Facilities Justification

LUMA performed an initial risk assessment as per NERC CIP-014-2 standard requirement, which mandates the transmission owner to perform a risk assessment to identify and protect its transmission stations and transmission substations, with their associated primary control centers, which if rendered inoperable or damaged as a result of a physical attack could result in instability, uncontrolled separation, or cascading events within an interconnection. Of the fifty-six (56) substations that were studied to determine standard applicability – Thirteen (13) 230 kV and forty-three (43) 115 kV substations - seven (7) were identified as Critical Infrastructure Protection (CIP) substations, including the Costa Sur TC. The study found that a Costa Sur TC loss results in generation deficiency above the online generators remaining headroom, creating a Generation issue of low spinning reserve post outage.

To mitigate this issue with the Costa Sur TC, LUMA recommends the reconfiguration of this critical transmission station into two stations. The new substation (e.g., Guayanilla TC) will reduce the required load drop in the system after a Costa Sur TC substation outage and increases the available generation as considered in the NERC CIP-014-2 assessment, making an island-wide outage less likely. In the existing configuration, EcoElectrica units given to their radial connection to the Costa Sur substation would be disconnected during a CIP event. However, once the new configuration is established, the EcoElectrica units connection will be physically isolated from the Costa Sur substation and will not be disconnected during a CIP event at the Costa Sur substation. The proposed configuration improves the generation to load balance mismatch post substation outage from 630 MW to 142 MW, representing a substantial reduction (77%) in the post outage generation to load balance mismatch. This mismatch is typically picked up by the remaining spinning reserve or addressed through system load drop.

The new substation also helps mitigate the thermal overloading issues on 3-115 kV transmission lines and helps reduce the loadings on many other transmission facilities. It will also reduce loading on the 230/115kV transformers in the southern and central portion of the island, which would be especially valuable if a transformer is forced offline on a high-load day.

406 Mitigation Opportunity Cost Estimate

Architectural & Engineering to Design:	$6.9M
Procurement:	$52.9M
Construction:	$22.7M
Project Total Estimated:	$82.5M

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the base design phase and site selection and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA before construction activities.

Attachments

Attachments will be provided after High-Level Assessments (HLA) are completed.

Document Name	Description
N/A	Project Cost Estimates
N/A	Engineering Studies
N/A	Location Maps and Site Picture

FEMA Project Scope of Work

Project Name:

Salinas TC - New Substation

Revision: 0

Date: 07NOV2022

Approvals

The signatures below formally approve the FEMA Project Scope of Work.

Grant Manager's Name	Signature	Date
REDACTED	REDACTED	REDACTED 2022.11.07 21:08:35 -04'00'
Program Brief Owner	**Signature**	**Date**
REDACTED	REDACTED	

Document Change Control

Rev.	Date of Issue	Brief Description of Change
A	2 SEP 2022	Issued for Review
0	07 NOV 2022	Issued for Signature

Contents

Overview

Project Name:	Salinas TC - New Substation
Region:	Ponce
Damage Number:	223189
Damaged Inventory/Asset Category:	Island Wide Substations
FEMA Project Number:	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. COR3 and FEMA will review the completed document to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities, including Section 406 hazard mitigation for a particular project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that is eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

Facilities

Facilities List

Name	Number	GPS Coordinates
Salinas TC (New Substation)	TBD	REDACTED

Facilities Description

Construction of a new 230kV transmission center, to be named Salinas TC, as a hazard mitigation measure to allow for more adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures. The new transmission station will be built to effectively reconfigure the critical Aguirre TC into two substations, moving transmission lines from the existing substation to the new substation, reducing the load in the existing lines and enhancing the network interconnection among transmission centers, substations and transmission control centers.

The existing Aguirre TC substation has paramount impact on the Puerto Rico transmission network because of its size and the importance of the generators it connects to the grid. A catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts. Furthermore, there are transmission lines emanating out of Aguirre TC that are considered overloaded and there are planned utility-scale renewable facilities planned for interconnection, including CIRO 1 and two Tranche 1 projects.

The construction of a new Salinas TC is proposed as a Hazard Mitigation measure that improves the system resiliency against substation outages and renders a more secure operation of the electrical grid.

Project Scope

Scope of Work Description

The scope of work includes the engineering, procurement of materials, acquisition of land, and construction of a new transmission center in Salinas, Puerto Rico. The new transmission center will consist of 230kV and 115kV infrastructure as follows:

New Salinas TC 230kV Infrastructure:

- Twelve (12) circuit breakers in a breaker-and-a-half configuration with services for:
  - Line 50700 to A.E.S.
  - Line 51000 to Aguas Buenas TC
  - Line 51000 to Aguirre TC
  - Line 50700 to Aguirre TC
  - Two (2) 230/115kV Transformers

New Salinas TC 115kV Infrastructure:

- Nine (9) circuit breakers in a breaker-and-a-half configuration with services for:
  - Line 40200 to Jobos TC
  - Line service for Tranche 2 future projects
  - Line service for Tranche 2 future projects
  - Line 40200 to Aguirre TC
  - Two (2) 230/115kV Transformers

Other scopes including SCADA and RTU replacements, microwave point-to-point network, transport network, and field area network may be provided as part of separate projects in the future.

