

March 31, 2023

BY ELECTRONIC FILING

Mr. Bernard Logan, Clerk
c/o Document Control Center
State Corporation Commission
1300 East Main Street
Tyler Building – 1st Floor
Richmond, Virginia 23219

*Application of Virginia Electric and Power Company for
approval and certification of electric transmission facilities:
Line #2011 230 kV Partial Rebuild Project*
Case No. PUR-2023-00049

Dear Mr. Logan:

Please find enclosed for electronic filing in the above-captioned proceeding the application for approval of electric transmission facilities on behalf of Virginia Electric and Power Company (the “Company”). This filing contains the Application, Appendix, Direct Testimony, and DEQ Supplement, including attachments.

As indicated in Section II.A.12.b of the Appendix, an electronic copy of the maps of the Virginia Department of Transportation “General Highway Map” for Fairfax County and Prince William County, as well as the digital geographic information system (“GIS”) map required by § 56-46.1 of the Code of Virginia, which is Attachment II.A.2 to the Appendix, were provided via an e-room to the Commission’s Division of Public Utility Regulation on March 30, 2023.

Please do not hesitate to call if you have any questions in regard to the enclosed.

Very truly yours,



Vishwa B. Link

Enclosures

cc: William H. Chambliss, Esq.
Mr. David Essah (without enclosures)

Mr. Bernard Logan, Clerk

March 31 2023

Page 2

Mr. Neil Joshipura (without enclosures)

Mr. Michael A. Cizenski (without enclosures)

David J. DePippo, Esq.

Annie C. Larson, Esq.

Jennifer D. Valaika, Esq.

Anne Hampton Haynes, Esq.

Briana M. Jackson, Esq.



**Dominion
Energy[®]**

**Application, Appendix,
DEQ Supplement, Direct
Testimony and Exhibits of
Virginia Electric and Power
Company**

**Before the State Corporation
Commission of Virginia**

**Line #2011 230 kV Partial
Rebuild Project**

Application No. 323

Case No. PUR-2023-00049

Filed: March 31, 2023

Volume 1 of 2

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF
VIRGINIA ELECTRIC AND POWER COMPANY
FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

Line #2011 230 kV Partial Rebuild Project

Application No. 323

Case No. PUR-2023-00049

Filed: March 31, 2023

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF)	
)	
VIRGINIA ELECTRIC AND POWER COMPANY)	Case No. PUR-2023-00049
)	
For approval and certification of electric)	
transmission facilities: Line #2011 230 kV)	
Partial Rebuild Project)	

**APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY
FOR APPROVAL AND CERTIFICATION OF
ELECTRIC TRANSMISSION FACILITIES:
LINE #2011 230 kV PARTIAL REBUILD PROJECT**

Pursuant to § 56-46.1 of the Code of Virginia (“Va. Code”) and the Utility Facilities Act, Va. Code § 56-265.1 *et seq.*, Virginia Electric and Power Company (“Dominion Energy Virginia” or the “Company”), by counsel, files with the State Corporation Commission of Virginia (the “Commission”) this application for approval and certification of electric transmission facilities (the “Application”). In support of its Application, Dominion Energy Virginia respectfully shows as follows:

1. Dominion Energy Virginia is a public service corporation organized under the laws of the Commonwealth of Virginia furnishing electric service to the public within its Virginia service territory. The Company also furnishes electric service to the public in portions of North Carolina. Dominion Energy Virginia’s electric system—consisting of facilities for the generation, transmission, and distribution of electric energy—is interconnected with the electric systems of neighboring utilities and is a part of the interconnected network of electric systems serving the continental United States. By reason of its operation in two states and its interconnections with other utilities, the Company is engaged in interstate commerce.

2. In order to perform its legal duty to furnish adequate and reliable electric service, Dominion Energy Virginia must, from time to time, replace existing transmission facilities or construct new transmission facilities in its system.

3. In this Application, in order to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation (“NERC”) Reliability Standards, Dominion Energy Virginia proposes in the Cities of Manassas and Manassas Park, and the Counties of Prince William and Fairfax, Virginia (the “Manassas Airport Area”) the following (collectively, the “Partial Rebuild Project”):

- Rebuild approximately 7.25 miles of the existing overhead 230 kV Cannon Branch-Clifton Line #2011 from existing Structure #2011/68, which is located one span outside of the Company’s existing Cannon Branch Substation and is not being replaced, to the Clifton Substation.¹ Specifically, the Company proposes to replace the existing Line #2011 1590 ACSR (45/7) conductor from Structure #2011/68 to Clifton Substation with three-phase twin-bundled 768.2 ACSS/TW type conductor, designed for a maximum operating temperature (“MOT”) of 250 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA.² In order to accommodate the higher capacity of the uprated conductor, the Company additionally proposes to replace the existing single circuit 230 kV monopoles, which are primarily weathering steel monopoles, with single circuit 230 kV weathering steel monopoles.
- Replace all substation equipment at the Clifton Substation that is associated with Line #2011 and not currently rated for 4000 ampere (“amp” or “A”) to provide a

¹ Structure #2011/68, which is located one span outside of the Company’s existing Cannon Branch Substation, is not being replaced. In a recent case before the Commission, the Company received approval to remove approximately 0.06 mile of the existing 230 kV Line #2011 between the Cannon Branch Substation and Structure #2011/68. *Application of Virginia Electric and Power Company For approval and certification of electric transmission facilities: Line #2011 Extension from Cannon Branch to Winters Branch*, Case No. PUR-2021-00291, Final Order (June 24, 2022). That project will be in service before the Company anticipates construction to begin on the proposed Partial Rebuild Project. Therefore, while Line #2011 is currently the Cannon Branch-Clifton Line #2011, once the project in Case No. PUR-2021-00291 is complete, Line #2011 will run from the Clifton Substation to the Winters Branch Substation and be renamed Clifton-Winters Branch Line #2011. For ease of reference in the Application, the Company is referring to the line segment for this Partial Rebuild Project simply as “Line #2011.”

² Apparent power, measured in megavolt amperes (“MVA”), is made up of real power (megawatt or “MW”) and reactive power megavolt ampere reactive (“MVAR”). The power factor (“pf”) is the ratio of real power to apparent power. For loads with a high pf (approaching unity), real power will approach apparent power and the two can be used interchangeably. Load loss criteria specify real power (MW) units because that represents the real power that will be dropped; however, MVA is used to describe the equipment ratings to handle the apparent power, which includes the real and reactive load components.

4000A single breaker rating.

- Uprate the Company’s line switches to 4000A at the Prince William Delivery Point (“DP”) and Battery Heights DP, both of which are the City of Manassas’s DPs tapped from Line #2011.

4. The proposed Partial Rebuild Project is needed to comply with mandatory NERC Reliability Standards for transmission facilities and the Company’s mandatory planning criteria (“Planning Criteria”),³ as well as maintain reliable electric service for overall load growth projected for the Project area.

5. The existing Line #2011 is part of the Company’s 230 kV network that supports the delivery of generation to retail and wholesale customers in the Prince William County Data Center Opportunity District and the Manassas Airport Area, which are part of the larger Woodbridge load area (the “Woodbridge Load Area”). The Manassas Airport Area has been designated as part of the Data Center Opportunity Overlay District in Prince William County and has therefore been a coveted location for data center developers. The Company has received multiple DP requests for new transformers at existing substations as well as new substations to accommodate this projected load growth. As a result, the Company presented three supplemental projects (DOM-2020-0001, DOM-2020-0004, and DOM-2020-0005) (the “Supplemental Projects”) to PJM Interconnection, L.L.C. (“PJM”) prior to the summer of 2020.

6. Prior to integrating a supplemental project into the Regional Transmission Expansion Plan (“RTEP”) base case, PJM performs a do no harm (“DNH”) study to evaluate whether a proposed supplemental project will adversely impact the reliability of the transmission

³ The Company’s Transmission Planning Criteria (effective April 1, 2022) are attached to its Facility Interconnections Requirement (“FIR”) document, which is available online at <https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connectionrequirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E>.

system, as represented in the planning models used in all other PJM reliability planning studies. The DNH case includes all Transmission Owner supplemental projects that have been presented to PJM. PJM, as well as the Company, will run traditional reliability analysis on each supplemental project added to the DNH case to ensure no harm is created to the network. In this case, the DNH process identified several subsequent N-1-1 overloads on the Company's existing 230 kV Line #2011 in the Manassas Airport Area caused by the previously presented Supplemental Projects.

7. The proposed Partial Rebuild Project will reconductor the 230 kV Line #2011 using a higher capacity conductor, including terminal upgrades, which will increase the expected summer normal rating to 1,573 MVA. In order to accommodate the higher capacity of the updated conductor, the Company additionally proposes to replace the existing single circuit 230 kV monopoles, which are primarily weathering steel monopoles, with single circuit 230 kV weathering steel monopoles. Accordingly, the proposed Partial Rebuild Project will increase the transmission capacity of the 230 kV Line #2011 serving the Manassas Airport Area, resolving N-1-1 criteria violations for several segments of the line that have been identified by PJM. Additionally, the Partial Rebuild Project will help maintain reliable service and support the overall growth in the area.

8. The proposed Partial Rebuild Project also will replace all substation equipment at the Clifton Substation that is associated with Line #2011 and not currently rated for 4000A to provide a 4000A single breaker rating. Breakers, switches, and other station equipment will need to be replaced as well to support the 4000A single breaker rating on Line #2011. The Company

will replace four breakers, twelve switches, breaker leads, bus segments, line trap, surge arresters, and line leads.⁴

9. The length of the proposed route for the Partial Rebuild Project is approximately 7.25 miles. The majority of the proposed route will be within existing right-of-way, existing easements, and Company-owned property, which are adequate for the proposed Partial Rebuild Project.⁵ Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition and construction of new right-of-way, the Company did not consider any alternate routes requiring new right-of-way for this Partial Rebuild Project.

10. The desired in-service date for the Partial Rebuild Project is December 31, 2025. The Company estimates it will take approximately 27 months for detailed engineering, scheduled outages, materials procurement, permitting, and construction of the Partial Rebuild Project after a final order from the Commission. Due to system outage constraints and availability, the transmission line rebuild will be segmented so that the construction will only occur during “seasons” of low energy demand. Low demand seasons are defined as March 1 – June 15, and September 15 – December 31 each year. During each season of construction, a segment of the transmission line will be de-energized, wrecked and rebuilt completely before reenergizing. The Company anticipates construction of the transmission line rebuild will require four full seasons to complete. Accordingly, to support this estimated pre-construction activity timeline and

⁴ The Company will not perform any substation work at the Cannon Branch Substation in connection with this Partial Rebuild Project. The Company is performing substation-related work at the Cannon Branch Substation as part of the project approved in Case No. PUR-2021-00291.

⁵ The entire length of the proposed route is adequate for construction of the Partial Rebuild Project except at the proposed location of Structure #2011/58. The Company has entered into a purchase agreement with the landowner to purchase the required property in fee to secure sufficient land rights at this proposed structure location. *See also* Section II.A.4 and Section II.A.6 of the Appendix.

construction plan, the Company respectfully requests a final order by September 29, 2023. Should the Commission issue a final order by September 29, 2023, the Company estimates that construction should begin in March 2024, and be completed by December 31, 2025. This construction timeline will enable the Company to meet the targeted in-service date for the Partial Rebuild Project. This schedule is contingent upon obtaining the necessary permits and scheduling outages. Dates may need to be adjusted based on permitting delays or design modifications in order to comply with additional agency requirements identified during the permitting application process, as well as ability to schedule outages, and unpredictable delays due to labor shortages or materials/supply issues.

11. The estimated conceptual cost of the proposed Partial Rebuild Project is approximately \$31.7 million, which includes approximately \$27.3 million for transmission-related work and approximately \$4.4 million for substation-related work (2022 dollars). The description of the proposed Partial Rebuild Project is described in detail in Sections I and II of the Appendix attached to this Application.

12. Based on consultations with the Virginia Department of Environmental Quality (“DEQ”), the Company has developed a supplement (“DEQ Supplement”) containing information designed to facilitate review and analysis of the proposed facilities by the DEQ and other relevant agencies. The DEQ Supplement is attached to this Application.

13. Based on the Company’s experience, the advice of consultants, and a review of published studies by experts in the field, the Company believes that there is no causal link to harmful health or safety effects from electric and magnetic fields generated by the Company’s existing or proposed facilities. Section IV of the Appendix provides further details on Dominion Energy Virginia’s consideration of the health aspects of electric and magnetic fields.

14. Section V of the Appendix provides a proposed route description for public notice purposes and a list of federal, state, and local agencies and officials that the Company has or will notify about the Application.

15. In addition to the information provided in the Appendix and the DEQ Supplement, this Application is supported by the pre-filed direct testimony of Company Witnesses Steven J. Schweiger, Chloe A. Genova, Aaron C. Kuhn, and Craig R. Hurd filed with this Application.

16. As this Application seeks approval to rebuild an existing line, the Company respectfully requests, in the interest of judicial economy, that the Commission issue an Order for Notice and Comment setting forth a procedural schedule in this proceeding without an evidentiary hearing, but with an opportunity for interested persons to request an evidentiary hearing if the issues raised cannot be addressed adequately without a hearing. An Order for Notice and Comment will still allow the Company, Commission Staff, and any interested parties that join the proceeding to develop a complete record without prejudice, as Staff or any party may file with the Commission a request for hearing.

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF
VIRGINIA ELECTRIC AND POWER COMPANY
FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

Line #2011 230 kV Partial Rebuild Project

Application No. 323

Appendix

Containing Information in Response to
“Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia”

Case No. PUR-2023-00049

Filed: March 31, 2023

TABLE OF CONTENTS

Executive Summary i

I. Necessity for the Proposed Project 1

II. Description of the Proposed Project 36

III. Impact of Line on Scenic, Environmental and Historic Features 207

IV. Health Aspects of EMF..... 261

V. Notice..... 277

EXECUTIVE SUMMARY

In order to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation (“NERC”) Reliability Standards, Virginia Electric and Power Company (“Dominion Energy Virginia” or the “Company”) proposes in the Cities of Manassas and Manassas Park, and the Counties of Prince William and Fairfax, Virginia (the “Manassas Airport Area”) the following (collectively, the “Partial Rebuild Project”):

- Rebuild approximately 7.25 miles of the existing overhead 230 kV Cannon Branch-Clifton Line #2011 from existing Structure #2011/68, which is located one span outside of the Company’s existing Cannon Branch Substation and is not being replaced, to the Clifton Substation.¹ Specifically, the Company proposes to replace the existing Line #2011 1590 ACSR (45/7) conductor from Structure #2011/68 to Clifton Substation with three-phase twin-bundled 768.2 ACSS/TW type conductor, designed for a maximum operating temperature (“MOT”) of 250 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA.² In order to accommodate the higher capacity of the uprated conductor, the Company additionally proposes to replace the existing single circuit 230 kV monopoles, which are primarily weathering steel monopoles, with single circuit 230 kV weathering steel monopoles.
- Replace all substation equipment at the Clifton Substation that is associated with Line #2011 and not currently rated for 4000 ampere (“amp” or “A”) to provide a 4000A single breaker rating.
- Uprate the Company’s line switches to 4000A at the Prince William Delivery Point (“DP”) and Battery Heights DP, both of which are the City of Manassas’s DPs tapped from Line #2011.

The proposed Partial Rebuild Project is needed to comply with mandatory NERC Reliability Standards for transmission facilities and the Company’s mandatory planning criteria (“Planning

¹ Structure #2011/68, which is located one span outside of the Company’s existing Cannon Branch Substation, is not being replaced. In a recent case before the State Corporation Commission (the “Commission”), the Company received approval to remove approximately 0.06 mile of the existing 230 kV Line #2011 between the Cannon Branch Substation and Structure #2011/68. *Application of Virginia Electric and Power Company For approval and certification of electric transmission facilities: Line #2011 Extension from Cannon Branch to Winters Branch*, Case No. PUR-2021-00291, Final Order (June 24, 2022). That project will be in service before the Company anticipates construction to begin on the proposed Partial Rebuild Project. Therefore, while Line #2011 is currently the Cannon Branch-Clifton Line #2011, once the project in Case No. PUR-2021-00291 is complete, Line #2011 will run from the Clifton Substation to the Winters Branch Substation and be renamed Clifton-Winters Branch Line #2011. For ease of reference in the Appendix, the Company is referring to the line segment for this Partial Rebuild Project simply as “Line #2011.”

² Apparent power, measured in megavolt amperes (“MVA”), is made up of real power (megawatt or “MW”) and reactive power megavolt ampere reactive (“MVAR”). The power factor (“pf”) is the ratio of real power to apparent power. For loads with a high pf (approaching unity), real power will approach apparent power and the two can be used interchangeably. Load loss criteria specify real power (MW) units because that represents the real power that will be dropped; however, MVA is used to describe the equipment ratings to handle the apparent power, which includes the real and reactive load components.

Criteria”),³ as well as maintain reliable electric service for overall load growth projected for the Project area. The existing Line #2011 is part of the Company’s 230 kV network that supports the delivery of generation to retail and wholesale customers in the Prince William County Data Center Opportunity District and the Manassas Airport Area, which are part of the larger Woodbridge load area (the “Woodbridge Load Area”). The Manassas Airport Area has been designated as part of the Data Center Opportunity Overlay District in Prince William County and has therefore been a coveted location for data center developers. The Company has received multiple DP requests for new transformers at existing substations as well as new substations to accommodate this projected load growth. As a result, the Company presented three supplemental projects (DOM-2020-0001, DOM-2020-0004, and DOM-2020-0005) (the “Supplemental Projects”) to PJM Interconnection, L.L.C. (“PJM”) prior to the summer of 2020. Prior to integrating a supplemental project into the Regional Transmission Expansion Plan (“RTEP”) base case, PJM performs a do no harm (“DNH”) study to evaluate whether a proposed supplemental project will adversely impact the reliability of the transmission system, as represented in the planning models used in all other PJM reliability planning studies. The DNH case includes all transmission owner (“TO”) supplemental projects that have been presented to PJM. PJM, as well as the Company, will run traditional reliability analysis on each supplemental project added to the DNH case to ensure no harm is created to the network. In this case, the DNH process identified several subsequent N-1-1 overloads on the Company’s existing 230 kV Line #2011 in the Manassas Airport Area caused by the previously presented Supplemental Projects.

The proposed Partial Rebuild Project will reconductor the 230 kV Line #2011 using a higher capacity conductor, including terminal upgrades, which will increase the expected summer normal rating to 1,573 MVA. In order to accommodate the higher capacity of the uprated conductor, the Company additionally proposes to replace the existing single circuit 230 kV monopoles, which are primarily weathering steel monopoles, with single circuit 230 kV weathering steel monopoles. Accordingly, the proposed Partial Rebuild Project will increase the transmission capacity of the 230 kV Line #2011 serving the Manassas Airport Area, resolving N-1-1 criteria violations for several segments of the line that have been identified by PJM. Additionally, the Partial Rebuild Project will help maintain reliable service and support the overall growth in the area.

The proposed Partial Rebuild Project also will replace all substation equipment at the Clifton Substation that is associated with Line #2011 and not currently rated for 4000A to provide a 4000A single breaker rating. Breakers, switches, and other station equipment will need to be replaced as well to support the 4000A single breaker rating on Line #2011. The Company will replace four breakers, twelve switches, breaker leads, bus segments, line trap, surge arresters, and line leads.⁴

The length of the proposed route for the Partial Rebuild Project is approximately 7.25 miles. The

³ The Company’s Transmission Planning Criteria (effective April 1, 2022) are attached to its Facility Interconnections Requirement (“FIR”) document, which is available online at <https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connectionrequirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E>.

⁴ The Company will not perform any substation work at the Cannon Branch Substation in connection with this Partial Rebuild Project. The Company is performing substation-related work at the Cannon Branch Substation as part of the project approved in Case No. PUR-2021-00291.

majority of the proposed route will be within existing right-of-way, existing easements, and Company-owned property, which are adequate for the proposed Partial Rebuild Project.⁵ Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition and construction of new right-of-way, the Company did not consider any alternate routes requiring new right-of-way for this Partial Rebuild Project.

The estimated conceptual cost of the proposed Partial Rebuild Project is approximately \$31.7 million, which includes approximately \$27.3 million for transmission-related work and approximately \$4.4 million for substation-related work (2022 dollars).

The desired in-service date for the Partial Rebuild Project is December 31, 2025. The Company estimates it will take approximately 27 months for detailed engineering, scheduled outages, materials procurement, permitting, and construction of the Partial Rebuild Project after a final order from the Commission. Due to system outage constraints and availability, the transmission line rebuild will be segmented so that the construction will only occur during “seasons” of low energy demand. Low demand seasons are defined as March 1 – June 15, and September 15 – December 31 each year. During each season of construction, a segment of the transmission line will be de-energized, wrecked and rebuilt completely before reenergizing. The Company anticipates construction of the transmission line rebuild will require four full seasons to complete. Accordingly, to support this estimated pre-construction activity timeline and construction plan, the Company respectfully requests a final order by September 29, 2023. Should the Commission issue a final order by September 29, 2023, the Company estimates that construction of the Partial Rebuild Project should begin in March 2024 and be completed by December 31, 2025. This schedule is contingent upon obtaining the necessary permits and outages. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process, as well as the ability to schedule outages, and unpredictable delays due to labor shortages or materials/supply issues.

⁵ The entire length of the proposed route is adequate for construction of the Partial Rebuild Project except at the proposed location of Structure #2011/58. The Company has entered into a purchase agreement with the landowner to purchase the required property in fee to secure sufficient land rights at this proposed structure location. *See also* Section II.A.4 and Section II.A.6 of the Appendix.

I. NECESSITY FOR THE PROPOSED PROJECT

- A. **State the primary justification for the proposed project (for example, the most critical contingency violation including the first year and season in which the violation occurs). In addition, identify each transmission planning standard(s) (of the Applicant, regional transmission organization (“RTO”), or North American Electric Reliability Corporation) projected to be violated absent construction of the facility.**

Response: The proposed Partial Rebuild Project is needed to comply with mandatory NERC Reliability Standards for transmission facilities and the Company’s Planning Criteria, as well as maintain reliable electric service for overall load growth projected for the Project area. See Attachment I.A.1 for an overview map of the proposed Partial Rebuild Project.

Dominion Energy Virginia’s transmission system is responsible for providing transmission service: (i) for redelivery to the Company’s retail customers; (ii) to Appalachian Power Company, Old Dominion Electric Cooperative, Northern Virginia Electric Cooperative (“NOVEC”), Central Virginia Electric Cooperative, and Virginia Municipal Electric Association for redelivery to their retail customers in Virginia; and (iii) to North Carolina Electric Membership Corporation and North Carolina Eastern Municipal Power Agency for redelivery to their customers in North Carolina (collectively, the “Dominion Energy Zone” or “DOM Zone”).

Dominion Energy Virginia is part of the PJM regional transmission organization, which provides service to a large portion of the eastern United States. PJM is currently responsible for ensuring the reliability of, and coordinating the movement of, electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia. This service area has a population of approximately 65 million and, on August 2, 2006, set a record high of 166,929 MW for summer peak demand, of which Dominion Energy Virginia’s load portion was approximately 19,256 MW. On August 9, 2022, the Company set a record high of 21,156 MW for summer peak demand. On December 24, 2022, the Company set a winter and all-time record demand of 22,189 MW. Based on the 2023 PJM Load Forecast, the Dominion Energy Zone is expected to grow with average growth rates of 5.0% summer and 4.8% winter over the next 10 years compared to the PJM average of 0.8% and 1.0% over the same period for the summer and winter, respectively.

Dominion Energy Virginia is also part of the Eastern Interconnection transmission grid, meaning its transmission system is interconnected, directly or indirectly, with all of the other transmission systems in the United States and Canada between the Rocky Mountains and the Atlantic Coast, except for Quebec and most of Texas. All of the transmission systems in the Eastern Interconnection are dependent on each other for moving bulk power through the transmission system and for reliability support. Dominion Energy Virginia’s service to its customers is

extremely reliant on a robust and reliable regional transmission system.

NERC has been designated by the Federal Energy Regulatory Commission (“FERC”) as the electric reliability organization for the United States. Accordingly, NERC requires that the planning authority and transmission planner develop planning criteria to ensure compliance with NERC Reliability Standards. Mandatory NERC Reliability Standards require that a TO develop facility interconnection requirements that identify load and generation interconnection minimum requirements for a TO’s transmission system, as well as the TO’s reliability criteria.⁶

Federally mandated NERC Reliability Standards constitute minimum criteria with which all public utilities must comply as components of the interstate electric transmission system. Moreover, the Energy Policy Act of 2005 mandates that electric utilities follow these NERC Reliability Standards and imposes fines on utilities found to be in noncompliance up to \$1.3 million per day per violation.

PJM’s RTEP is the culmination of a FERC-approved annual transmission planning process that includes extensive analysis of the electric transmission system to determine any needed improvements.⁷ PJM’s annual RTEP is based on the effective criteria in place at the time of the analyses, including applicable standards and criteria of NERC, PJM, and local reliability planning criteria, among others.⁸ Projects identified through the RTEP process are developed by the TO in coordination with PJM, and are presented at the Transmission Expansion Advisory Committee (“TEAC”) meetings prior to inclusion in the RTEP that is then presented for approval by the PJM Board of Managers (the “PJM Board”).

Outcomes of the RTEP process include three types of transmission system upgrades or projects: (i) baseline upgrades are those that resolve a system reliability criteria violation, which can include planning criteria from NERC, ReliabilityFirst, SERC Reliability Corporation, PJM, and TOs; (ii) network upgrades are new or upgraded facilities required primarily to eliminate reliability criteria violations caused by proposed generation, merchant transmission, or long-term firm transmission service requests; and (iii) supplemental projects are projects initiated by the TO in order to interconnect new customer load, address degraded equipment performance, improve operational flexibility and efficiency, and increase infrastructure resilience. While supplemental projects are included in the RTEP, and the PJM Board administers stakeholder review of supplemental projects as part of the RTEP process, the PJM Board does not actually approve such projects. See Section I.J for a discussion of the PJM process as it relates to this Partial Rebuild

⁶ See FAC-001-3 (R1, R3) (effective April 1, 2021), which can be found at <https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-interconnection-requirements-signed.pdf?la=en&rev=38f51ffb04b1489f921b32a41d9887c8>.

⁷ PJM Manual 14B (effective July 1, 2021) focuses on the RTEP process and can be found at: <https://www.pjm.com/-/media/documents/manuals/m14b.ashx>.

⁸ See PJM Manual 14B, Attachment D: PJM Reliability Planning Criteria.

Project.

Supplemental Projects

Prior to summer 2020, the Company presented three Supplemental Projects to PJM to accommodate projected load growth in the Manassas Airport Area, as described below. During the 2020 DNH analysis of these Supplemental Projects based on the 2025 RTEP case, PJM identified multiple potential NERC criteria violations (N-1-1 thermal overload) in the Manassas Airport Area requiring the need for the proposed Partial Rebuild Project.

Cloverhill 230 kV Delivery – Third Transformer (DOM-2020-0001)

In November 2019, the Company's Distribution Planning Group submitted a DP request to add a third 84 MVA distribution transformer at the Company's existing Cloverhill Substation in Prince William County. The need for this new transformer is being driven by continued data center load growth and alternate feed contract reservations. The original requested in-service date for this request was June 1, 2022, which later was revised to June 2023, due to delays by the equipment manufacturer. Project DOM-2020-0001 was assigned PJM supplemental project number s2321.1 and accepted by PJM into the Local Plan on November 4, 2020, as discussed in Section I.J. See Attachment I.J.2 for a copy of the presentation submitted at the November 2020 TEAC meeting.

Winters Branch 230 kV Delivery – Third Transformer (DOM-2020-0004)

In February 2020, the Company's Distribution Planning Group submitted a DP request to add a third, 84 MVA distribution transformer at the Company's existing Winters Branch Substation in Prince William County. The need for the new transformer was driven by continued data center load growth and alternate feed contract reservations. The original requested in-service date was January 1, 2022, which later was revised to July 29, 2022, due to delays in construction. Project DOM-2020-0004 was assigned PJM supplemental project number s2321.2 and accepted into the Local Plan on November 4, 2020. See Attachment I.J.2. The new transformer was installed in July 2022 and has been placed into service.

Winters Branch 230 kV Delivery – Fourth Transformer (DOM-2020-0005)

In October 2020, the Company's Distribution Planning Group submitted another DP request to add a fourth, 84 MVA distribution transformer at Winters Branch Substation in Prince William County. The new transformer is being driven by continued load growth in the area and contingency loading for the loss of one of the existing transformers. The original requested in-service date was March 1, 2023, which later was revised to March 15, 2024, due to manufacturer delays on acquiring the transformer. Project DOM-2020-0005 was assigned PJM supplemental project number s2321.3 and accepted into the Local Plan on November 4, 2020. See Attachment I.J.2.

Need for the Partial Rebuild Project

The Northern Virginia data center market is spread across Loudoun, Fairfax, and Prince William Counties. The combination of competitive colocation/cloud environment, fiber connectivity, strategic geographic location, low risk of business disruptions, affordable and reliable power, and the business climate in Virginia has created the largest market for data center capacity in the United States.

Within Prince William County, the existing Line #2011 is part of the Company's 230 kV network that supports the delivery of generation to retail and wholesale customers in the Prince William County Data Center Opportunity District and the Manassas Airport Area, which are part of the larger Woodbridge Load Area. For purposes of this Application, the primary substations in the Manassas Airport Area include the City of Manassas's Airport DP and Dominion Energy Virginia's existing Cannon Branch, Winters Branch, and Cloverhill Substations, and the Company's future Brickyard Substation⁹ and Wakeman Substation.¹⁰ See Attachment I.A.2 for the one-line diagram of the existing transmission system in the Partial Rebuild Project area.

The Manassas Airport Area has been designated as part of the Data Center Opportunity Overlay District in Prince William County and has therefore been a coveted location for data center developers. The Data Center Opportunity Zone was created to allow for by-right data center development based off proximity to high voltage transmission lines of 115 kV or more and planned for office or industrial uses.¹¹ Attachment I.A.1 shows the Data Center Opportunity Zone Overlay in the Manassas Airport Area. The Company anticipates extensive growth in the Manassas Airport Area over the next 5 to 10 years as many large parcels in the area are currently owned or under contract by data center developers.

The Company received multiple DP requests for new transformers at existing substations as well as new substations to accommodate this projected load growth,

⁹ Brickyard Substation (s2131) has a target in-service date of May 31, 2024. The need for the Brickyard Substation was presented to PJM as part of the M-3 process on May 15, 2019; the solution for the need was presented on November 17, 2019; and the solution was accepted into the local plan on November 4, 2020. Brickyard Substation was not included as part of the 2025 RTEP case build that identified the need for this Partial Rebuild Project. However, as the Brickyard Substation is located within the Manassas Airport Area in the immediate vicinity of Line #2011, it will add to the loading on Line #2011 and further contribute to the 300 MW N-1-1 Load Drop Violations.

¹⁰ Wakeman Substation (s2630.1) has a target in-service date of February 28, 2024. The need for the Wakeman Substation was presented to PJM as part of the M-3 process on November 4, 2020; the solution for the need was presented on August 10, 2020; and the solution was accepted into the local plan on November 30, 2021. Wakeman Substation was not included as part of the 2025 RTEP case build that identified the need for this Partial Rebuild Project. However, as the Wakeman Substation is located within the Manassas Airport Area in the immediate vicinity of Line #2011, it will add to the loading on Line #2011 and further contribute to the 300 MW N-1-1 Load Drop Violations.

¹¹ See the following link:

https://library.municode.com/va/prince_william_county/codes/code_of_ordinances?nodeId=CH32ZO_ARTVOVDI_PT509DACEOPZOOVDI.

as discussed above. As a result, the Company presented the three Supplemental Projects (DOM-2020-0001, DOM-2020-0004, and DOM-2020-0005) prior to the summer of 2020. See Section I.B for additional discussion regarding the Supplemental Projects. Prior to integrating a supplemental project into the RTEP base case, PJM performs a DNH study to evaluate whether a proposed supplemental project will adversely impact the reliability of the transmission system, as represented in the planning models used in all other PJM reliability planning studies. The DNH case includes all TO supplemental projects that have been presented to PJM. PJM, as well as the Company, will run traditional reliability analysis on each supplemental project added to the DNH case to ensure no harm is created to the network. In this case, the DNH process identified several subsequent N-1-1 overloads on the Company's existing 230 kV Line #2011 in the Manassas Airport Area caused by the previously presented Supplemental Projects.

The Partial Rebuild Project addresses and resolves potential thermal violations for the sequential N-1-1 loss of 230 kV Gainesville-Railroad Line # 2151 and Liberty-Vint Hill Line #2163 identified in PJM's 2025 RTEP planning model as part of the Supplemental M3 process. The Partial Rebuild Project was submitted as a solution to PJM in regard to violations identified via the DNH analysis at the October 6, 2020 TEAC meeting, as discussed in Section I.J. PJM and the Company are continuing to learn more about customer needs within Northern Virginia. Via PJM's DNH process, a summer planning model is kept up to date on a monthly basis between the annual release of RTEP cases. Due to the addition of the three Supplemental Projects discussed above, harm was identified by PJM to be addressed by the Partial Rebuild Project.

Importantly, Prince William County and the City of Manassas are becoming central hubs in the data center market as new load growth and customers continue to materialize at a rapid pace as of this filing. If not relieved by this proposed Project, combined with others proposed or planned in the near term, the identified reliability violations will severely impact the transmission system's ability to provide reliable service to Dominion Energy Virginia's customers in the Prince William County and Manassas areas. See [Attachment I.J.1](#) for a copy of the presentation submitted at the October 2020 TEAC meeting.

The planned one-line diagram—which includes the Partial Rebuild Project, the Supplemental Projects, the future Brickyard and Wakeman Substations, and the Line #2011 Extension from Cannon Branch to Winters Branch (Case No. PUR-2021-00291)—is provided in [Attachment I.A.3](#).

Description of the Partial Rebuild Project

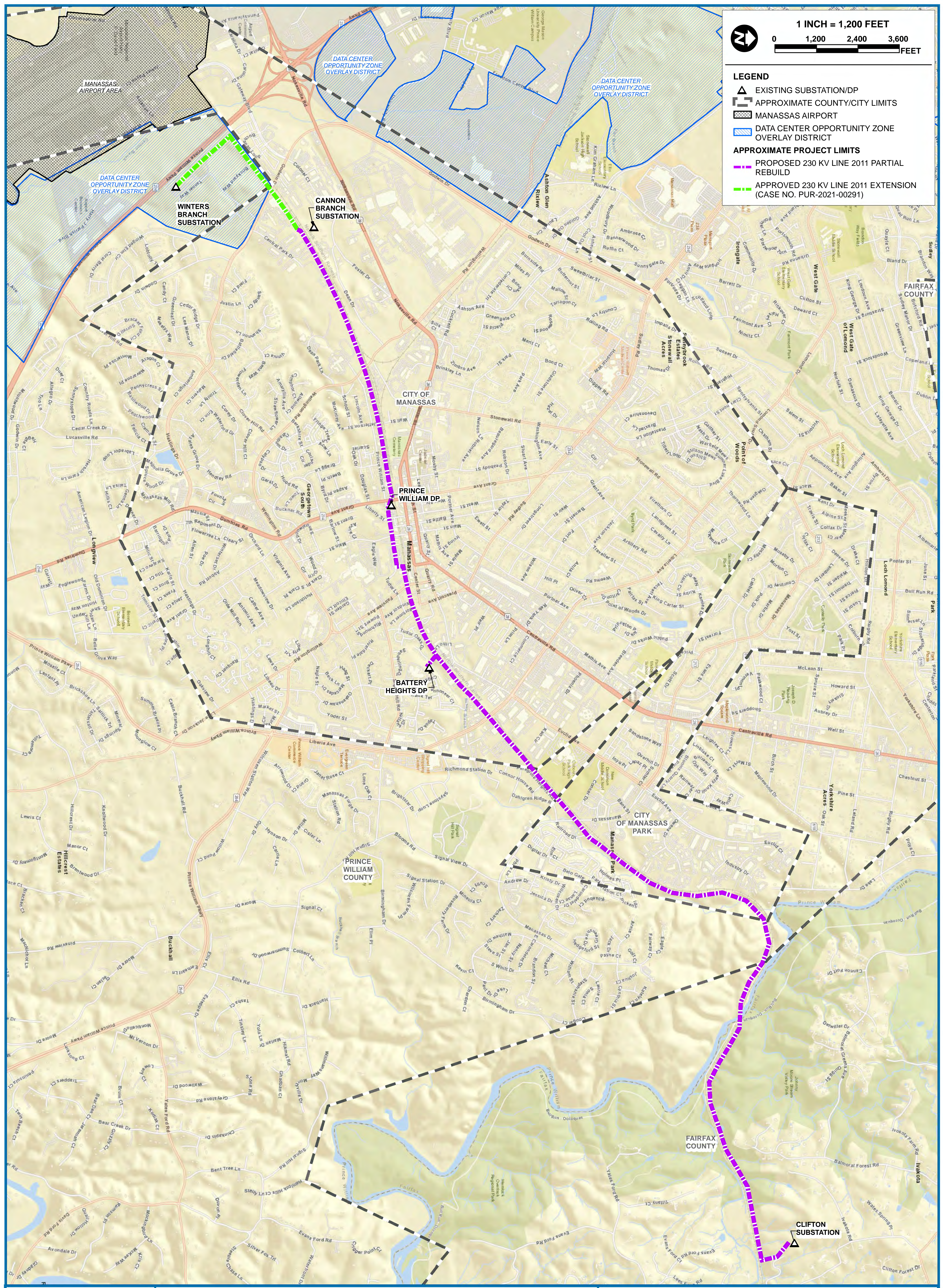
As part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of existing overhead 230 kV transmission Line #2011 from existing Structure #2011/68, which is located one span outside of the Company's existing Cannon Branch Substation and is not being replaced, to the

Clifton Substation. Specifically, the Company proposes to replace the existing Line #2011 1590 ACSR (45/7) conductor with three-phase twin-bundled 768.2 ACSS/TW type conductor, designed for a MOT of 250 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA. In order to accommodate the higher capacity of the uprated conductor, the Company additionally proposes to replace the existing single circuit 230 kV steel monopoles, which are primarily weathering steel monopoles, with single circuit 230 kV weathering steel monopoles. As part of the proposed Partial Rebuild Project, the Company will also make certain upgrades to the Clifton Substation and various DPs, as discussed in Section II.C.

Additionally, the proposed Partial Rebuild Project will replace all substation equipment at the Clifton Substation that is associated with Line #2011 and not currently rated for 4000A to provide a 4000A single breaker rating. Breakers, switches, and other station equipment will need to be replaced as well to support the 4000A single breaker rating on Line #2011. The Company will replace four breakers, twelve switches, breaker leads, bus segments, line trap, surge arresters, and line leads.¹²

In summary, the proposed Partial Rebuild Project will increase the transmission capacity of the 230 kV Line #2011 serving the Manassas Airport Area, resolving N-1-1 criteria violations for several segments of the line that have been identified by PJM in compliance with mandatory NERC Reliability Standards and the Company's Planning Criteria. Additionally, the Partial Rebuild Project will help maintain reliable service and support the overall growth in the area.

¹² See, *supra* n. 4.



PROJECT MANAGER:	CZ
DRAWN:	LC
JOB NUMBER:	103811
DATE:	10/13/2022
REVISIONS:	

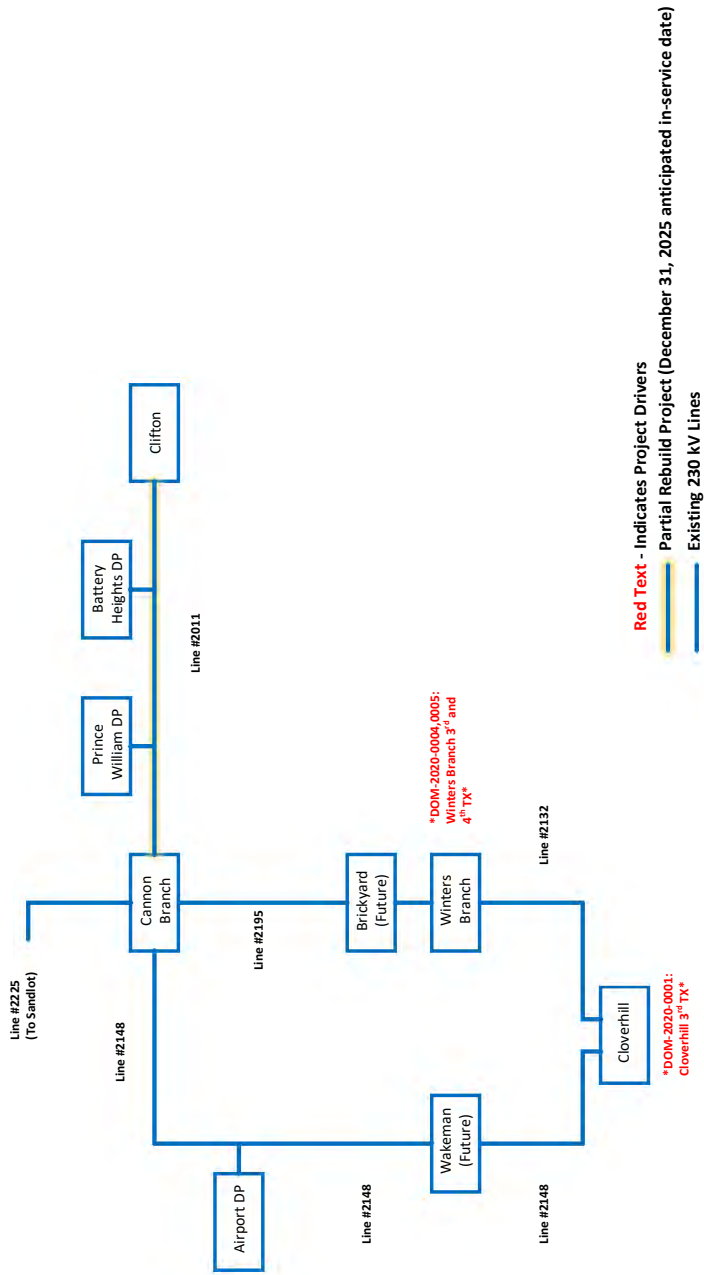
LINE #2011 230 KV
PARTIAL REBUILD PROJECT
APPLICANT: DOMINION ENERGY VIRGINIA
PROJECT OVERVIEW MAP
I.A.1.
CITY OF MANASSAS, CITY OF MANASSAS PARK,
PRINCE WILLIAM COUNTY, AND FAIRFAX COUNTY, VIRGINIA



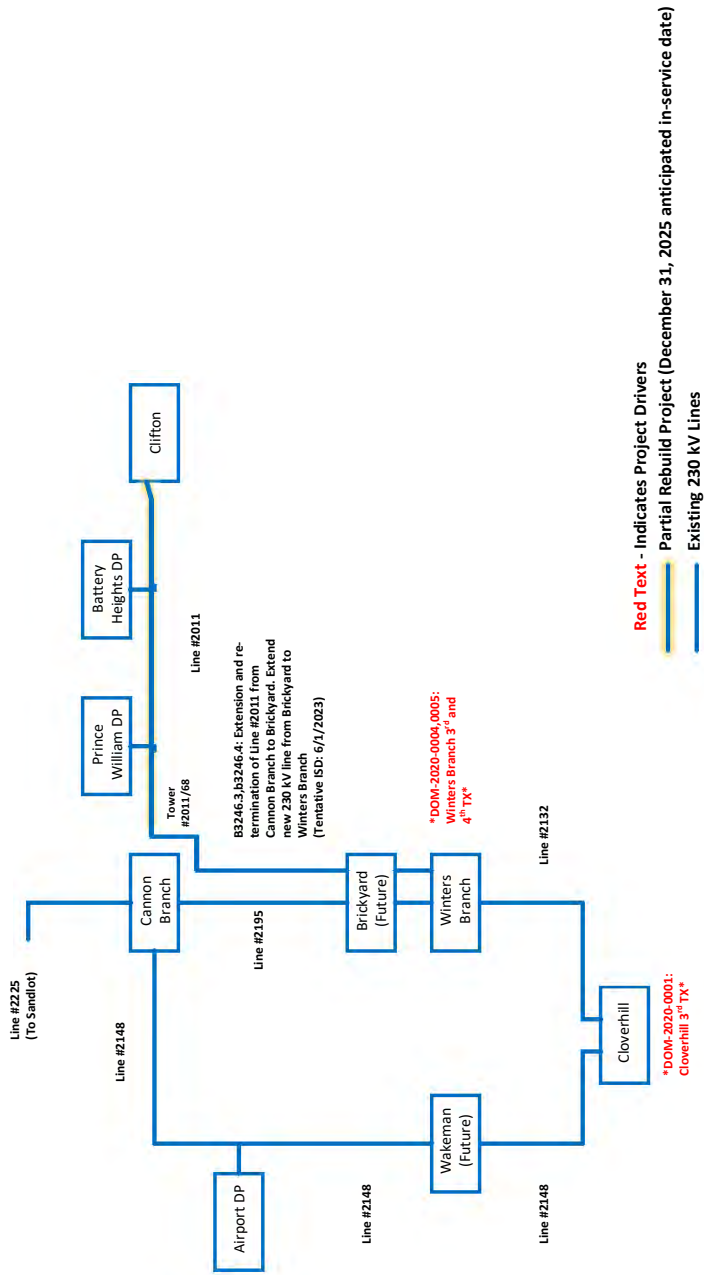
CORPORATE | 6575 WEST LOOP SOUTH, SUITE 300, BELLAIRE, TX 77401
 P: 713.520.5400



One-Line of Project Area (Existing)



One-Line of Project Area (Post-Line #2011 Extension)



I. NECESSITY FOR THE PROPOSED PROJECT

- B. Detail the engineering justifications for the proposed project (for example, provide narrative to support whether the proposed project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Applicant's system, etc.). Describe any known future project(s), including but not limited to generation, transmission, delivery point or retail customer projects, that require the proposed project to be constructed. Verify that the planning studies used to justify the need for the proposed project considered all other generation and transmission facilities impacting the affected load area, including generation and transmission facilities that have not yet been placed into service. Provide a list of those facilities that are not yet in service.**

Response: **(1) Engineering Justification for Project**

Detail the engineering justifications for the proposed project (for example, provide narrative to support whether the proposed project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Applicant's system, etc.).