The detailed design is estimated to be completed by Q4-2023, and construction work is estimated to be completed by 2027.

Notes:

1. This project's scope is independent of FAASt 178503 —AGUIRRE TC - BKRS and FAASt TBD - Aguirre TC Phase 2
2. The land acquisition process is estimated to take 6-12 months to complete. Detailed Engineering design will not commence until the land is acquired.

Type of Project

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements, including any:
    a. Other improvements not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

Alternate Project: Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved, or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, give the rationale for the recommendation.
Restoration to Codes and Standards
This work will comply with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the preliminary A&E work results.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).

2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.

3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.

4. LUMA's latest Design Criteria Document (DCD), which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019)

5. Transmission Reliability Standards and Criteria (TPL), NERC Critical Infrastructure Protection (CIP), and other relevant Industry standards

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

The class 5 estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies.

Architectural & Engineering Design:	$6.5M
Construction & Procurement:	$69.7M
Total Estimate for the Project:	$76.2M

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

As part of the island wide grid restration, LUMA proposes the construction and integration of a new Salinas TC substation to facilitate the adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures. The construction of the new substation is being proposed as a 406 Hazard Mitigation (HM) measure to improve the system resiliency against substation outages and render a more secure operation of the electrical grid.

Facilities Justification

LUMA performed an initial risk assessment as per NERC CIP-014-2 standard requirement, which mandates the transmission owner to perform a risk assessment to identify and protect its transmission stations and transmission substations, with their associated primary control centers, which if rendered inoperable or damaged as a result of a physical attack could result in instability, uncontrolled separation, or cascading events within an interconnection. Of the fifty-six (56) substations that were studied to determine standard applicability – Thirteen (13) 230 kV and forty-three (43) 115 kV substations - seven (7) were identified as Critical Infrastructure Protection (CIP) substations, including the Aguirre TC. The study found that an Aguirre TC outage need nearly 75% (or more) of the system online generators remaining headroom to accommodate the lost generation, deeming it a critical substation.

To mitigate this issue with the Aguirre TC, LUMA recommends the reconfiguration of this critical transmission station into two stations to reduce the likelihood of an island-wide outage in the case of an extreme event. In the existing configuration, the following generators are all connected to Aguirre TC (Net MW are in parentheses):

- Aguirre Unit 1 (430 MW) – connected to 230 kV bus
- Aguirre Unit 2 (429 MW)—connected to 230 kV bus
- Aguirre Combined Cycle 1 (292 MW)—connected to 230 kV bus
- Aguirre Combined Cycle 2 (285 MW)—connected to 230 kV bus
- Aguirre CT 1 (21 MW)—connected to 115kV bus
- Aguirre CT 2 (21 MW)—connected to 115kV bus

Therefore, for an extreme event that removes Aguirre TC from service, the maximum generation loss Is 1,478 MW. The new substation would move the Point of Interconnection (POI) for Aguirre Combined Cycle to the new Salinas substation, thus removing 577 MW from Aguirre TC, for a new total of 901 MW generation loss for an extreme event at Aguirre TC. The frequency decline from loss of 901 MW of generation is more likely to be arrested by ramping up spinning reserves and load shedding than the frequency decline from loss of 1,478 MW of generation.

The new substation will also reduce a near overload on the Juncos-Humacao 115kV transmission line. For the dual circuit tower contingency loss of Sabana Llana-Aguas Buenas 230kV line and Sabana Llana-Cacao 230kV line, the Juncos-Humacao 115kV line loads to 89.33% of its emergency rating, with this project reducing this loading to 83.85% of emergency rating. In addition, the new substation will reduce transformer loadings on the 230/115kV transformers in the area, which may become an issue during shutdown plus contingency conditions or for extreme events. The new substation will also provide new potential points of interconnection for renewable generation projects in the area.

406 Mitigation Opportunity Cost Estimate

Architectural & Engineering to Design:	$6.5M
Procurement:	$48.3M
Construction:	$21.4M
Project Total Estimated:	$76.2M

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the base design phase and site selection and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA before construction activities.

Attachments

Attachments will be provided after High-Level Assessments (HLA) are completed.

Document Name	Description
N/A	Project Cost Estimates
N/A	Engineering Studies
N/A	Location Maps and Site Picture

FEMA Project Scope of Work

Project Name:

Jobos TC

Revision: 0

Date: 07NOV2022

Approvals

The signatures below formally approve the FEMA Project Scope of Work.

Grant Manager's Name	Signature	Date
REDACTED	REDACTED	REDACTED 2022.11.07 19:34:44 -04'00'
Program Brief Owner	**Signature**	**Date**
REDACTED	REDACTED	

Document Change Control

Rev.	Date of Issue	Brief Description of Change
A	2 SEP 2022	Issued for Review
0	7 NOV 2022	Issued for Signature

Contents

Overview

Project Name:	Jobos TC
Region:	Ponce
Damage Number:	223189
Damaged Inventory/Asset Category:	Island Wide Substations
FEMA Project Number:	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. COR3 and FEMA will review the completed document to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities, including Section 406 hazard mitigation for a particular project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that is eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

Facilities

Facilities List

Name	Number	GPS Coordinates
Jobos Transmission Center	N/A	REDACTED

Facilities Description

The Jobos TC switchyard consists of facilities that operate at nominal voltages of 115kV and 38kV. It includes:

- One (1) 38/13.2 kV, 12/22.4 MVA, step down transformer for substation 4003 Jobos
- Two (2) 115/38 kV, 60/112 MVA, step down transformers
- Six (6) 115 kV circuit breakers:
  - Five (5) oil circuit breakers (OCBs)
  - One gas circuit breaker (GCB)
- Twelve (12) 38 kV circuit breakers:
  - Eight (8) OCBs
  - Four (4) GCBs
- Two (2) gas turbine generation units connected at the 38 kV bus

There are also transmission lines emanating out of Jobos TC that are considered important interconnections between nearby TCs in the Ponce region, including connections to and from other neighboring districts.

A NERC CIP-014 assessment identifed the Jobos TC substation as being NERC CIP-014-2 impactive, meaning it is proven to have very large, cascading impact on the Puerto Rico transmission network because of its size and the importance of the generators and neighboring TCs it connects to the grid. A catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts.

The proposed project will bring this station to LUMA Energy and industry standards, improve electrical system resiliency and reliability, mitigate safety hazards, and address environmental concerns.

Project Scope

Scope of Work Description

The SOW consists of the engineering and construction to rebuild the 115kV and 38kV infrastructure as follows:

<u>115 kV infrastructure</u>

- Replace existing 115kV switchyard with a new breaker-and-a-half bus with twelve (12) circuit breakers
- Install new 115/38 kV, 60/80/100/112 MVA transformer (T2)
- Evaluate one (1) existing 115 kV GCB (GCB 0090) and replace if needed

<u>38 kV infrastructure</u>

- Replace existing 38kV swithyard with a new breaker-and-a-half bus with eighteen (18) circuit breakers
- Add new 38kV service to Jobos Gas Turbines (GT)
- Add new service for Tranche 1 project
- Install new 38/13.2kV, 18/33.6 MVA, step down wye-wye transformer of substation 4003 Jobos TC

The scope also includes the installation of a new control enclosure with protection, control, telecommunications and automation equipment for 13.2kV, 38 kV and 115 kV systems.

Other scopes including SCADA and RTU replacements, microwave point-to-point network, transport network, and field area network may be provided as part of separate projects in the future.

The detailed design is estimated to be completed by Q4-2023, and construction work is estimated to be completed by 2026.

Type of Project

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements, including any:
    a. Other improvements not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint

Alternate Project: Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved, or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, give the rationale for the recommendation.
Restoration to Codes and Standards
This work will comply with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the preliminary A&E work results.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).

2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.

3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.

4. LUMA's latest Design Criteria Document (DCD), which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019)

5. Transmission Reliability Standards and Criteria (TPL), NERC Critical Infrastructure Protection (CIP), and other relevant Industry standards

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

The class 5 estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies.

Architectural & Engineering Design:	$3.9M
Construction & Procurement:	$39M
Total Estimate for the Project:	$42.9M

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

As part of the island wide grid restoration, LUMA proposes the reconfiguration of the Jobos TC substation to improve the system resiliency against substation outages and render a more secure operation of the electrical grid. The rebuild of the substation to reconfigure its bus design is being proposed as a 406 Hazard Mitigation (HM) measure to facilitate the adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures making an island-wide outage less likely.

The Jobos TC has been identified as being NERC CIP-014-2 impactive, meaning it has paramount impact on the Puerto Rico transmission network because of its size and the importance of the generators and neighboring TCs It connects to the grid. A catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts. Furthermore, there are transmission lines emanating out of Sabana Llana TC that are considered important interconnections between nearby TCs in the San Juan region, including connections to and from other neighboring districts.

In the existing configuration, a bus fault or a failed breaker fault on the 38 kV side of Jobos TC removes half or all 38kV subtransmission from service. This causes numerous overloads and loss of load in the system. In the proposed configuration, a bus or failed breaker fault causes, at most, 2 transmission elements to be removed from service, resolving numerous overloads to the system and making a failed breaker and bus faults at the key Jobos substation much less severe. Therefore, the reconstruction and reconfiguration of the Jobos TC substation is considered a hazard mitigation measure to allow for more adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures that improves the system resilience against substation outages and renders a more secure operation of the electrical grid.

406 Mitigation Opportunity Cost Estimate

Architectural & Engineering to Design:	$3.9M
Procurement:	$23M
Construction:	$16M
Project Total Estimated:	$42.9M

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the base design phase and site selection and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA before construction activities.