See Section I.A of the Appendix.

(2) Known Future Projects

Describe any known future project(s), including but not limited to generation, transmission, delivery point or retail customer projects, that require the proposed project to be constructed.

The proposed Partial Rebuild Project is needed to resolve violations of mandatory NERC Reliability Standards and prepare for the demand growth projected for the future, particularly in the Manassas Airport Area, as described in Section I.A. The future Supplemental Projects described in Section I.A, which were developed to address this future load growth, require the construction of the proposed Partial Rebuild Project in order to resolve the identified NERC reliability violations resulting from those projects and other additional load in the area.¹³

Further, the Company is aware of additional data center campuses and required substations to serve Dominion Energy Virginia and NOVEC customer load that are in the conceptual phase. For purposes of this filing, the Company limited the scope of future projects to only those projects that have been presented to PJM.

¹³ See *supra* n. 9 and n. 10. While not identified as part of the 2025 RTEP base case that identified the need for this Partial Rebuild Project, the future Brickyard and Wakeman Substations will add to the loading on Line #2011 and further contribute to the capacity constraints on this line that will be resolved by the Partial Rebuild Project.

(3) Planning Studies

Verify that the planning studies used to justify the need for the proposed project considered all other generation and transmission facilities impacting the affected load area, including generation and transmission facilities that have not yet been placed into service.

The planning studies run by PJM and the Company identified the need for the Partial Rebuild Project as detailed in Section I.A. The DNH study process used the most recent (at that time) DNH RTEP case, which is based off of the 2025 RTEP model updated on a monthly basis.

The DNH case includes all TO supplemental projects that have been presented to PJM. PJM, as well as the Company, will run traditional reliability analysis on each supplemental project added to the DNH case to ensure no harm is created to the network. In this case, the DNH process revealed potential reliability violations in the Manassas Airport Area.

(4) Facilities List

Provide a list of those facilities that are not yet in service.

Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

- C. Describe the present system and detail how the proposed project will effectively satisfy present and projected future electrical load demand requirements. Provide pertinent load growth data (at least five years of historical summer and winter peak demands and ten years of projected summer and winter peak loads where applicable). Provide all assumptions inherent within the projected data and describe why the existing system cannot adequately serve the needs of the Applicant (if that is the case). Indicate the date by which the existing system is projected to be inadequate.

Response: Attachment I.G.1 shows the portion of the Company's transmission system in the area of the proposed Partial Rebuild Project. The existing Line #2011 is part of the Company's 230 kV network, which supports the delivery of generation to retail and wholesale customers including the Prince William County Data Center Opportunity District and the area surrounding Manassas Regional Airport. This area is part of the larger Woodbridge Load Area, which is one of the three load zones that make up the Company's Northern Virginia Region (the other two load zones are Alexandria/ Arlington and Fairfax).

The table in Attachment I.C.1 provides ten years of historical and projected summer and winter peak loads for the Company's Woodbridge Load Area through 2032, which includes Line #2011. The projected loads in Attachment I.C.1 represent the Company's forecasted peaks based on actual load and the PJM 2023 Load Forecast. Over the period from 2023 to 2032, the summer peak electrical demand for this area is projected to vary between 2,222 MW and 2,624 MW, and the winter peak electrical demand for this area is projected to vary between 1,786 MW and 2,090 MW.

The existing Line #2011 cannot adequately serve the needs of the Company and its customers due to the violation of NERC Reliability Standards and the Company's Planning Criteria, as discussed in Sections I.A and I.B.

Completing the Partial Rebuild Project will support Dominion Energy Virginia's continued reliable electric service to retail and wholesale customers and will support the future overall growth and system generation capability in the area.

Historical load (MW)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Woodbridge - Summer	1760.7	1773.4	1772.9	1857.0	1878.6	1939.6	1750.0	2133.8	2077.9	2175.0
Woodbridge - Winter	1463.3	1698.2	1722.8	1614.1	1683.5	1855.3	1640.9	1557.7	1586.5	1763.0

Projected load (MW)*

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Woodbridge - Summer	2222.0	2255.0	2295.0	2321.0	2408.0	2440.0	2475.0	2512.0	2593.0	2624.0
Woodbridge - Winter	1786.0	1804.0	1828.0	1852.0	1924.0	1952.0	1974.0	2002.0	2064.0	2090.0

*Forecasted values are based on the PJM 2023 Load Forecast

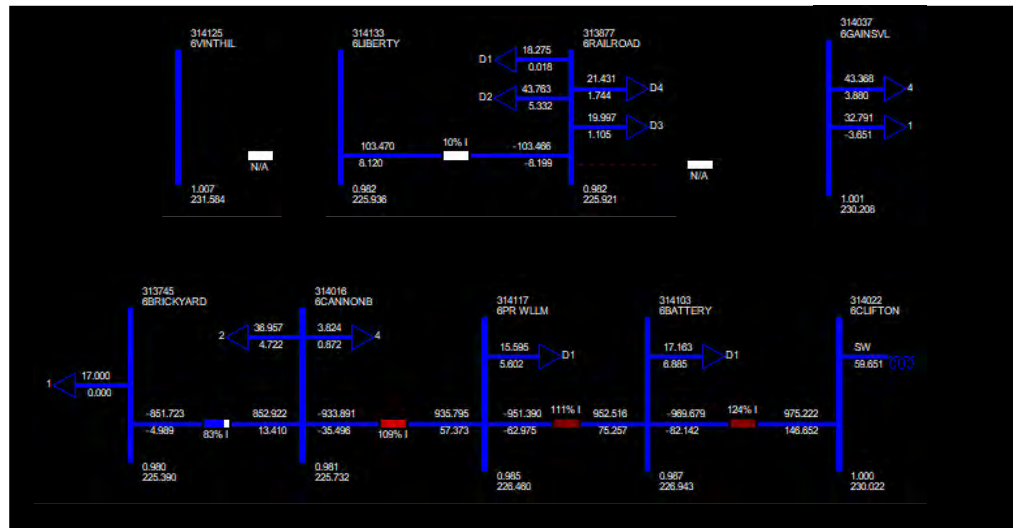
I. NECESSITY FOR THE PROPOSED PROJECT

D. If power flow modeling indicates that the existing system is, or will at some future time be, inadequate under certain contingency situations, provide a list of all these contingencies and the associated violations. Describe the critical contingencies including the affected elements and the year and season when the violation(s) is first noted in the planning studies. Provide the applicable computer screenshots of single-line diagrams from power flow simulations depicting the circuits and substations experiencing thermal overloads and voltage violations during the critical contingencies described above.

Response: For the DNH study¹⁴ performed on the September 2020 version of the 2025 RTEP model, the N-1-1 contingency and driver behind the proposed Partial Rebuild Project, loss of Gainesville-Railroad 230 kV Line #2151 and Liberty-Vint Hill 230 kV Line #2163 was identified as creating overloads on the following Line #2011 segments: Winters Branch Substation-Prince William DP, Prince William DP-Battery Heights DP, and Battery Heights DP-Clifton Substation.

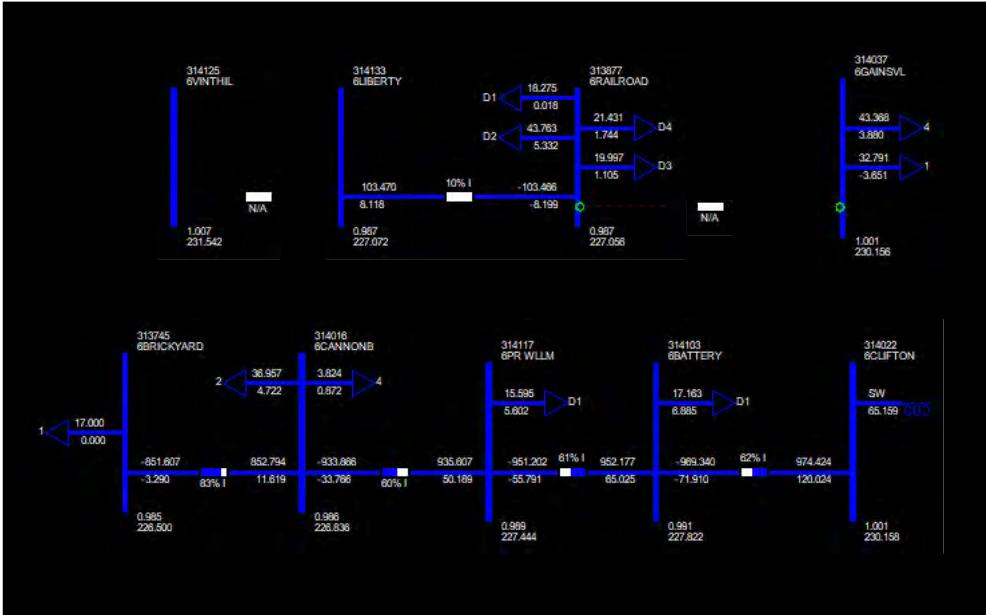
Upon presentation of the proposed Partial Rebuild Project to stakeholders via the October 6, 2020 TEAC meeting, it was included in the October 2020 version of the 2025 RTEP model in which the aforementioned violation was resolved.

RTEP Summer 2025 September DNH Case: Violation Identified



¹⁴ If, because of the DNH study, system upgrades are required, such upgrades will be considered part of the supplemental project and are the responsibility of the TO sponsoring the supplemental project.

RTEP Summer 2025 October DNH Case: Violation Resolved



I. NECESSITY FOR THE PROPOSED PROJECT

- E. Describe the feasible project alternatives, if any, considered for meeting the identified need including any associated studies conducted by the Applicant or analysis provided to the RTO. Explain why each alternative was rejected.**

Response: No feasible project alternatives were submitted to PJM.

As stated in Section I.A, the Partial Rebuild Project is necessary to resolve potential criteria violations of mandatory NERC Reliability Standards. In consideration of this need, the following alternatives were considered by the Company but were ultimately rejected as unsuccessful in resolving the criteria violations described in Section I.D.

Transmission Alternatives

230 kV Line Extension from Cannon Branch to Nokesville

This transmission alternative would provide a networking solution via the 2025 PJM RTEP model in which an approximately 6.8-mile 230 kV line extension would be brought from the Cannon Branch Substation to the Nokesville Substation, using three-phase twin-bundled 768.2 ACSS/TW type conductor, designed for a MOT of 250 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA. Before considering moving toward the conceptual design phase, it was determined that the thermal capacity constraints on the Battery Heights DP-Clifton Substation segment of Line #2011 would not be resolved. Therefore, this alternative was rejected by the Company.

Conversion of Line #163 from 115 kV to 230 kV

This transmission alternative to the Partial Rebuild Project would convert 115 kV Line #163 to 230 kV from the Cannon Branch Substation to the Bull Run Substation. Using the 2025 PJM RTEP model, it was determined that with the 230 kV conversion in place, the thermal capacity violation on the Battery Heights DP-Clifton Substation segment of Line #2011 would result in a loading percentage of 98-99% upon the N-1-1 loss of Cannon Branch-Wakeman Line #2148 and Brickyard-Cannon Branch Line #2195. In consideration of viable solutions to violations identified in the RTEP model, PJM does not consider solutions that leave the affected transmission asset above an approximately 95% thermal constraint as an acceptable mitigation. This alternative would require not only PJM's acceptance, but also significant coordination efforts between the City of Manassas and NOVEC in order to upgrade the equipment at the Woods DP and Stonewall DP. Therefore, due to the overall increased complexity and minimal overall relief of capacity constraints driving the need for this Partial Rebuild Project, it was determined that this solution would not be the optimal alternative and was rejected by the Company.

Use of 2782 Athens Conductor

The Company determined that reconductoring the existing Line #2011 steel poles with the Company's standard 3-phase twin bundled 768.2 ACSS conductor was not an option for this Partial Rebuild Project. This is because when installing the proposed conductor at a tension that achieved required clearances, the existing poles experienced shaft failures, as they were only designed for single 1590 ACSR.

Accordingly, the Company's Conceptual Transmission Engineering Department considered as a transmission alternative using a non-standard conductor that could balance structural loading with the ampacity requirements submitted by the Planning Department. The 2782 ACCC "Athens" was identified as an alternative conductor that would allow the Company to replace as few structures as possible while also balancing Planning's requirements to serve future need. The 2782 Athens conductor provides for a minimum summer transfer capacity of 1,524 MVA, which is below the Company's standard 230 kV conductor that has a minimum summer transfer of 1,573 MVA. Additionally, the Company determined that more than half of the existing structures would still require replacement to support the Athens conductor.

Given that the proposed Athens conductor would be insufficient to serve the planned and potential future load growth in the Manassas Airport Area, and that the majority of the structures supporting this conductor would still require replacement, this alternative was rejected by the Company.

Demand-Side Resources

Pursuant to the Commission's November 26, 2013, Order entered in Case No. PUE-2012-00029, and its November 1, 2018, Final Order entered in Case No. PUR-2018-00075 ("2018 Final Order"), the Company is required to provide analysis of demand-side resources ("DSM") incorporated into the Company's planning studies. DSM is the broad term that includes both energy efficiency ("EE") and demand response ("DR"). In this case, PJM and the Company have identified a need for the Partial Rebuild Project based on the need to address violations of NERC Reliability Standards and the Company's Planning Criteria, thereby enabling the Company to maintain the overall long-term reliability of its transmission system.¹⁵ Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs that are considered in PJM's fixed resource requirement ("FRR") plan because PJM only dispatches DR when the system is under stress (*i.e.*, a system emergency). Accordingly, while existing DSM is considered to the extent the load forecast accounts for it, DR that has been bid previously into PJM's reliability pricing model

¹⁵ While the PJM load forecast does not directly incorporate DR, its load forecast incorporates variables derived from Itron that reflect EE by modeling the stock of end-use equipment and its usages. Further, because PJM's load forecast considers the historical non-coincident peak ("NCP") for each load serving entity ("LSE") within PJM, it reflects the actual load reductions achieved by DSM programs to the extent an LSE has used DSM to reduce its NCPs.

(“RPM”) market is not a factor in this particular Application because of the identified need for the Partial Rebuild Project. Based on these considerations, the evaluation of the Partial Rebuild Project demonstrated that despite accounting for DSM consistent with PJM’s methods, the Partial Rebuild Project is necessary.

Incremental DSM also will not absolve the need for the Partial Rebuild Project. As reflected in Attachment I.C.1, the load area for this Partial Rebuild Project (historic and projected) ranges from 1,463 to 2,624 MW (winter and summer). By way of comparison, statewide, the Company achieved demand savings of 308.4 MW (net) / 396.8 MW (gross) from its DSM Programs in 2021.

I. NECESSITY FOR THE PROPOSED PROJECT

- F. Describe any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.**

Response: The proposed Partial Rebuild Project includes the removal of 65 single circuit 230 kV structures, which are primarily weathering steel monopoles. The existing 65 steel monopoles will be replaced with 66 weathering steel monopoles to match the existing finish of the remaining structures.

The existing Line #2011 1590 ACSR (45/7) conductor will be replaced with three-phase twin-bundled 768.2 ACSS/TW type conductor from existing Structure #2011/68, which is not being replaced, to the Company's existing Clifton Substation. The existing Line #2011 1590 ACSR (45/7) conductor has a normal/emergency transfer capability of 939 MVA. The one 3#6 ALWD shield wire will be replaced with two DNO11410 OPGW shield wires.

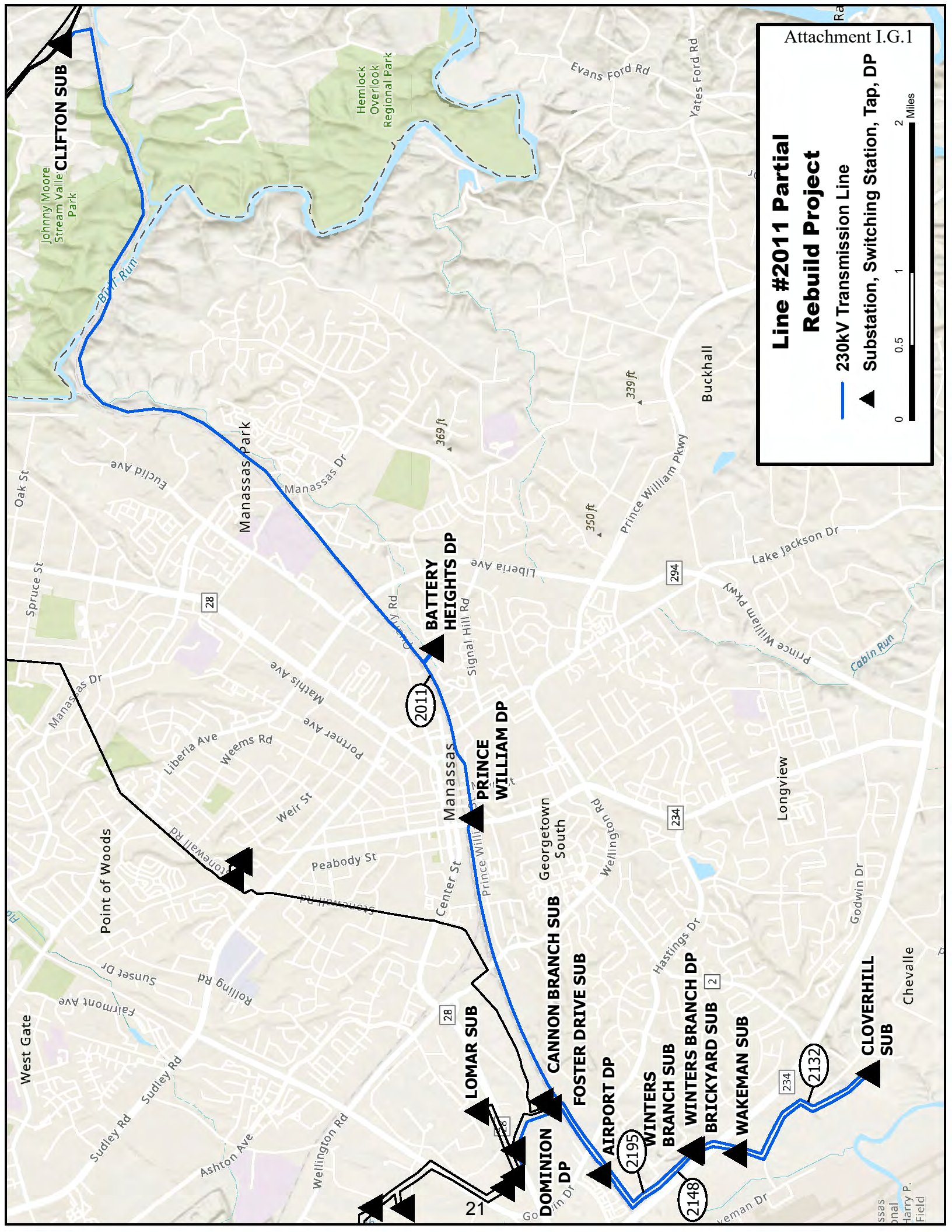
I. NECESSITY FOR THE PROPOSED PROJECT

- G. Provide a system map, in color and of suitable scale, showing the location and voltage of the Applicant's transmission lines, substations, generating facilities, etc., that would affect or be affected by the new transmission line and are relevant to the necessity for the proposed line. Clearly label on this map all points referenced in the necessity statement.**

Response: See Attachment I.G.1.

Line #2011 Partial Rebuild Project

- 230KV Transmission Line
- ▲ Substation, Switching Station, Tap, DP



I. NECESSITY FOR THE PROPOSED PROJECT

H. Provide the desired in-service date of the proposed project and the estimated construction time.

Response: The desired in-service date for the Partial Rebuild Project is December 31, 2025.

The Company estimates it will take approximately 27 months for detailed engineering, scheduled outages, materials procurement, permitting, and construction of the Partial Rebuild Project after a final order from the Commission. Due to system outage constraints and availability, the transmission line rebuild will be segmented so that the construction will only occur during “seasons” of low energy demand. Low demand seasons are defined as March 1 – June 15, and September 15 – December 31 each year. During each season of construction, a segment of the transmission line will be de-energized, wrecked and rebuilt completely before reenergizing. The Company anticipates construction of the transmission line rebuild will require four full seasons to complete. Accordingly, to support this estimated pre-construction activity timeline and construction plan, the Company respectfully requests a final order by September 29, 2023. Should the Commission issue a final order by September 29, 2023, the Company estimates that construction of the Partial Rebuild Project should begin in March 2024 and be completed by December 31, 2025. This schedule is contingent upon obtaining the necessary permits and outages. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process, as well as the ability to schedule outages, and unpredictable delays due to labor shortages or materials/supply issues.

I. NECESSITY FOR THE PROPOSED PROJECT

- I. Provide the estimated total cost of the project as well as total transmission-related costs and total substation-related costs. Provide the total estimated cost for each feasible alternative considered. Identify and describe the cost classification (e.g. “conceptual cost,” “detailed cost,” etc.) for each cost provided.**

Response: The estimated conceptual cost of the proposed Partial Rebuild Project is approximately \$31.7 million, which includes approximately \$27.3 million for transmission-related work and approximately \$4.4 million for substation-related work (2022 dollars).

I. NECESSITY FOR THE PROPOSED PROJECT

- J. If the proposed project has been approved by the RTO, provide the line number, regional transmission expansion plan number, cost responsibility assignments, and cost allocation methodology. State whether the proposed project is considered to be a baseline or supplemental project.**

Response: The Partial Rebuild Project proposal was submitted as a solution to PJM in regard to violations identified via the DNH analysis at the October 6, 2020 TEAC meeting. See Attachment I.J.1. The three Supplemental Projects discussed in Section I.A were submitted to PJM for inclusion in the 2020 Local Plan, including the Partial Rebuild Project as the selected solution. See Attachment I.J.2. Upon acceptance into the 2020 Local Plan, the Partial Rebuild Project was assigned Supplemental ID s2321.4.

The Partial Rebuild Project is presently allocated 100% to the DOM Zone.

Dominion Supplemental Projects

Transmission Expansion Advisory
Committee
October 6, 2020

Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2020-0001, DOM-2020-0004, DOM-2020-0005

Meeting Date: 10/06/2020

Process Stage: SOLUTIONS

Supplemental Project Driver: Do No Harm Analysis

Specific Assumption Reference:

Customer load request will be evaluated per Dominion's Facility Interconnections Requirements Document & Dominion's Transmission Planning Criteria.

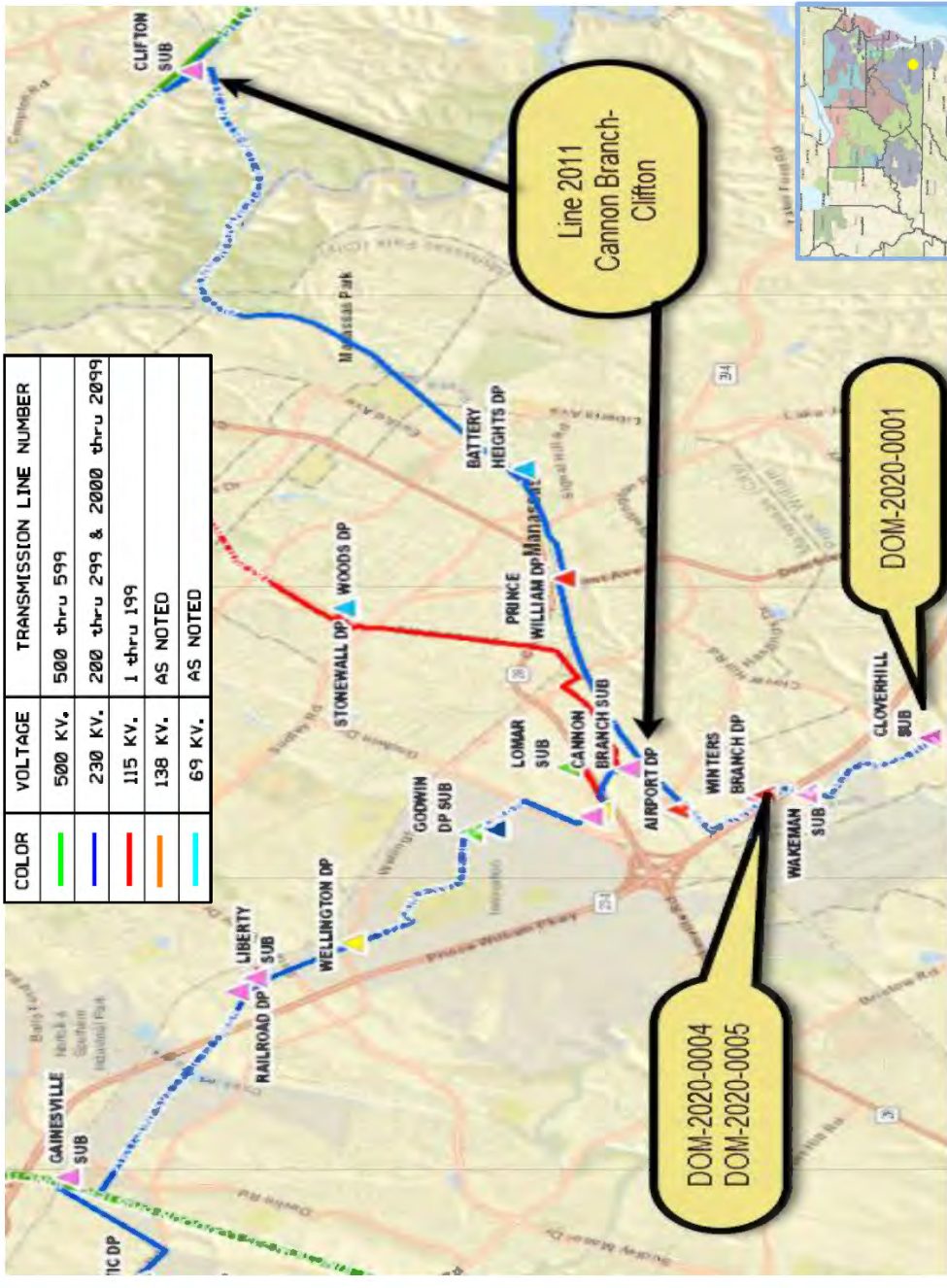
Problem Statement:

PJM has identified several N-1-1 contingencies that result in overloads associated with 230kV Line 2011 during the 2020 Do-No-Harm analysis.

For example the loss of 230kV Line 2151 (Gainesville-Railroad) and 230kV Line 2163 (Liberty-Vint Hill) creates overloads for Line 2011 segments:

- Segment 1 - Battery Heights-Clifton – (Existing rating of 797 MVA)
- Segment 2 - Battery Heights-Prince William (Existing rating of 876 MVA)
- Segment 3 -Prince William-Cannon Branch (Existing rating of 939 MVA)

The violations are caused by previously presented Supplemental Projects in the Dominion Zone in the area.



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Proposed Solution :

Re-conductor the 230kV Line 2011 from Clifton to Cannon Branch (7.54 miles) using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1574 MVA.

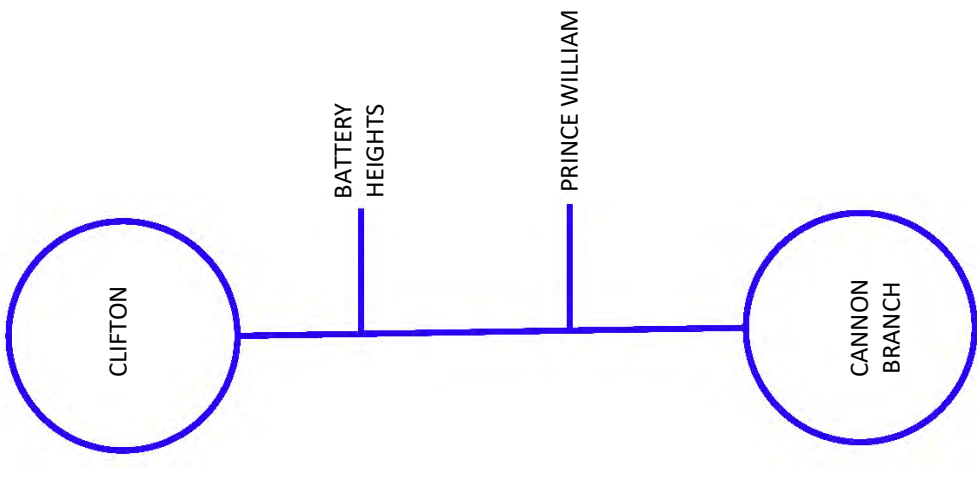
TO Alternatives Considered :

No feasible alternatives

Estimated cost: \$ 17.0M

Projected In-service Date: 12/31/2025

Project Status: Conceptual



Submission of Supplemental Projects for Inclusion in the Local Plan



Dominion Transmission Zone: Supplemental Do No Harm (DNH) Analysis

Need Number: DOM-2020-0001, DOM-2020-0004, DOM-2020-0005

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 11/04/2020

Project Driver: Do No Harm Analysis

Specific Assumption Reference:

None.

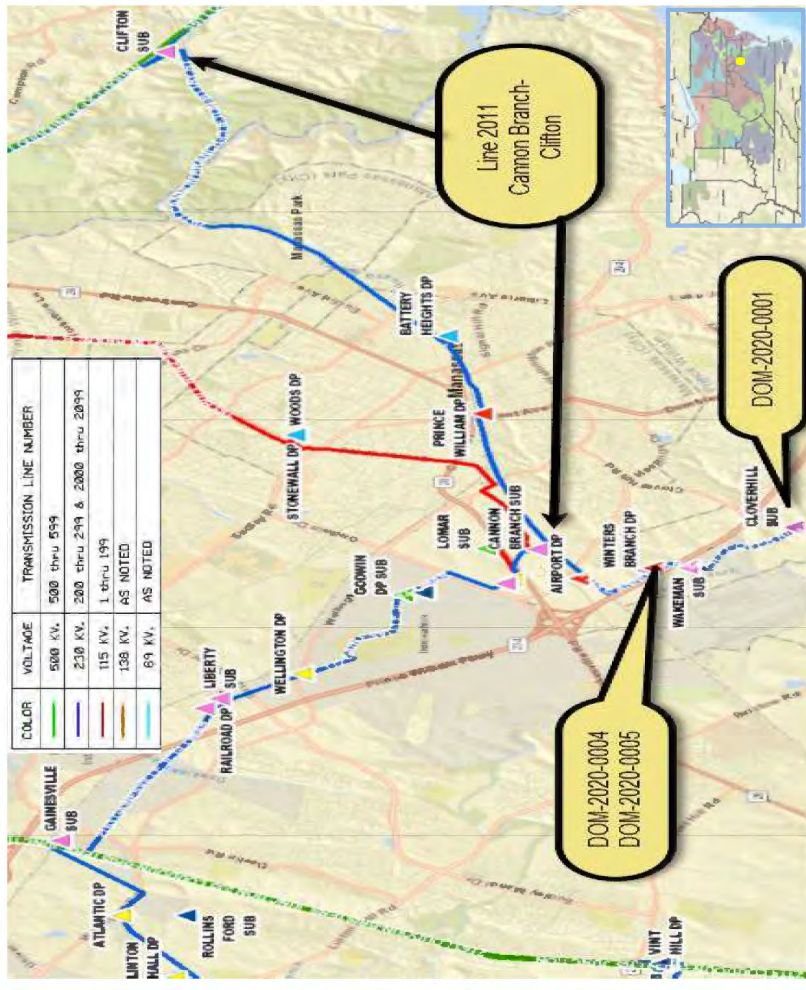
Problem Statement:

PJM has identified several N-1-1 contingencies that result in overloads associated with Line 2011 during the 2020 Do-No-Harm analysis.

For example the loss of Line 2151 (Gainesville-Railroad) and Line 2163 (Liberty-Vint Hill) creates overloads for Line 2011 segments:

- Segment 1 - Battery Heights-Clifton – (Existing rating of 797 MVA)
- Segment 2 - Battery Heights-Prince William (Existing rating of 876 MVA)
- Segment 3 -Prince William-Cannon Branch (Existing rating of 939 MVA)

The violations are caused by previously presented Supplemental Projects in the Dominion Zone in the area.



Dominion Transmission Zone: Supplemental Do No Harm (DNH) Analysis

Need Number: DOM-2020-0001, DOM-2020-0004, DOM-2020-0005

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 11/04/2020

Selected Solution :

Re-conductor the 230kV Line 2011 from Clifton to Cannon Branch (7.54 miles) using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1574 MVA.

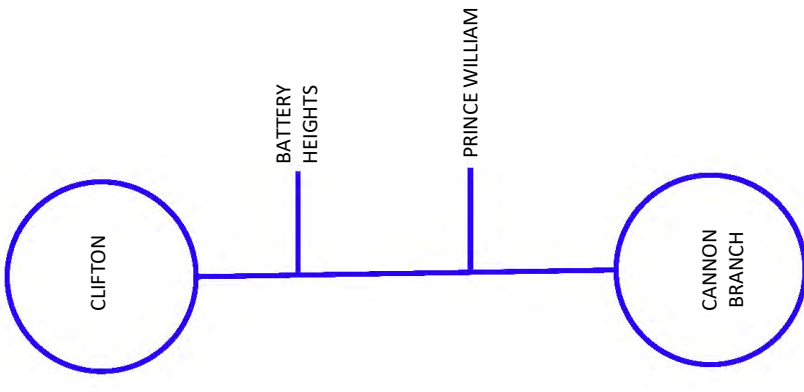
Estimated cost: \$ 17.0M

Projected In-service Date: 12/31/2025

Supplemental Project ID: s2321.4

Project Status: Conceptual

Model: 2025 RTEP



I. NECESSITY FOR THE PROPOSED PROJECT

- K. If the need for the proposed project is due in part to reliability issues and the proposed project is a rebuild of an existing transmission line(s), provide five years of outage history for the line(s), including for each outage the cause, duration and number of customers affected. Include a summary of the average annual number and duration of outages. Provide the average annual number and duration of outages on all Applicant circuits of the same voltage, as well as the total number of such circuits. In addition to outage history, provide five years of maintenance history on the line(s) to be rebuilt including a description of the work performed as well as the cost to complete the maintenance. Describe any system work already undertaken to address this outage history.**

Response: Not applicable. See Section I.A.

I. NECESSITY FOR THE PROPOSED PROJECT

- L. If the need for the proposed project is due in part to deterioration of structures and associated equipment, provide representative photographs and inspection records detailing their condition.**

Response: Not applicable. See Section I.A.

I. NECESSITY FOR THE PROPOSED PROJECT

- M. In addition to the other information required by these guidelines, applications for approval to construct facilities and transmission lines interconnecting a Non-Utility Generator (“NUG”) and a utility shall include the following information:**
- 1. The full name of the NUG as it appears in its contract with the utility and the dates of initial contract and any amendments;**
 - 2. A description of the arrangements for financing the facilities, including information on the allocation of costs between the utility and the NUG;**
 - 3. a. For Qualifying Facilities (“QFs”) certificated by Federal Energy Regulatory Commission (“FERC”) order, provide the QF or docket number, the dates of all certification or recertification orders, and the citation to FERC Reports, if available;**
b. For self-certificated QFs, provide a copy of the notice filed with FERC;
 - 4. Provide the project number and project name used by FERC in licensing hydroelectric projects; also provide the dates of all orders and citations to FERC Reports, if available; and**
 - 5. If the name provided in 1 above differs from the name provided in 3 above, give a full explanation.**

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

- N. Describe the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations and other ground facilities associated with the proposed project.**

Response: Not applicable.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

1. Provide the length of the proposed corridor and viable alternatives.

Response: The total length of the existing transmission corridor containing the Partial Rebuild Project extends approximately 7.25 miles from existing Structure #2011/68, which is not being replaced and is located one span outside of the Company’s existing Cannon Branch Substation, to the Clifton Substation.

No alternative routes are proposed for the Partial Rebuild Project. See Section II.A.9.

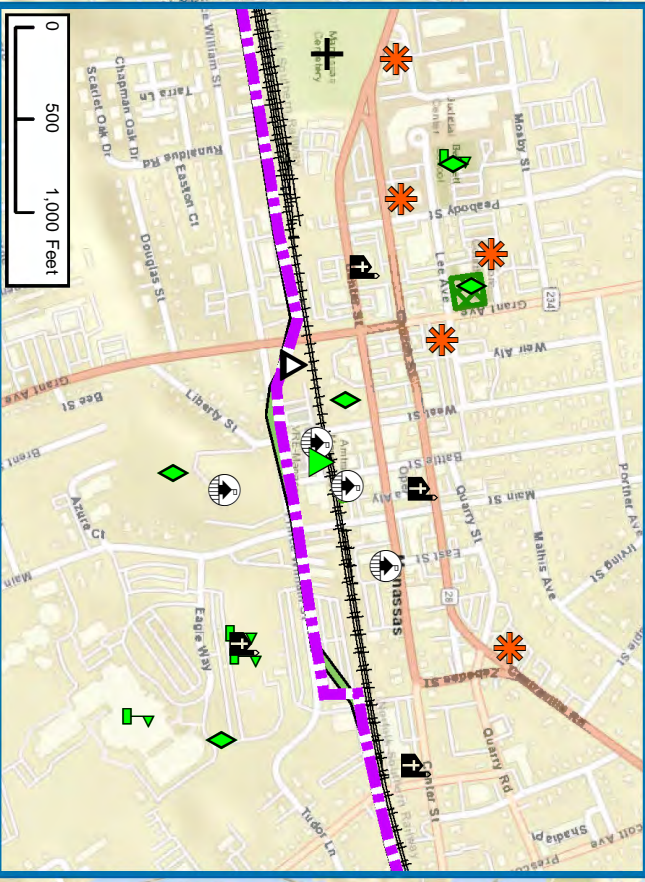
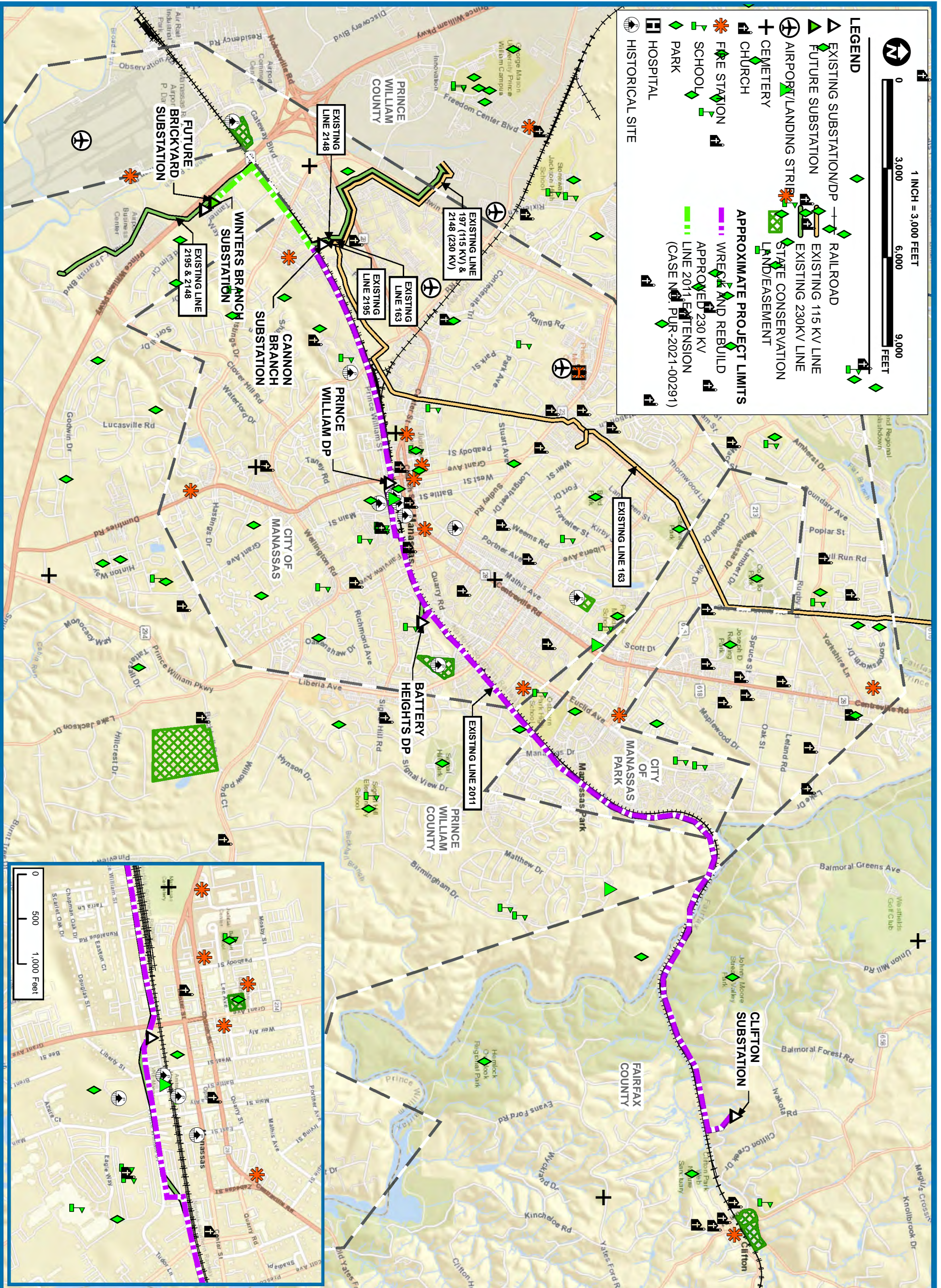
II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

2. **Provide color maps of suitable scale (including both general location mapping and more detailed GIS-based constraints mapping) showing the route of the proposed line and its relation to: the facilities of other public utilities that could influence the route selection, highways, streets, parks and recreational areas, scenic and historic areas, open space and conservation easements, schools, convalescent centers, churches, hospitals, burial grounds/cemeteries, airports and other notable structures close to the proposed project. Indicate the existing linear utility facilities that the line is proposed to parallel, such as electric transmission lines, natural gas transmission lines, pipelines, highways, and railroads. Indicate any existing transmission ROW sections that are to be quitclaimed or otherwise relinquished. Additionally, identify the manner in which the Applicant will make available to interested persons, including state and local governmental entities, the digital GIS shape file for the route of the proposed line.**

Response: See Attachment II.A.2. No portion of the 7.25-mile existing transmission corridor is proposed to be quitclaimed or relinquished.