Attachments

Attachments will be provided after High-Level Assessments (HLA) are completed.

Document Name	Description
N/A	Project Cost Estimates

N/A	Engineering Studies
N/A	Location Maps and Site Picture

FEMA Project Scope of Work

Project Name:

San Juan SP TC

Revision: 0

Date: 07NOV2022

Approvals

The signatures below formally approve the FEMA Project Scope of Work.

Grant Manager's Name	Signature	Date
REDACTED	REDACTED	REDACTED 2022.11.07 21:12:23 -04'00'
Program Brief Owner	**Signature**	**Date**
REDACTED	REDACTED	

Document Change Control

Rev.	Date of Issue	Brief Description of Change
A	2 SEP 2022	Issued for Review
0	7 NOV 2022	Issued for Signature

Contents

Overview

Project Name:	San Juan SP TC
Region:	San Juan
Damage Number:	223189
Damaged Inventory/Asset Category:	Island Wide Substations
FEMA Project Number:	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. COR3 and FEMA will review the completed document to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities, including Section 406 hazard mitigation for a particular project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that is eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

Facilities

Facilities List

Name	Number	GPS Coordinates
San Juan SP Transmission Center	N/A	REDACTED

Facilities Description

The San Juan SP TC switchyard consists of facilities that operate at nominal voltages of 115kV and 38kV. It includes:

- Ten (10) 38 kV circuit breakers:
  - Seven (7) oil circuit breakers (OCBs)
  - Three (3) gas circuit breakers (GCBs)
- Three (3) ESST transformers connected to the 38kV buses
- Twenty-one (21) 115kV circuit breakers
  - Six (6) oil circuit breakers (OCBs)
  - Fifteen (15) gas circuit breakers (GCBs)
- One (1) 115/38kV, 60/80/100/112 MVA power transformer (Year 1996)
- One (1) deenergized 115/38kV, 90/120/150/168 MVA power transformer at site (Year 2017)
- Two (2) STM generation units with two (2) associated GT units connected at the 115kV buses
- Four (4) generation units connected at the 115kV bus

This TC has paramount impact on the Puerto Rico transmission network because of its size and the importance of the generators it connects to the grid. There are also transmission lines emanating out of San Juan SP TC that are considered important interconnections between nearby TCs in the San Juan area, including connections to and from other neighboring districts. Therefore, a catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts.

This project will improve electrical system resiliency and reliability, mitigate safety hazards, and address environmental concerns.

Project Scope

Scope of Work Description

Phase 1: Repair and Replacement of existing 115kV and 38kV Infrastructure

- Evaluate the energization of the existing 38kV GIS, and decommissioning existing 38kV yard.
  - Note: If the GIS manufacturer cannot recommend energization, a new GIS will be procured and installed in the existing building.
- Replace six (6) 115kV oil circuit breakers with new gas circuit breakers.
- Replace disconnect switches associated with the circuit breakers.
- Replace lines switches with new motor operated disconnect (MOD) switches.
- Replace surge arresters.
- Replace insulators as needed.
- Evaluate condition of exiting GCBs to determine if replacements are needed.

- Evaluate the buses infrastructure to determine if replacements are needed.
- Replace one (1) 115/38 kV, 60/80/100/112 MVA transformer since it is reaching end of its useful life.
- Evaluate the construction of three (3) additional services in the 115kV for the two (2) underground 115kV lines and the existing transformer bank #2.
- Evaluate the construction of 5 or 6 GIS bays in the existing building to complete the requirements for the 115kV bus in Phase 2 of the project.

The detailed design for Phase 1 is estimated to be completed by Q3-2023, and construction work is estimated to be completed by 2025.

Phase 2: Design and construction of new 115kV and 38kV Infrastructure

This phase includes the acquisition of land, engineering, and construction of a new 115kV transmission center as a mitigation measure. The new substation, to be named San Juan TC, is considered to allow adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading system failures.

The new transmission center will consist of new 115kV and 38kV infrastructure as follows:

New San Juan TC 115kV Infrastructure:

- New 18-breakers in a breaker-and-a-half configuration to provide services for:
  - Line 40400 to Hato Rey TC
  - Line 38700 to Palo Seco
  - Line 38600 to Bayamón TC
  - Line 38400 to Viaducto TC
  - New Line XXXXX to Viaducto TC
  - New Line XXXXX San Juan SP #1
  - New Line XXXXX San Juan SP #2
  - Generation Unit #8
  - STM #5
  - STM #6
  - New 115/38kV, 60/80/100/112 MVA Transformer

New San Juan TC 38kV Infrastructure:

- New 5-breaker ring bus to provide services for:
  - Line 5800 to San Fernando
  - Line 3900 to Caparra
  - New Line 8200 to Cataño
  - ESST 7 & 8
  - New 115/38 kV, 60/80/100/112 MVA Transformer

The segregation of the generators also require new generator breakers, requiring the following modifications in the connections of San Juan SP:

Existing San Juan SP 115 kV infrastructure modifications:

- Eighteen (18) circuit breakers in a breaker-and-a-half configuration with services for:
  - Line 38500 to Hato Rey TC
  - Line 41600 to Palo Seco

- Line 38300 to Monacillos TC
- Line 38100 to Viaducto TC
- New Line XXXXX San Juan SP #1
- New Line XXXXX San Juan SP #2
- New Line 38000 to Isla Grande
- Generation Unit #7 (note that this service needs to consider the G&T Demarcation)
- Generation Unit #9 (note that this service needs to consider the G&T Demarcation)
- Generation Unit #10 (note that this service needs to consider the G&T Demarcation)
- New 115/38 kV, 60/80/100/112 MVA transformer (T1)
- New 115/38 kV, 60/80/100/112 MVA transformer (T2)

Existing San Juan SP 38kV infrastructure modifications:

- Evaluate new breaker-and-a-half configuration with a total of twelve (12) GCBs to provide services for:
  - Line 5900 to Crematorio
  - Line 4400 to Caparra
  - Line 8200 Amelia
  - ESST 5 & 6 (note that this service needs to consider the G&T Demarcation)
  - ESST 9 & 10 (note that this service needs to consider the G&T Demarcation)
  - New T1: 115/38 kV, 60/80/100/112 MVA
  - New T2: 115/38 kV, 60/80/100/112 MVA

Construction of a physical barrier between San Juan SP and the New San Juan TC, such as a tall perimeter wall around the new station, will also be considered to reduce the risk of physical and failure propagation between the two sites.

Other scopes including SCADA and RTU replacements, microwave point-to-point network, transport network, and field area network may be provided as part of separate projects in the future.

The final SOW (plans and specifications) and construction dates for Phase 2 will be provided upon submittal of Phase 1 final SOW.
Notes:

1. The land acquisition process for the new San Juan TC is estimated to take 6-12 months to complete. Detailed Engineering design will not commence until the land is acquired.

Type of Project

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements, including any:
   a. Other improvements not required by codes and standards
   b. Changes in facility size, capacity, dimension, or footprint

Alternate Project: Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved, or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, give the rationale for the recommendation.
Restoration to Codes and Standards
This work will comply with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the preliminary A&E work results.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD), which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019)
5. Transmission Reliability Standards and Criteria (TPL), NERC Critical Infrastructure Protection (CIP), and other relevant Industry standards

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

The class 5 estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies.

Architectural & Engineering Design:	$8M
Construction & Procurement:	$81.7M
Total Estimate for the Project:	$89.7M

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

As part of the island wide grid restoration, LUMA proposes the reconfiguration of the San Juan SP substation and construction of a new San Juan TC to improve the system resiliency against substation outages and render a more secure operation of the electrical grid. The project is being proposed as a 406 Hazard Mitigation (HM) measure to facilitate the adequate segregation of critical interconnecting transmission lines and reduce the risk of cascading electrical system failures making an island-wide outage less likely.

LUMA performed an initial risk assessment as per NERC CIP-014-2 standard requirement, which mandates the transmission owner to perform a risk assessment to identify and protect its transmission stations and transmission substations, with their associated primary control centers, which if rendered inoperable or damaged as a result of a physical attack could result in instability, uncontrolled separation, or cascading events within an interconnection. Of the fifty-six (56) substations that were studied to determine standard applicability – thirteen (13) 230 kV and forty-three (43) 115 kV substations - seven (7) were identified as Critical Infrastructure Protection (CIP) substations, including the San Juan SP TC. The study found that a San Juan SP TC outage need nearly 75% (or more) of the system online generators remaining headroom to accommodate the lost generation, deeming it a critical substation. In addition, a catastrophic failure in this substation can rapidly propagate into other parts of the transmission system and result in widespread blackouts.

To mitigate this issue with the San Juan SP TC, LUMA recommends the reconfiguration of this critical transmission station into two stations. The proposed project will reduce the likelihood of an extensive outage of the Puerto Rico power system, such as what occurred on February 21, 2022 or April 6, 2022. By reconfiguring the substation and separating the line interconnections, ordinary faults are less likely to lead to compounded outages and major loss of load, and extreme events, such as the loss of all equipment at a voltage level at a substation, are less likely to lead to widespread blackouts. The project will also reduce loadings on 115kV and 38kV transmission lines and the San Juan 115/38kV transformers.

The new transmission station, to be named San Juan TC, will enhance the network interconnection among transmission centers, substations and transmission control centers. In the proposed configuration, San Juan Combined Cycle Unit #5 & #6, and CT #8 are interconnected to the new 115kV switchyard (total 300 MW of generation), and San Juan CT #7, #9, & #10 are left on the existing 115 kV switchyard (total 260 MW). This will effectively reduce the amount of generation connected to a single switchyard, which reduces the generation loss and frequency decline in the event of an extreme event at San Juan SP TC, possibly averting a widespread outage. In addition, the establishment of a physical barrier between San Juan SP and the New San Juan TC, such as a tall perimeter wall around the new station, reduces the risk of physical and failure propagation between the existing and new substation.

406 Mitigation Opportunity Cost Estimate

Architectural & Engineering to Design:	$8M
Procurement:	$45M
Construction:	$36.7M
Project Total Estimated:	$89.7M

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during the base design phase and site selection and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA before construction activities.

Attachments

Attachments will be provided after High-Level Assessments (HLA) are completed.

Document Name	Description
N/A	Project Cost Estimates
N/A	Engineering Studies
N/A	Location Maps and Site Picture

FEMA Project Scope of Work

Project Name:

New Substation Culebra

Date: 29AUG2022

Approvals

The signatures below formally approve the FEMA Project Scope of Work.

Grant Manager's Name	Signature	Date
REDACTED	REDACTED	REDACTED 2022.09.06 10:55:21 -04'00'
Program Brief Owner	**Signature**	**Date**
REDACTED	REDACTED	Sep 29, 2022

Document Change Control

Rev.	Date of Issue	Brief Description of Change
0	12 AUG 2022	Issued for Review
1	29 AUG 2022	Issued for Use

Contents

Overview

Project Name:	New Substation Culebra
Region:	Carolina
Damage Number:	223189
Damaged Inventory/Asset Category:	Island Wide Substations
FEMA Project Number:	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. COR3 and FEMA will review the completed document to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities, including Section 406 hazard mitigation for a particular project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that is eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

Facilities

Facilities List

Name	Number	GPS Coordinates
New Culebra Substation	TBD	REDACTED

Facilities Description

The distribution system on the island of Vieques is currently served only by Substation 3801 Culebra. This existing substation is supplied by 38 kV line 5400 and has a single 38/4.16 kV transformer with two distribution feeders. The creation of a new substation in Culebra will provide an alternate source to feed the distribution loads on the island in case of a failure of substation 3801. Loads will be re-distributed between substations, which will also aid in improving the reliability, resiliency, and voltage profile of the feeders. This project will thus address the need to increase reliability, and resiliency, restore system functionality and mitigate safety hazards with the backup of all feeders from the existing substation Culebra 3801.

The existing electrical infrastructure at Culebra substation 3801 includes aging infrastructure and presents reliability, safety, and corrosion issues. It also has many components that are obsolete and difficult to obtain spare parts. The new Culebra substation is an essential integration to bring the electrical infrastructure in Vieques to LUMA Energy and industry standards, improve system resiliency and reliability, mitigate safety hazards, and address environmental concerns.

Facilities Justification

The proposed new Culebra substation provides the following benefits to the electrical system on the island:

1. **Reliability:** Improve system reliability by introducing a second distribution substation on the island. Under contingency conditions, integrating new circuit breakers and a power transformer in this substation will increase operational flexibility and provide alternate sources of electrical service.
2. **Resiliency:** Restore and improve system functionality and safety hazards mitigation to reduce risk to people and property.
3. **Capacity:** improve electrical ability to serve the existing and new forecasted load demand of the surrounding area, accommodate future distributed energy resources (DER), and implement non-wire alternatives (NWA).
4. **Environmental:** Minimize environmental risks by incorporating modern technologies and code-compliant design and infrastructure that reduce the risk of damage to the environment.
5. **Safety:** increase safety for personnel and equipment, aligning with LUMA Energy's Health, Safety, Environmental, Quality (HSEQ) and Crisis Management Policies.

Project Scope

To develop the engineering, procurement of materials, and construction of a new distribution substation facility in Culebra, Puerto Rico. This facility will connect to transmission line 5400 and requires identifying and acquiring new land or property of approximately 12,500 Sq Feet.

Major equipment requirements are as follows:

- One (1) 38/4.16 kV transformer
- Two (2) Motor-operated disconnect switches (MODs)
- One (1) 38 kV Gas circuit breaker
- A prefabricated metal control enclosure with the following main components:
  - 15 kV gas-insulated switchgear (GIS) with 6 circuit breakers and space for future service
  - Control, protection, telecom, metering systems, and corresponding auxiliary systems.
- An emergency generator PAD (GEN SET ready) for the telecom and protection equipment.
- New transmission lines from the existing Line 5400 point of connection to the new site
- New distribution lines from the new site to designated loads

The detailed design is estimated to be completed by Q1-2024, and construction work is estimated to be completed by 2024 (See note 2 below).

Notes:

1. This project's scope is independent of FAASt 165209 — Substation 3801 Culebra project
2. The land acquisition process is estimated to take 6-12 months to complete. Engineering design will not be able to be commenced until the land is acquired.
3. Scope Reference: LUMA functional specification document dated 8.2.2022 document.

Type of Project

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements, including any:
   a. Other improvements not required by codes and standards
   b. Changes in facility size, capacity, dimension, or footprint

Alternate Project: Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved, or Alternate) If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, give the rationale for the recommendation.
Alternate Project
This work will comply with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the preliminary A&E work results.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD), which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019)
5. Transmission Reliability Standards and Criteria (TPL), NERC CIP, and other relevant Industry standards

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

The class 5 estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies.