The Company will make the digital Geographic Information Systems (“GIS”) shape file available to interested persons upon request to counsel for the Company as listed in the Partial Rebuild Project Application.



LINE #2011 230 KV
 PARTIAL REBUILD PROJECT
 APPLICANT: DOMINION ENERGY VIRGINIA

ENVIRONMENTAL CONSTRAINTS MAP II.A.2.

CITY OF MANASSAS,
 CITY OF MANASSAS PARK,
 PRINCE WILLIAM COUNTY,
 AND FAIRFAX COUNTY, VIRGINIA

res

CORPORATE | 6575 WEST LOOP SOUTH, SUITE 300, BELLAIRE, TX 77401
 P: 713.520.5400

www.res.us

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

- 3. Provide a separate color map of a suitable scale showing all the Applicant's transmission line ROWs, either existing or proposed, in the vicinity of the proposed project.**

Response: See Attachment I.G.1.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

4. **To the extent the proposed route is not entirely within existing ROW, explain why existing ROW cannot adequately service the needs of the Applicant.**

Response: The majority of the 7.25-mile Partial Rebuild Project is located within an existing 60-foot right-of-way or on Company-owned property,¹⁶ or otherwise subject to easements¹⁷ primarily acquired in the early 1990s. The Company has determined that it will need to acquire land rights at one structure location for construction of the Partial Rebuild Project.

The Company will need to obtain new property rights for Structure #2011/58 because the proposed location of that structure will be on a privately-owned parcel that does not currently have a structure. The Company has entered into a purchase agreement with the landowner to purchase the required the property in fee for land rights for Structure #2011/58.

Additionally, while the existing right-of-way is currently adequate, for safety and constructability reasons, the Company currently is negotiating with landowners to acquire parcels in fee at two structure locations: Structures #2011/36 and #2011/37. If the Company is unable to acquire the parcels in fee at these locations, the Company will work to expand the existing easements or otherwise stay within the existing easements.

See also Section II.A.6.

¹⁶ The existing 60-foot right-of-way extends from Structure #2011/6 to Structure #2011/32 and from Structure #2011/63 to Structure #2011/68. Structure #2011/2 through Structure #2011/5 are located on Company-owned property at the Clifton Substation.

¹⁷ The easements extend from Structure #2011/33 to Structure #2011/62.

II. DESCRIPTION OF THE PROPOSED PROJECT

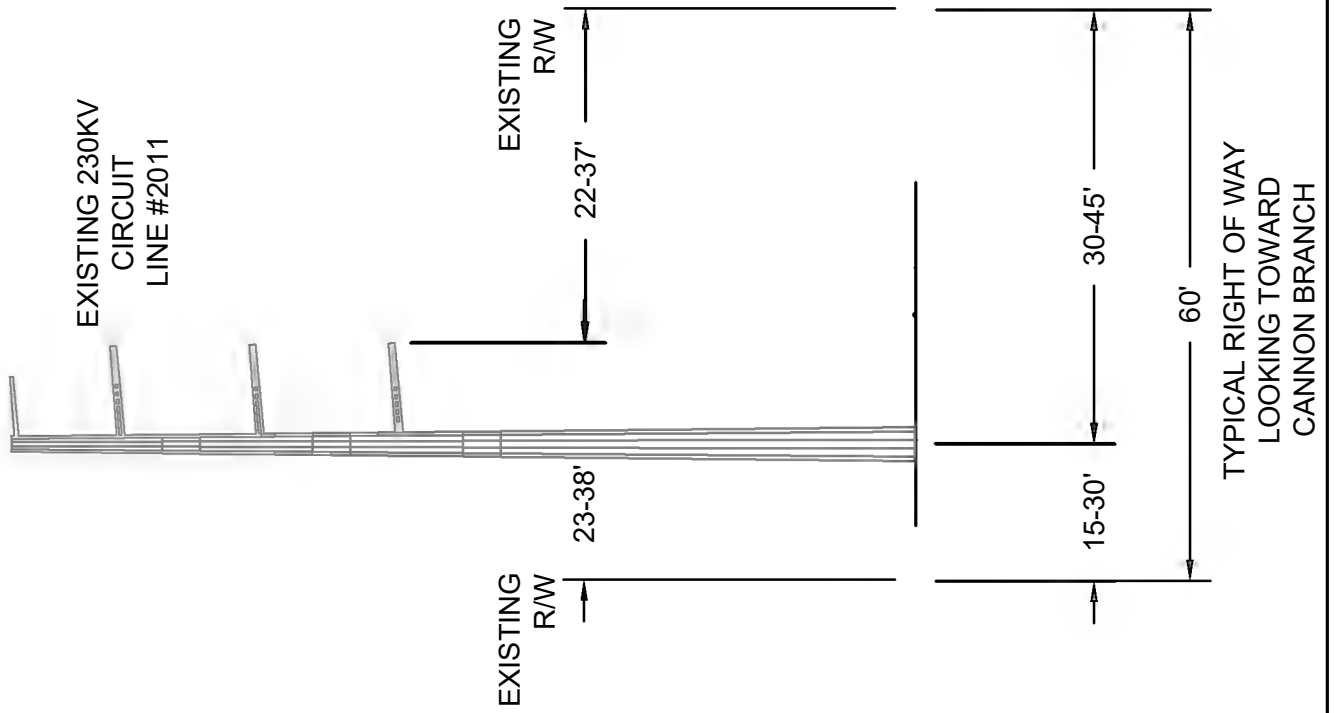
A. Right-of-way (“ROW”)

5. **Provide drawings of the ROW cross section showing typical transmission line structure placements referenced to the edge of the ROW. These drawings should include:**
 - a. **ROW width for each cross section drawing;**
 - b. **Lateral distance between the conductors and edge of ROW;**
 - c. **Existing utility facilities on the ROW; and**
 - d. **For lines being rebuilt in existing ROW, provide all of the above (i) as it currently exists, and (ii) as it will exist at the conclusion of the proposed project.**

Response: See Attachments II.A.5.i-vii.

Note that there is no existing right-of-way cross section drawing that corresponds to the proposed drawing in Attachment II.A.5.v, which depicts the proposed configuration from Structures #2011/33 through #2011/45, Structures #2011/48 through #2011/51, and Structures #2011/53 through #2011/62. Along the majority of this segment of the line, the Company has land rights but not traditional right-of-way, so there is no “ROW cross section showing typical transmission line structure placements.” The proposed configuration in Attachment II.A.5.v depicts the varying right-of-way the Company is planning to acquire along that segment of the line. Note that Structures #2011/33 through #2011/45 and Structures #2011/53 through #2011/62 have the arms on the right side (when facing toward Cannon Branch) and overhang Norfolk Southern Railroad property, with the exception of Structure #2011/36, which overhangs the City of Manassas’s Quarry Road. Structures #2011/48 through #2011/51 have arms on the left side (when facing toward Cannon Branch) and overhang the City of Manassas’s Prince William Street.

LINE #2011
2011/15-2011/30
EXISTING CONFIGURATION

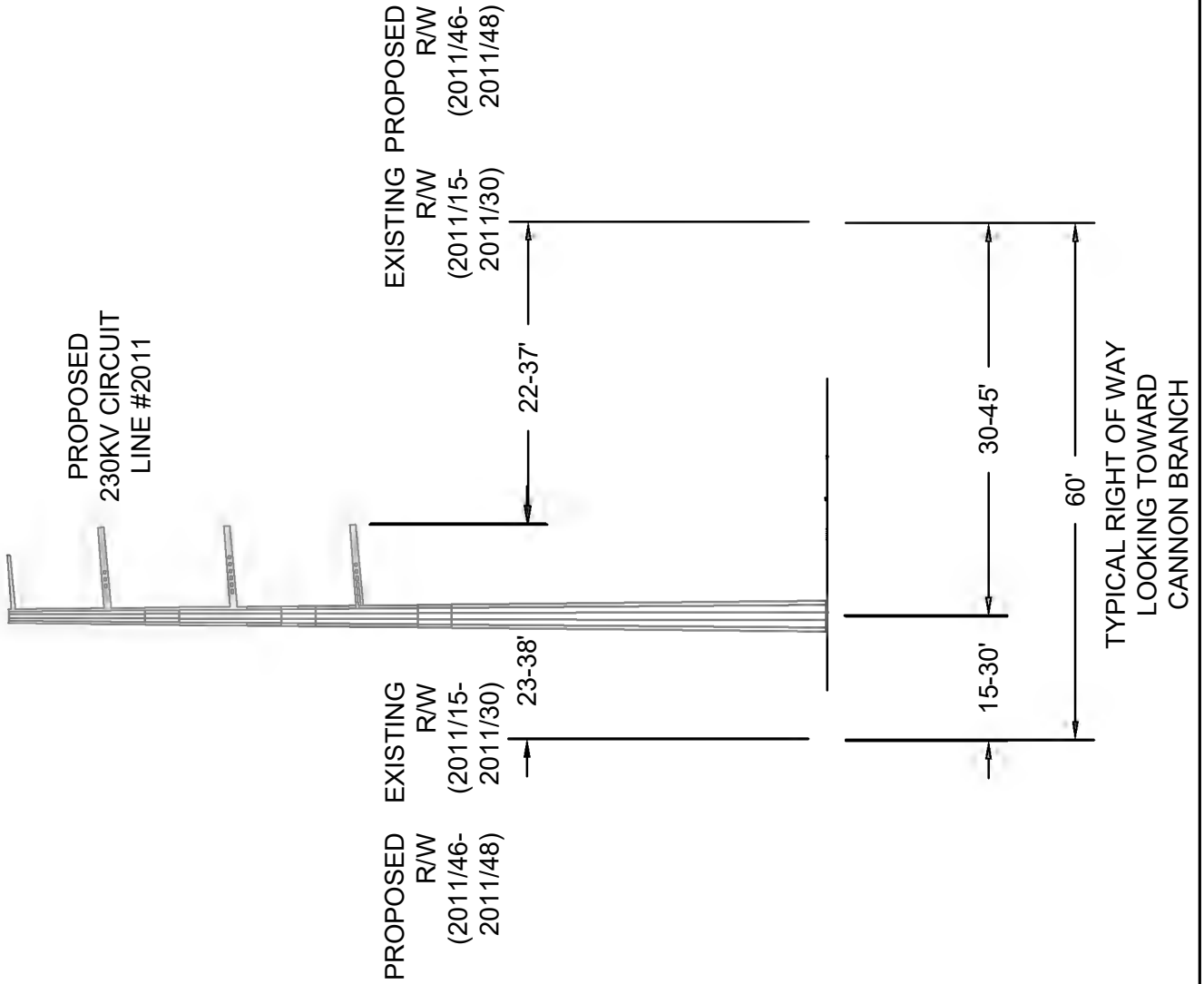


LINE #2011

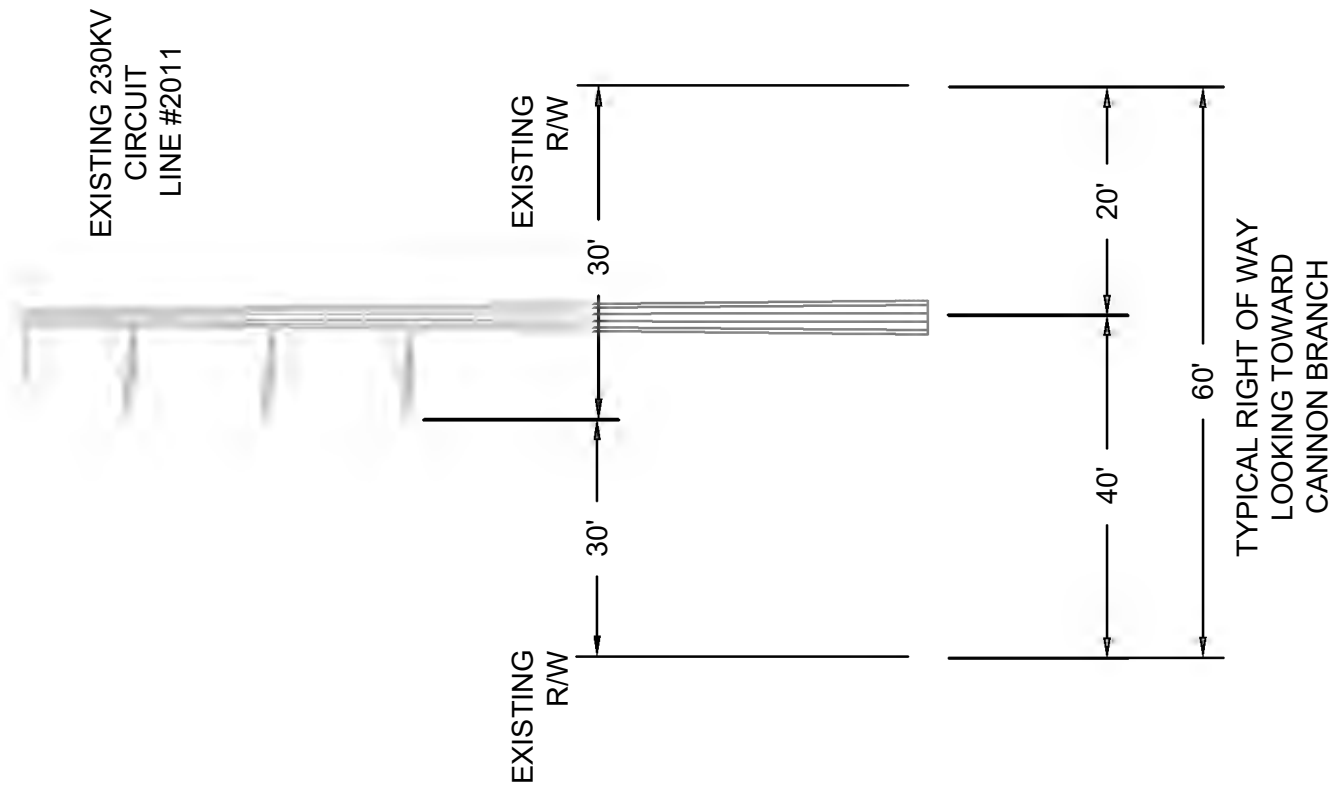
2011/15-2011/30

2011/46-2011/48

PROPOSED CONFIGURATION

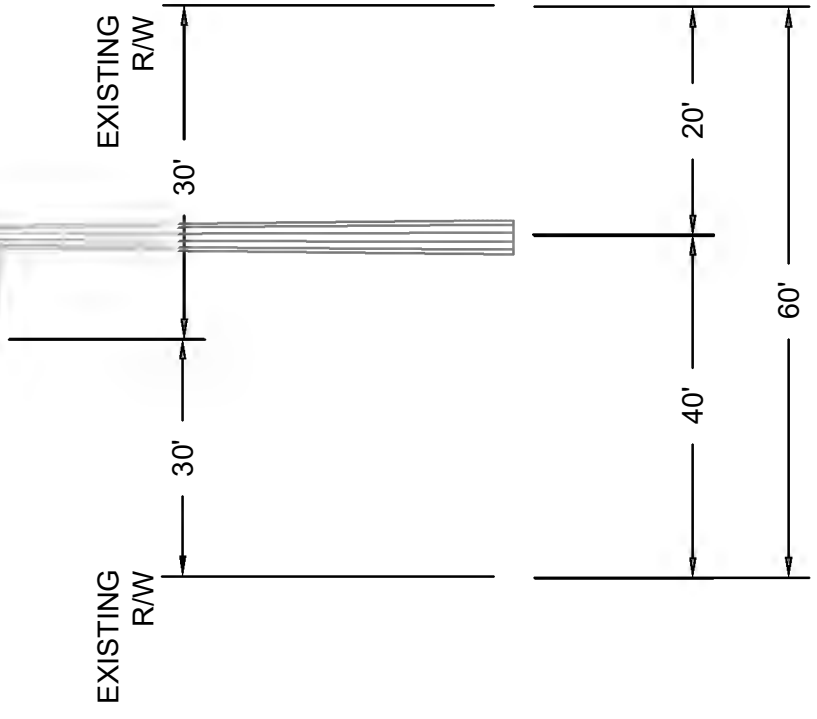


LINE #2011
2011/31-2011/32
EXISTING CONFIGURATION

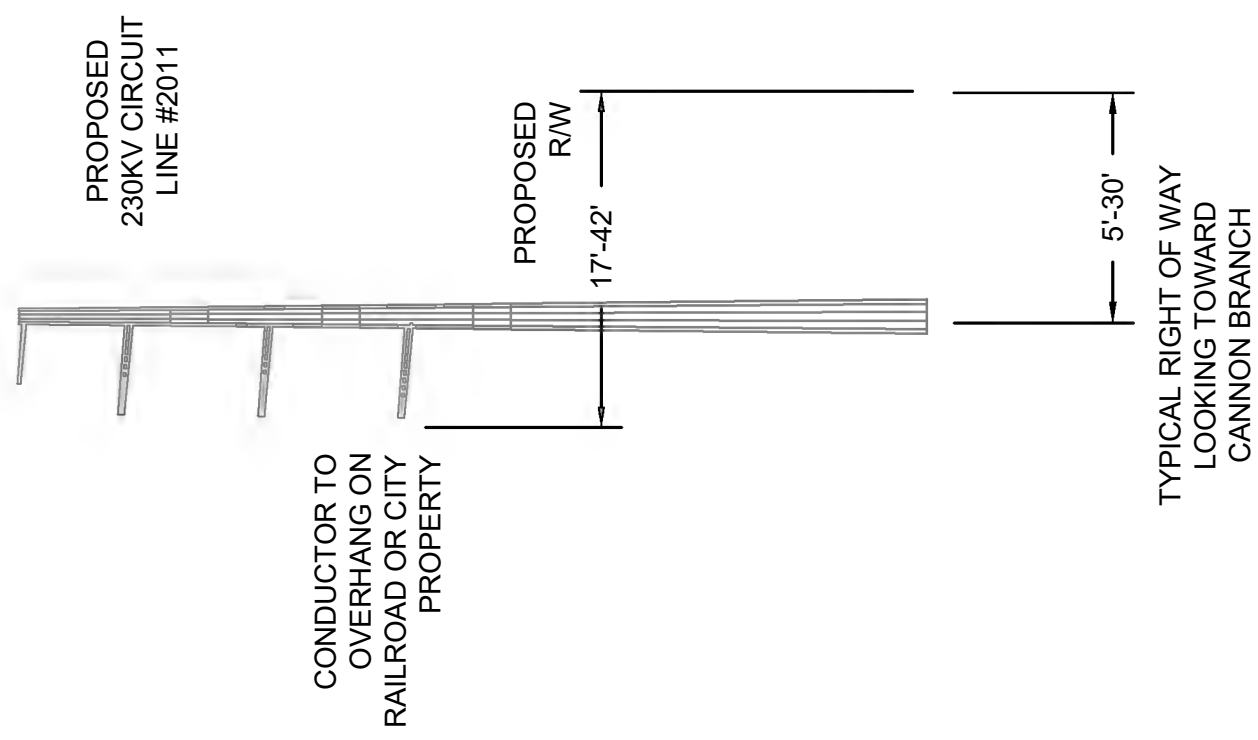


LINE #2011
2011/31-2011/32
PROPOSED CONFIGURATION

PROPOSED
230KV CIRCUIT
LINE #2011

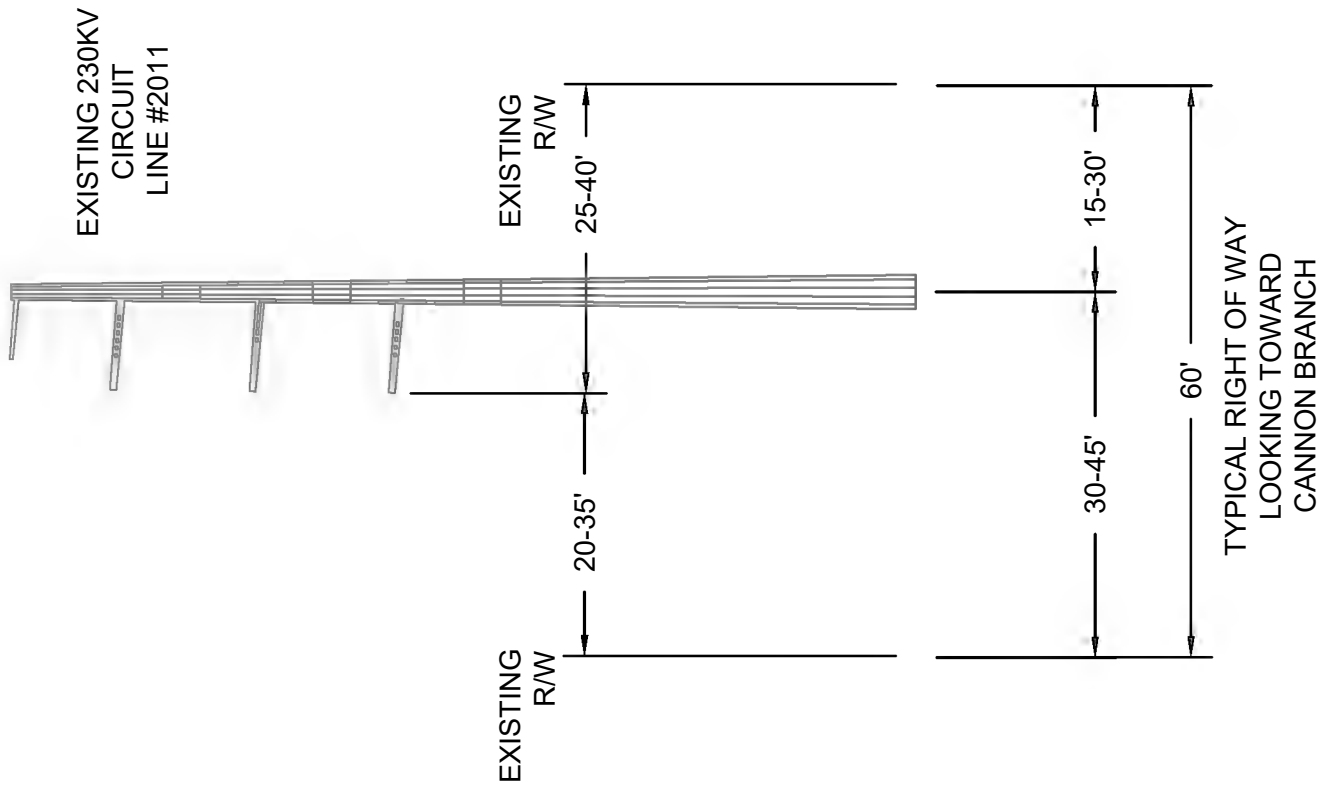


LINE #2011
2011/33-2011/45
2011/48-2011/51
2011/53-2011/62
PROPOSED CONFIGURATION



LINE #2011
2011/6-2011/14
2011/63-2011/67

EXISTING CONFIGURATION

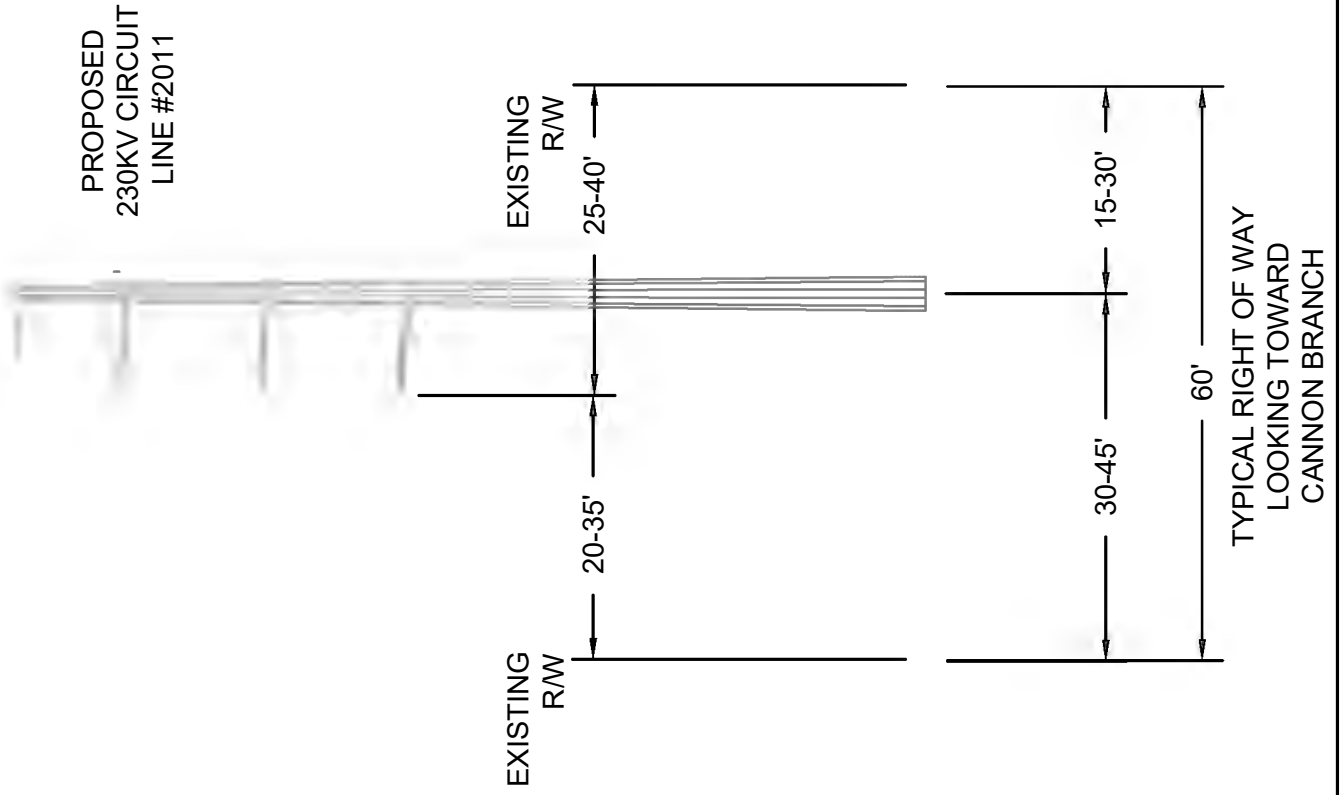


LINE #2011

2011/6-2011/14

2011/63-2011/67

PROPOSED CONFIGURATION



II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

6. Detail what portions of the ROW are subject to existing easements and over what portions new easements will be needed.

Response: The majority of the Partial Rebuild Project is within existing right-of-way, existing easements, or on Company-owned property. For the remaining segments, the Company desires to acquire additional easements, as discussed below.

At the request of the Cities of Manassas and Manassas Park, the Company is working with the Cities to slightly shift the location of the existing route and structures from existing easements while remaining on the same property owned by the Cities. See Attachment II.B.3.v. These shifts are located at Structures #2011/25 through #2011/27 (City of Manassas Park) and Structures #2011/46 through #2011/48 (City of Manassas). Between Structures #2011/46A and #2011/51, the line will continue to overhang Prince William Street, and at Structure #2011/36, the line will continue to overhang Quarry Road.

Finally, in compliance with the National Electric Safety Code (“NESC”), the Company is seeking a varying right-of-way width of up to 20 feet between some but not all of the structures ranging from Structures #2011/33 through #2011/62. While Line #2011 is currently within the existing transmission corridor, the Company does not currently have blowout rights in those segments of the line. The NESC requires horizontal clearance to be maintained between a 230 kV conductor and other installations in excess of eight and a half feet. While there are no other installations within eight and a half feet of the existing 230 kV corridor, it is prudent to obtain rights to ensure no installation is constructed in the future. Accordingly, to ensure that horizontal clearances continue to be met, the Company will pursue an easement at varying widths along these segments of the line, as needed.

The existing transmission corridor also crosses existing conservation easements, including Northern Virginia Regional Park Authority land (inclusive of 0.44 mile of Bull Run Regional Park), and Fairfax County Park Authority land (inclusive of 0.69 mile of Johnny Moore Stream Valley Park). The existing corridor also intersects a small portion of Hemlock Overlook Regional Park, which is managed by the Northern Virginia Regional Park Authority, and then runs parallel to the northern border of the Hemlock Overlook Regional Park for approximately 1.6 miles. See Attachment II.A.6 for a conservation easement map of the Partial Rebuild Project.

See also Section II.A.4.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

7. **Detail the proposed ROW clearing methods to be used and the ROW restoration and maintenance practices planned for the proposed project.**

Response: See Sections II.A.4 and II.A.6. The width of the existing transmission line corridor for the Partial Rebuild Project is currently maintained for operation of the existing transmission line facilities. Based on existing conditions, minimal tree clearing would be required from Structures #2011/25 through #2011/68 as these structures are positioned within a highly developed area along the Norfolk Southern Railroad. Some trimming of tree limbs along the edge of the right-of-way between Structures #2011/14 through #2011/25 and Structures #2011/31 through #2011/33 and within the existing easements between Structures #2011/34 through #2011/35 and #2011/37 through #2011/48 may be conducted to support construction activities for the Partial Rebuild Project. Additionally, minimal tree clearing may be required within the transmission line corridor at locations discussed in Sections II.A.4 and II.A.6.

For any such minimal clearing, trees will be cut to no more than three inches above ground level. Trees located outside of the right-of-way that are tall enough to potentially impact the transmission facilities, commonly referred to as “danger trees,” may also need to be cut. Danger trees will be cut to be no more than three inches above ground level, limbed, and will remain where felled. Debris that is adjacent to homes will be disposed of by chipping or removal. In other areas, debris may be mulched or chipped as practicable. Danger tree removal will be accomplished by hand in wetland areas and within 100 feet of streams, if applicable. Care will be taken not to leave debris in streams or wetland areas. Matting may be used for heavy equipment in these areas. Erosion control devices will be used on an ongoing basis during all clearing and construction activities.

Erosion control will be maintained and temporary stabilization for all soil disturbing activities will be used until the right-of-way has been restored. Upon completion of the Partial Rebuild Project, the Company will restore the right-of-way utilizing site rehabilitation procedures outlined in the Company’s Standards & Specifications for Erosion & Sediment Control and Stormwater Management for Construction and Maintenance of Linear Electric Transmission Facilities that was approved by the Virginia Department of Environmental Quality (“DEQ”). Time of year and weather conditions may affect when permanent stabilization takes place.

This right-of-way will continue to be maintained on a regular cycle to prevent interruptions to electric service and provide ready access to the right-of-way in order to patrol and make emergency repairs. Periodic maintenance to control woody growth will consist of hand cutting, machine mowing, and herbicide application.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

8. Indicate the permitted uses of the proposed ROW by the easement landowner and the Applicant.

Response: Any non-transmission use will be permitted that:

- Is in accordance with the terms of the easement agreement for the right-of-way;
- Is consistent with the safe maintenance and operation of the transmission lines;
- Will not restrict future line design flexibility; and,
- Will not permanently interfere with future construction.

Subject to the terms of the easement, examples of typical permitted uses include but are not limited to:

- Agriculture;
- Hiking Trails;
- Fences;
- Perpendicular Road Crossings;
- Perpendicular Utility Crossings;
- Residential Driveways; and,
- Wildlife / Pollinator Habitat.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

9. **Describe the Applicant’s route selection procedures. Detail the feasible alternative routes considered. For each such route, provide the estimated cost and identify and describe the cost classification (e.g. “conceptual cost,” “detailed cost,” etc.). Describe the Applicant’s efforts in considering these feasible alternatives. Detail why the proposed route was selected and other feasible alternatives were rejected. In the event that the proposed route crosses, or one of the feasible routes was rejected in part due to the need to cross, land managed by federal, state, or local agencies or conservation easements or open space easements qualifying under §§ 10.1-1009 – 1016 or §§ 10.1-1700 – 1705 of the Code (or a comparable prior or subsequent provision of the Code), describe the Applicant’s efforts to secure the necessary ROW.**

Response: The Company’s route selection for transmission line rebuild projects begins with a review of existing rights-of-way. This approach generally minimizes impacts on the natural and human environments. This approach is also consistent with Attachment 1 to these Guidelines, which provides a tool routinely used by the Company in routing its transmission line projects. Specifically, this approach is consistent with Guideline #1, which states that existing rights-of-way should be given priority when adding new transmission facilities, and §§ 56-46.1 and 56-259 of the Code of Virginia (“Va. Code”), which promote the use of existing rights-of-way for new transmission facilities. For the proposed Partial Rebuild Project, the majority of the 7.25-mile route is within the existing right-of-way, existing easements, or on Company-owned property. See Sections II.A.4 and II.A.6.

Given the availability of existing right-of-way and/or easements and the statutory preference given to the use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on entirely new right-of-way, the Company did not consider any alternate routes requiring new right-of-way for this Partial Rebuild Project.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

10. Describe the Applicant’s construction plans for the project, including how the Applicant will minimize service disruption to the affected load area. Include requested and approved line outage schedules for affected lines as appropriate.

Response: No service to customers will be interrupted during construction of the Partial Rebuild Project, as the Company has the ability to switch all load to alternate sources. Assuming a final order from the Commission by September 29, 2023, as requested in Section I.H of this Appendix, the Company estimates that construction of the Partial Rebuild Project should begin in March 2024 and be completed by December 1, 2025.

Construction of the Partial Rebuild Project will be completed in the following segments: Winters Branch-Prince William DP, Prince William DP-Battery Heights DP, and Battery Heights DP-Clifton Substation. The Company plans to take the following outages for each segment.

- Winters Branch-Prince William DP segment: This segment of the Partial Rebuild Project is approximately 1.61 miles from Structure #2011/68, which is not being replaced, to Structure #2011/52 at the Prince William DP. Structure #2011/52 is the backbone inside the Prince William DP and is not being replaced. The Company currently anticipates that this segment will be completed from fall to winter of 2024.
- Prince William DP-Battery Heights segment: This segment of the Partial Rebuild Project is approximately 0.95 mile from Structure #2011/52 at the Prince William DP to Structure #2011/38A at the Battery Heights DP. Structure #2011/38A is the backbone inside the Battery Heights DP and is not being replaced. The Company currently anticipates that this segment will be completed in the spring of 2025.
- Battery Heights-Clifton Substation segment: This segment of the Partial Rebuild Project is approximately 4.69 miles from Structure #2011/38A at the Battery Heights DP to Structure #2011/1 at the Clifton Substation. Structure #2011/1 is the backbone in the Clifton Substation and is not being replaced. The Company currently anticipates that outages to complete this segment will be broken up between spring and fall 2025 (total of four months).

The Company will request line outages from PJM prior to the date of such outages. It is customary for PJM to not grant approval of the outages until shortly before the outages are expected to occur and, therefore, they may be subject to change.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

11. Indicate how the construction of this transmission line follows the provisions discussed in Attachment 1 of these Guidelines.

Response: As noted in Section II.A.9, Attachment 1 to these Guidelines contains a tool routinely used by the Company in routing its transmission line projects.

The Company utilized Guideline #1 (existing rights-of-way should be given priority when adding additional facilities) by siting the proposed Partial Rebuild Project within the existing transmission corridor.

By utilizing the existing transmission corridor, the proposed Partial Rebuild Project will minimize impacts to any site listed on the National Register of Historic Places (“NRHP”). Thus, it is consistent with Guideline #2 (where practical, rights-of-way should avoid sites listed on the NRHP). See Section III.A for a description of the resources identified in the Stage I Pre-Application Analysis (“Stage I Analysis”) prepared by Dutton and Associates (“Dutton”) on behalf of the Company, which is included with the DEQ Supplement as Attachment 2.I.1. Consistent with its customary practice, the Company will coordinate with the Virginia Department of Historic Resources (“VDHR”) regarding the findings of the Stage I Analysis.

The Company has communicated with local, state, and federal agencies prior to filing this Application consistent with Guideline #4 (where government land is involved the applicant should contact the agencies early in the planning process). See Sections III.B and III.J of this Appendix, and the DEQ Supplement.

The Company follows recommended construction methods in the Guidelines on a site-specific basis for typical construction projects (Guideline #8, #10, #11, #15, #16, #18, and #22).

The Company also utilizes recommended guidelines in clearing right-of-way, constructing facilities, and maintaining rights-of-way after construction. Moreover, secondary uses of right-of-way that are consistent with the safe maintenance and operation of facilities are permitted.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (“ROW”)

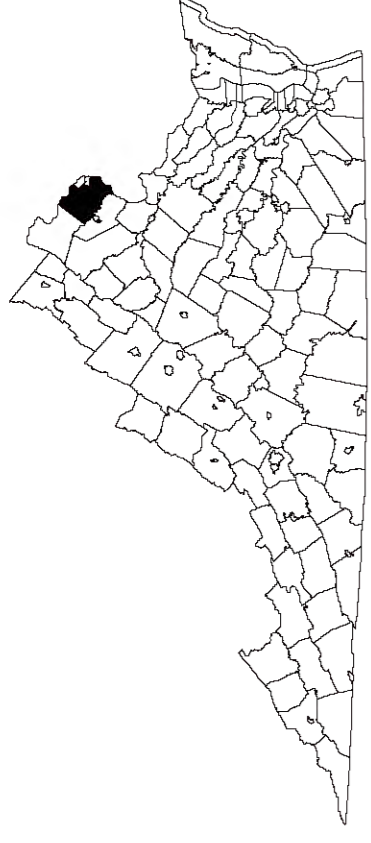
12. a. **Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the Applicant's certificated service area: (1) identify each electric utility affected; (2) state whether any affected electric utility objects to such construction; and (3) identify the length of line(s) proposed to be located in the service area of an electric utility other than the Applicant; and**
- b. **Provide three (3) color copies of the Virginia Department of Transportation “General Highway Map” for each county and city through which the line will pass. On the maps show the proposed line and all previously approved and certificated facilities of the Applicant. Also, where the line will be located outside of the Applicant’s certificated service area, show the boundaries between the Applicant and each affected electric utility. On each map where the proposed line would be outside of the Applicant's certificated service area, the map must include a signature of an appropriate representative of the affected electric utility indicating that the affected utility is not opposed to the proposed construction within its service area.**

Response: a. The proposed approximately 7.25-mile Partial Rebuild Project is located within Prince William County (5.30 miles) and Fairfax County (1.95 miles). The 5.30 miles located in Prince William County is inclusive of the Cities of Manassas (3.43 miles) and Manassas Park (1.40 miles).

The proposed Partial Rebuild Project is not located entirely within Dominion Energy Virginia’s service territory. Approximately 3.8 miles of the Partial Rebuild Project is located in NOVEC’s service territory and approximately 3.41 miles of the Partial Rebuild Project is located in the City of Manassas’s service territory. Neither NOVEC nor the City of Manassas object to the construction of the Partial Rebuild Project.

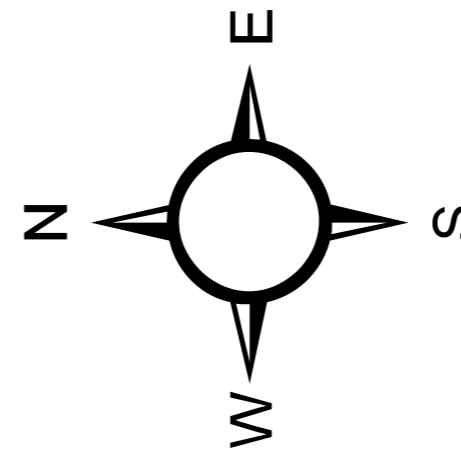
- b. Electronic copies of the maps of the Virginia Department of Transportation “General Highway Map” for Fairfax County and Prince William County are marked as required and filed with the Application. Reduced copies of the maps are provided as Attachment II.A.12.b.i (Fairfax County) and Attachment II.A.12.b.ii (Prince William County).

Fairfax County Road Map



This digital map depicts the Virginia Electric and Power Company ("Company") transmission facilities in this county as approved by the Virginia State Corporation Commission ("SCC"), and any proposed transmission facilities in this county, as of October 13, 2022. Other Company facilities previously authorized by the SCC may be depicted on prior SCC approved county maps.

Stream data from Esri. Road data from Esri and VDOT. Transmission line and electric service territory data from Department of Homeland Infrastructure. Rail data from VGIN.



NORTHERN VIRGINIA ELECTRIC COOPERATIVE IS NOT OPPOSED TO SUCH CONSTRUCTION IN ITS SERVICE TERRITORY.