Architectural & Engineering Design:	$5.6M
Construction & Procurement:	$39.5M
Total Estimate for the Project:	$45.1M

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

The full scope of this project is included under the 406 Hazard Mitigation Opportunity, including the acquisition of land for the new site, engineering and construction of the substation infrastructure, and procurement of all substation equipment (e.g., GIS, transformers, GCBs, etc.). The construction of a new substation in the island of Culebra is required to address the lack of system redundancy in the existing Culebra 3801 substation. The new substation will increase and restore the reliability, resiliency, system functionality, and mitigate safety hazards by providing a backup of all feeders from the existing substation Culebre 3801.

The proposed new Vieques substation provides the following benefits to the electrical system in the island:

1- **Reliability:** Improve system reliability with the replacement of aged and deteriorated electrical equipment, currently in a higher risk of failure, subsequently affecting our customers. Under contingency conditions, the integration of new circuit breakers and power transformer replacement will be included to increase operational flexibility and provide alternate sources of electrical service.
2- **Resiliency:** Restore and improve system functionality, and safety hazards mitigation to reduce risk to people and property.
3- **Capacity:** improve electrical capacity to serve the existing and new forecasted load demand of the surrounding area and accommodate future distributed energy resources (DER) and the implementation of non-wire alternatives (NWA).
4- **Environmental:** Minimize environmental risks by replacing oil circuit breakers with gas circuit breakers (GCBs).
5- **Safety:** increase safety for personnel and equipment, aligning with LUMA Energy's Health, Safety, Environmental, Quality (HSEQ) and Crisis Management Policies.

406 Mitigation Opportunity Cost Estimate

Architectural & Engineering to Design:	$5.6M
Procurement:	$16.5M
Construction:	$23M
Project Total Estimated:	$45.1M

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during base design phase and site selection and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA before construction activities.

Attachments

Attachments will be provided after High Level Assessments (HLA) are completed.

Document Name	Description
N/A	Project Cost Estimates

N/A	Engineering Studies
N/A	Location Maps and Site Picture

FEMA Project Scope of Work

Project Name:

New Substation Vieques

Date: 29AUG2022

Approvals

The signatures below formally approve the FEMA Project Scope of Work.

Grant Manager's Name	Signature	Date
REDACTED	REDACTED	REDACTED 2022.09.06 10:54:14 -04'00'
Program Brief Owner	**Signature**	**Date**
REDACTED	REDACTED	Sep 29, 2022

Document Change Control

Rev.	Date of Issue	Brief Description of Change
0	12 AUG 2022	Issued for Review
1	29 AUG 2022	Issued for Use

Contents

Overview

Project Name:	Vieques 2502 - New Substation
Region:	Carolina
Damage Number:	223189
Damaged Inventory/Asset Category:	Island Wide Substations
FEMA Project Number:	<Provided by FEMA>

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. COR3 and FEMA will review the completed document to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities, including Section 406 hazard mitigation for a particular project.

LUMA Energy provides the Operations and Maintenance of the electric service to the entire island of Puerto Rico. Puerto Rico Electric Power Authority (PREPA) is the agency that owns the facilities, sites, and systems identified in this Scope of Work that is eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents.

Facilities

Facilities List

Name	Number	GPS Coordinates
New Vieques Substation	2502	REDACTED

Facilities Description

The distribution system in the island of Vieques is currently served only by Substation 2501 Vieques. This existing substation is supplied by 38 kV line 5400 and has a single 38/4.16 kV transformer with three distribution feeders. The creation of a new substation in Vieques will provide an alternate source to feed the distribution loads on the island. Loads will be re-distributed between substations, which will also aid in improving the reliability, resiliency, and voltage profile of the feeders. This project will thus address the need to increase the reliability, and resiliency, restore system functionality and mitigate safety hazards with the backup of all feeders from existing substation Vieques 2501.

The existing electrical infrastructure at Vieques substation 2501 includes aging infrastructure and presents reliability, safety, and corrosion issues. It also has many components that are obsolete and difficult to obtain. The new Vieques substation is an essential integration to bring the electrical infrastructure in Vieques to LUMA Energy and industry standards, improve system resiliency and reliability, mitigate safety hazards, and address environmental concerns.

Facilities Justification

The proposed new Vieques substation provides the following benefits to the electrical system on the island:

1. **Reliability:** Improve system reliability by introducing a second distribution substation on the island. Under contingency conditions, integrating new circuit breakers and a power transformer in this substation will increase operational flexibility and provide alternate sources of electrical service.
2. **Resiliency:** Restore and improve system functionality and safety hazards mitigation to reduce risk to people and property.
3. **Capacity:** improve electrical ability to serve the existing and new forecasted load demand of the surrounding area, accommodate future distributed energy resources (DER), and implement non-wire alternatives (NWA).
4. **Environmental:** Minimize environmental risks by incorporating modern technologies and code-compliant design and infrastructure that reduce the risk of damage to the environment.
5. **Safety:** increase safety for personnel and equipment, aligning with LUMA Energy's Health, Safety, Environmental, Quality (HSEQ) and Crisis Management Policies.