Thomas Pierpoint

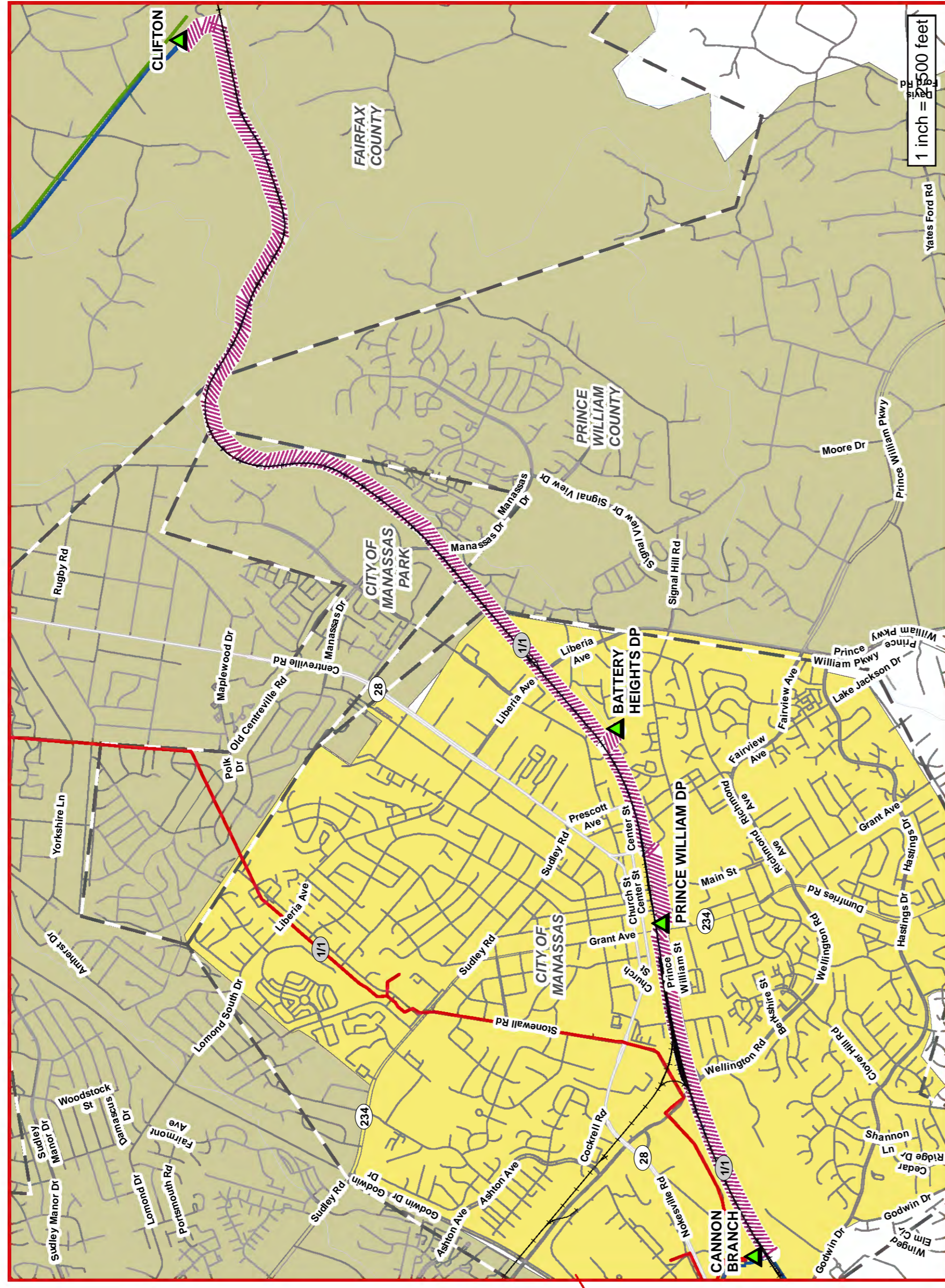
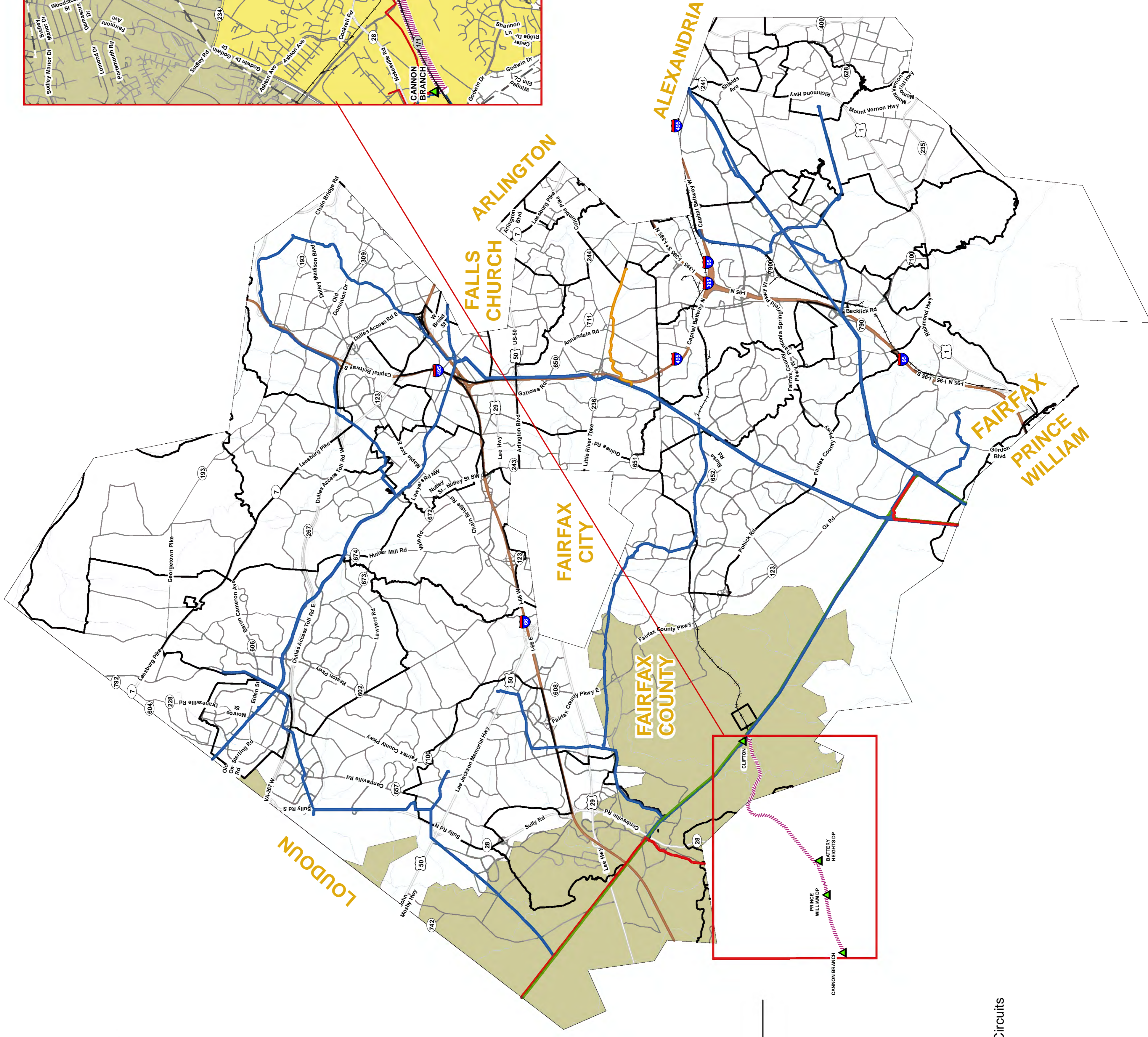
SIGNATURE _____
 NAME (PRINT) Thomas Pierpoint
 DATE 3/24/2023 TITLE VP, Operations

Legend

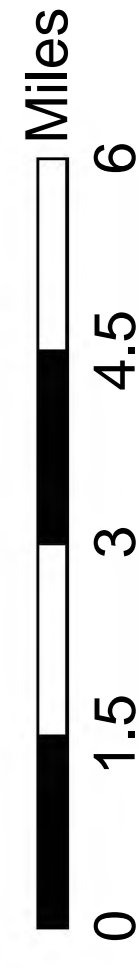
- Wreck and Rebuild of 230 kV Line 2011
- Number of Lines of Structures/Number of Circuits
- Existing Substation
- Existing 115 kV Line
- Existing 230 kV Line
- Existing 500 kV Line
- City of Manassas (Va)

Provider Service Territory

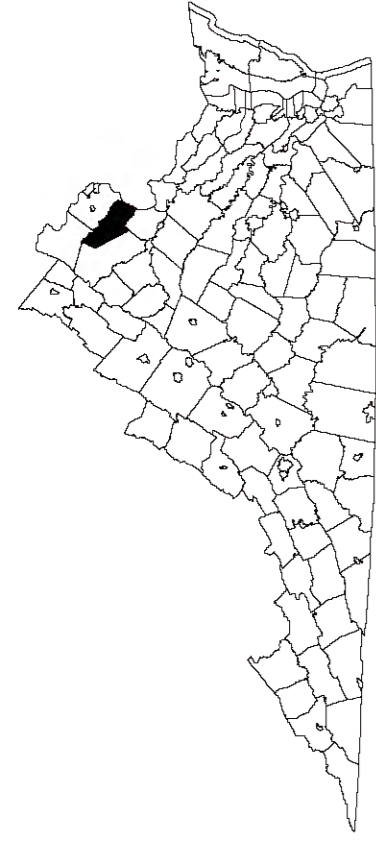
- Northern Virginia Electric Cooperation
- VEPCO



*Road data obtained from VDOT and Esri, current as of August 2022.

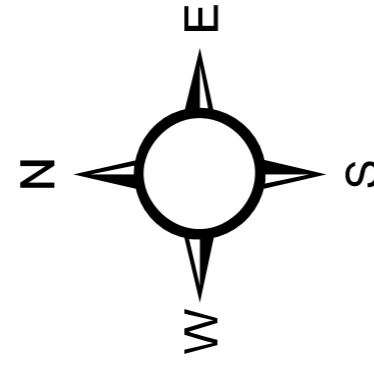


City of Manassas, City of Manassas Park, and Prince William County Road Map



This digital map depicts the Virginia Electric and Power Company ("Company") transmission facilities in this county as approved by the Virginia State Corporation Commission ("SCC"), and any proposed transmission facilities in this county, as of October 13, 2022. Other Company facilities previously authorized by the SCC may be depicted on prior SCC approved county maps.

Stream data from Esri. Road data from Esri and VDOT. Transmission line and electric service territory data from Department of Homeland Infrastructure. Rail data from VGIN.



VIRGINIA ELECTRIC AND POWER COMPANY PLANS TO REMOVE AND CONSTRUCT TRANSMISSION LINES AND SUBSTATIONS AS SHOWN IN PINK DASHES ON THIS MAP.

THE CITY OF MANASSAS IS NOT OPPOSED TO SUCH CONSTRUCTION IN ITS SERVICE TERRITORY.

SIGNATURE _____

NAME (PRINT) Tony Dawood

DATE 3/28/2023 TITLE Director of Utilities

NORTHERN VIRGINIA ELECTRIC COOPERATIVE IS NOT OPPOSED TO SUCH CONSTRUCTION IN ITS SERVICE TERRITORY.

SIGNATURE _____

NAME (PRINT) Thomas Pierpoint

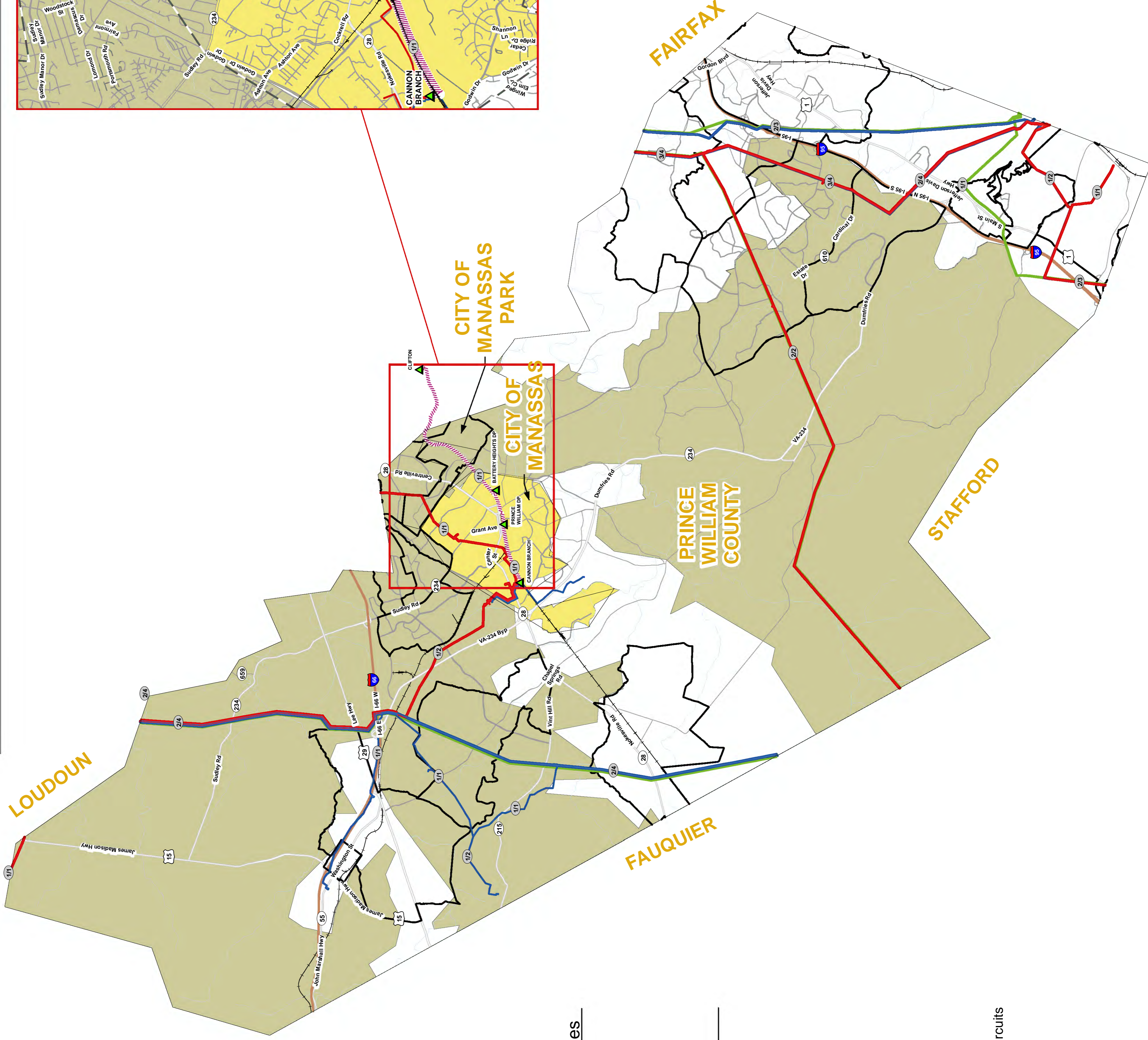
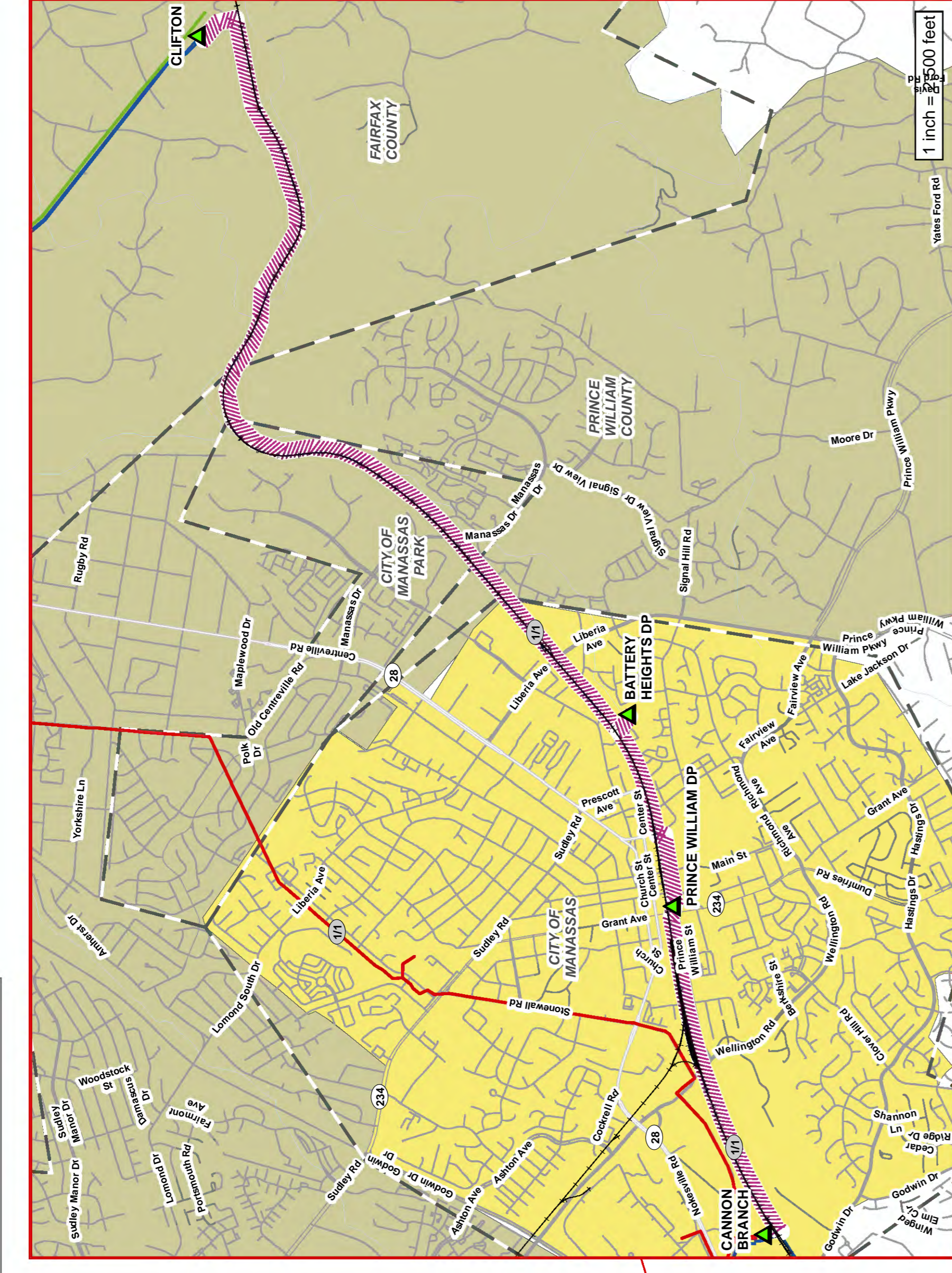
DATE 3/24/2023 TITLE VP, Operations

Legend

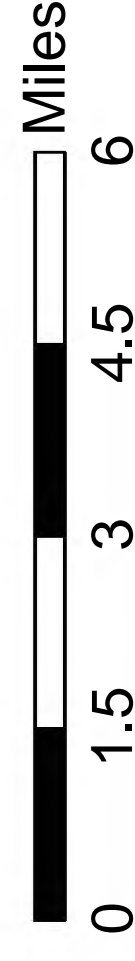
- Wreck and Rebuild of 230 kV Line 2011
- Number of Lines of Structures/Number of Circuits
- Existing Substation
- Existing 115 kV Line
- Existing 230 kV Line
- Existing 500 kV Line
- City of Manassas (Va)

Provider Service Territory

- Northern Virginia Electric Cooperation
- VEPCO



*Road data obtained from VDOT and Esri, current as of August 2022.



II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

- 1. Detail the number of circuits and their design voltage, initial operational voltage, any anticipated voltage upgrade, and transfer capabilities.**

Response: The single circuit 230 kV Line #2011 will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,573 MVA.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

2. **Detail the number, size(s), type(s), coating and typical configurations of conductors. Provide the rationale for the type(s) of conductor(s) to be used.**

Response: The single circuit 230 kV Line #2011 will have 3-phase twin-bundled 768.2 ACSS (20/7) conductors arranged as shown in Attachments II.B.3.i-iv with two fiber optic shield wires. The twin-bundled 768.2 ACSS (20/7) conductors and fiber optic shield wire are a Company standard for new 230 kV construction.

II. DESCRIPTION OF THE PROPOSED PROJECT

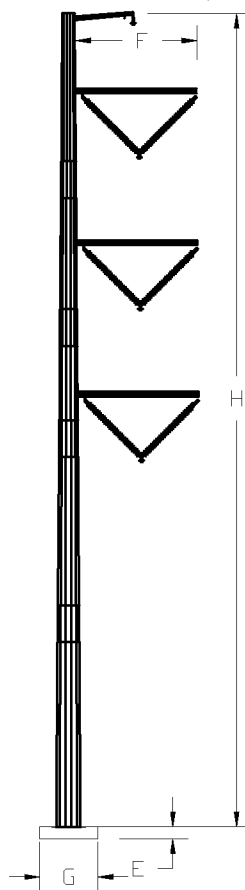
B. Line Design and Operational Features

- 3. With regard to the proposed supporting structures over each portion of the ROW for the preferred route, provide diagrams (including foundation reveal) and descriptions of all the structure types, to include:**
 - a. mapping that identifies each portion of the preferred route;**
 - b. the rationale for the selection of the structure type;**
 - c. the number of each type of structure and the length of each portion of the ROW;**
 - d. the structure material and rationale for the selection of such material;**
 - e. the foundation material;**
 - f. the average width at cross arms;**
 - g. the average width at the base;**
 - h. the maximum, minimum and average structure heights;**
 - i. the average span length; and**
 - j. the minimum conductor-to-ground clearances under maximum operating conditions.**

Response: See Attachment II.B.3.i-iv.

See Attachment II.B.3.v for approximate mapping of the proposed structures for the Partial Rebuild Project, which is subject to change during final engineering.

LINE #2011 PARTIAL REBUILD PROJECT
2011/6 - 2011/67

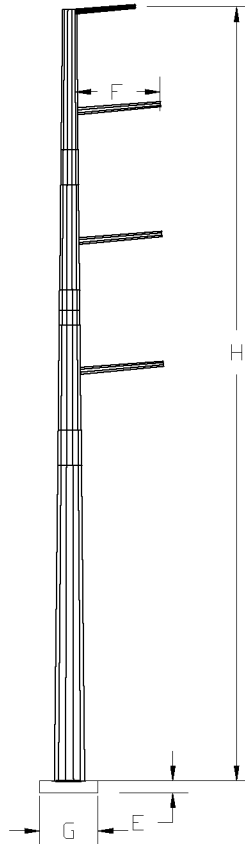


230kV SC ENGINEERED MONOPOLE SUSPENSION STRUCTURE

- | | |
|-----------------------------------|--|
| A. MAPPING OF THE ROUTE: | SEE ATTACHMENT II.B.3.v |
| B. RATIONALE FOR STRUCTURE TYPE: | TO MATCH EXISTING LINE |
| C. LENGTH OF R/W (STRUCTURE QTY): | 6.5 MILES (26 STRUCTURES) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | TO MATCH EXISTING LINE |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 2 |
| F. AVERAGE WIDTH AT CROSS ARM: | 16.5' |
| G. AVERAGE WIDTH AT BASE: | SEE NOTE 2 |
| H. MINIMUM STRUCTURE HEIGHT: | 100' |
| MAXIMUM STRUCTURE HEIGHT: | 140' |
| AVERAGE STRUCTURE HEIGHT: | 121' |
| I. AVERAGE SPAN LENGTH (RANGE): | 556' (284'-825') (SEE NOTE 4) |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 22.5' (AT MAXIMUM OPERATING TEMPERATURE) |

- NOTES: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. A MINIMUM FOUNDATION REVEAL SHALL BE 1.5 FEET. FOUNDATION DIAMETER SHALL BE BASED ON FINAL ENGINEERING.
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND DO NOT INCLUDE FOUNDATION REVEAL.
4. THE SPAN ASSOCIATED WITH EACH STRUCTURE IS THE AHEAD SPAN.

LINE #2011 PARTIAL REBUILD PROJECT
2011/6 - 2011/67

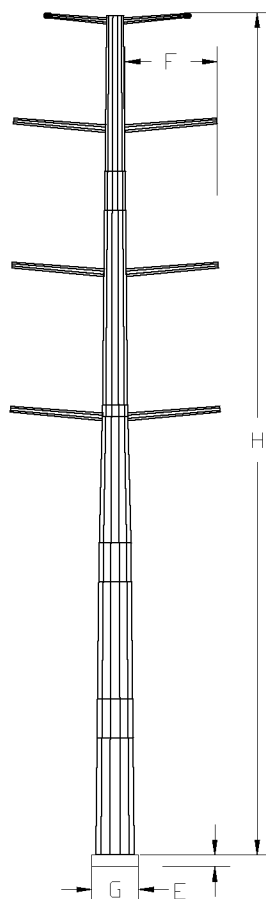


230kV SC ENGINEERED MONOPOLE DDE STRUCTURE

- | | |
|-----------------------------------|--|
| A. MAPPING OF THE ROUTE: | SEE ATTACHMENT II.B.3.v |
| B. RATIONALE FOR STRUCTURE TYPE: | TO MATCH EXISTING LINE |
| C. LENGTH OF R/W (STRUCTURE QTY): | 6.5 MILES (33 STRUCTURES) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | TO MATCH EXISTING LINE |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 2 |
| F. AVERAGE WIDTH AT CROSS ARM: | 12' |
| G. AVERAGE WIDTH AT BASE: | SEE NOTE 2 |
| H. MINIMUM STRUCTURE HEIGHT: | 85' |
| MAXIMUM STRUCTURE HEIGHT: | 130' |
| AVERAGE STRUCTURE HEIGHT: | 120' |
| I. AVERAGE SPAN LENGTH (RANGE): | 551' (82'-901') (SEE NOTE 4) |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 22.5' (AT MAXIMUM OPERATING TEMPERATURE) |

- NOTES: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. A MINIMUM FOUNDATION REVEAL SHALL BE 1.5 FEET. FOUNDATION DIAMETER SHALL BE BASED ON FINAL ENGINEERING.
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND DO NOT INCLUDE FOUNDATION REVEAL.
4. THE SPAN ASSOCIATED WITH EACH STRUCTURE IS THE AHEAD SPAN.

LINE #2011 PARTIAL REBUILD PROJECT
2011/38, BATTERY HEIGHTS TAP

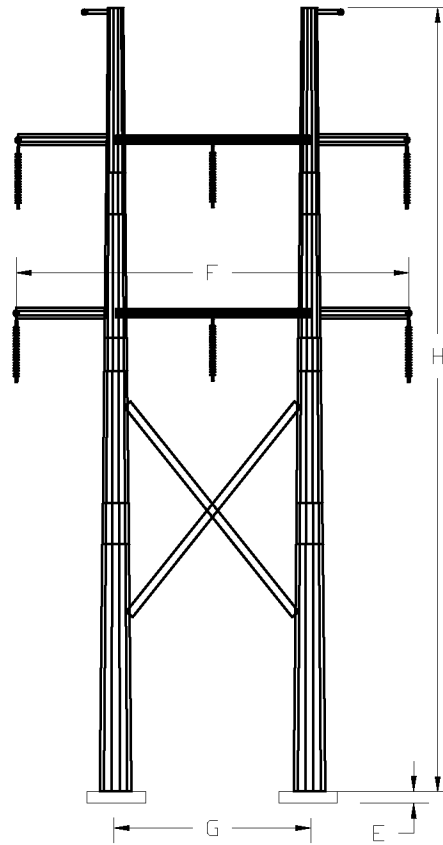


230kV SC ENGINEERED MONOPOLE DDE TAP STRUCTURE

- | | |
|-----------------------------------|--|
| A. MAPPING OF THE ROUTE: | SEE ATTACHMENT II.B.3.v |
| B. RATIONALE FOR STRUCTURE TYPE: | TO MATCH EXISTING LINE |
| C. LENGTH OF R/W (STRUCTURE QTY): | 6.5 MILES (1 STRUCTURE) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | TO MATCH EXISTING LINE |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 2 |
| F. AVERAGE WIDTH AT CROSS ARM: | 12' |
| G. AVERAGE WIDTH AT BASE: | SEE NOTE 2 |
| H. MINIMUM STRUCTURE HEIGHT: | 120' |
| MAXIMUM STRUCTURE HEIGHT: | 120' |
| AVERAGE STRUCTURE HEIGHT: | 120' |
| I. AVERAGE SPAN LENGTH (RANGE): | 386' (386'-386') (SEE NOTE 4) |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 22.5' (AT MAXIMUM OPERATING TEMPERATURE) |

- NOTES: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. A MINIMUM FOUNDATION REVEAL SHALL BE 1.5 FEET. FOUNDATION DIAMETER SHALL BE BASED ON FINAL ENGINEERING.
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND DO NOT INCLUDE FOUNDATION REVEAL.
4. THE SPAN ASSOCIATED WITH EACH STRUCTURE IS THE AHEAD SPAN.

LINE #2011 PARTIAL REBUILD PROJECT
2011/38B



230kV DC ENGINEERED H-FRAME

- | | |
|-----------------------------------|--|
| A. MAPPING OF THE ROUTE: | SEE ATTACHMENT II.B.3.v |
| B. RATIONALE FOR STRUCTURE TYPE: | TO MATCH EXISTING LINE |
| C. LENGTH OF R/W (STRUCTURE QTY): | 6.5 MILES (1 STRUCTURE) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | TO MATCH EXISTING LINE |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 2 |
| F. AVERAGE WIDTH AT CROSS ARM: | 48' |
| G. AVERAGE WIDTH AT BASE: | SEE NOTE 2 |
| H. MINIMUM STRUCTURE HEIGHT: | 95' |
| MAXIMUM STRUCTURE HEIGHT: | 95' |
| AVERAGE STRUCTURE HEIGHT: | 95' |
| I. AVERAGE SPAN LENGTH (RANGE): | 109' (109'-109') (SEE NOTE 4) |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 22.5' (AT MAXIMUM OPERATING TEMPERATURE) |

- NOTES: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. A MINIMUM FOUNDATION REVEAL SHALL BE 1.5 FEET. FOUNDATION DIAMETER SHALL BE BASED ON FINAL ENGINEERING.
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND DO NOT INCLUDE FOUNDATION REVEAL.
4. THE SPAN ASSOCIATED WITH EACH STRUCTURE IS THE AHEAD SPAN.



THE PROPOSED APPROXIMATE STRUCTURE HEIGHTS ARE FROM THE CONCEPTUAL DESIGN CREATED TO ESTIMATE THE COST OF THE PARTIAL REBUILD PROJECT AND ARE SUBJECT TO CHANGE BASED ON FINAL ENGINEERING DESIGN.

Structure Number	2011/1	2011/2	2011/3	2011/4	2011/5	2011/6	2011/7	2011/8	2011/9	2011/10	2011/11	2011/12	2011/13	2011/14	2011/15	2011/16	2011/17	2011/18	2011/19	2011/20	2011/21	2011/22	2011/23	2011/24
Existing Height (ft)	70	120	120	115	115	105	100	80	95	120	115	100	120	90	125	95	110	95	120	120	90	95	120	125
Proposed Height (ft)	N/A	120	120	120	110	110	105	85	100	125	120	100	120	95	125	95	110	105	125	120	90	95	120	125
Structure Number	2011/25	2011/26	2011/27	2011/28	2011/29	2011/30	2011/31	2011/32	2011/33	2011/34	2011/35	2011/36	2011/37	2011/38	2011/38A	2011/38B	2011/39	2011/40	2011/41	2011/42	2011/43	2011/44	2011/45	2011/46
Existing Height (ft)	120	120	130	130	135	110	115	130	130	110	115	115	121	107	80	N/A	116	132	111	114	95	99	95	97
Proposed Height (ft)	125	125	130	145	145	115	115	130	130	125	120	120	120	120	N/A	95	115	125	115	125	105	125	105	105
Structure Number	2011/46A	2011/47	2011/48	2011/49	2011/50	2011/51	2011/52	2011/53	2011/54	2011/55	2011/56	2011/57	2011/58	2011/59	2011/60	2011/61	2011/62	2011/63	2011/64	2011/65	2011/66	2011/67	2011/68	
Existing Height (ft)	N/A	80	100	95	65	60	70	105	120	120	129	115	115	115	115	115	110	110	110	115	115	120	100	
Proposed Height (ft)	100	115	115	N/A	100	90	N/A	N/A	120	125	120	125	120	120	120	120	115	120	130	120	115	120	N/A	

1 INCH = 700 FEET

0 700 1,400 2,100 FEET



LEGEND

- EXISTING SUBSTATION/DP
- FUTURE SUBSTATION
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- APPROVED STRUCTURE
- EXISTING 115 KV LINE
- EXISTING 230KV LINE
- APPROXIMATE PROJECT LIMITS
- WRECK AND REBUILD
- APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)

LINE #2011 230 KV
 PARTIAL REBUILD PROJECT
 APPLICANT: DOMINION ENERGY VIRGINIA

EXISTING AND PROPOSED STRUCTURES MAP
 II.B.3.v.

CITY OF MANASSAS, CITY OF MANASSAS PARK,
 PRINCE WILLIAM COUNTY, AND FAIRFAX COUNTY,
 VIRGINIA

ores | 6575 WEST LOOP SOUTH, SUITE 300, BELLAIRE, TX 77401
 P: 713.520.5400
 WWW.RES.US

PROJECT MANAGER: CZ
 DRAWN: LC
 JOB NUMBER: 103811
 DATE EXPORTED: 10/27/2022
 REVISIONS: 02/28/2023 (LC)

SHEET 1 OF 4

Document Path: R:\Res\entg\Projects\103811_TL_2011_11B3v_Structures_11x17.mxd Date Saved: 2/28/2023



THE PROPOSED APPROXIMATE STRUCTURE HEIGHTS ARE FROM THE CONCEPTUAL DESIGN CREATED TO ESTIMATE THE COST OF THE PARTIAL REBUILD PROJECT AND ARE SUBJECT TO CHANGE BASED ON FINAL ENGINEERING DESIGN.

Structure Number	2011/1	2011/2	2011/3	2011/4	2011/5	2011/6	2011/7	2011/8	2011/9	2011/10	2011/11	2011/12	2011/13	2011/14	2011/15	2011/16	2011/17	2011/18	2011/19	2011/20	2011/21	2011/22	2011/23	2011/24
Existing Height (ft)	70	120	120	115	115	105	100	80	95	120	115	100	120	90	125	95	110	95	120	120	90	95	120	125
Proposed Height (ft)	N/A	120	120	120	120	110	105	85	100	125	120	100	120	95	125	95	110	105	125	120	90	95	120	125
Structure Number	2011/25	2011/26	2011/27	2011/28	2011/29	2011/30	2011/31	2011/32	2011/33	2011/34	2011/35	2011/36	2011/37	2011/38	2011/38A	2011/38B	2011/39	2011/40	2011/41	2011/42	2011/43	2011/44	2011/45	2011/46
Existing Height (ft)	120	120	130	130	135	110	115	130	130	110	115	115	121	107	80	N/A	116	132	111	114	95	99	95	97
Proposed Height (ft)	125	125	130	145	145	115	115	130	130	125	120	120	120	120	N/A	95	115	125	115	125	105	125	105	105
Structure Number	2011/46A	2011/47	2011/48	2011/49	2011/50	2011/51	2011/52	2011/53	2011/54	2011/55	2011/56	2011/57	2011/58	2011/59	2011/60	2011/61	2011/62	2011/63	2011/64	2011/65	2011/66	2011/67	2011/68	
Existing Height (ft)	N/A	80	100	95	65	60	70	N/A	120	120	129	115	115	115	115	110	115	110	110	115	115	120	100	
Proposed Height (ft)	100	115	115	N/A	100	90	N/A	N/A	120	125	120	125	120	120	120	120	115	120	130	120	120	115	N/A	



1 INCH = 700 FEET
 0 700 1,400 2,100
 FEET



- LEGEND**
- EXISTING SUBSTATION/DP
 - FUTURE SUBSTATION
 - EXISTING STRUCTURE
 - PROPOSED STRUCTURE
 - APPROVED STRUCTURE
- APPROXIMATE PROJECT LIMITS**
- EXISTING 115 KV LINE
 - EXISTING 230KV LINE
 - WRECK AND REBUILD
 - APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)

LINE #2011 230 KV
 PARTIAL REBUILD PROJECT
 APPLICANT: DOMINION ENERGY VIRGINIA

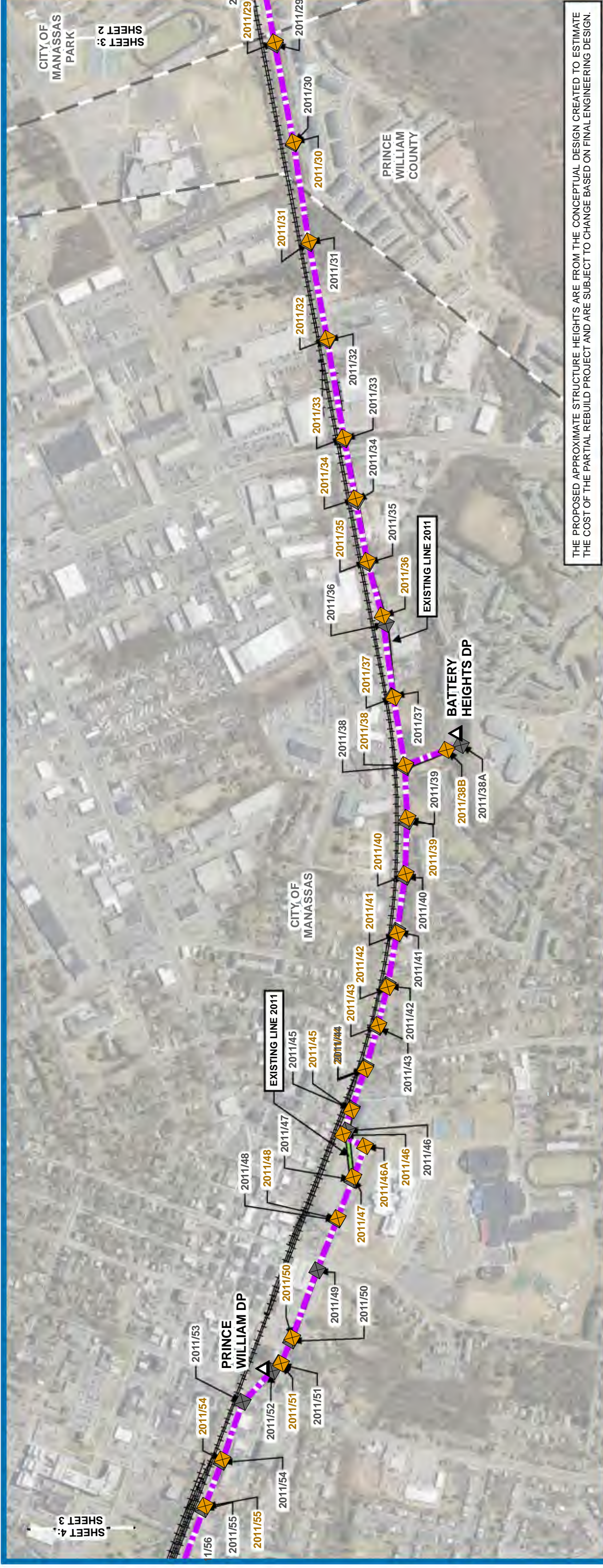
EXISTING AND PROPOSED STRUCTURES MAP
 II.B.3.v.
 CITY OF MANASSAS, CITY OF MANASSAS PARK,
 PRINCE WILLIAM COUNTY, AND FAIRFAX COUNTY,
 VIRGINIA




CORPORATE | 6575 WEST LOOP SOUTH, SUITE 300, BELLAIRE, TX 77401
 P: 713.520.5400
 WWW.RES.US

PROJECT MANAGER: CZ
 DRAWN: LC
 JOB NUMBER: 109811
 DATE EXPORTED: 10/27/2022
 REVISIONS: 02/28/2023 (LC)

SHEET 2 OF 4



THE PROPOSED APPROXIMATE STRUCTURE HEIGHTS ARE FROM THE CONCEPTUAL DESIGN CREATED TO ESTIMATE THE COST OF THE PARTIAL REBUILD PROJECT AND ARE SUBJECT TO CHANGE BASED ON FINAL ENGINEERING DESIGN.

Structure Number	2011/1	2011/2	2011/3	2011/4	2011/5	2011/6	2011/7	2011/8	2011/9	2011/10	2011/11	2011/12	2011/13	2011/14	2011/15	2011/16	2011/17	2011/18	2011/19	2011/20	2011/21	2011/22	2011/23	2011/24
Existing Height (ft)	70	120	120	115	115	105	100	80	95	120	115	100	120	90	125	95	110	95	120	120	90	95	120	125
Proposed Height (ft)	N/A	120	120	120	120	110	105	85	100	125	120	100	120	95	125	95	110	105	125	120	90	95	120	125
Structure Number	2011/25	2011/26	2011/27	2011/28	2011/29	2011/30	2011/31	2011/32	2011/33	2011/34	2011/35	2011/36	2011/37	2011/38	2011/38A	2011/38B	2011/39	2011/40	2011/41	2011/42	2011/43	2011/44	2011/45	2011/46
Existing Height (ft)	120	120	130	130	135	110	115	130	130	110	115	115	121	107	80	N/A	116	132	111	114	95	99	95	97
Proposed Height (ft)	125	125	130	145	145	115	115	130	130	125	120	120	120	120	N/A	95	115	125	115	125	105	125	105	105
Structure Number	2011/46A	2011/47	2011/48	2011/49	2011/50	2011/51	2011/52	2011/53	2011/54	2011/55	2011/56	2011/57	2011/58	2011/59	2011/60	2011/61	2011/62	2011/63	2011/64	2011/65	2011/66	2011/67	2011/68	
Existing Height (ft)	N/A	80	100	115	65	60	70	N/A	100	120	125	115	115	115	115	115	110	110	110	115	115	120	100	
Proposed Height (ft)	100	115	115	115	100	90	N/A	N/A	100	120	125	120	120	120	120	120	115	120	130	120	120	115	N/A	



- LEGEND**
- EXISTING SUBSTATION/DP
 - FUTURE SUBSTATION
 - EXISTING STRUCTURE
 - PROPOSED STRUCTURE
 - APPROVED STRUCTURE
- APPROXIMATE PROJECT LIMITS**
- EXISTING 115 KV LINE
 - EXISTING 230KV LINE
 - WRECK AND REBUILD
 - APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)

LINE #2011 230 KV
 PARTIAL REBUILD PROJECT
 APPLICANT: DOMINION ENERGY VIRGINIA

EXISTING AND PROPOSED STRUCTURES MAP
 II.B.3.v.

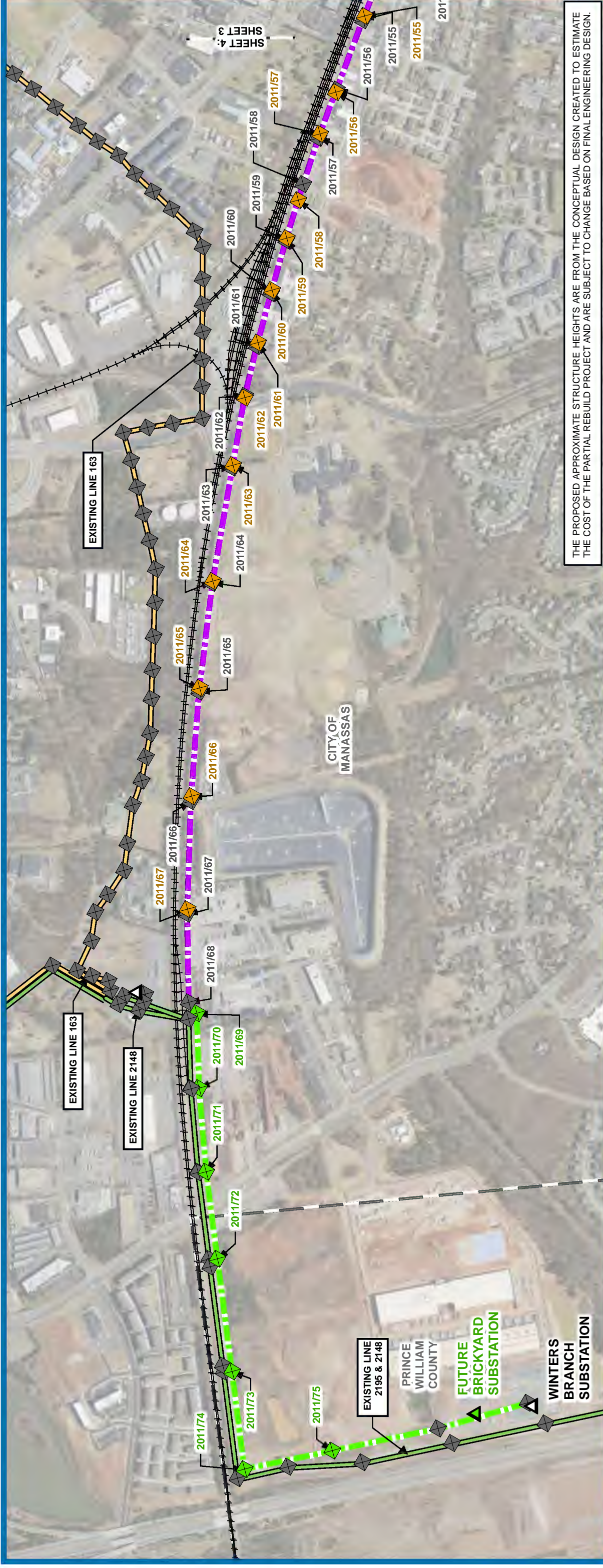
CITY OF MANASSAS, CITY OF MANASSAS PARK,
 PRINCE WILLIAM COUNTY, AND FAIRFAX COUNTY,
 VIRGINIA

res
 Dominion Energy

CORPORATE | 6575 WEST LOOP SOUTH, SUITE 300, BELLAIRE, TX 77401
 P: 713.520.5400
 WWW.RES.US

PROJECT MANAGER: CZ
 DRAWN: LC
 JOB NUMBER: 109811
 DATE EXPORTED: 10/27/2022
 REVISIONS: 02/28/2023 (LC)

SHEET 3 OF 4



THE PROPOSED APPROXIMATE STRUCTURE HEIGHTS ARE FROM THE CONCEPTUAL DESIGN CREATED TO ESTIMATE THE COST OF THE PARTIAL REBUILD PROJECT AND ARE SUBJECT TO CHANGE BASED ON FINAL ENGINEERING DESIGN.

Structure Number	2011/1	2011/2	2011/3	2011/4	2011/5	2011/6	2011/7	2011/8	2011/9	2011/10	2011/11	2011/12	2011/13	2011/14	2011/15	2011/16	2011/17	2011/18	2011/19	2011/20	2011/21	2011/22	2011/23	2011/24
Existing Height (ft)	70	120	120	115	115	105	100	80	95	120	115	100	120	90	125	95	110	95	120	120	90	95	120	125
Proposed Height (ft)	N/A	120	120	120	120	110	105	85	100	125	120	100	120	95	125	95	110	105	125	120	90	95	120	125
Structure Number	2011/25	2011/26	2011/27	2011/28	2011/29	2011/30	2011/31	2011/32	2011/33	2011/34	2011/35	2011/36	2011/37	2011/38	2011/38A	2011/38B	2011/39	2011/40	2011/41	2011/42	2011/43	2011/44	2011/45	2011/46
Existing Height (ft)	120	120	130	130	135	110	115	130	130	110	115.167	115	120.667	107	80	N/A	116	132	111	114	95	99	95	97
Proposed Height (ft)	125	125	130	145	145	115	115	130	130	125	120	120	120	120	N/A	95	115	125	115	125	105	125	105	105
Structure Number	2011/46A	2011/47	2011/48	2011/49	2011/50	2011/51	2011/52	2011/53	2011/54	2011/55	2011/56	2011/57	2011/58	2011/59	2011/60	2011/61	2011/62	2011/63	2011/64	2011/65	2011/66	2011/67	2011/68	
Existing Height (ft)	N/A	80	100	95	65	60	70	105	120	120	129	115	115	115	115	115	110	110	110	115	115	120	100	
Proposed Height (ft)	100	115	115	N/A	100	90	N/A	N/A	120	125	120	125	120	120	120	120	115	120	130	120	120	115	N/A	



- LEGEND**
- EXISTING SUBSTATION/DP
 - FUTURE SUBSTATION
 - EXISTING STRUCTURE
 - PROPOSED STRUCTURE
 - APPROVED STRUCTURE
 - EXISTING 115 KV LINE
 - EXISTING 230KV LINE
- APPROXIMATE PROJECT LIMITS**
- WRECK AND REBUILD
 - APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)

LINE #2011 230 KV
PARTIAL REBUILD PROJECT
APPLICANT: DOMINION ENERGY VIRGINIA

EXISTING AND PROPOSED STRUCTURES MAP
II.B.3.v.

CITY OF MANASSAS, CITY OF MANASSAS PARK,
PRINCE WILLIAM COUNTY, AND FAIRFAX COUNTY,
VIRGINIA

CORPORATE | 6575 WEST LOOP SOUTH, SUITE 300, BELLAIRE, TX 77401
 P: 713.520.5400
 www.res.us

PROJECT MANAGER:	CZ
DRAWN:	LC
JOB NUMBER:	109811
DATE EXPORTED:	10/27/2022
REVISIONS:	02/28/2023 (LC)

SHEET
4 OF 4

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

- 4. With regard to the proposed supporting structures for all feasible alternate routes, provide the maximum, minimum and average structure heights with respect to the whole route.**

Response: Not applicable.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

5. For lines being rebuilt, provide mapping showing existing and proposed structure heights for each individual structure within the ROW, as proposed in the application.

Response: See [Attachment II.B.3.v](#) for structure mapping.

See the table below for the existing and proposed heights of structures related to the Partial Rebuild Project. The proposed approximate structure heights are from the conceptual design created to estimate the cost of the Partial Rebuild Project and are subject to change based on final engineering design. The approximate structure heights do not include foundation reveal.

Structure Number	Existing Structure Height (ft)	Proposed Structure Above Ground Height (ft)	Attachment II.B.3. Structure Type
2011/2	120	120	*
2011/3	120	120	*
2011/4	115	120	*
2011/5	115	120	*
2011/6	105	110	II.B.3.ii
2011/7	100	105	II.B.3.i
2011/8	80	85	II.B.3.ii
2011/9	95	100	II.B.3.i
2011/10	120	125	II.B.3.ii
2011/11	115	120	II.B.3.ii
2011/12	100	100	II.B.3.i
2011/13	120	120	II.B.3.i
2011/14	90	95	II.B.3.ii
2011/15	125	125	II.B.3.ii
2011/16	95	95	II.B.3.ii
2011/17	110	110	II.B.3.ii
2011/18	95	105	II.B.3.ii
2011/19	120	125	II.B.3.ii
2011/20	120	120	II.B.3.ii
2011/21	90	90	II.B.3.ii
2011/22	95	95	II.B.3.ii
2011/23	120	120	II.B.3.ii
2011/24	125	125	II.B.3.ii
2011/25	120	125	II.B.3.i
2011/26	120	125	II.B.3.ii

Structure Number	Existing Structure Height (ft)	Proposed Structure Above Ground Height (ft)	Attachment II.B.3. Structure Type
2011/27	130	130	II.B.3.ii
2011/28	130	145	II.B.3.i
2011/29	135	145	II.B.3.i
2011/30	110	115	II.B.3.i
2011/31	115	115	II.B.3.i
2011/32	130	130	II.B.3.i
2011/33	130	130	II.B.3.i
2011/34	110	125	II.B.3.i
2011/35	115	120	II.B.3.ii
2011/36	115	120	II.B.3.ii
2011/37	121	120	II.B.3.ii
2011/38	107	120	II.B.3.iii
2011/38B		95	II.B.3.iv
2011/39	116	115	II.B.3.ii
2011/40	132	125	II.B.3.ii
2011/41	111	115	II.B.3.ii
2011/42	114	125	II.B.3.i
2011/43	95	105	II.B.3.ii
2011/44	99	125	II.B.3.i
2011/45	95	105	II.B.3.ii
2011/46	97	105	II.B.3.ii
2011/46A		100	II.B.3.ii
2011/47	80	115	II.B.3.i
2011/48	100	115	II.B.3.i
2011/49	95	**	
2011/50	65	100	II.B.3.ii
2011/51	60	90	II.B.3.iv
2011/53	105	**	
2011/54	120	120	II.B.3.ii
2011/55	120	125	II.B.3.i
2011/56	129	120	II.B.3.i
2011/57	115	125	II.B.3.i
2011/58	115	120	II.B.3.i
2011/59	115	120	II.B.3.i
2011/60	115	120	II.B.3.i
2011/61	115	120	II.B.3.i
2011/62	115	115	II.B.3.ii
2011/63	110	120	II.B.3.ii
2011/64	110	130	II.B.3.i

Structure Number	Existing Structure Height (ft)	Proposed Structure Above Ground Height (ft)	Attachment II.B.3. Structure Type
2011/65	115	120	II.B.3.i
2011/66	115	120	II.B.3.i
2011/67	120	115	II.B.3.i
Minimum	60	80	
Maximum	135	145	
Average	110	116	

* Proposed Structures #2011/2 through #2011/5 are located on Company-owned property and therefore are not included in Attachments II.A.5 and II.B.3. Existing structures that are not being replaced and are excluded from minimum, maximum, and average calculations.

** Existing structures that are being removed and not replaced; excluded from minimum, maximum, and average calculations.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

- 6. Provide photographs for [a] typical existing facilities to be removed, [b] comparable photographs or representations for proposed structures, and [c] visual simulations showing the appearance of all planned transmission structures at identified historic locations within one mile of the proposed centerline and in key locations identified by the Applicant.**

Response: *(a) Photographs for typical existing facilities to be removed*

A representative photograph of the typical existing structure on Line #2011 is provided in Attachment II.B.6.a.

(b) Comparable photographs or representations for proposed structures

A representative photograph of the typical structure proposed for the Partial Rebuild Project is provided in Attachment II.B.6.b.

(c) Visual simulations from historic and other key locations

Visual simulations showing the appearance of proposed transmission structures are provided for historic properties where the Partial Rebuild Project will be visible. Attachment II.B.6.c includes viewshed maps and visual simulations of proposed structures at identified historic locations within 1.0 mile of the proposed centerline of the Partial Rebuild Project and existing photographs and simulations of the proposed structures from the selected Observation Points (“OPs”), which were completed in October 2022 and submitted to VDHR on March 6, 2023. Attachment II.B.6.c was created using GIS modeling to depict whether the existing and proposed structures are or will be visible from historic properties. OPs used for the simulations are indicated on the maps provided. The below table identifies historic properties.

Historic Property	OP	Comments
Battery Hill Redoubt (VDHR ID# 029-5006)	1, 2	No visibility of the Partial Rebuild Project.
Signal Hill (VDHR ID# 076-0016)	1	Visibility of only tops of monopoles above treeline. Minimal visual impact as structures will generally remain the same height or increase in height by 5 feet or less.
Orange and Alexandria Railroad Bridge Piers (VDHR ID# 076-0238)*	N/A	Conductor and two structures visible from different vantage points. Minimal visual impact as the two existing structures that are currently visible will remain as such with one slightly taller, while the intervening vegetation will continue to screen visibility of those structures that are not currently visible.

Historic Property	OP	Comments
Old Manassas Courthouse (VDHR ID# 076-5080)	1, 2	No visibility of the Partial Rebuild Project from OP 1. Two structures visible from OP 2. Minimal visual impact as the minimal change/reduction in height will not likely be perceptible.
Conner House (VDHR ID# 152-0001)	1, 2	Multiple structures visible from OP 1 and 2. Minimal visual impact as the Partial Rebuild Project will not introduce any noticeable change in setting or viewshed of or from the resource which already includes visibility of several structures that are seen amongst and across extensive non historic development within a compromised setting.
Louisiana Brigade Winter Camp (VDHR ID# 152-5001)	1	No visibility of the Partial Rebuild Project.
Liberia (VDHR ID# 155-0001)	1	No visibility of the Partial Rebuild Project.
Jennie Dean Memorial Site (VDHR ID# 155-0010)	1, 2	Multiple structures visible from OP 1 and 2. Minimal visual impact as the anticipated visibility will remain similar, with structures that are currently visible will remain as such with one slightly taller, while the intervening vegetation will continue to screen visibility of those structures that are not currently visible.
Annaburg (VDHR ID# 155-0021)	1, 2	Visibility of only top of one monopole through gap in treeline. Minimal visual impacts as the one structure that is currently visible will be decreased in height and the intervening vegetation and development that currently screens the majority of existing structures will continue to do so from the Annaburg property and vicinity, while visibility of the structure that can currently be seen will diminish.
Old Manassas Water Tower (VDHR ID# 155-0141)	1	Chance visibility of only tops of monopoles above treeline and existing development. Minimal visual impact as there is a chance that individual structures may rise just above the existing treeline and development that currently screens the existing structures.
Manassas Historic District (VDHR ID# 155-0161)	1, 2, 3, 4, 5, 6, 7	Multiple structures visible from OP 1, 2, and 7. One structure visible from OP 6. No visibility of the Partial Rebuild Project from OP 3, 4, and 5. Minimal visual impacts as visibility will remain similar from the commercial area, with structures that are currently visible remaining as such, although varying slightly by individual structure. Meanwhile, the intervening vegetation and development will continue to screen visibility of those structures that are not currently visible from the residential areas at further distances in the district. Because the change in height of individual structures will be minimal and the tallest structure will be decreased in height, the overall change will not likely be perceptible.

Historic Property	OP	Comments
Mayfield Fortification, Liberia Avenue and Quarry Road (VDHR ID# 155-5002)	1, 2	No visibility of the Partial Rebuild Project from OP 1. Multiple structures visible from OP 2. Minimal visual impacts as visibility will remain similar, with structures that are currently visible remaining as such, while the intervening vegetation will continue to screen visibility of those structures that are not currently visible. Because the structures that are currently visible will generally remain the same height and configuration, the change will not be perceptible at the distance they are set.
Cannon Branch Fort (VDHR ID# 155-5020)	1	No visibility of the Partial Rebuild Project.
Clifton Historic District (VDHR ID #194-0003)	1	No visibility of the Partial Rebuild Project.
Blackburn's Ford Battlefield, Route 28 (VDHR ID# 029-5117)	1	No visibility of the Partial Rebuild Project.
Bristoe Station Battlefield (VDHR ID# 076-5036)	1, 2, 3, 4, 5, 6, 7	No visibility of the Partial Rebuild Project from OP 1, 3, 5, 6, and 7. Multiple structures visible from OP 2 and 4. Minimal visual impact as anticipated visibility of the Partial Rebuild Project will remain similar to current views, and remain visible with a slight change in height and configuration where it is already visible, and remain screened by intervening topography, development, and vegetation from locations where structures are not currently visible.
Second Battle of Manassas/Bull Run, Balls Ford Road (VDHR ID# 076-5190)	1, 2, 3	Multiple structures visible from OP 1. No visibility of the Partial Rebuild Project from OP 2 and 3. Minimal visual impacts as anticipated visibility of the Partial Rebuild Project will remain similar to current views, and remain visible with a slight change in height and configuration where it is already visible, and remain screened by intervening topography, development, and vegetation from locations where structures are not currently visible.
First Battle of Manassas/Bull Run (VDHR ID# 076-5335)	1, 2, 3	Visibility of only tops of monopoles above treeline from OP 1. No visibility of the Partial Rebuild Project from OP 2 and 3. Minimal visual impacts as visibility of the Partial Rebuild Project will remain nearly identical to current views, with most structures screened from view by intervening topography, development, and vegetation.
Union Mills District, Union Mills Road (VDHR ID# 029-0410)	1, 2	No visibility of the Partial Rebuild Project. Minimal visual impacts as the vegetation and topography within the vicinity allow only narrow and interrupted views of the top of several structures and short lengths of conductor from other vantage points. It is anticipated that the intervening topography and vegetation will continue to completely screen visibility of the replacement structures from most vantages throughout the district and where existing structures are visible in close proximity, the views will not noticeably change.
Bennett School (VDHR ID# 076-0061)	1	Multiple structures visible above rooflines. Minimal visual impacts as the currently visible structures will remain as such, although visibility may be reduced, while the intervening development will continue to screen structures replacing those that are currently not visible.

Historic Property	OP	Comments
Pickeral House (VDHR ID# 055-0171)*	N/A	No impact as the associated building has been demolished and no longer retains architectural significance.
Manassas Cemetery and Confederate Cemetery in Manassas (VDHR ID# 155-0162)*	N/A	Several structures visible. Minimal visual impacts as visibility will remain similar following the Partial Rebuild Project, with limited views of those structures in the immediate vicinity while those further away will remain screened.

*Note: Visual simulations were not completed for these resources as existing conditions were sufficient for determining the anticipated viewshed and potential visual impacts. Please reference the Stage I Analysis prepared by Dutton on behalf of the Company, which is included with the DEQ Supplement as Attachment 2.I.1, for representative photographs and a description of the resources that were identified.

See Section III.A for a description of the resources identified in the Stage I Analysis prepared by Dutton on behalf of the Company, which is included with the DEQ Supplement as Attachment 2.I.1. Dutton’s inspection of these resources revealed that most are located within the vicinity of the City of Manassas and the associated urban and suburban areas. As such, the setting of most resources already includes a wide variety of non-historic features, including dense development and modern infrastructure. The existing project transmission line and multiple structures are currently visible from many of the resources, particularly those in close proximity to or crossed by the Partial Rebuild Project. Meanwhile, the line and structures tend to be partially to completely screened from resources set further away due to the development and vegetation patterns in the area. Because the transmission line is to be rebuilt with replacement structures generally in the same locations with the same or only minimal increase in height, there will not be a substantial, or in most cases perceptible change in visibility as a result of the Partial Rebuild Project. It is therefore Dutton’s opinion that based upon the definition of impacts above, the proposed Partial Rebuild Project will have no more than a minimal impact on any architectural resources that are designated a National Historic Landmark (“NHL”), listed in the NRHP, or determined eligible or potentially eligible for listing.

Simulations of the Partial Rebuild Project from key locations are provided in Attachment III.B.4.



**Existing Structure Type:
230 kV Single Circuit Steel Monopole (Tangent)**

Attachment II.B.6.a

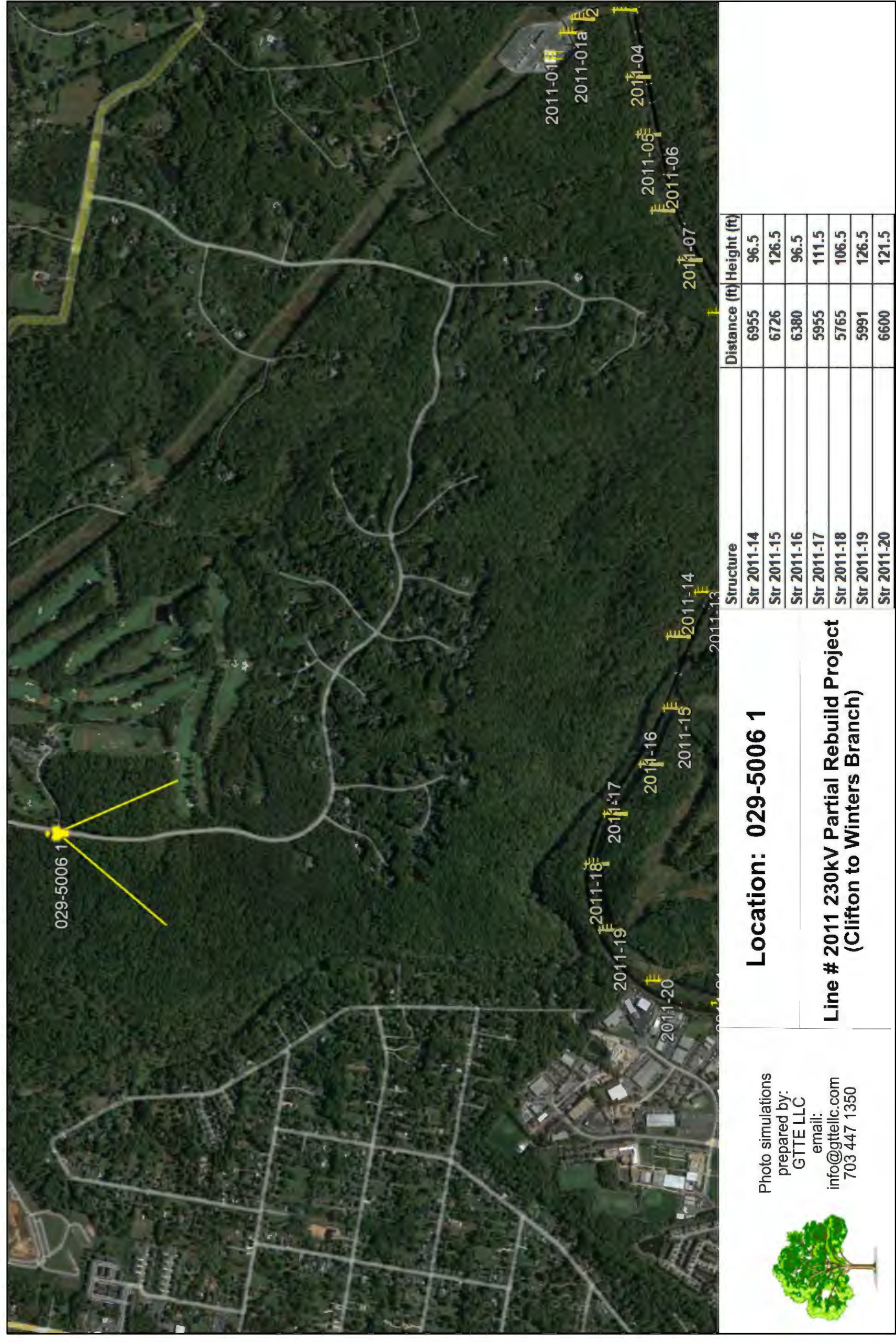




**Proposed Structure Type:
230 kV Single Circuit Steel Monopole (Tangent)**

Attachment II.B.6.b





Location: 029-5006 1

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-6: Battery Hill Redoubt Simulation 1 – Simulation location, direction of view, and structures modeled from entrance to Westfields Golf Club. Source: GTTE, LLC




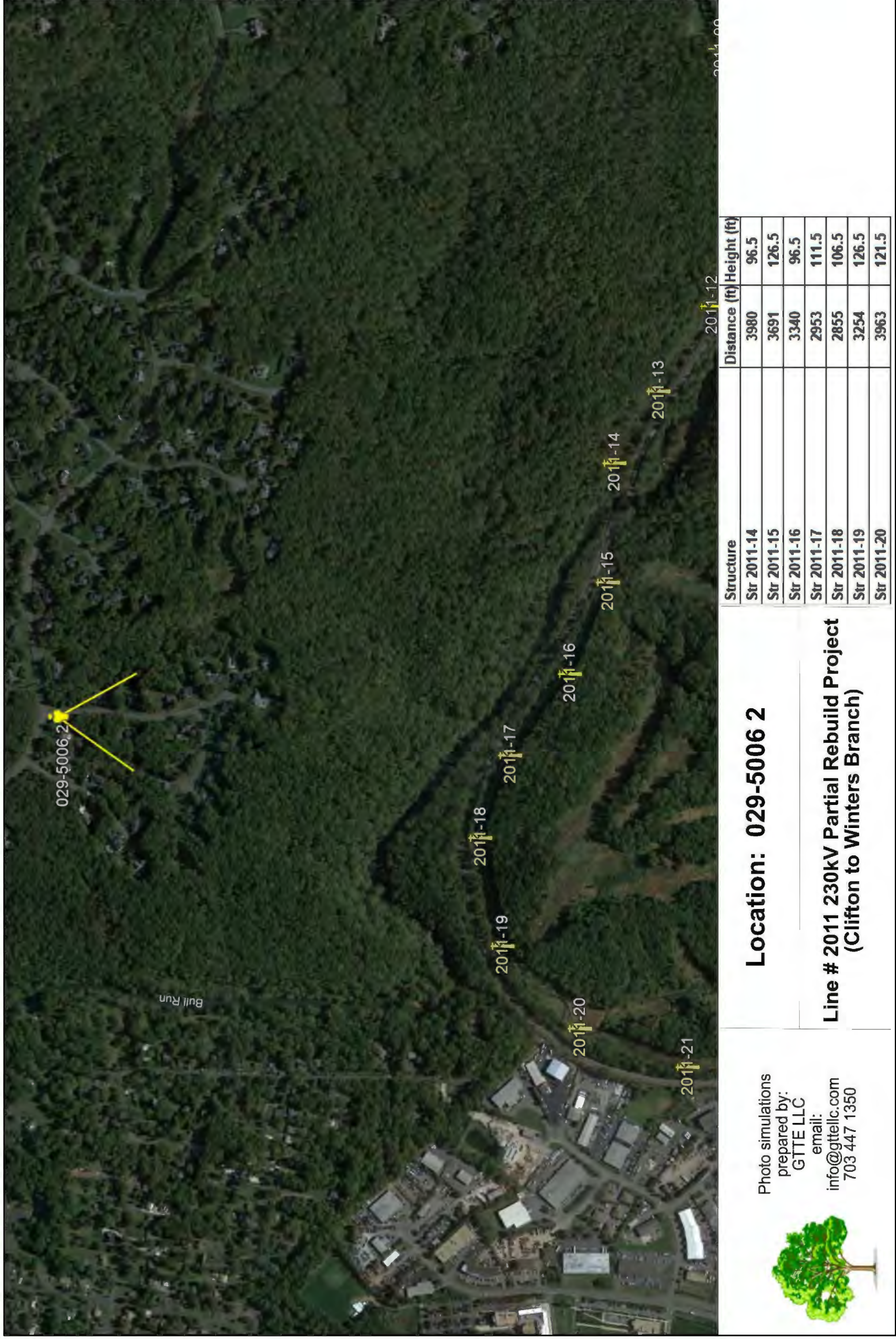
<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 029-5006 1</p>	<p>Existing View</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>		<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>	

Figure 5-7: Battery Hill Redoubt Simulation 1 – Existing view from entrance to Westfields Golf Club. Source: GTTE, LLC



Figure 5-8: Battery Hill Redoubt Simulation 1 – Proposed view from entrance to Westfields Golf Club – (Structures not visible shown in yellow). Source: GTTE, LLC



Location: 029-5006 2

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-9: Battery Hill Redoubt Simulation 2 – Simulation location, direction of view, and structures modeled from Balmoral Greens Avenue. Source: GTTE, LLC



Figure 5-10: Battery Hill Redoubt Simulation 2 – Existing view from Balmoral Greens Avenue. Source: GTTE, LLC



Figure 5-11: Battery Hill Redoubt Simulation 2 – Proposed view from Balmoral Greens Avenue – (Structures not visible shown in yellow). Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p> 		<p>Location: 076-0016</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>		<table border="1"> <thead> <tr> <th>Structure</th> <th>Distance (ft)</th> <th>Height (ft)</th> </tr> </thead> <tbody> <tr><td>Str 2011-30</td><td>3767</td><td>111.5</td></tr> <tr><td>Str 2011-31</td><td>3853</td><td>116.5</td></tr> <tr><td>Str 2011-32</td><td>4044</td><td>131.5</td></tr> <tr><td>Str 2011-33</td><td>4354</td><td>131.5</td></tr> <tr><td>Str 2011-34</td><td>4596</td><td>126.5</td></tr> <tr><td>Str 2011-35</td><td>4868</td><td>116.5</td></tr> <tr><td>Str 2011-36</td><td>5149</td><td>116.5</td></tr> <tr><td>Str 2011-37</td><td>5552</td><td>121.5</td></tr> <tr><td>Str 2011-38</td><td>5933</td><td>120.0</td></tr> </tbody> </table>	Structure	Distance (ft)	Height (ft)	Str 2011-30	3767	111.5	Str 2011-31	3853	116.5	Str 2011-32	4044	131.5	Str 2011-33	4354	131.5	Str 2011-34	4596	126.5	Str 2011-35	4868	116.5	Str 2011-36	5149	116.5	Str 2011-37	5552	121.5	Str 2011-38	5933	120.0
Structure	Distance (ft)	Height (ft)																																
Str 2011-30	3767	111.5																																
Str 2011-31	3853	116.5																																
Str 2011-32	4044	131.5																																
Str 2011-33	4354	131.5																																
Str 2011-34	4596	126.5																																
Str 2011-35	4868	116.5																																
Str 2011-36	5149	116.5																																
Str 2011-37	5552	121.5																																
Str 2011-38	5933	120.0																																

Figure 5-16: Signal Hill Simulation 1 – Simulation location, direction of view, and structures modeled from interpretive kiosk. Source: GTTE, LLC



Figure 5-17: Signal Hill Simulation 1 – Existing view from interpretive kiosk. Source: GTTE, LLC



Figure 5-18: Signal Hill Simulation 1 – Proposed view from interpretive kiosk – (Visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC

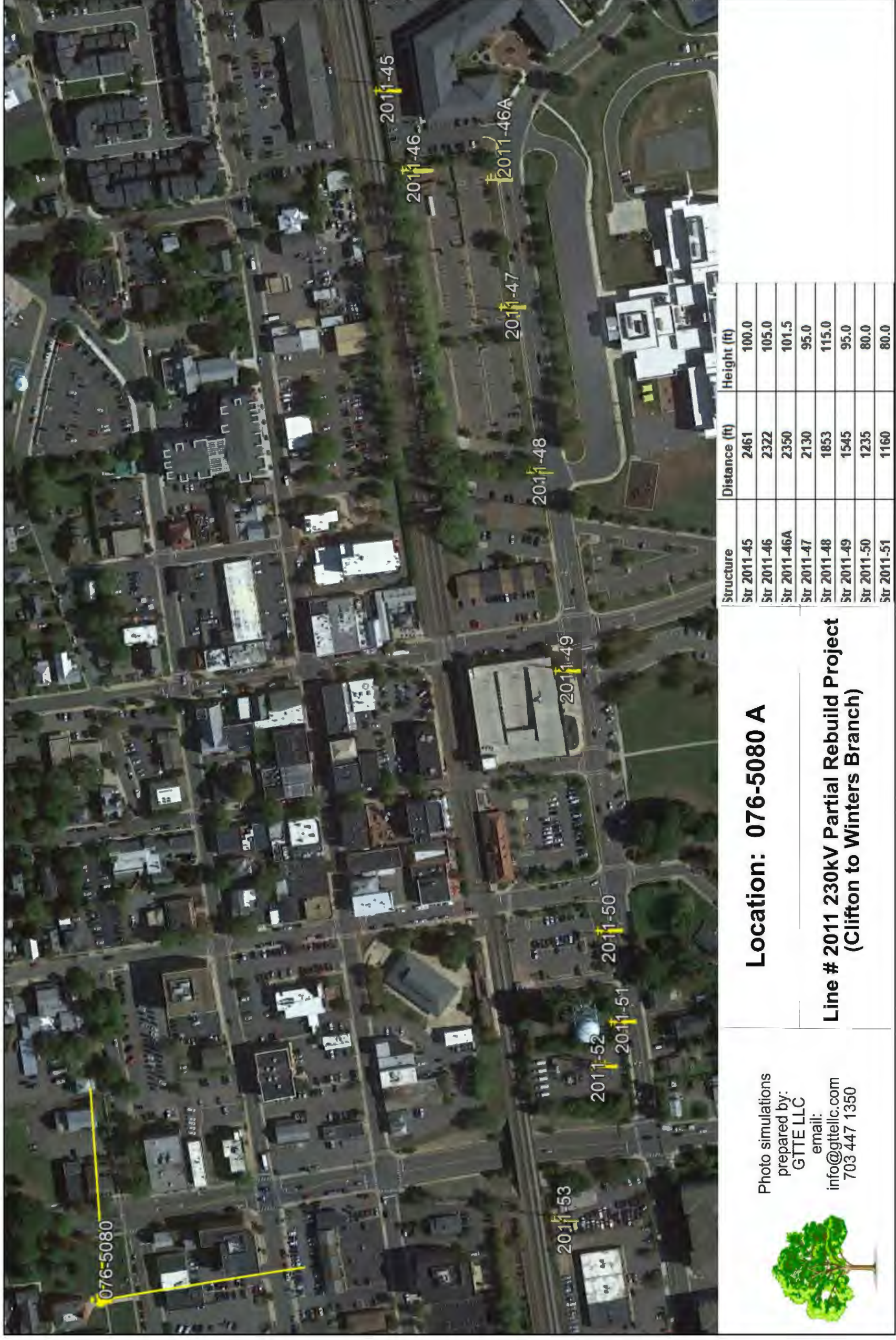


Figure 5-31: Prince William County Courthouse Simulation 1 – Simulation location, direction of view, and structures modeled from front lawn to southeast. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350



Line #2011 230kV Partial Rebuild

Location: 076-5080 A

Existing View

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.



Figure 5-32: Prince William County Courthouse Simulation 1 – Existing view from front lawn to southeast. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 076-5080 A

Proposed View
 (Location of towers not visible are overlaid with yellow tower icon)

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-33: Prince William County Courthouse Simulation 1 – Proposed view from front lawn to southeast – (Structures not visible shown in yellow). Source: GTTE, LLC



Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Location: 076-5080 B

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Structure	Distance (ft)	Height (ft)
Str 2011-54	1039	120.0
Str 2011-55	1247	125.0
Str 2011-56	1654	120.0
Str 2011-57	1958	125.0

Figure 5-34: Prince William County Courthouse Simulation 2 – Simulation location, direction of view, and structures modeled from front lawn to southwest. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 076-5080 B</p>	<p>Existing View</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>		<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>	

Figure 5-35: Prince William County Courthouse Simulation 2 – Existing view from front lawn to southwest. Source: GTTE, LLC



Figure 5-36: Prince William County Courthouse Simulation 2 – Proposed view from front lawn to southeast – (Two visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC

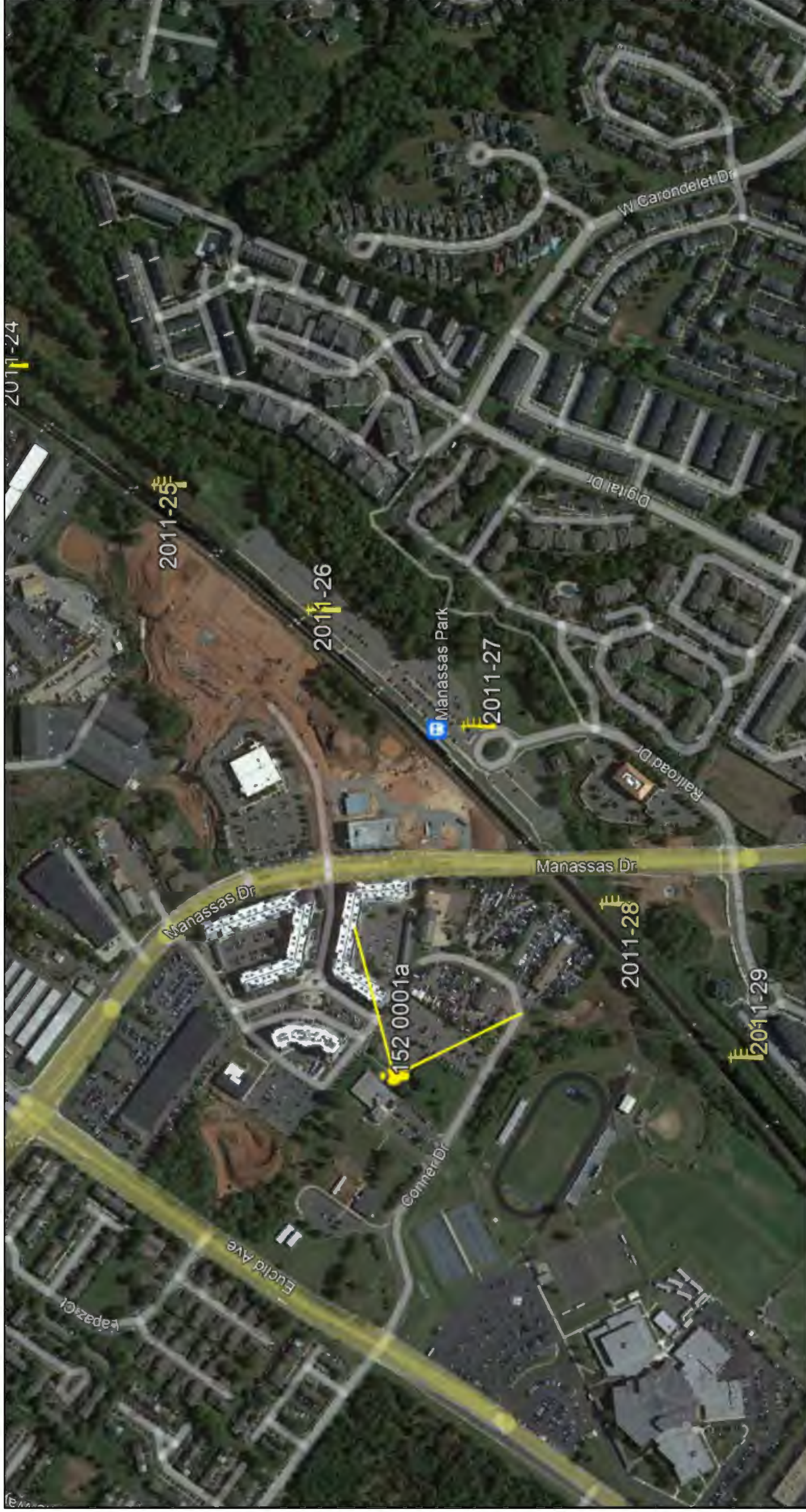


Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350	Location: 152 0001a Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)		Structure	Distance (ft)	Height (ft)
			Str 2011-26	1747	141.5
			Str 2011-27	1333	131.5
			Str 2011-28	1037	141.5

Figure 5-43: Connor House Simulation 1 – Simulation location, direction of view, and structures modeled from front of home. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 152 0001a

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-44: Conner House Simulation 1 – Existing view from front of home. Source: GTTE, LLC



Photo simulations prepared by:
GTTE LLC
email: info@gttelc.com
703 447 1350

Line #2011 230kV Partial Rebuild

Location: 152 0001a

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

Proposed View

(Location of towers not visible are overlaid with yellow tower icon)



This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-45: Conner House Simulation 1 – Proposed view from front of home – (Visible structures shown as they would appear). Source: GTTE, LLC



<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p>		<p>Location: 152 0001b</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>	
Structure	Distance (ft)	Height (ft)	
Str 2011-30	1666	111.5	
Str 2011-31	2290	116.5	
Str 2011-32	2963	131.5	
Str 2011-33	3638	131.5	

Figure 5-46: Conner House Simulation 2 – Simulation location, direction of view, and structures modeled from side of home. Source: GTTE, LLC



Figure 5-47: Conner House Simulation 2 – Existing view from front of home. Source: GTTE, LLC



Figure 5-48: Conner House Simulation 2 – Proposed view from front of home – (Visible structures shown as they would appear). Source: GTTE, LLC

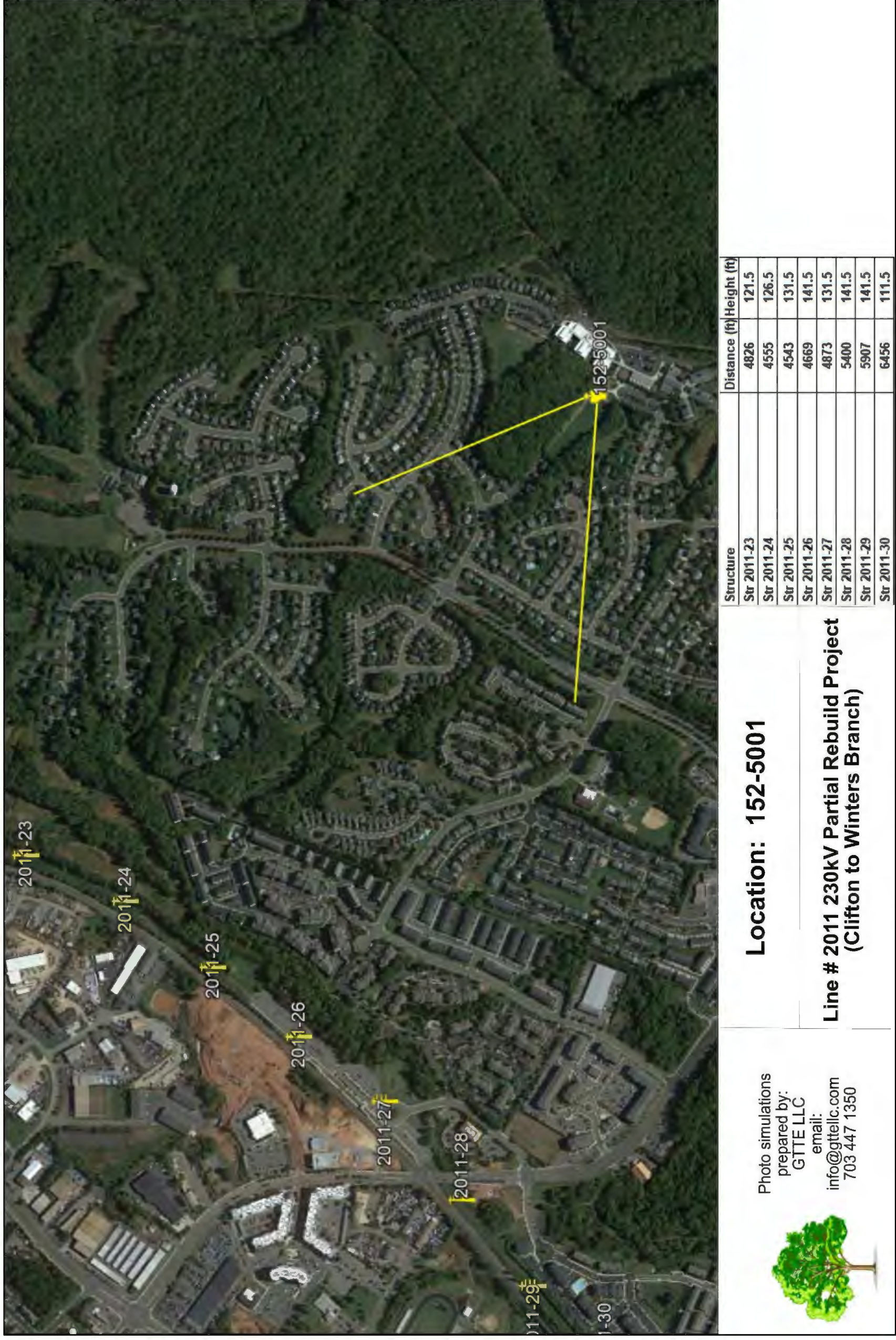


Figure 5-56: Louisiana Brigade Winter Camp Simulation 1 – Simulation location, direction of view, and structures modeled from field adjacent to preservation area. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Location: 152-5001

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

Existing View

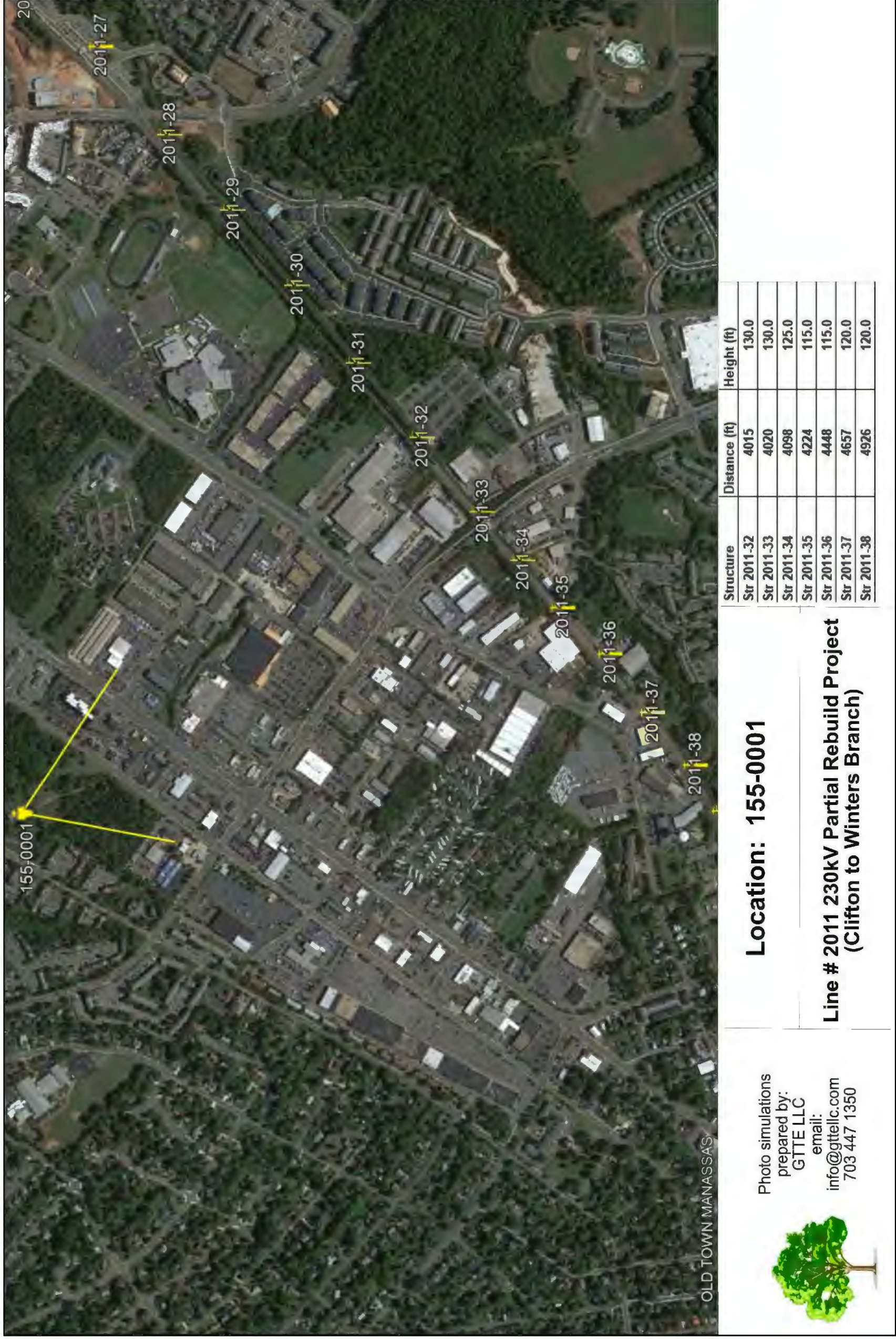


This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-57: Louisiana Brigade Winter Camp Simulation 1 – Existing view from field adjacent to preservation area. Source: GTTE, LLC



Figure 5-58: Louisiana Brigade Winter Camp Simulation 1 – Proposed view from field adjacent to preservation area – (Structures not visible shown in yellow). Source: GTTE, LLC



Location: 155-0001

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Structure	Distance (ft)	Height (ft)
Str 2011-32	4015	130.0
Str 2011-33	4020	130.0
Str 2011-34	4098	125.0
Str 2011-35	4224	115.0
Str 2011-36	4448	115.0
Str 2011-37	4657	120.0
Str 2011-38	4926	120.0

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-65: Liberia Simulation 1 – Simulation location, direction of view, and structures modeled from front of house. Source: GTTE, LLC



Figure 5-66: Liberia Simulation 1 – Existing view from front of house. Source: GTTE, LLC



Figure 5-67: Liberia Simulation 1 – Proposed view from front of house – (Structures not visible shown in yellow). Source: GTTE, LLC

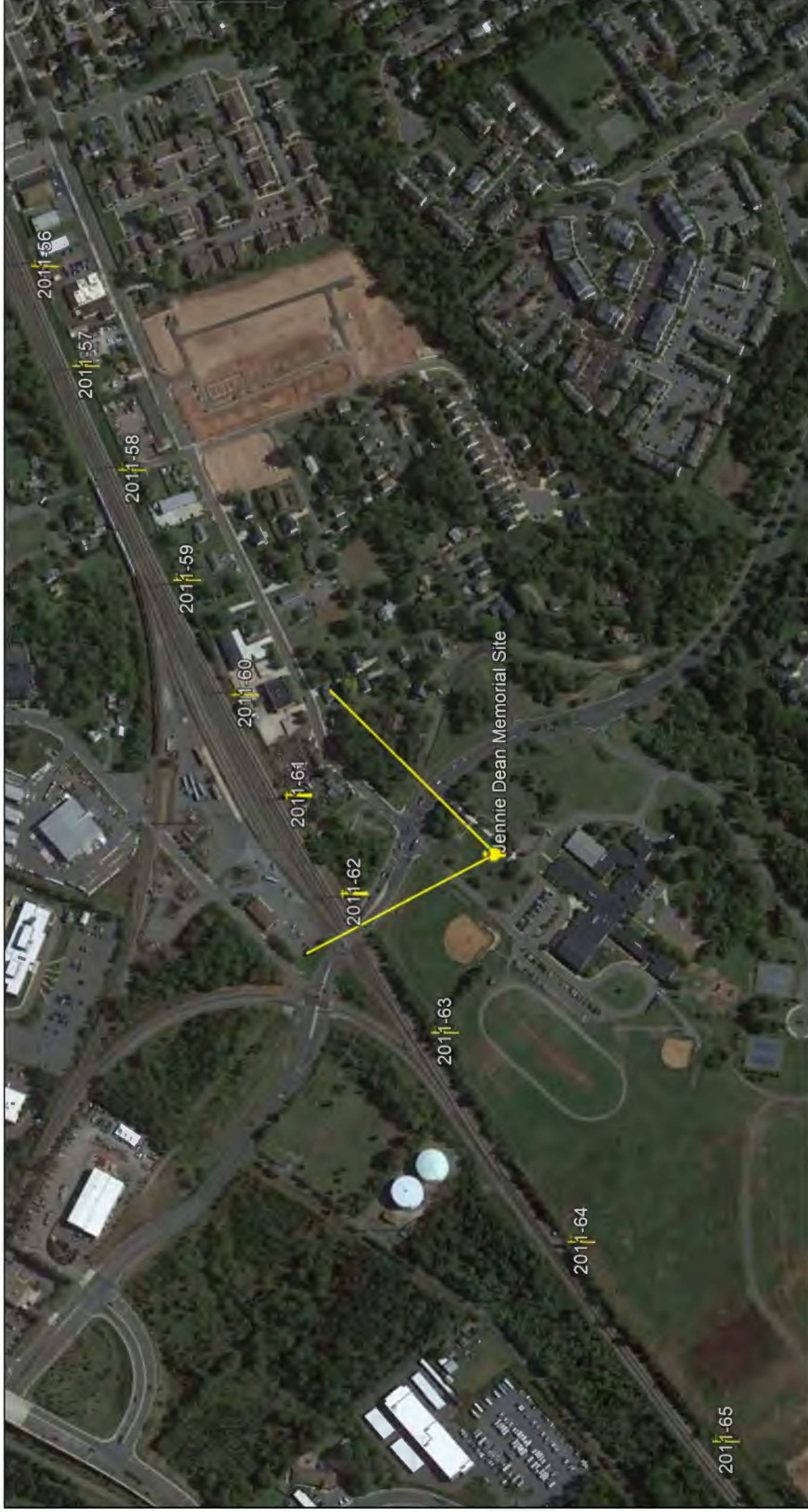


Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350

Location:
Jennie Dean Memorial North
Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)

Structure	Distance (ft)	Height (ft)
Str 2011-61	649	115.0
Str 2011-62	472	120.0

Figure 5-75: Jennie Dean Memorial Simulation 1 – Simulation location, direction of view, and structures modeled from interpretive area looking north. Source: GTTE, LLC



Figure 5-76: Jennie Dean Memorial Simulation 1 – Existing view from interpretive area looking north. Source: GTTE, LLC



Figure 5-77: Jennie Dean Memorial Simulation 1 – Proposed view from interpretive area looking north – (Visible structures shown as they would appear). Source: GTTE, LLC



<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p> 	<p>Location: Jennie Dean Memorial West Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>		<p>Structure</p>	<p>Distance (ft)</p>	<p>Height (ft)</p>
	Str 2011-63	644	130.0		
	Str 2011-64	1360	115.0		
	Str 2011-65	2143	120.0		

Figure 5-78: Jennie Dean Memorial Simulation 2 – Simulation location, direction of view, and structures modeled from interpretive area looking west. Source: GTTE, LLC



Figure 5-79: Jennie Dean Memorial Simulation 2 – Existing view from interpretive area looking west. Source: GTTE, LLC



Figure 5-80: Jennie Dean Memorial Simulation 2 – Proposed view from interpretive area looking west – (Structures not visible shown in yellow). Source: GTTE, LLC



Figure 5-90: Annaburg Simulation 1 – Simulation location, direction of view, and structures modeled from side yard to northeast. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-0021 A

Existing View

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.