Project Scope

Scope of Work Description

To develop the engineering, procurement of materials, and construction of a new distribution substation facility in Vieques, Puerto Rico. This facility will connect to transmission line 5400 and requires identifying and acquiring new land or property of approximately 13,500 Sq Feet.

Major tasks and equipment requirements:

- One (1) 38/4.16 kV transformer
- Two (2) Motor-operated disconnect switches (MODs)
- One (1) 38 kV Gas circuit breaker
- A prefabricated metal control enclosure with the following main components:
  - 15 kV gas-insulated switchgear (GIS) with 7 circuit breakers and space for future service
  - Control, protection, telecom, metering systems, and corresponding auxiliary systems.
- An emergency generator PAD (GEN SET ready) for the telecom and protection equipment.
- New transmission lines from the existing Line 5400 point of connection to the new site
- New distribution lines from the new site to designated loads

The detailed design is estimated to be completed by Q1-2024, and construction work is estimated to be completed by 2024.

Notes:

1. This project's scope is independent of FAASt 165225 — Substation 2501 Vieques project
2. The land acquisition process is estimated to take 6-12 months to complete. Engineering design will not be able to be commenced until the land is acquired.
3. Scope Reference: LUMA functional specification document dated 7.29.2022 document.

Type of Project

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements, including any:
   a. Other improvements not required by codes and standards
   b. Changes in facility size, capacity, dimension, or footprint

Alternate Project: Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved, or Alternate)
If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, give the rationale for the recommendation.
Alternate Project
This work will comply with FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020)

Note: If preliminary A&E work has not been completed, the type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on the preliminary A&E work results.

Preliminary Engineering

Is architectural and engineering funding required to help define the intended scope of work?

Yes

Codes and Standards

Which codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

The following will be referenced when applying specific codes, specifications, and standards to the project design:

1. Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR February 2020).
2. Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
3. FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
4. LUMA's latest Design Criteria Document (DCD), which aggregates the design considerations of the vast majority of the consensus-based codes, specifications, and standards listed in FEMA Recovery Interim Policy 104-009-11 Version 2.1 (December 20, 2019)
5. Transmission Reliability Standards and Criteria (TPL), NERC CIP, and other relevant Industry standards

Codes, Specifications, and Standards

Yes If yes, describe how incorporated below.
Applicable codes and standards will be identified and incorporated into the plans and specifications.

Industry Standards

Yes If yes, describe how incorporated below.
Applicable industry standards will be identified and incorporated into the plans and specifications.

Estimate

The class 5 estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies.

Architectural & Engineering Design:	$5.6M
Construction & Procurement:	$39.5M
Total Estimate for the Project:	$45.1M

406 Hazard Mitigation Proposal

406 Mitigation Opportunity Scope of Work

The full scope of this project is included under the 406 Hazard Mitigation Opportunity, including the acquisition of land for the new site, engineering and construction of the substation infrastructure, and procurement of all substation equipment (e.g., GIS, transformers, GCBs, etc.). The construction of a new substation on the island of Vieques is required to address the lack of system redundancy in the existing Vieques 2501 substation. The new substation will increase and restore the reliability, resiliency, and system functionality and mitigate safety hazards by providing a backup of all feeders from the existing substation Vieques 2501.

The proposed new Vieques substation provides the following benefits to the electrical system in the island:

1- **Reliability:** Improve system reliability by replacing aged and deteriorated electrical equipment, currently at a higher risk of failure, subsequently affecting our customers. Under contingency conditions, the integration of new circuit breakers and power transformer replacement will be included to increase operational flexibility and provide alternate sources of electrical service.
2- **Resiliency:** Restore and improve system functionality and safety hazards mitigation to reduce risk to people and property.
3- **Capacity:** improve electrical ability to serve the existing and new forecasted load demand of the surrounding area, accommodate future distributed energy resources (DER), and implement non-wire alternatives (NWA).
4- **Environmental:** Minimize environmental risks by replacing oil circuit breakers with gas circuit breakers (GCBs).
5- **Safety:** increase safety for personnel and equipment, aligning with LUMA Energy's Health, Safety, Environmental, Quality (HSEQ) and Crisis Management Policies.

406 Mitigation Opportunity Cost Estimate

Architectural & Engineering to Design:	$5.6M
Procurement:	$16.5M
Construction:	$23M
Project Total Estimated:	$45.1M

Note: If available, detailed engineering cost estimates will be included as an attachment.

Environmental & Historic Preservation Requirements

EHP considerations will be identified and evaluated during base design phase and site selection and submitted to FEMA for review. Requirements will be incorporated into the final design and construction documents to be approved by FEMA before construction activities.

Attachments

Attachments will be provided after High Level Assessments (HLA) are completed.

Document Name	Description
N/A	Project Cost Estimates

N/A	Engineering Studies
N/A	Location Maps and Site Picture

Exhibit 2

Excel Spreadsheet with Updated List of Projects Submitted via email