Figure 5-91: Annaburg Simulation 1 – Existing view from side yard to northeast. Source: GTTE, LLC



Figure 5-92: Annaburg Simulation 1 – Proposed view from side yard to northeast – (Structures not visible shown in yellow). Source: GTTE, LLC

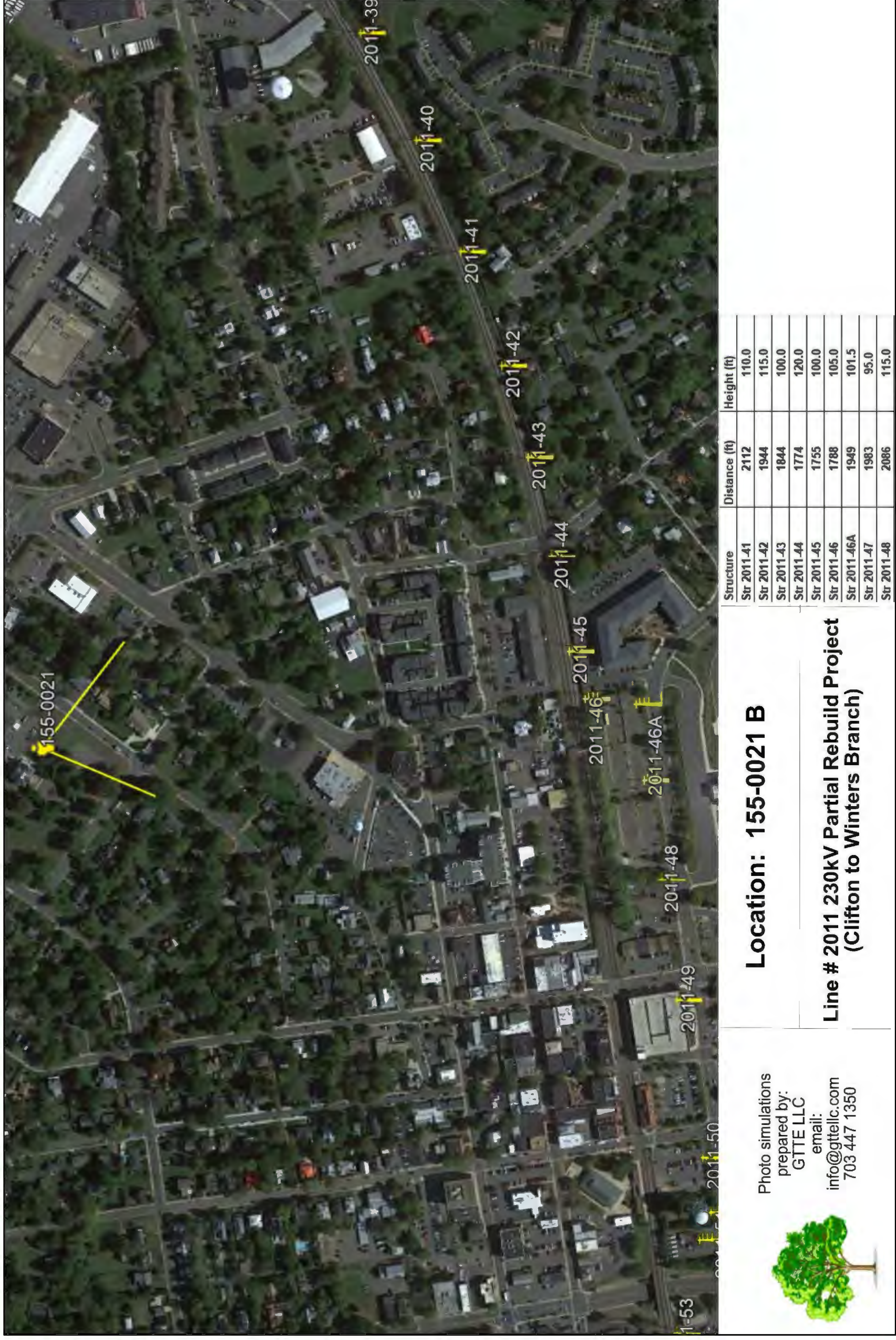


Figure 5-93: Annaburg Simulation 1 – Simulation location, direction of view, and structures modeled from side yard to south. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350



Existing View

Location: 155-0021 B

Line #2011 230kV Partial Rebuild

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

Figure 5-94: Annaburg Simulation 1 – Existing view from side yard to south. Source: GTTE, LLC



Figure 5-95: Annaburg Simulation 2 – Proposed view from side yard to south – (Structures not visible shown in yellow). Source: GTTE, LLC



<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p>		<p>Location: 155-0141</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>		<p>Structure</p>	<p>Distance (ft)</p>	<p>Height (ft)</p>
		Str 2011-42	1610	115.0		
		Str 2011-43	1362	100.0		
		Str 2011-44	1120	120.0		
		Str 2011-45	934	100.0		
		Str 2011-46	889	105.0		
		Str 2011-46A	1025	101.5		
		Str 2011-47	984	95.0		

Figure 5-101: Old Manassas Water Tower Simulation 1 – Simulation location, direction of view, and structures modeled from base of tower. Source: GTTE, LLC





<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 155-0141</p>	<p>Existing View</p> <p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p> 
--	--	----------------------------------	---

Figure 5-102: Old Manassas Water Tower Simulation 1 – Existing view from base of tower. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350



Line #2011 230kV Partial Rebuild

Location: 155-0141

Existing View

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-103: Old Manassas Water Tower Simulation 1 – Proposed view from base of tower – (Structures not visible shown in yellow). Source: GTTE, LLC



Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Location: 155-0161 2A

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Structure	Distance (ft)	Height (ft)
Str 2011-46A	1454	101.5
Str 2011-47	1206	95.0
Str 2011-48	879	100.0
Str 2011-49	496	95.0

Figure 5-123: Manassas Historic District Simulation 1 – Simulation location, direction of view, and structures modeled Manassas Rail Depot looking east. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-0161 2A

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-124: Manassas Historic District Simulation 1 – Existing view from Manassas Rail Depot looking east. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 155-0161 2A</p>	<p>Proposed View (Location of towers not visible are overlaid with yellow tower icon)</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>		<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>	

Figure 5-125: Manassas Historic District Simulation 1 – Proposed view from Manassas Rail Depot looking east – (Visible structure shown as it would appear. Structures not visible shown in yellow). Source: GTTE, LLC



Location: 155-0161 2B

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Structure	Distance (ft)	Height (ft)
Str 2011-51	1145	80.0
Str 2011-52	1214	0.0
Str 2011-53	1346	105.0
Str 2011-54	1775	120.0
Str 2011-55	2123	125.0
Str 2011-56	2641	120.0
Str 2011-57	2986	125.0
Str 2011-58	3358	120.0

Figure 5-126: Manassas Historic District Simulation 2 – Simulation location, direction of view, and structures modeled Manassas Rail Depot looking west. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-0161 2B

Existing View

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.



Figure 5-127: Manassas Historic District Simulation 2 – Existing view from Manassas Rail Depot looking west. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-0161 2B

Proposed View

(Location of towers not visible are overlaid with yellow tower icon)



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-128: Manassas Historic District Simulation 2 – Proposed view from Manassas Rail Depot looking west – (Visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC



Location: 076-5080 A

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Structure	Distance (ft)	Height (ft)
Str 2011-45	2461	100.0
Str 2011-46	2322	105.0
Str 2011-47	2130	95.0
Str 2011-48	1853	115.0
Str 2011-49	1545	95.0
Str 2011-50	1235	80.0
Str 2011-51	1160	80.0

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-129: Manassas Historic District Simulation 3 – Simulation location, direction of view, and structures modeled from Manassas Courthouse. Source: GTTE, LLC



Figure 5-130: Manassas Historic District Simulation 3 – Existing view from Manassas Courthouse. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350



Line #2011 230kV Partial Rebuild

Location: 076-5080 A

Proposed View
 (Location of towers not visible are overlaid with yellow tower icon)

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.



Figure 5-131: Manassas Historic District Simulation 3 – Proposed view from Manassas Courthouse – (Structures not visible shown in yellow). Source: GTTE, LLC



<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p>		<p>Location: 155-0161 3a</p>																												
<p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>		<table border="1"> <thead> <tr> <th>Structure</th> <th>Distance (ft)</th> <th>Height (ft)</th> </tr> </thead> <tbody> <tr> <td>Str 2011-42</td> <td>2163</td> <td>115.0</td> </tr> <tr> <td>Str 2011-43</td> <td>1876</td> <td>100.0</td> </tr> <tr> <td>Str 2011-44</td> <td>1573</td> <td>120.0</td> </tr> <tr> <td>Str 2011-45</td> <td>1292</td> <td>100.0</td> </tr> <tr> <td>Str 2011-46</td> <td>1167</td> <td>105.0</td> </tr> <tr> <td>Str 2011-46A</td> <td>1226</td> <td>101.5</td> </tr> <tr> <td>Str 2011-47</td> <td>1046</td> <td>95.0</td> </tr> <tr> <td>Str 2011-48</td> <td>872</td> <td>115.0</td> </tr> </tbody> </table>	Structure	Distance (ft)	Height (ft)	Str 2011-42	2163	115.0	Str 2011-43	1876	100.0	Str 2011-44	1573	120.0	Str 2011-45	1292	100.0	Str 2011-46	1167	105.0	Str 2011-46A	1226	101.5	Str 2011-47	1046	95.0	Str 2011-48	872	115.0	
Structure	Distance (ft)	Height (ft)																												
Str 2011-42	2163	115.0																												
Str 2011-43	1876	100.0																												
Str 2011-44	1573	120.0																												
Str 2011-45	1292	100.0																												
Str 2011-46	1167	105.0																												
Str 2011-46A	1226	101.5																												
Str 2011-47	1046	95.0																												
Str 2011-48	872	115.0																												

Figure 5-132: Manassas Historic District Simulation 4 – Simulation location, direction of view, and structures modeled from intersection of Main and Church Streets. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 155-0161 3A</p>	<p>Existing View</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>		<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>	

Figure 5-133: Manassas Historic District Simulation 4 – Existing view from intersection of Main and Church Streets. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-0161 3A

Proposed View

(Location of towers not visible are overlaid with yellow tower icon)

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-134: Manassas Historic District Simulation 4 – Proposed view from intersection of Main and Church Streets – (Visible structure shown as it would appear. Structures not visible shown in yellow). Source: GTTE, LLC

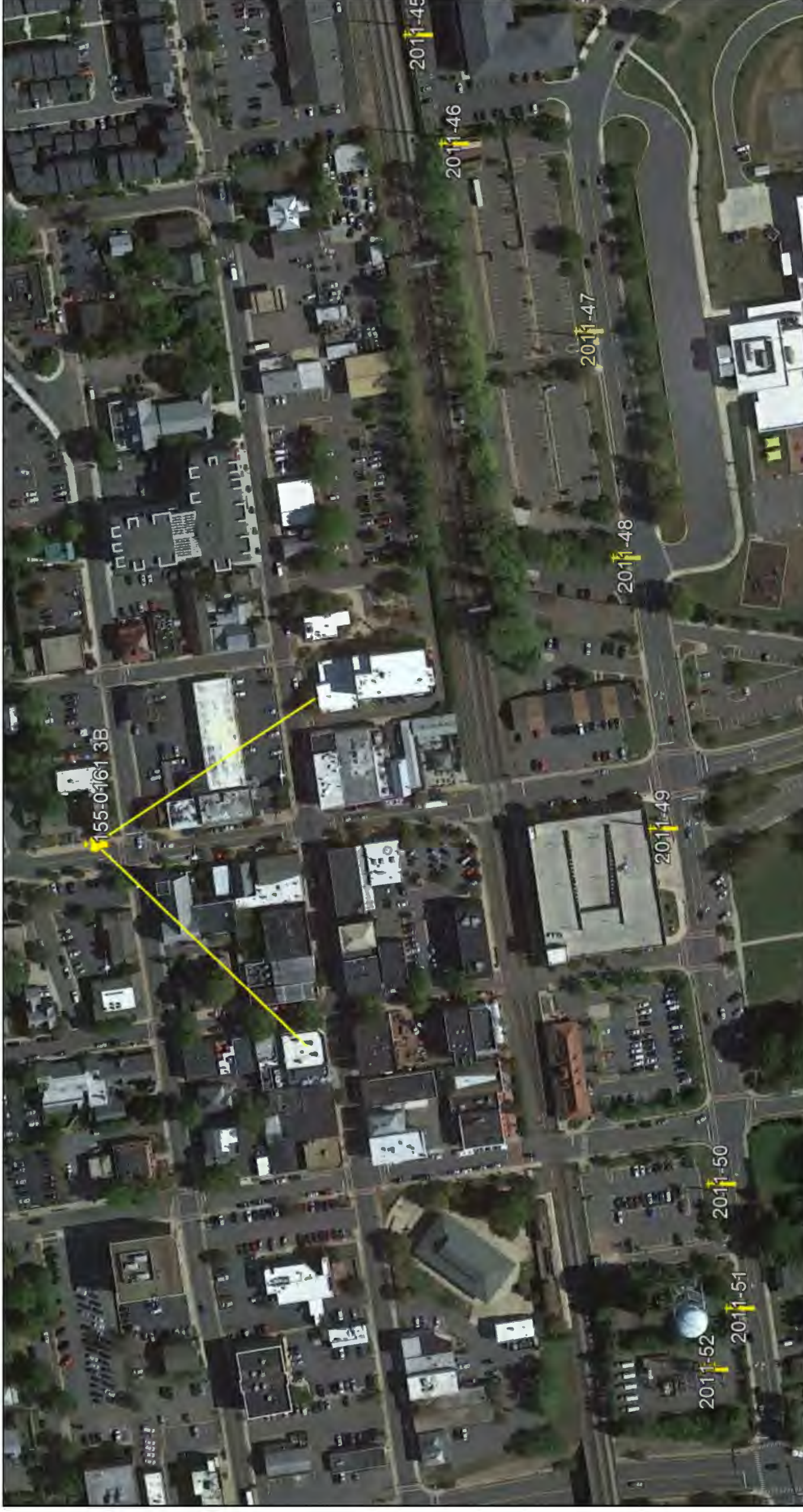


Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Location: 155-0161 3a

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Structure	Distance (ft)	Height (ft)
Str 2011-48	871	115.0
Str 2011-49	816	95.0
Str 2011-50	1024	80.0
Str 2011-51	1145	80.0

Figure 5-135: Manassas Historic District Simulation 5 – Simulation location, direction of view, and structures modeled from intersection of Main and Church Streets. Source: GTTE, LLC





<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p> <p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>	<p>Location: 155-0161 3B</p>	<p>Existing View</p>
<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>			

Figure 5-136: Manassas Historic District Simulation 5 – Existing view from intersection of Main and Church Streets. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350



Line #2011 230kV Partial Rebuild

Location: 155-0161 3B

Proposed View
 (Location of towers not visible are overlaid with yellow tower icon)

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-137: Manassas Historic District Simulation 5 – Proposed view from intersection of Main and Church Streets – (Visible structure shown as it would appear. Structures not visible shown in yellow). Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p> 	<p>Location: 155-0161 1 A</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>	<table border="1"> <thead> <tr> <th>Structure</th> <th>Distance (ft)</th> <th>Height (ft)</th> </tr> </thead> <tbody> <tr> <td>Str 2011-40</td> <td>1411</td> <td>125.0</td> </tr> <tr> <td>Str 2011-41</td> <td>1037</td> <td>110.0</td> </tr> <tr> <td>Str 2011-42</td> <td>683</td> <td>115.0</td> </tr> <tr> <td>Str 2011-43</td> <td>446</td> <td>100.0</td> </tr> </tbody> </table>	Structure	Distance (ft)	Height (ft)	Str 2011-40	1411	125.0	Str 2011-41	1037	110.0	Str 2011-42	683	115.0	Str 2011-43	446	100.0
Structure	Distance (ft)	Height (ft)															
Str 2011-40	1411	125.0															
Str 2011-41	1037	110.0															
Str 2011-42	683	115.0															
Str 2011-43	446	100.0															

Figure 5-138: Manassas Historic District Simulation 6 – Simulation location, direction of view, and structures modeled from intersection of Center Street and Fairview Avenue. Source: GTTE, LLC





<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 155 0161 1 A</p>	<p>Existing View</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>		<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p> 	

Figure 5-139: Manassas Historic District Simulation 6 – Existing view from intersection of Center Street and Fairview Avenue. Source: GTTE, LLC



Figure 5-140: Manassas Historic District Simulation 6 – Proposed view from intersection of Center Street and Fairview Avenue – (Visible structures shown as they would appear). Source: GTTE, LLC

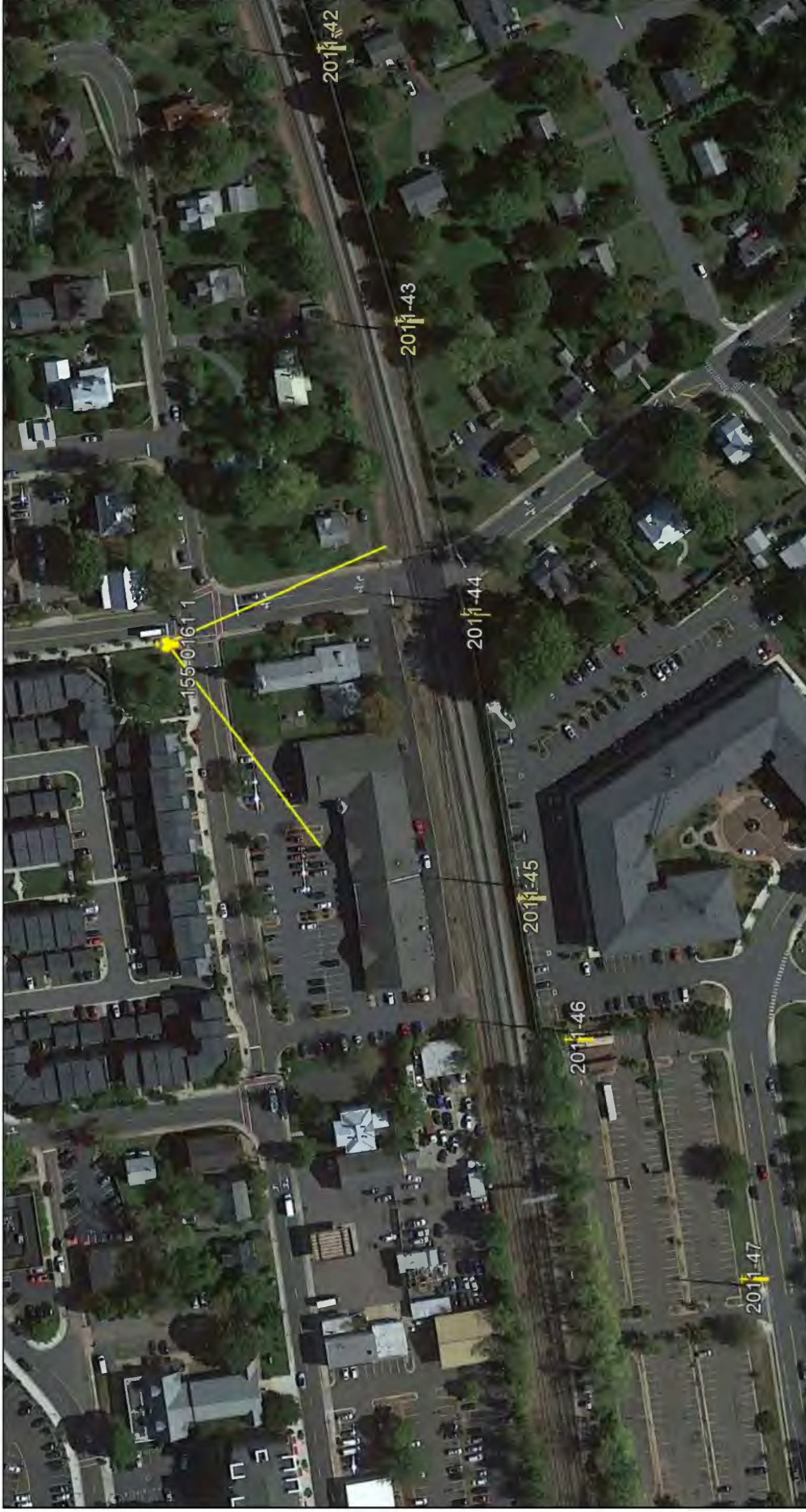




Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350

Location: 155-0161 1 B

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Structure	Distance (ft)	Height (ft)
Str 2011-44	343	120.0
Str 2011-45	491	100.0
Str 2011-46	630	105.0

Figure 5-141: Manassas Historic District Simulation 7 – Simulation location, direction of view, and structures modeled from intersection of Center Street and Fairview Avenue. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155 0161 1 B

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-142: Manassas Historic District Simulation 7 – Existing view from intersection of Center Street and Fairview Avenue. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 155 0161 1 B</p>	<p>Proposed View (Location of towers not visible are overlaid with yellow tower icon)</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>		<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>	

Figure 5-143: Manassas Historic District Simulation 7 – Proposed view from intersection of Center Street and Fairview Avenue – (Visible structures shown as they would appear). Source: GTTE, LLC



Structure	Distance (ft)	Height (ft)
Str 2011-36	1118	115.0
Str 2011-37	1476	120.0
Str 2011-38	1875	120.0
Str 2011-39	2241	115.0
Str 2011-40	2630	125.0
Str 2011-41	3026	110.0

Location: 155-5002 A

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-149: Mayfield Fortification Simulation 1 – Simulation location, direction of view, and structures modeled from interpretive kiosk looking west. Source: GTTE, LLC



Photo simulations prepared by:
GTTE LLC
email: info@gttelc.com
703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-5002a

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-150: Mayfield Fortification Simulation 1 – Existing view interpretive kiosk looking west. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350



Line #2011 230kV Partial Rebuild

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

Location: 155-5002a

(Location of towers not visible are overlaid with yellow tower icon)

Proposed View

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-151: Mayfield Fortification Simulation 1 – Proposed view from interpretive kiosk looking west – (Structures not visible shown in yellow). Source: GTTE, LLC



Location: 155-5002b

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Structure	Distance (ft)	Height (ft)
Str 2011-30	3185	110.0
Str 2011-31	2509	115.0
Str 2011-32	1871	130.0
Str 2011-33	1342	130.0
Str 2011-34	1103	125.0

Figure 5-152: Mayfield Fortification Simulation 2 – Simulation location, direction of view, and structures modeled from interpretive kiosk looking north. Source: GTTE, LLC





<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p> <p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>	<p>Location: 155-5002 B</p> <p>Existing View</p> <p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p> 
--	---	--

Figure 5-153: Mayfield Fortification Simulation 2 – Existing view interpretive kiosk looking north. Source: GTTE, LLC



Figure 5-154: Mayfield Fortification Simulation 2 – Proposed view from interpretive kiosk looking north – (Visible structures shown as they would appear). Source: GTTE, LLC



Structure	Distance (ft)	Height (ft)
Str 2011-63	8261	130.0
Str 2011-64	7436	115.0
Str 2011-65	6615	120.0
Str 2011-66	5815	115.0
Str 2011-67	5018	115.0

Location:
Cannon Branch Fort
Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)

Photo simulations prepared by:
 GTTE LLC
 email:
 info@gttellc.com
 703 447 1350



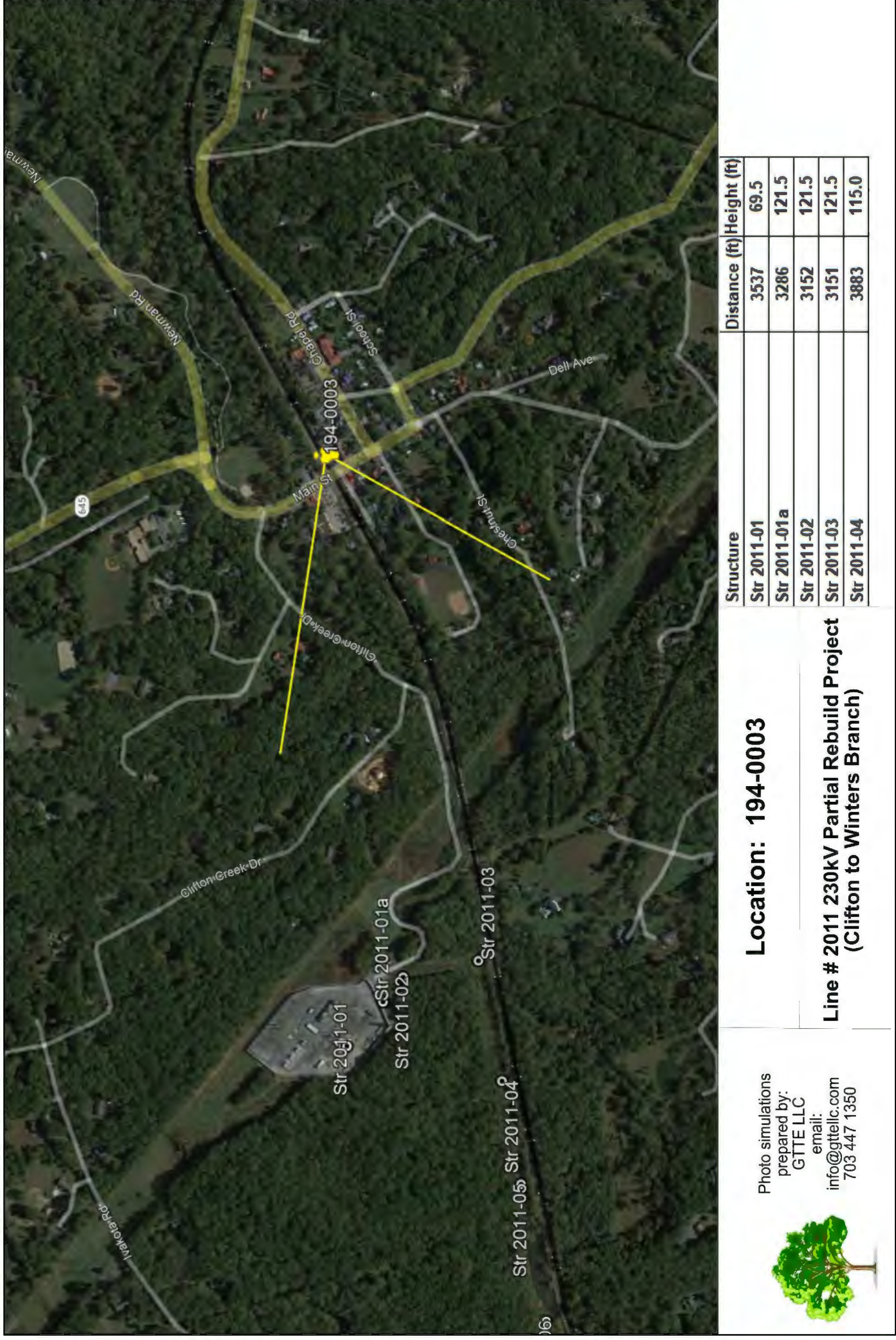
Figure 5-160: Cannon Branch Fort Simulation 1 – Simulation location, direction of view, and structures modeled from parking lot. Source: GTTE, LLC



Figure 5-161: Cannon Branch Fort Simulation 1 – Existing view from parking lot. Source: GTTE, LLC



Figure 5-162: Cannon Branch Fort Simulation 1 – Proposed view from parking lot – (Structures not visible shown in yellow). Source: GTTE, LLC



Structure	Distance (ft)	Height (ft)
Str 2011-01	3537	69.5
Str 2011-01a	3286	121.5
Str 2011-02	3152	121.5
Str 2011-03	3151	121.5
Str 2011-04	3883	115.0

Location: 194-0003



**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-169: Clifton Historic District Simulation 1 – Simulation location, direction of view, and structures modeled from Main Street and railroad. Source: GTTE, LLC



<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p> <p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>	<p>Location: 194-0003</p>	<p>Existing View</p> 
--	---	----------------------------------	---

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-170: Clifton Historic District Simulation 1 – Existing view from Main Street and Railroad. Source: GTTE, LLC



Figure 5-171: Clifton Historic District Simulation 1 – Proposed view from Main Street and railroad – (Structures not visible shown in yellow). Source: GTTE, LLC



Structure	Distance (ft)	Height (ft)
Str 2011-19	5671	126.5
Str 2011-20	5492	121.5
Str 2011-21	5759	91.5
Str 2011-22	6339	96.5
Str 2011-23	6834	121.5
Str 2011-24	7199	126.5
Str 2011-25	7485	131.5
Str 2011-26	7609	141.5
Str 2011-27	8196	131.5

Location: Manassas 1

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-176: Blackburn's Ford Battlefield Simulation 1 – Simulation location, direction of view, and structures modeled from Centerville Road. Source: GTTE, LLC



Photo simulations prepared by:
GTTE LLC
email: info@gttelc.com
703 447 1350

Line #2011 230kV Partial Rebuild

Location: Manassas 1

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

Existing View



This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-177: Blackburn's Ford Battlefield Simulation 1 – Existing view from Centerville Road. Source: GTTE, LLC



Figure 5-178: Blackburn's Ford Battlefield Simulation 1 – Proposed view from gate to property – (Structures not visible shown in yellow). Source: GTTE, LLC

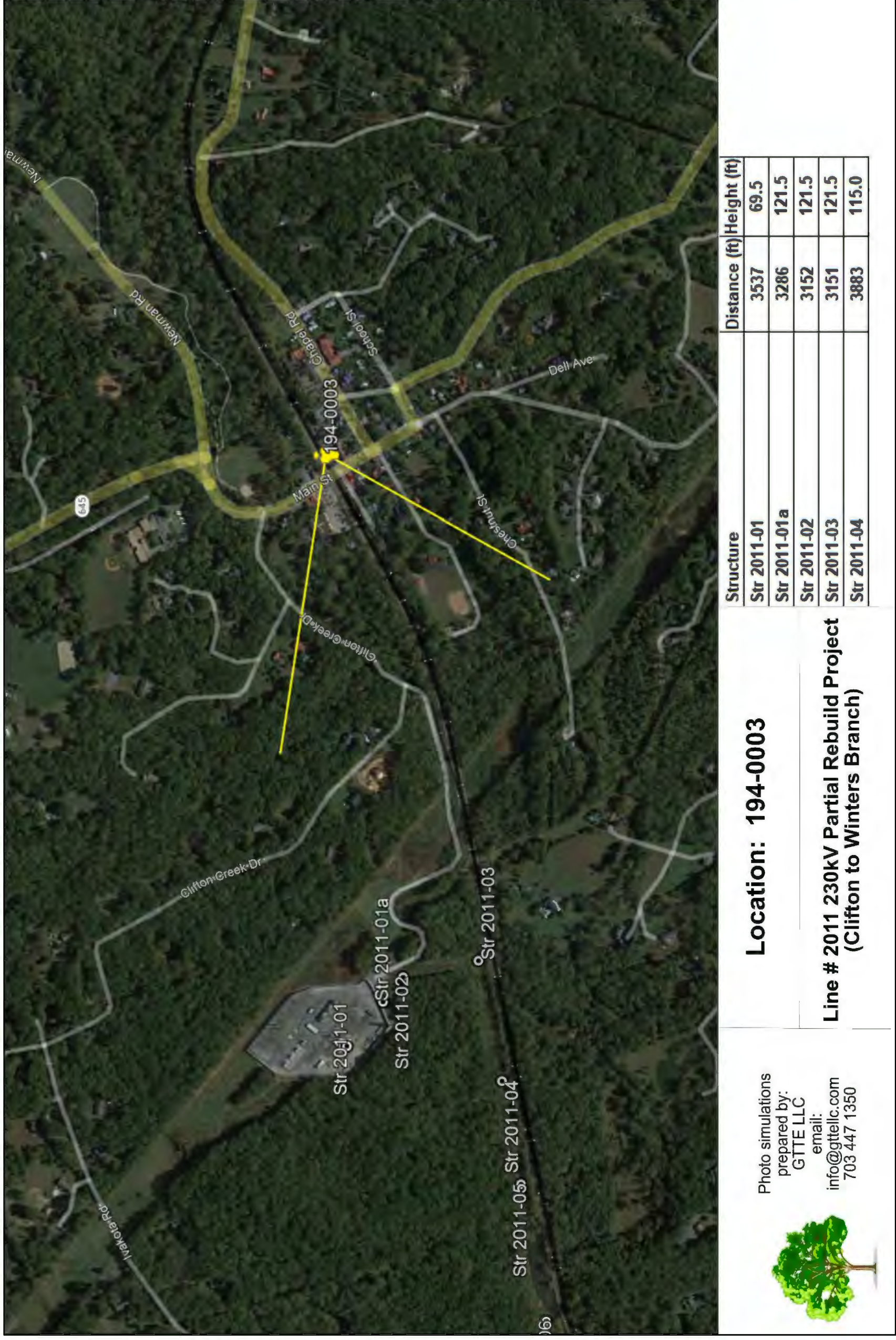


Photo simulations prepared by:
 GTTE LLC
 email:
 info@gttellc.com
 703 447 1350



Location: 194-0003

**Line # 2011 230kV Partial Rebuild Project
 (Clifton to Winters Branch)**

Figure 5-198: Bristoe Station Battlefield Simulation 1 – Simulation location, direction of view, and structures modeled from Clifton. Source: GTTE, LLC



Figure 5-199: Bristoe Station Battlefield Simulation 1 – Existing view from Clifton. Source: GTTE, LLC



Figure 5-200: Bristoe Station Battlefield Simulation 1 – Proposed view from Clifton – (Structures not visible shown in yellow). Source: GTTE, LLC

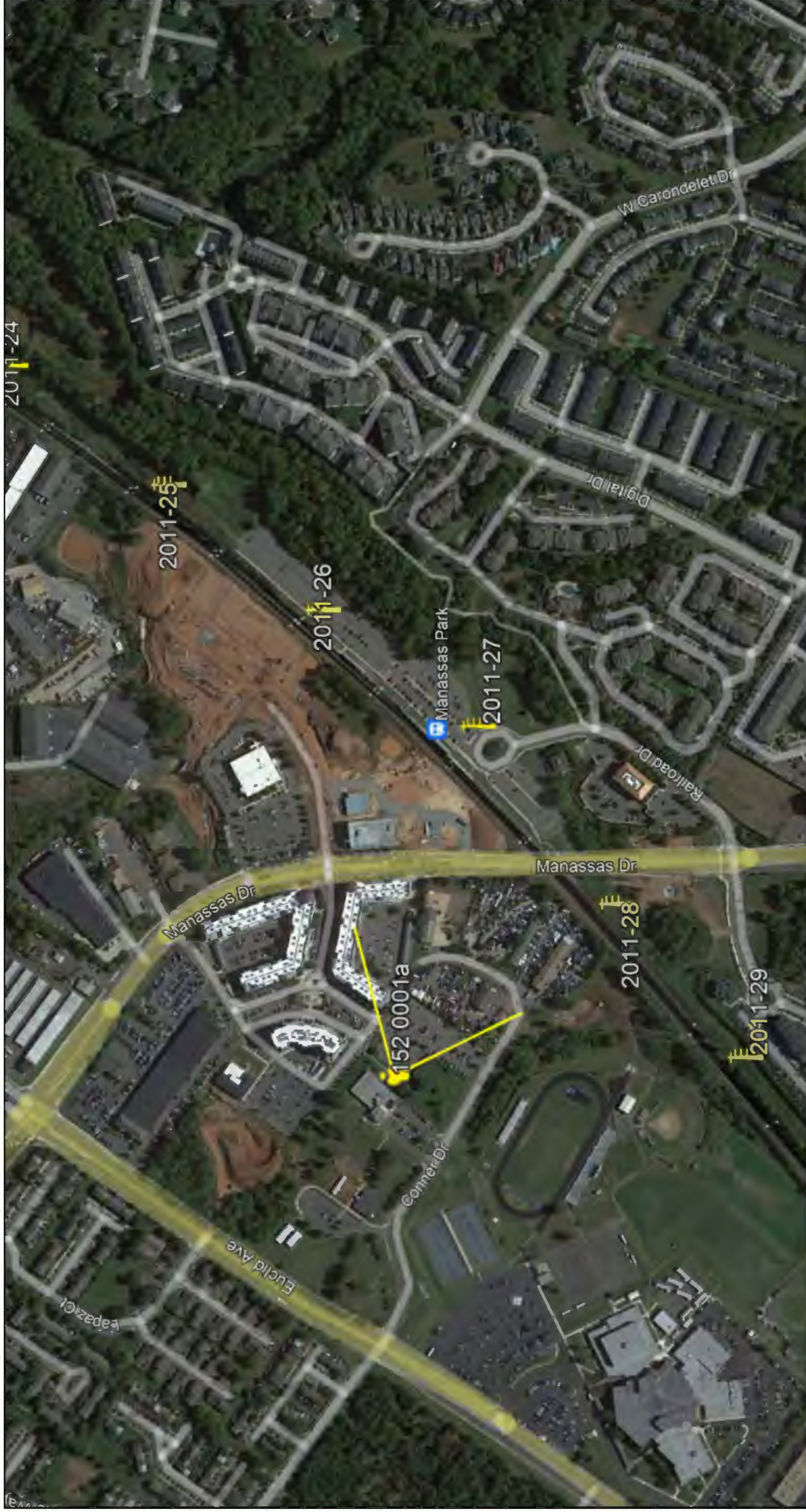


Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350	Location: 152 0001a Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)		Structure	Distance (ft)	Height (ft)
			Str 2011-26	1747	141.5
			Str 2011-27	1333	131.5
			Str 2011-28	1037	141.5

Figure 5-201: Bristoe Station Battlefield Simulation 2 – Simulation location, direction of view, and structures modeled from Conner House. Source: GTTE, LLC



Photo simulations prepared by:
GTTE LLC
email: info@gttelc.com
703 447 1350

Line #2011 230kV Partial Rebuild

Location: 152 0001a

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-202: Bristoe Station Battlefield Simulation 2 – Existing view from Conner House. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350



Line #2011 230kV Partial Rebuild

Location: 152 0001a

Proposed View
 (Location of towers not visible are overlaid with yellow tower icon)



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-203: Bristoe Station Battlefield Simulation 2 – Proposed view from Conner House – (Visible structures shown as they would appear). Source: GTTE, LLC

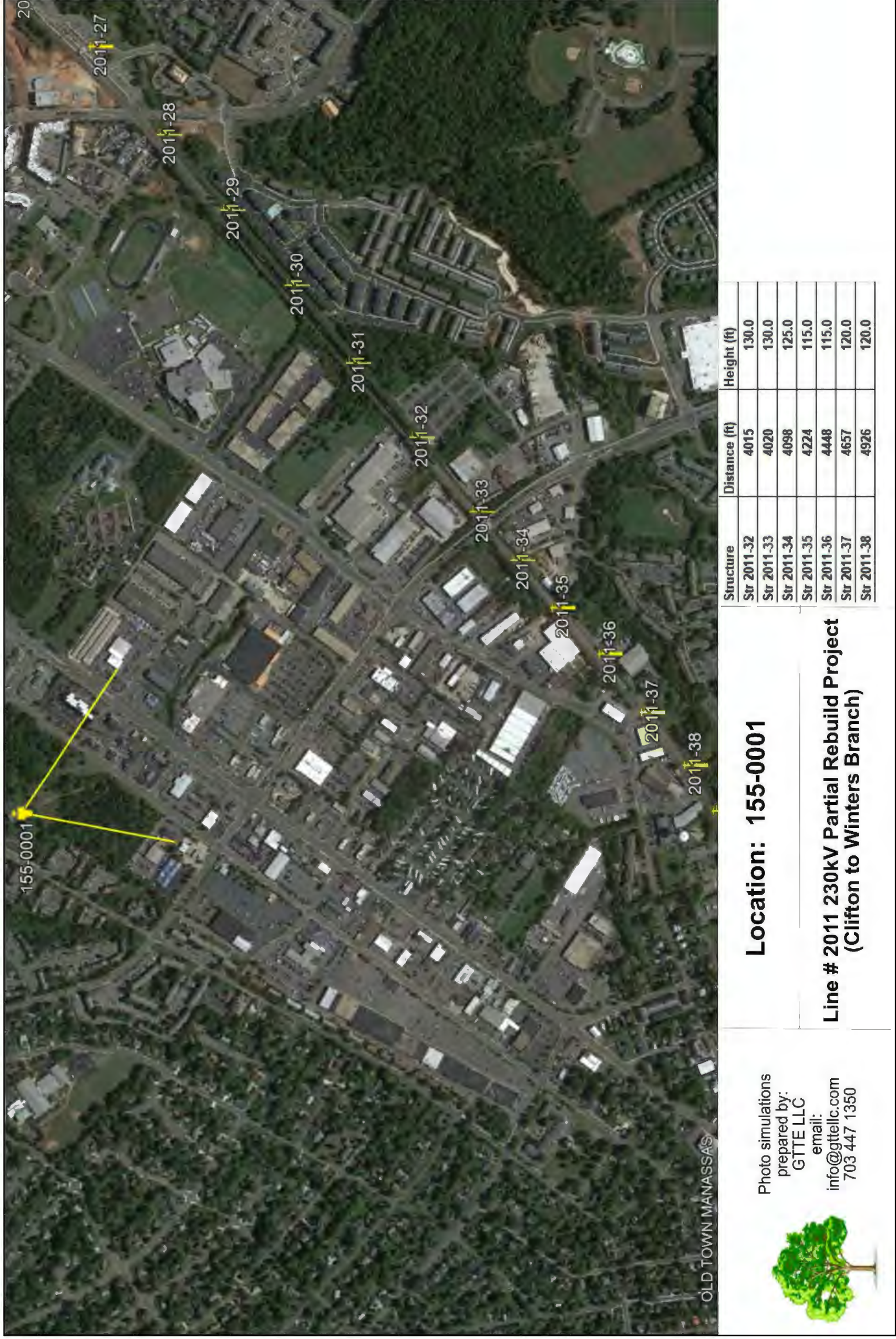


Figure 5-204: Bristoe Station Battlefield Simulation 3 – Simulation location, direction of view, and structures modeled from Liberia. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-0001

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-205: Bristoe Station Battlefield Simulation 3 – Existing view from Liberia. Source: GTTE, LLC



Figure 5-206: Bristoe Station Battlefield Simulation 3 – Proposed view from Liberia – (Structures not visible shown in yellow). Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p> 		<p>Location: 155-5002b</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>		<p>Structure</p> <p>Str 2011-30</p> <p>Str 2011-31</p> <p>Str 2011-32</p> <p>Str 2011-33</p> <p>Str 2011-34</p>	<p>Distance (ft)</p> <p>3185</p> <p>2509</p> <p>1871</p> <p>1342</p> <p>1103</p>	<p>Height (ft)</p> <p>110.0</p> <p>115.0</p> <p>130.0</p> <p>130.0</p> <p>125.0</p>
---	--	---	--	--	---	--

Figure 5-207: Bristoe Station Battlefield Simulation 4 – Simulation location, direction of view, and structures modeled from Mayfield Fortification. Source: GTTE, LLC





<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p> <p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>	<p>Location: 155-5002 B</p>	<p>Existing View</p> <p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p> 
--	---	------------------------------------	---

Figure 5-208: Bristoe Station Battlefield Simulation 4 – Existing view from Mayfield Fortification. Source: GTTE, LLC





<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p> <p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>	<p>Location: 155-5002 B</p>	<p>Proposed View (Location of towers not visible are overlaid with yellow tower icon)</p> <p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p> 
--	---	------------------------------------	--

Figure 5-209: Bristoe Station Battlefield Simulation 4 – Proposed view from Mayfield Fortification – (Visible structures shown as they would appear). Source: GTTE, LLC



<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p> 		<p>Location: 155-0021 B</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>	<table border="1"> <thead> <tr> <th>Structure</th> <th>Distance (ft)</th> <th>Height (ft)</th> </tr> </thead> <tbody> <tr> <td>Str 2011-41</td> <td>2112</td> <td>110.0</td> </tr> <tr> <td>Str 2011-42</td> <td>1944</td> <td>115.0</td> </tr> <tr> <td>Str 2011-43</td> <td>1844</td> <td>100.0</td> </tr> <tr> <td>Str 2011-44</td> <td>1774</td> <td>120.0</td> </tr> <tr> <td>Str 2011-45</td> <td>1755</td> <td>100.0</td> </tr> <tr> <td>Str 2011-46</td> <td>1788</td> <td>105.0</td> </tr> <tr> <td>Str 2011-46A</td> <td>1949</td> <td>101.5</td> </tr> <tr> <td>Str 2011-47</td> <td>1983</td> <td>95.0</td> </tr> <tr> <td>Str 2011-48</td> <td>2086</td> <td>115.0</td> </tr> </tbody> </table>	Structure	Distance (ft)	Height (ft)	Str 2011-41	2112	110.0	Str 2011-42	1944	115.0	Str 2011-43	1844	100.0	Str 2011-44	1774	120.0	Str 2011-45	1755	100.0	Str 2011-46	1788	105.0	Str 2011-46A	1949	101.5	Str 2011-47	1983	95.0	Str 2011-48	2086	115.0
Structure	Distance (ft)	Height (ft)																															
Str 2011-41	2112	110.0																															
Str 2011-42	1944	115.0																															
Str 2011-43	1844	100.0																															
Str 2011-44	1774	120.0																															
Str 2011-45	1755	100.0																															
Str 2011-46	1788	105.0																															
Str 2011-46A	1949	101.5																															
Str 2011-47	1983	95.0																															
Str 2011-48	2086	115.0																															

Figure 5-210: Bristoe Station Battlefield Simulation 5 – Simulation location, direction of view, and structures modeled from Annaburg. Source: GTTE, LLC



Figure 5-211: Bristoe Station Battlefield Simulation 5 – Existing view from Annaburg. Source: GTTE, LLC



Figure 5-212: Bristoe Station Battlefield Simulation 5 – Proposed view from Annaburg – (Structures not visible shown in yellow). Source: GTTE, LLC

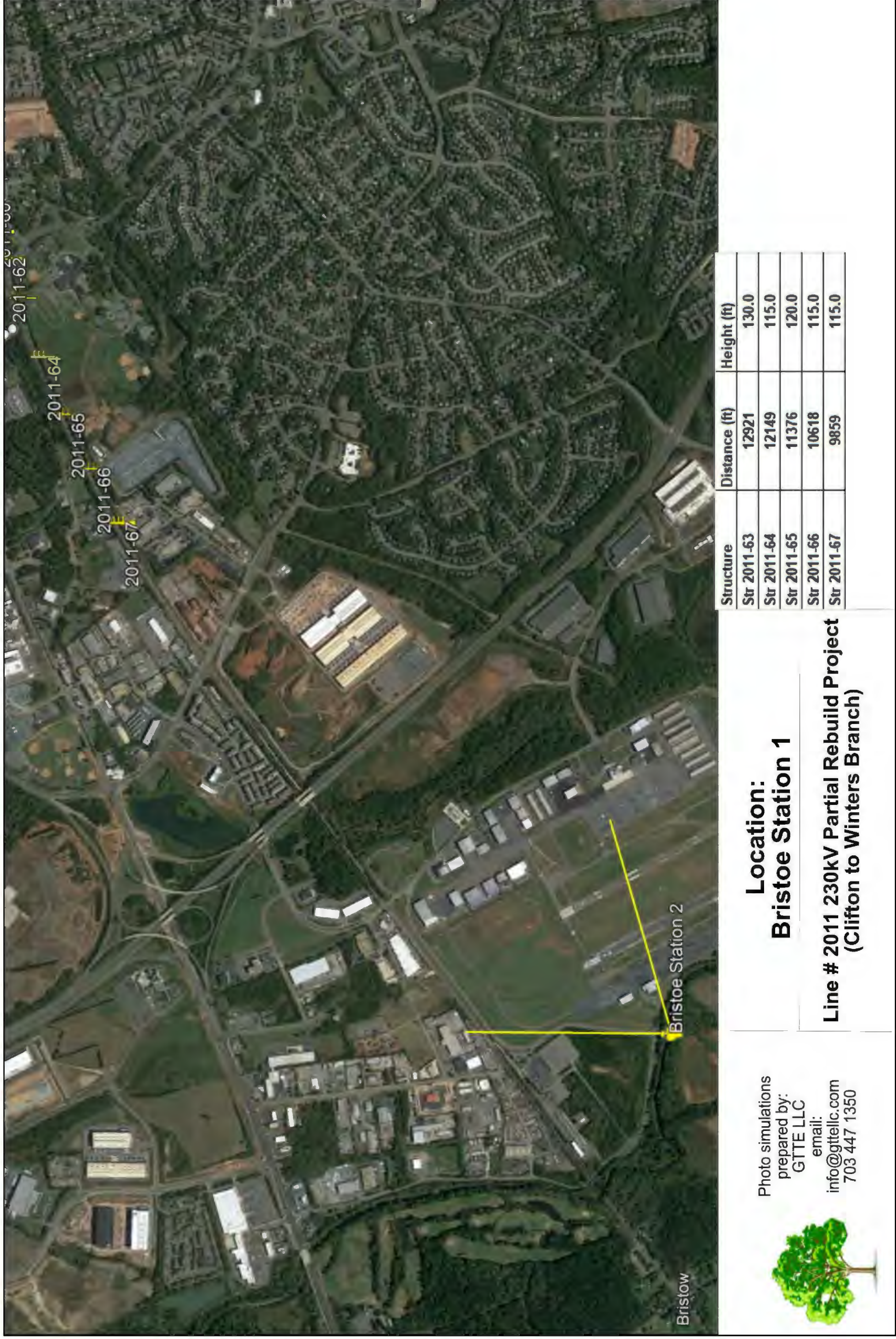


Figure 5-213: Bristoe Station Battlefield Simulation 6 – Simulation location, direction of view, and structures modeled from Manassas Regional Airport. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: Bristoe Station 2

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-214: Bristoe Station Battleground Simulation 6 – Existing view from Manassas Regional Airport. Source: GTTE, LLC



Figure 5-215: Bristoe Station Battlefield Simulation 6 – Proposed view from Manassas Regional Airport – (Structures not visible shown in yellow). Source: GTTE, LLC



**Location:
Bristoe Station 1**

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Structure	Distance (ft)	Height (ft)
Str 2011-63	12039	130.0
Str 2011-64	11216	115.0
Str 2011-65	10409	120.0
Str 2011-66	9636	115.0
Str 2011-67	8881	115.0

Figure 5-216: Bristoe Station Battlefield Simulation 7 – Simulation location, direction of view, and structures modeled from Hornbaker Road. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: Bristoe Station 1

Existing View

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.



Figure 5-217: Bristoe Station Battlefield Simulation 7 – Existing view from Hornbaker Road. Source: GTTE, LLC



Figure 5-218: Bristoe Station Battlefield Simulation 7 – Proposed view from Hornbaker Road – (Structures not visible shown in yellow). Source: GTTE, LLC



Location: 155-0161 2B

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Structure	Distance (ft)	Height (ft)
Str 2011-51	1145	80.0
Str 2011-52	1214	0.0
Str 2011-53	1346	105.0
Str 2011-54	1775	120.0
Str 2011-55	2123	125.0
Str 2011-56	2641	120.0
Str 2011-57	2986	125.0
Str 2011-58	3358	120.0

Figure 5-229: Second Manassas Battlefield Simulation 1 – Simulation location, direction of view, and structures modeled from Manassas Rail Depot. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 155-0161 2B

Existing View

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.



Figure 5-230: Second Manassas Battlefield Simulation 1 – Existing view from Manassas Rail Depot. Source: GTTE, LLC

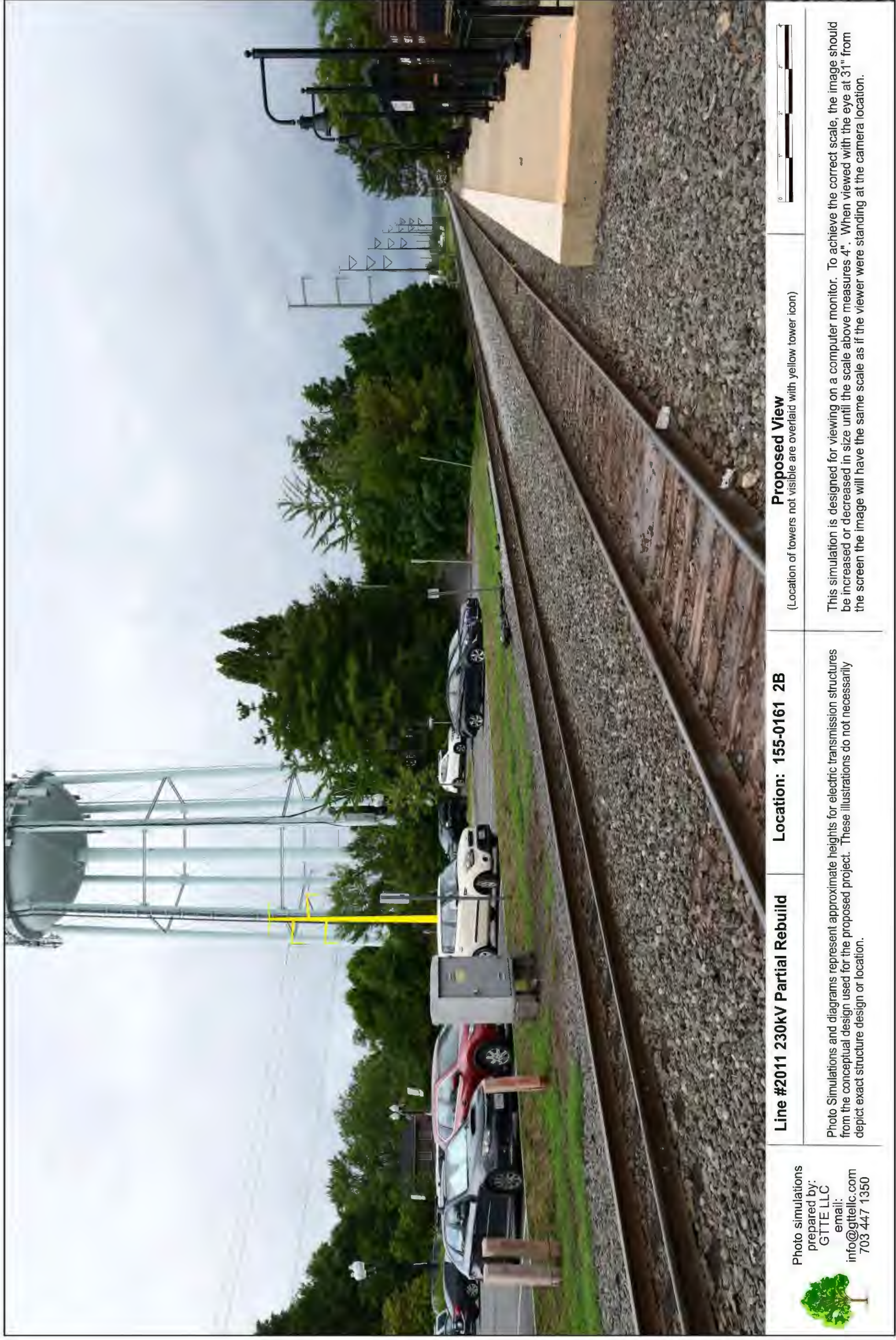


Figure 5-231: Second Manassas Battlefield Simulation 1 – Proposed view from Manassas Rail Depot – (Visible structure shown as they would appear). Source: GTTE, LLC



<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p> 		<p>Location: 155-0021 B</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>		<table border="1"> <thead> <tr> <th>Structure</th> <th>Distance (ft)</th> <th>Height (ft)</th> </tr> </thead> <tbody> <tr> <td>Str 2011-41</td> <td>2112</td> <td>110.0</td> </tr> <tr> <td>Str 2011-42</td> <td>1944</td> <td>115.0</td> </tr> <tr> <td>Str 2011-43</td> <td>1844</td> <td>100.0</td> </tr> <tr> <td>Str 2011-44</td> <td>1774</td> <td>120.0</td> </tr> <tr> <td>Str 2011-45</td> <td>1755</td> <td>100.0</td> </tr> <tr> <td>Str 2011-46</td> <td>1788</td> <td>105.0</td> </tr> <tr> <td>Str 2011-46A</td> <td>1949</td> <td>101.5</td> </tr> <tr> <td>Str 2011-47</td> <td>1983</td> <td>95.0</td> </tr> <tr> <td>Str 2011-48</td> <td>2086</td> <td>115.0</td> </tr> </tbody> </table>	Structure	Distance (ft)	Height (ft)	Str 2011-41	2112	110.0	Str 2011-42	1944	115.0	Str 2011-43	1844	100.0	Str 2011-44	1774	120.0	Str 2011-45	1755	100.0	Str 2011-46	1788	105.0	Str 2011-46A	1949	101.5	Str 2011-47	1983	95.0	Str 2011-48	2086	115.0
Structure	Distance (ft)	Height (ft)																																
Str 2011-41	2112	110.0																																
Str 2011-42	1944	115.0																																
Str 2011-43	1844	100.0																																
Str 2011-44	1774	120.0																																
Str 2011-45	1755	100.0																																
Str 2011-46	1788	105.0																																
Str 2011-46A	1949	101.5																																
Str 2011-47	1983	95.0																																
Str 2011-48	2086	115.0																																

Figure 5-232: Second Manassas Battlefield Simulation 2 – Simulation location, direction of view, and structures modeled from Annaburg. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 155-0021 B</p>	<p>Existing View</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>		<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>	

Figure 5-233: Second Manassas Battlefield Simulation 2 – Existing view from Annaburg. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p> <p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>	<p>Location: 155-0021 B</p>	<p>Proposed View (Location of towers not visible are overlaid with yellow tower icon)</p>
<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>			

Figure 5-234: Second Manassas Battlefield Simulation 2 – Proposed view from Annaburg – (Structures not visible shown in yellow). Source: GTTE, LLC



Structure	Distance (ft)	Height (ft)
Str 2011-19	5671	126.5
Str 2011-20	5492	121.5
Str 2011-21	5759	91.5
Str 2011-22	6339	96.5
Str 2011-23	6834	121.5
Str 2011-24	7199	126.5
Str 2011-25	7485	131.5
Str 2011-26	7609	141.5
Str 2011-27	8196	131.5

Location: Manassas 1

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-235: Second Manassas Battlefield Simulation 3 – Simulation location, direction of view, and structures modeled from Centerville Road. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p> <p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>	<p>Location: Manassas 1</p>	<p>Existing View</p> <p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>
--	---	------------------------------------	---

Figure 5-236: Second Manassas Battlefield Simulation 3 – Existing view from Centerville Road. Source: GTTE, LLC



Figure 5-237: Second Manassas Battlefield Simulation 3 – Proposed view from Centerville Road – (Structures not visible shown in yellow). Source: GTTE, LLC



Structure	Distance (ft)	Height (ft)
Str 2011-30	3767	111.5
Str 2011-31	3853	116.5
Str 2011-32	4044	131.5
Str 2011-33	4354	131.5
Str 2011-34	4596	126.5
Str 2011-35	4868	116.5
Str 2011-36	5149	116.5
Str 2011-37	5552	121.5
Str 2011-38	5933	120.0

Location: 076-0016

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-249: First Manassas Battlefield Simulation 1 – Simulation location, direction of view, and structures modeled from Signal Hill. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 076-0016

Existing View



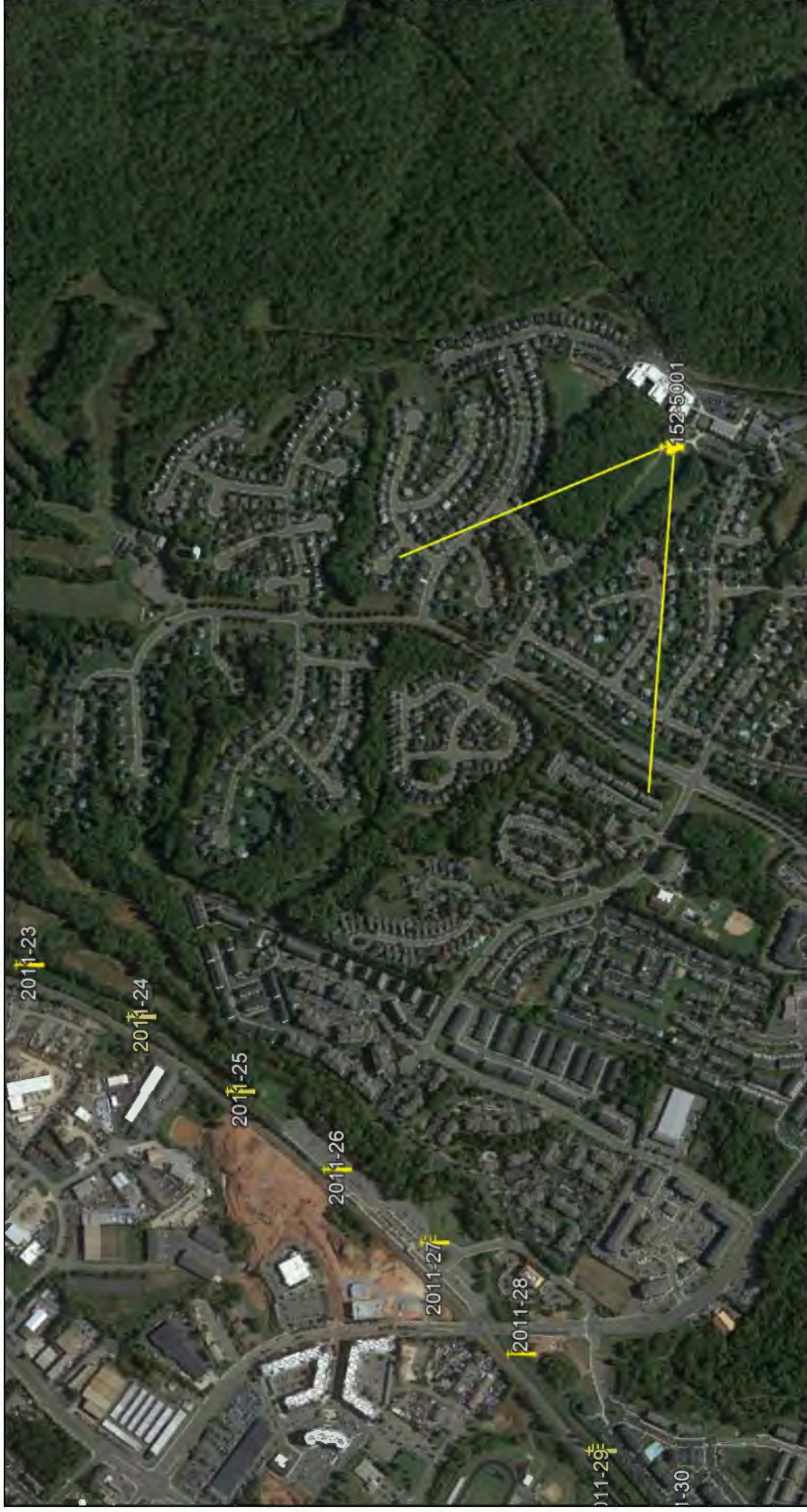
Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-250: First Manassas Battlefield Simulation 1 – Existing view from Signal Hill. Source: GTTE, LLC



Figure 5-251: First Manassas Battlefield Simulation 1 – Proposed view from Signal Hill – (Visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC



Location: 152-5001

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Structure	Distance (ft)	Height (ft)
Str 2011-23	4826	121.5
Str 2011-24	4555	126.5
Str 2011-25	4543	131.5
Str 2011-26	4669	141.5
Str 2011-27	4873	131.5
Str 2011-28	5400	141.5
Str 2011-29	5907	141.5
Str 2011-30	6456	111.5

Figure 5-252: First Manassas Battlefield Simulation 2 – Simulation location, direction of view, and structures modeled from Louisiana Brigade Winter Camp. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Location: 152-5001

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

Existing View



This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-253: First Manassas Battlefield Simulation 2 – Existing view from Louisiana Brigade Winter Camp. Source: GTTE, LLC



Figure 5-254: First Manassas Battlefield Simulation 2 – Proposed view from Louisiana Brigade Winter Camp – (Structures not visible shown in yellow). Source: GTTE, LLC

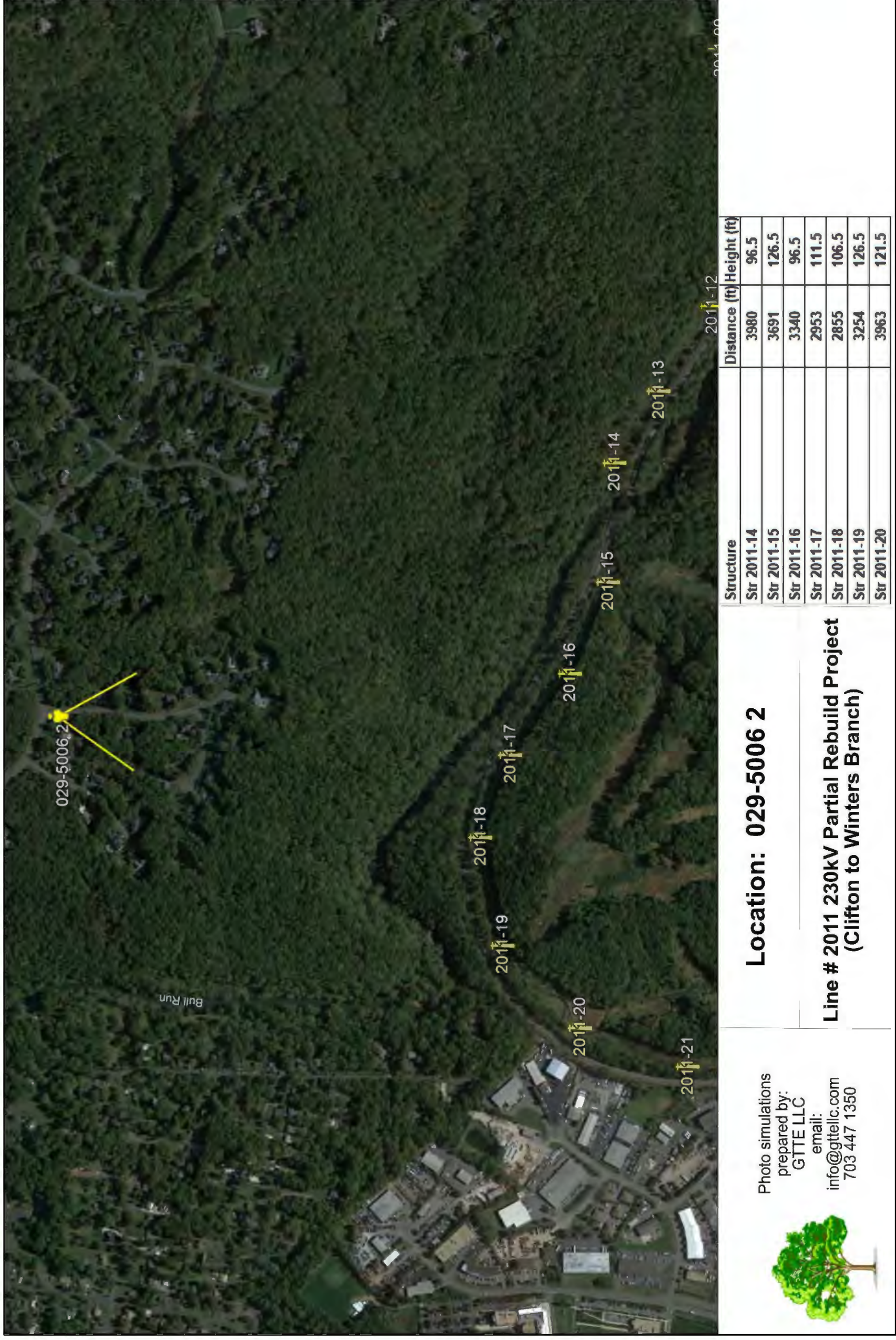


Figure 5-255: First Manassas Battlefield Simulation 3 – Simulation location, direction of view, and structures modeled from Battery Hill Redoubt. Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttelc.com 703 447 1350</p> 	<p>Line #2011 230kV Partial Rebuild</p>	<p>Location: 029-5006 2</p>	<p>Existing View</p>
<p>Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.</p>			<p>This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.</p>

Figure 5-256: First Manassas Battlefield Simulation 3 – Existing view from Battery Hill Redoubt. Source: GTTE, LLC



Figure 5-257: First Manassas Battlefield Simulation 3 – Proposed view from Battery Hill Redoubt – (Structures not visible shown in yellow). Source: GTTE, LLC

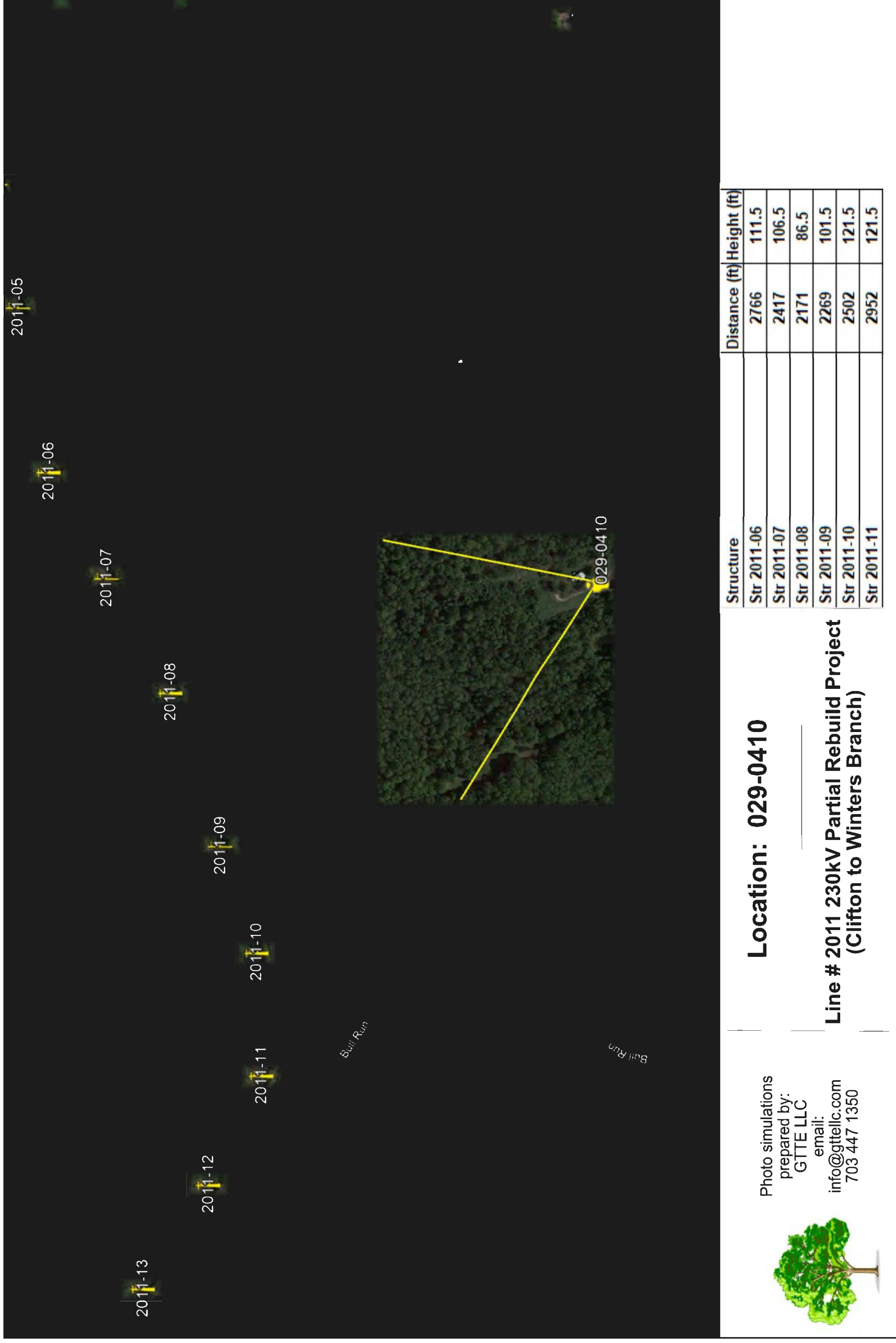


Figure 5-266: Union Mills Historic District Simulation 1 – Simulation location, direction of view, and structures modeled from Hemlock Overlook Regional Park. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 029-410

Existing View

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.



Figure 5-267: Union Mills Historic District Simulation 1 – Existing view from Hemlock Overlook Regional Park. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

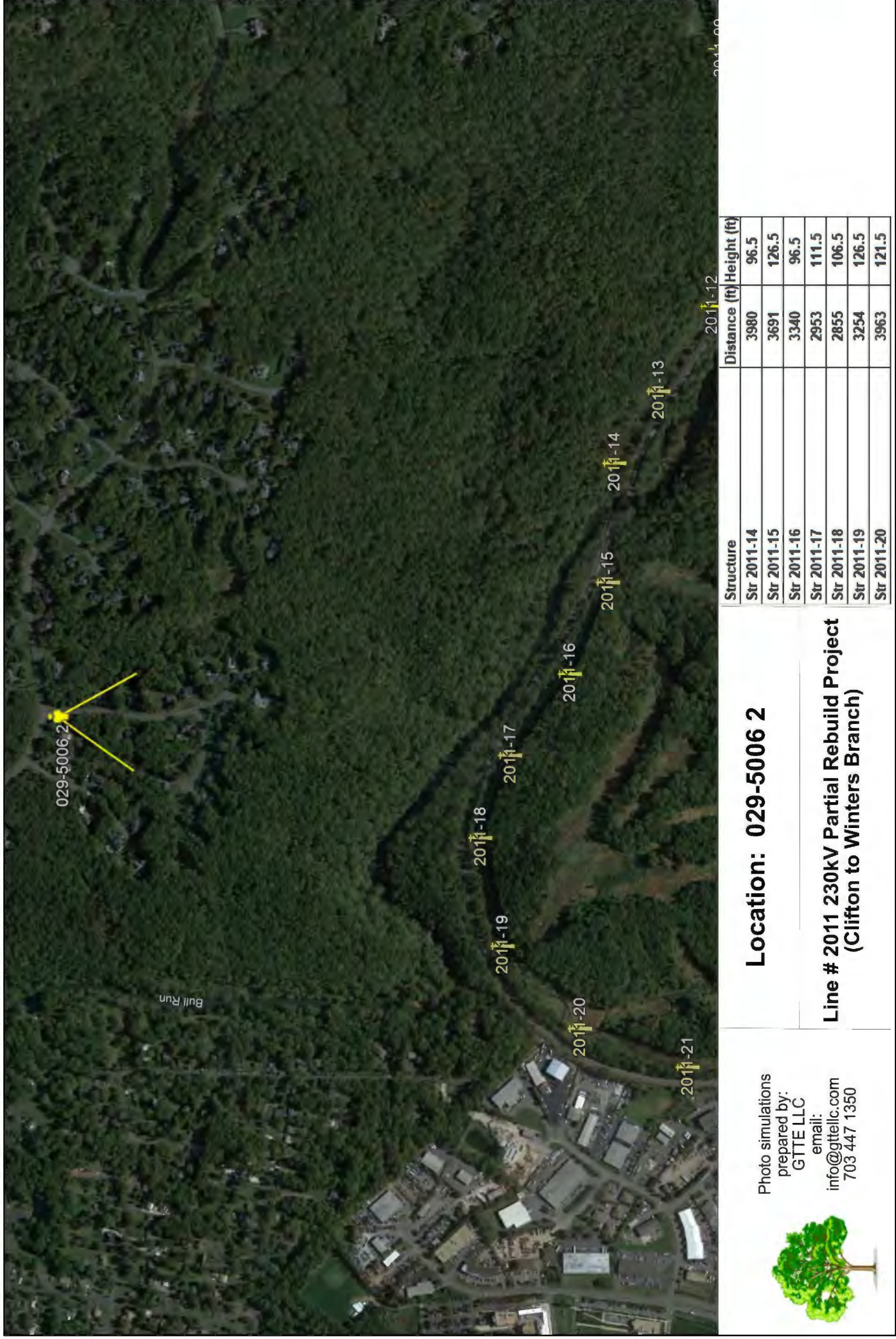
Location: 029-410

Proposed View
 (Location of towers not visible are overlaid with yellow tower icon)

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-268: Union Mills Historic District Simulation 1 – Proposed view from Hemlock Overlook Regional Park – (Structures not visible shown in yellow). Source: GTTE, LLC



Location: 029-5006.2

**Line # 2011 230kV Partial Rebuild Project
(Clifton to Winters Branch)**

Structure	Distance (ft)	Height (ft)
Str 2011-14	3980	96.5
Str 2011-15	3691	126.5
Str 2011-16	3340	96.5
Str 2011-17	2953	111.5
Str 2011-18	2855	106.5
Str 2011-19	3254	126.5
Str 2011-20	3963	121.5

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350



Figure 5-269: Union Mills Historic District Simulation 2 – Simulation location, direction of view, and structures modeled from Balmoral Greens Avenue. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 029-5006 2

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-270: Union Mills Historic District Simulation 2 – Existing view from Balmoral Greens Avenue. Source: GTTE, LLC



Figure 5-271: Union Mills Historic District Simulation 2 – Proposed view from Balmoral Greens Avenue – (Structures not visible shown in yellow). Source: GTTE, LLC




<p>Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350</p> 		<p>Location: 076-0061</p> <p>Line # 2011 230kV Partial Rebuild Project (Clifton to Winters Branch)</p>		<table border="1"> <thead> <tr> <th>Structure</th> <th>Distance (ft)</th> <th>Height (ft)</th> </tr> </thead> <tbody> <tr> <td>Str 2011-50</td> <td>1609</td> <td>80.0</td> </tr> <tr> <td>Str 2011-51</td> <td>1481</td> <td>80.0</td> </tr> <tr> <td>Str 2011-52</td> <td>1425</td> <td>0.0</td> </tr> <tr> <td>Str 2011-53</td> <td>1114</td> <td>105.0</td> </tr> <tr> <td>Str 2011-54</td> <td>961</td> <td>120.0</td> </tr> <tr> <td>Str 2011-55</td> <td>981</td> <td>125.0</td> </tr> </tbody> </table>	Structure	Distance (ft)	Height (ft)	Str 2011-50	1609	80.0	Str 2011-51	1481	80.0	Str 2011-52	1425	0.0	Str 2011-53	1114	105.0	Str 2011-54	961	120.0	Str 2011-55	981	125.0
Structure	Distance (ft)	Height (ft)																							
Str 2011-50	1609	80.0																							
Str 2011-51	1481	80.0																							
Str 2011-52	1425	0.0																							
Str 2011-53	1114	105.0																							
Str 2011-54	961	120.0																							
Str 2011-55	981	125.0																							

Figure 5-277: Bennett School Simulation 1 – Simulation location, direction of view, and structures modeled front of building. Source: GTTE, LLC



Photo simulations prepared by:
 GTTE LLC
 email: info@gttelc.com
 703 447 1350

Line #2011 230kV Partial Rebuild

Location: 076-0061

Existing View



Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-278: Bennett School Simulation 1 – Existing view from front of building. Source: GTTE, LLC



Figure 5-279: Bennett School Simulation 1 – Proposed view from front of building – (Visible structures shown as they would appear). Source: GTTE, LLC

II. DESCRIPTION OF THE PROPOSED PROJECT

- C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project. Include size, acreage, and bus configurations. Describe substation expansion capability and plans. Provide one-line diagrams for each.**

Response: There are no new substations, switching stations, or other ground facilities associated with the proposed Partial Rebuild Project, nor are any of the impacted stations being expanded. The Partial Rebuild Project will require the following station work:

At the Clifton Substation, the Company will replace all substation equipment associated with Line #2011 that is not currently rated for 4000A to provide a 4000A single breaker rating. Breakers, switches, and other station equipment will need to be replaced as well to support the 4000A single breaker rating on Line #2011. The Company will replace four breakers, twelve switches, breaker leads, bus segments, line trap, surge arresters, and line leads.

Additionally, the Company will uprate its line switches to 4000A at the Prince William DP and the Battery Heights DP, both of which are the City of Manassas's DPs tapped from Line #2011.

There is no station work being conducted at Cannon Branch Substation associated with the Partial Rebuild Project.¹⁸

¹⁸ See *supra*, n. 4.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

- A. Describe the character of the area that will be traversed by this line, including land use, wetlands, etc. Provide the number of dwellings within 500 feet, 250 feet and 100 feet of the centerline, and within the ROW for each route considered. Provide the estimated amount of farmland and forestland within the ROW that the proposed project would impact.

Response: Land Use

The Partial Rebuild Project area is located in the Cities of Manassas and Manassas Park and Fairfax and Prince William Counties for a total length of approximately 7.25 miles. From Structure #2011/68 to Structure #2011/25, land use around the existing right-of-way consists of mixed commercial, residential, and open space suburban areas. From Structure #2011/25 to Structure #2011/5, Line #2011 passes through Blooms Park, Bull Run Regional Park, Johnny Moore Stream Valley Park and a small portion of Hemlock Overlook Regional Park. The existing transmission line corridor also runs parallel to the northern border of the Hemlock Overlook Regional Park from Structure #2011/5 to Structure #2011/14.

Farmland/Forests

A total of 8.32 acres of prime farmland and 13.85 acres of farmland of statewide importance occurs within the existing transmission line corridor encompassing the Line #2011 Partial Rebuild Project area. A total of 29.31 acres of the transmission line corridor are designated as not prime farmland. See [Attachment III.A.1](#). Soils appropriate for prime farmland exist within the Partial Rebuild Project area; however, none of these areas are zoned for agricultural purposes or available for agricultural use. A large majority of the Partial Rebuild Project area has been previously developed, and the remainder crosses through regional and local parks. Therefore, the Partial Rebuild Project is not expected to impact agricultural land. Section 2.L of the DEQ Supplement discusses in detail the anticipated impacts of the Partial Rebuild Project on recreational, agricultural, and forest resources.

Wetlands

According to the U.S. Geological Survey topographic quadrangles (Manassas [2019], Nokesville [2019], and Independent Hill [2019]), the 7.25-mile section of Line #2011 proposed for rebuild crosses Russia Branch and Bull Run.

Within the existing transmission line corridor for the Partial Rebuild Project, the Company delineated wetlands and other Waters of the U.S. using the *Routine Determination Method* as outlined in the *1987 Corps of Engineers Wetland Delineation Manual* and methods described in the *2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0). The results of the delineation are included as

Attachment 2.D.1 to the DEQ Supplement. Section 2.D of the DEQ Supplement discusses in detail the anticipated impacts of the Partial Rebuild Project on tidal and non-tidal wetlands.

Historic Features

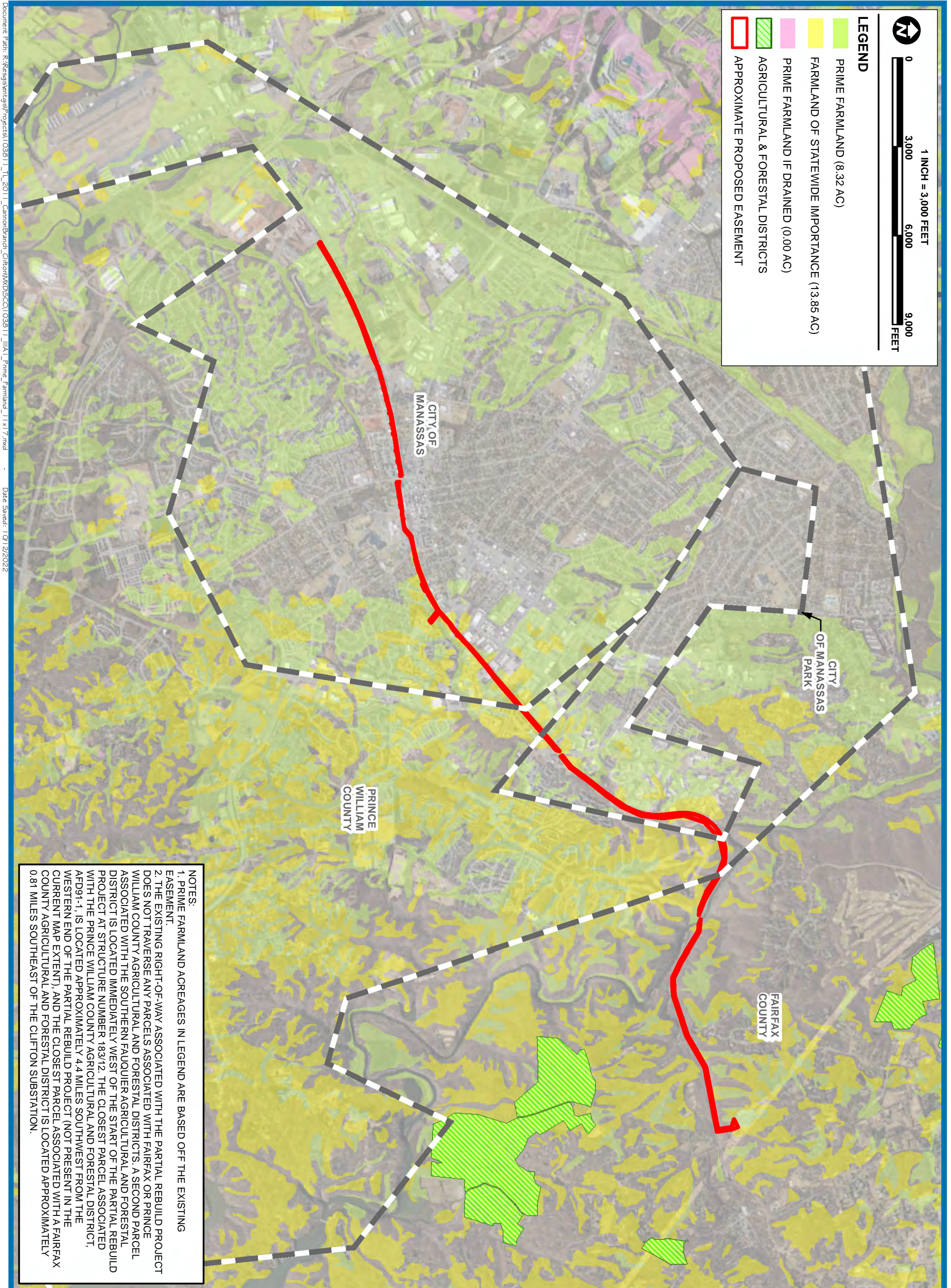
In October 2022, Dutton completed a Stage I Analysis of cultural resources for the Line #2011 230 kV Partial Rebuild Project in Prince William and Fairfax Counties, Virginia. The analysis was conducted in accordance with VDHR guidance titled *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (January 2008) and Commonwealth of Virginia State Corporation Commission Division of Public Utility Regulation *Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia* (August 2017). This report was forwarded to VDHR on March 6, 2023, and is included as Attachment 2.I.1 to the DEQ Supplement. Section 2.I of the DEQ Supplement discusses in detail the anticipated impacts of the Partial Rebuild Project on archeological, historic, scenic, cultural, and architectural resources.

Wildlife

A search of the U.S. Fish and Wildlife Information, Planning, and Consultation system, the Virginia Department of Wildlife Resources Virginia Fish and Wildlife Information Service, and the Virginia Department of Conservation and Recreation Natural Heritage Data Explorer public databases identified several federal and state listed species that have the potential to occur within the Partial Rebuild Project area. These resources are identified in the report included as Attachment 2.G.1 to the DEQ Supplement. The Company intends to reasonably minimize any impact on these resources and coordinate with DWR as appropriate. Sections 2.G and 2.K of the DEQ Supplement discuss in detail the anticipated impacts on natural heritage, threatened and endangered species, and wildlife resources.

Dwellings

According to Prince William and Fairfax Counties and the Cities of Manassas and Manassas Park GIS data, there are 428 dwellings located within 500 feet of the centerline of the Partial Rebuild Project, 169 dwellings located within 250 feet of the centerline, 63 dwellings located within 100 feet of the centerline. The Company will work with property owners to obtain new easements, including several restrictive easements to limit the expansion of any existing building heights.



Document Path: R:\res\gis\mxd\039111\2011_Cameras\Camera_ClipFromMDCSC01039111\11A_Prime_Farmland_11x17.mxd Date Saved: 10/12/2022

LINE #2011 230 KV PARTIAL REBUILD PROJECT (CLIFTON TO WINTERS BRANCH)
APPLICANT: DOMINION ENERGY VIRGINIA

PRIME FARMLAND MAP III.A.1.

CITY OF MANASSAS,
CITY OF MANASSAS PARK,
PRINCE WILLIAM COUNTY,
AND FAIRFAX COUNTY, VIRGINIA



CORPORATE | 6575 WEST LOOP SOUTH, SUITE 300, BELLAIRE, TX 77401
P: 713.520.5400

www.res.us

PROJECT MANAGER:	CZ
DRAWN:	LC
JOB NUMBER:	103811
DATE EXPORTED:	10/13/2022
REVISIONS:	

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

B. Describe any public meetings the Applicant has had with neighborhood associations and/or officials of local, state or federal governments that would have an interest or responsibility with respect to the affected area or areas.

Response: On September 21, 2022, the Company launched an internet website dedicated to the proposed Partial Rebuild Project, which can be found at the following address: www.dominionenergy.com/cliftonwintersbranch. The website includes a description and benefits of the proposed Partial Rebuild Project, an explanation of need, route map, photo simulations, project timeline, and information on the Commission review process. The website contains a feature that allows the content to be translated to Spanish.

On October 19, 2022, the Company sent project announcement postcards to approximately 2,231 property owners and residents within 1,000 feet of the Partial Rebuild Project. Each mailer included a postcard with an overview map and the URL to the Partial Rebuild Project website. In addition, the communication indicated that detailed materials would be posted to the dedicated Partial Rebuild Project website and how to contact the project team to provide any feedback or questions. Templates of the postcards with overview map are included as Attachment III.B.1.

Newspaper print advertisements, both in English and Spanish, regarding the Partial Rebuild Project and virtual open house were placed in the Prince William Times (circulation 24,005), Inside NOVA (circulation 25,000), and El Tiempo Latino (circulation 50,000). Copies of the advertisements were placed in the three papers in English or Spanish and are included as Attachment III.B.2.

Additionally, from October 27, 2022 to November 2, 2022, the Company used paid digital and social media campaigns to drive awareness and educate the public regarding the Company's Partial Rebuild Project and the virtual open house meeting. A copy of those digital advertisements, both in English and Spanish, are included as Attachment III.B.3. The event campaigns ran within Nextdoor, Facebook, Instagram, and Twitter. All phases urged local residents to visit the dedicated project website at www.dominionenergy.com/cliftonwintersbranch to learn more about the meeting and to participate virtually. Campaign results include over 588,000 Impressions Delivered, 0.77% Click Thru Rate, more than 2,100 Link Clicks and over 31,000 ad engagements, including reactions, likes, comments, shares and saves.

A virtual open house was held on November 2, 2022, at 6:00 p.m. At the virtual open house, the Company made available details about construction, project timing, and the Commission approval process. Traditional open house materials have been posted on the website for the proposed Partial Rebuild Project, including simulations of the proposed Partial Rebuild Project from key locations. The key

location simulations are included as Attachment III.B.4.

As part of preparing for the Partial Rebuild Project, the Company researched the demographics of the surrounding communities using the 2021-2026 Esri Updated Demographics data and the Environmental Protection Agency's Environmental Justice ("EJ") mapping and screening tool, EJScreen 2.0 and census data from the U.S. Census Bureau 2015–2019 American Community. This information revealed that 40 Census Block Groups ("CBGs") are within 1.0 mile of the existing transmission line. Of these, ten are intersected by the Partial Rebuild Project. A review of minority, income, and education census data identified populations within the study area that meet the U.S. Environmental Protection Agency defined threshold for EJ protections and the thresholds for "community of color" and "low income" set forth in Va. Code § 2.2-234 ("EJ Communities"). Communities of color have been identified in 31 out of 40 CBGs within the study area. Twenty-two out of 40 CBGs within the study area appear to be low income. Of the ten CBGs intersected by the Partial Rebuild Project, six meet the definition for a community of color and five meet the definition for low income.

Pursuant to Va. Code §§ 56.46.1 C and 56-259 C, as well as Attachment 1 of these Guidelines, there is a strong preference for the use/paralleling of existing utility rights-of-way whenever feasible. The majority of the proposed route will be within existing right-of-way, existing easements, and Company-owned property, which are adequate for the proposed Partial Rebuild Project. The Partial Rebuild Project is primarily located within the existing transmission line corridor and along the Norfolk Southern Railroad, uses weathering steel structures to better blend in with surrounding forested areas, and generally limits impacts on the surrounding areas due to an average increase in structure height of five feet. The existing transmission line and multiple structures are currently visible from many of the resources, particularly those in close proximity to or crossed by the Partial Rebuild Project. Meanwhile, the line and structures tend to be partially to completely screened from resources set further away due to the development and vegetation patterns in the area. Because the line is to be rebuilt with replacement structures generally in the same locations and the same or only minimal increase in height, there will not be a substantial, or in most cases perceptible change in visibility as a result of the Partial Rebuild Project. As such, the Partial Rebuild Project will pose no more than minimal visual impacts to surrounding communities. Based on the analysis of the Partial Rebuild Project, the Company does not anticipate disproportionately high or adverse impacts to the surrounding community and the EJ Communities located within the study area.

In addition to its evaluation of impacts, the Company has and will continue to engage the EJ Communities and others affected by the Partial Rebuild Project in a manner that allows them to meaningfully participate in the project development and approval process so that their views and input can be taken into consideration. See Attachment III.B.5 for a copy of the Company's Environmental Justice Policy.

Electric Transmission
P.O. Box 26666
Richmond, VA 23261



Actions Speak Louder

Investing in Our Communities

**YOU'RE INVITED TO
A VIRTUAL COMMUNITY MEETING
DETAILS ENCLOSED**



**Local Power Line
Project Information Enclosed**

Dominion Energy image. Not project specific.



IMPORTANT

Local Power Line Project Information

Clifton-Winters Branch 230 kV Transmission Line Partial Rebuild

Use your iPhone camera or the QR reader app on other smartphones to visit the project page on our website.



AT DOMINION ENERGY, we are committed to continually reviewing and analyzing our energy infrastructure to provide our neighbors with safe, reliable, and affordable electricity.

As a result of continued economic growth in the area and related demand for increased energy, we need to upgrade an existing 230 kV transmission line in your area. This project proposes to replace the structures and conductor along the portion of transmission line that runs from our Clifton Substation on Clifton Creek Drive in Fairfax County, through the City of Manassas, to just outside our Cannon Branch Substation, south of Nokesville Road in Prince William County. This portion of line to be rebuilt is adjacent to a new section of line which will soon be under construction between Cannon Branch and Winters Branch Substations.

You may see or have seen our crews conducting survey activities along the existing transmission line corridor. You can expect to see crews on foot or in vehicles accessing the right of way, which may include the use of access roads outside the right of way.

We are dedicated to working safely and courteously in your community and invite you to visit our project website to learn more and participate in an upcoming virtual community meeting.

CONTACT US — Visit DominionEnergy.com/cliftonwintersbranch for project updates. Or contact us by calling 888-291-0190 or sending an email to powerline@dominionenergy.com.



AT DOMINION ENERGY, protecting the grid and making it secure against natural and man-made acts is a top priority. We work alongside government officials to prepare for potential incidents that could affect our ability to provide electricity safely and reliably to the communities we serve. Learn how we're keeping you safe at powerlines101.dominionenergy.com.

This map is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

Para obtener información sobre el proyecto en Español, visite DominionEnergy.com/cliftonwintersbranch.

WHY:

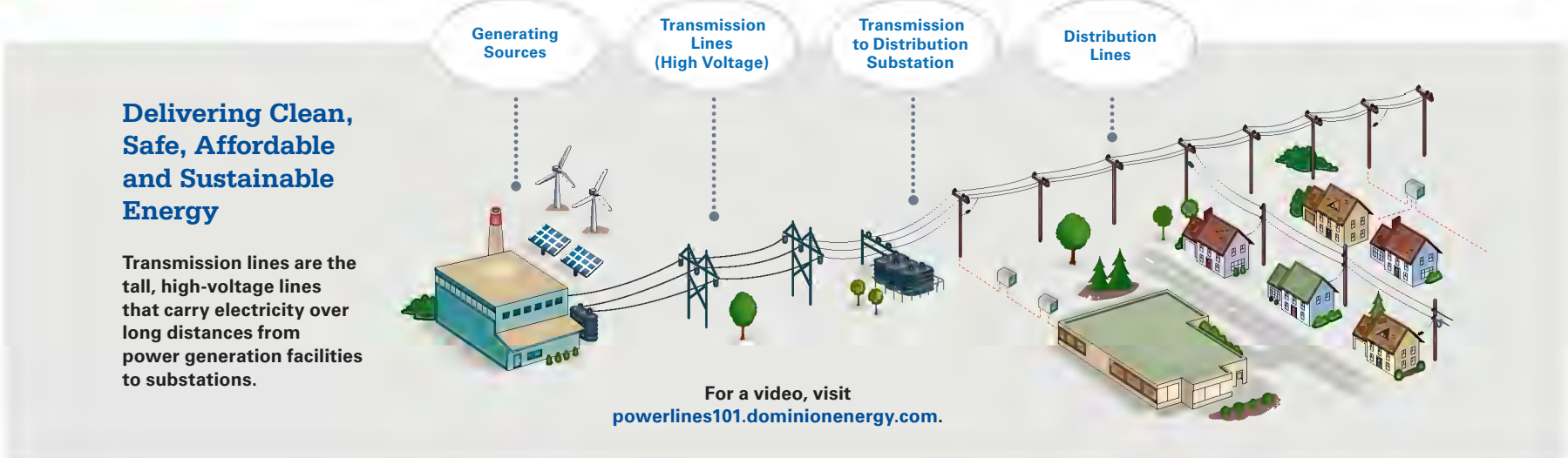
We need to reconductor, or replace the wire, for this transmission line in order to allow more energy to flow along the line. It will still be 230 kV, but the wire itself will be heavier to accommodate the increased energy flow. Because the new conductor will be heavier, it requires us to replace the structures which carry it.

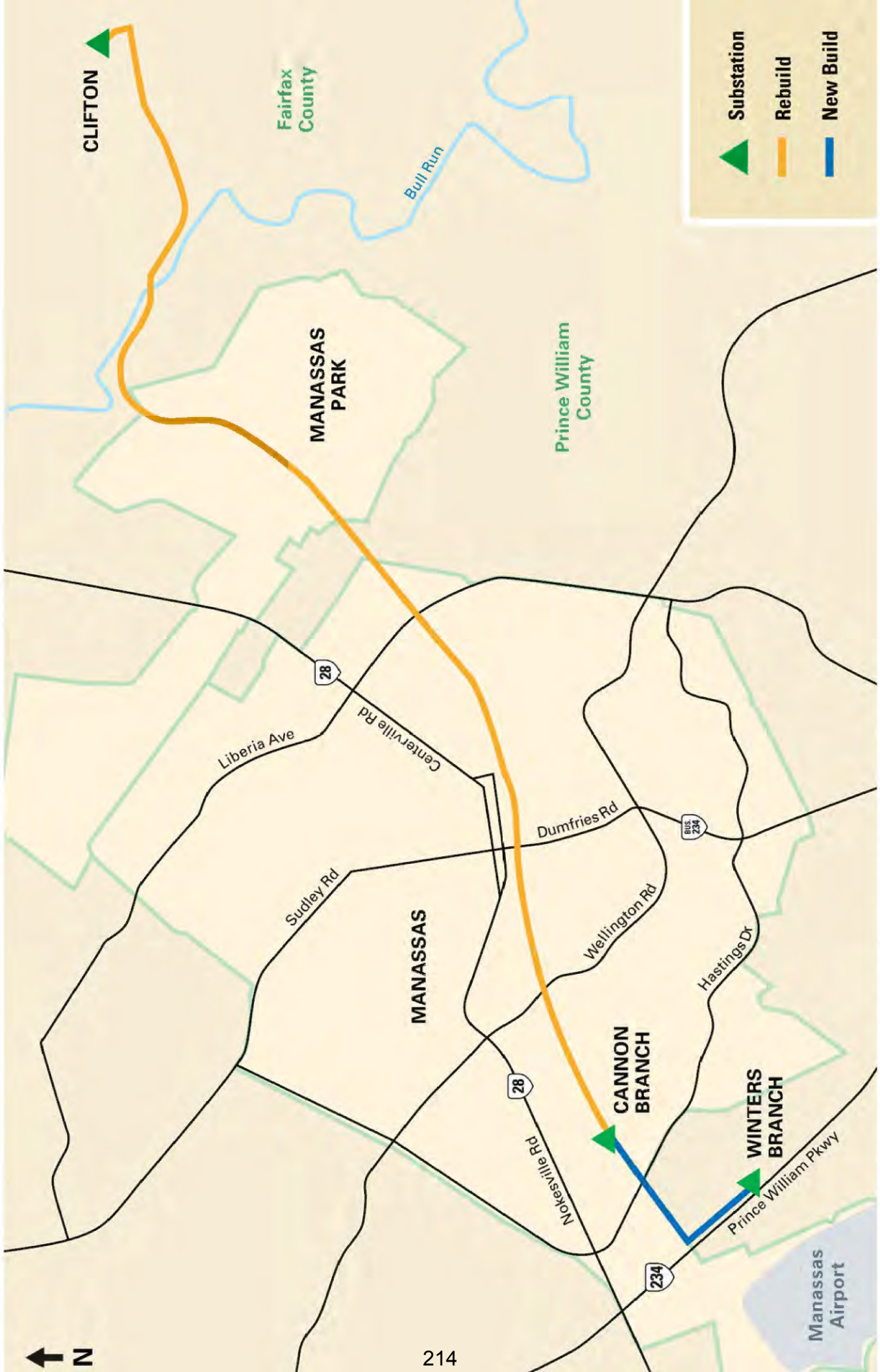
WHERE:

The portion of the line we're proposing to rebuild runs approximately 7.25 miles through the Cities of Manassas and Manassas Park in Prince William County into Fairfax County near the Town of Clifton.

VIRTUAL COMMUNITY MEETING

Live Via Webex Events
Wednesday, Nov. 2, 2022 • 6–7 p.m.
Hear a presentation and participate in a Q&A.
Visit DominionEnergy.com/cliftonwintersbranch for more information.





This map is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

You are invited to our Virtual Community Meeting

Learn more about the upcoming Clifton-Winters Branch Electric Transmission Line Project. This project will help strengthen service, safety and reliability for our customers.

Join us live online on Wednesday, November 2 at 6 p.m.

Learn more at [DominionEnergy.com/cliftonwintersbranch](https://www.DominionEnergy.com/cliftonwintersbranch)



Use your phone's camera or QR reader app to visit the project page directly.



**Dominion
Energy**

Actions Speak Louder

Le invitamos a nuestra reunión de la comunidad virtual

Obtenga más información sobre el futuro proyecto de la línea de transmisión eléctrica Clifton-Winters Branch. Este proyecto ayudará a reforzar el servicio, la seguridad y la confiabilidad para nuestros clientes.

Acompañenos en directo el miércoles

2 de noviembre a las 6 p.m.

Obtenga más información en

[DominionEnergy.com/cliftonwintersbranch](https://www.DominionEnergy.com/cliftonwintersbranch)



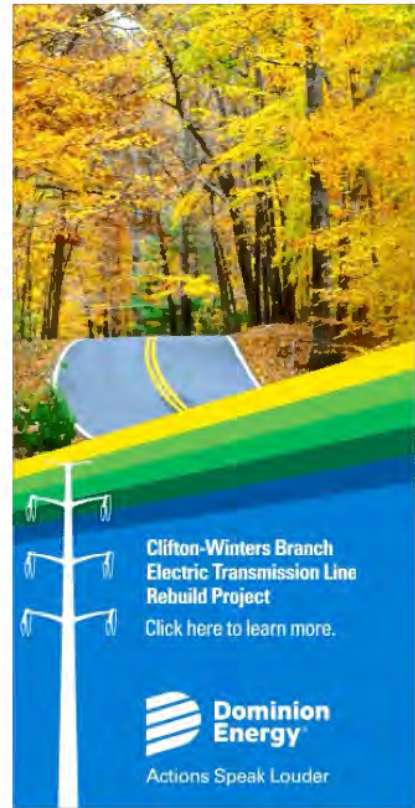
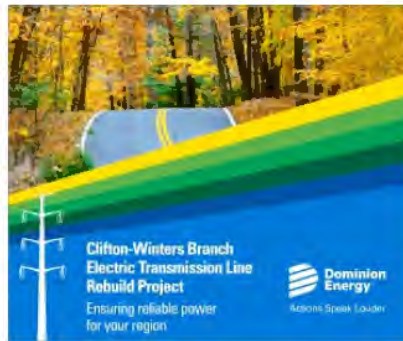
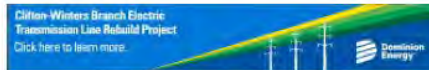
Utilice la cámara de su teléfono o la aplicación de lectura de códigos QR para visitar la página del proyecto directamente.



Actions Speak Louder

**Dominion Energy
Electric Transmission**

Clifton Winters
Awareness Display



**Dominion Energy
Electric Transmission**

Clifton Winters
Nextdoor & Social
Imagery

Pre-Event Nextdoor Image:



Post-Event Nextdoor Image:



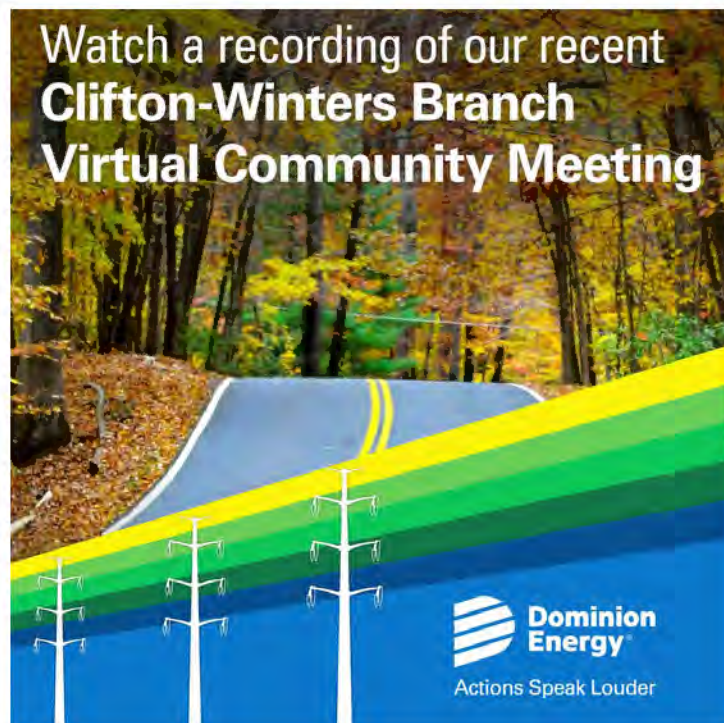
**Dominion Energy
Electric Transmission**

Clifton Winters
Social Videos

[Pre-Event Video \(click to play\)](#)



[Post-Event Video \(click to play\)](#)



**Dominion Energy
Electric Transmission**

Clifton Winters
Awareness Display



**Dominion Energy
Electric Transmission**

Clifton Winters
Nextdoor & Social
Imagery

Pre-Event Nextdoor Image:



Post-Event Nextdoor Image:

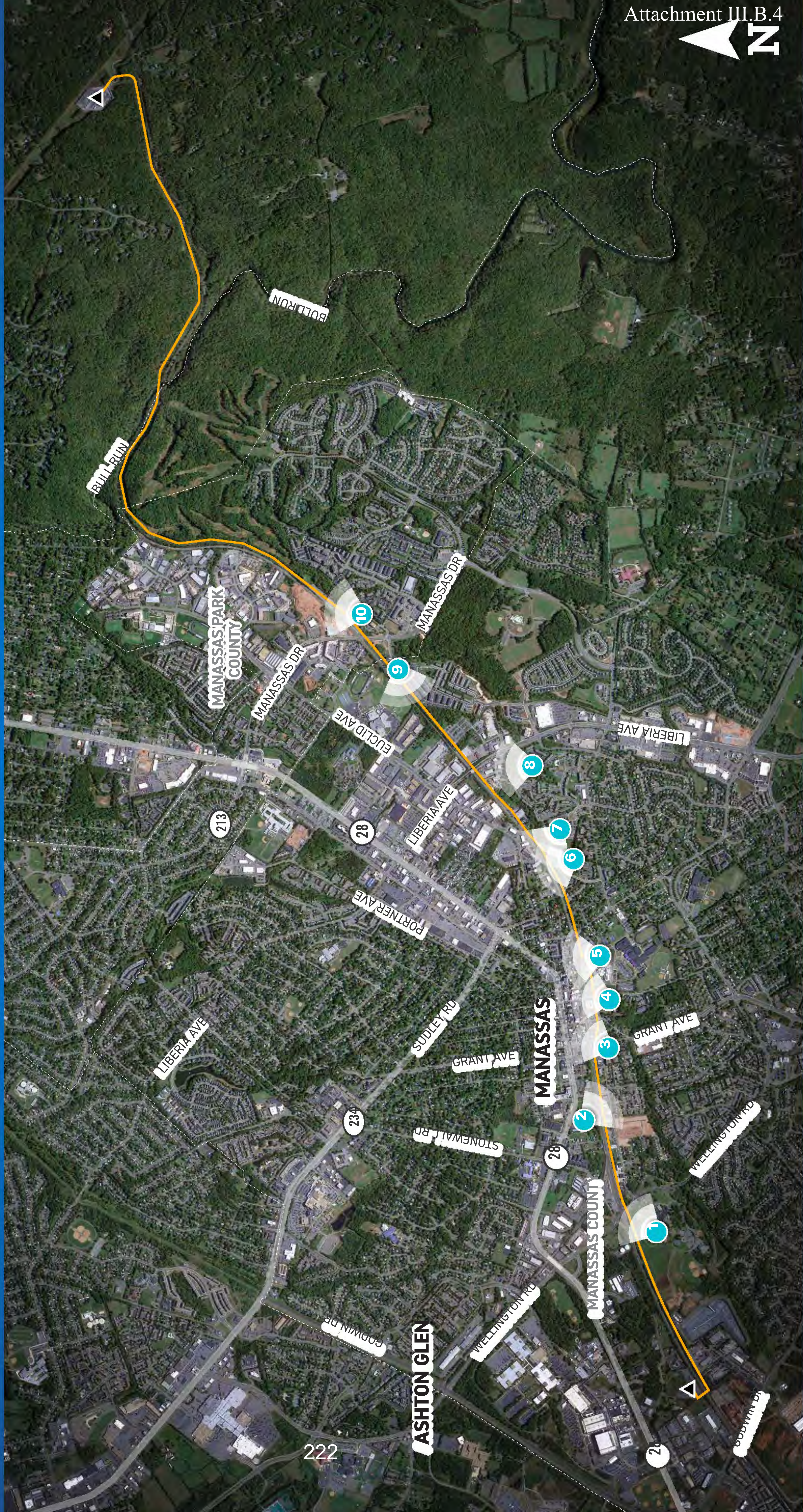


CLIFTON TO WINTERS BRANCH



Photo Locations



- Photo Viewpoint
- Existing Substation
- Proposed Transmission Line



CLIFTON TO WINTERS BRANCH

Viewpoint 1

Date: 09/01/2022 Time: 4:03 pm Viewing Direction: Northeast

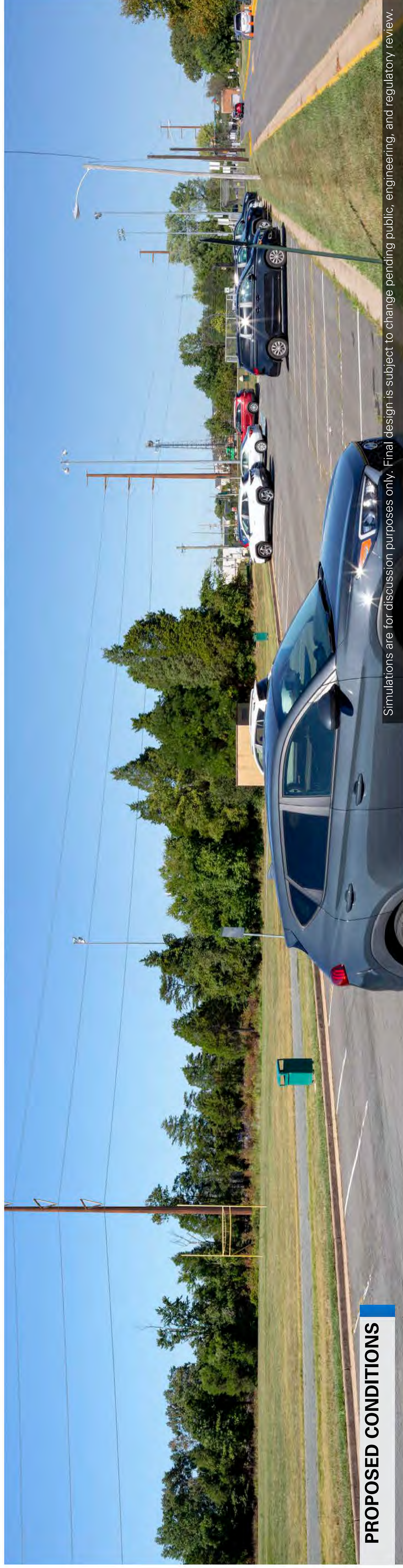
-  Viewpoint Location
-  Existing Substation

 Proposed Transmission Line



223

EXISTING CONDITIONS



PROPOSED CONDITIONS

Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

CLIFTON TO WINTERS BRANCH

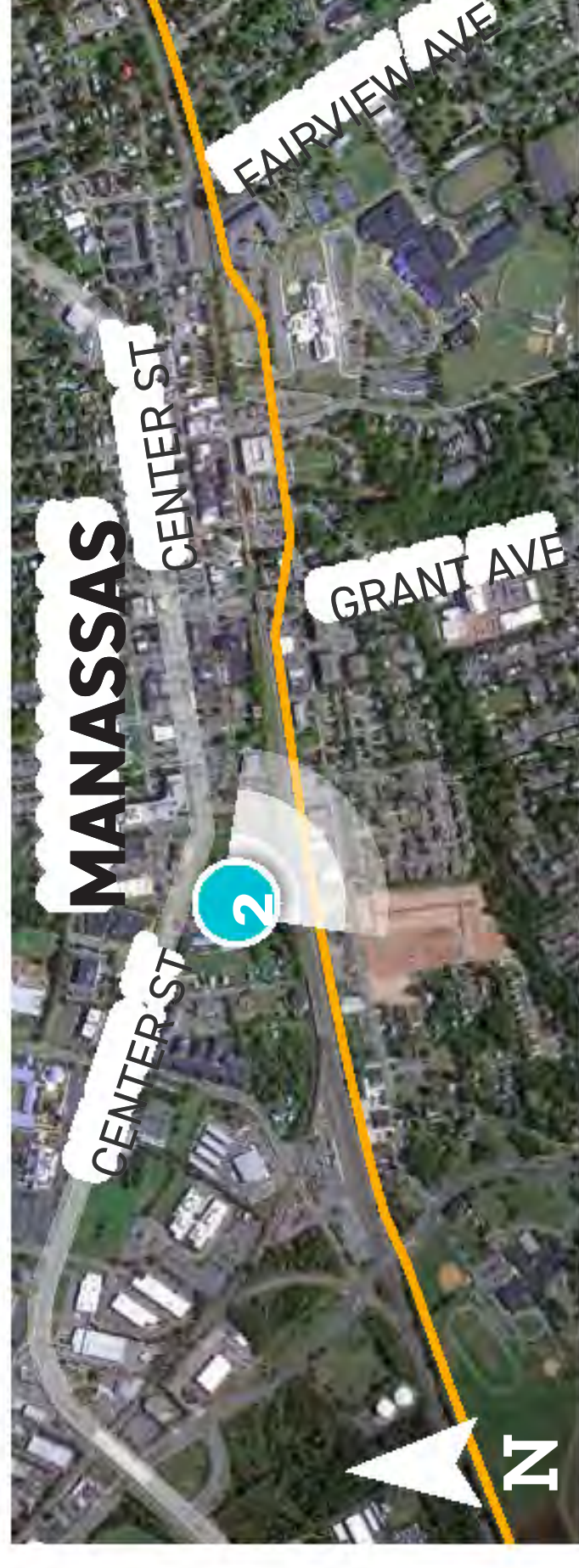
Viewpoint 2

Date: 09/01/2022 Time: 4:45 pm Viewing Direction: Southeast

 Viewpoint Location

 Proposed Transmission Line

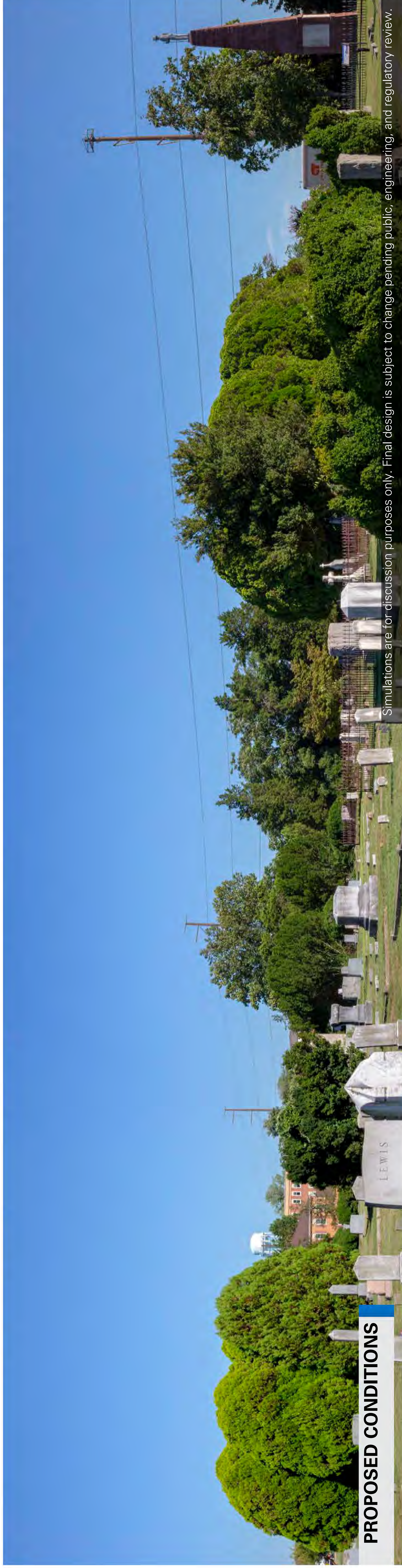
 Existing Substation



EXISTING CONDITIONS



PROPOSED CONDITIONS



Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

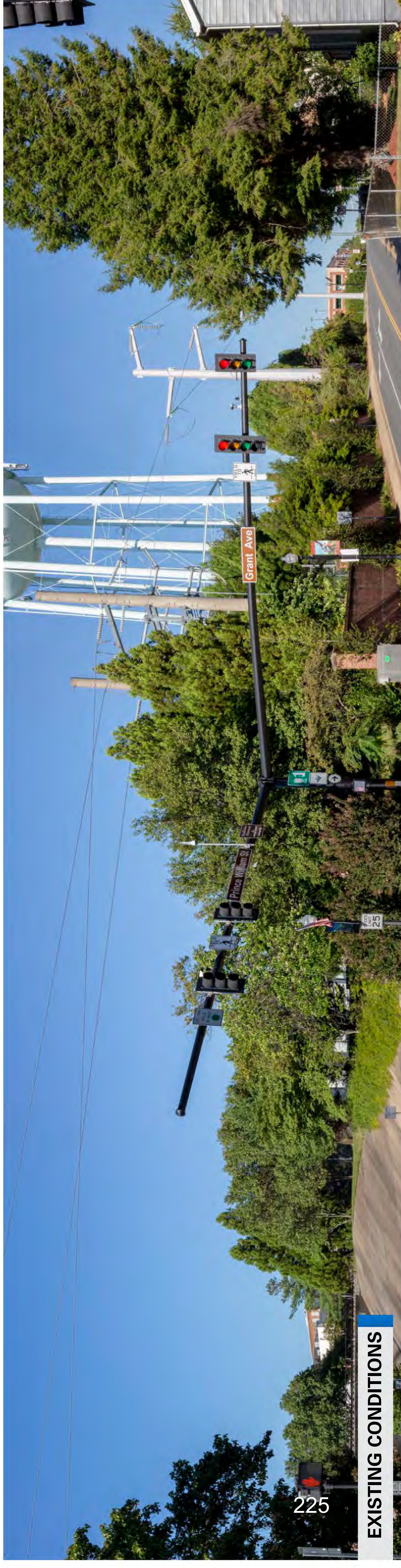
CLIFTON TO WINTERS BRANCH

Viewpoint 3

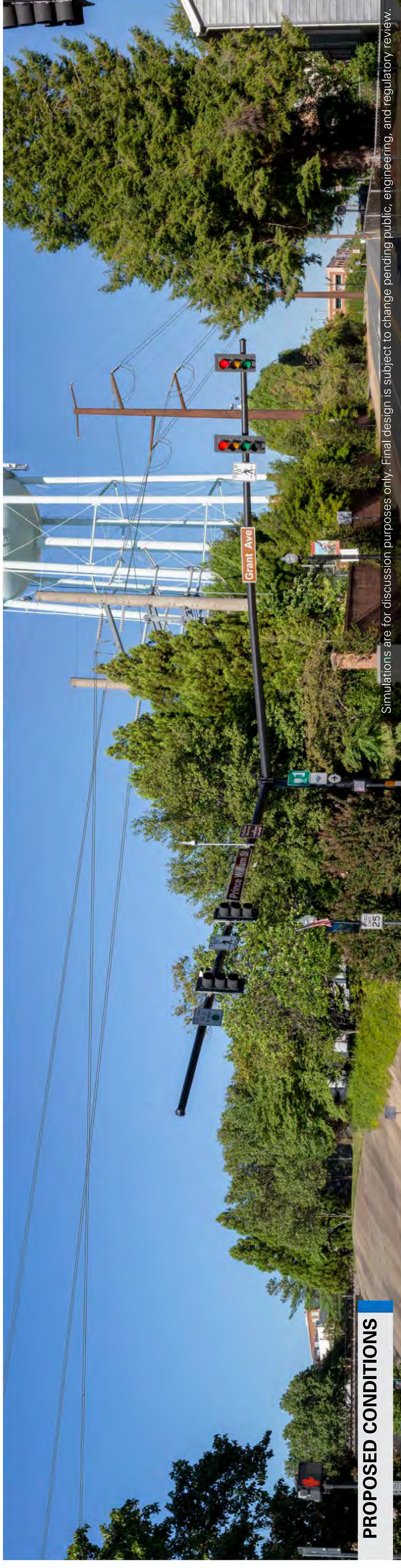
Date: 09/01/2022 Time: 5:14 pm Viewing Direction: Northeast

 Viewpoint Location

 Proposed Transmission Line



EXISTING CONDITIONS



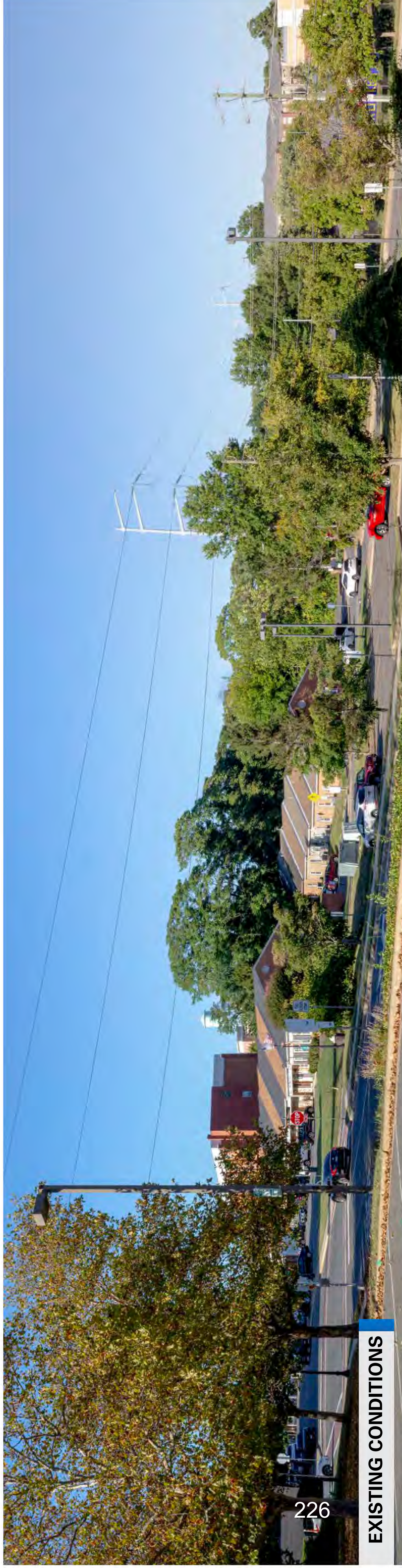
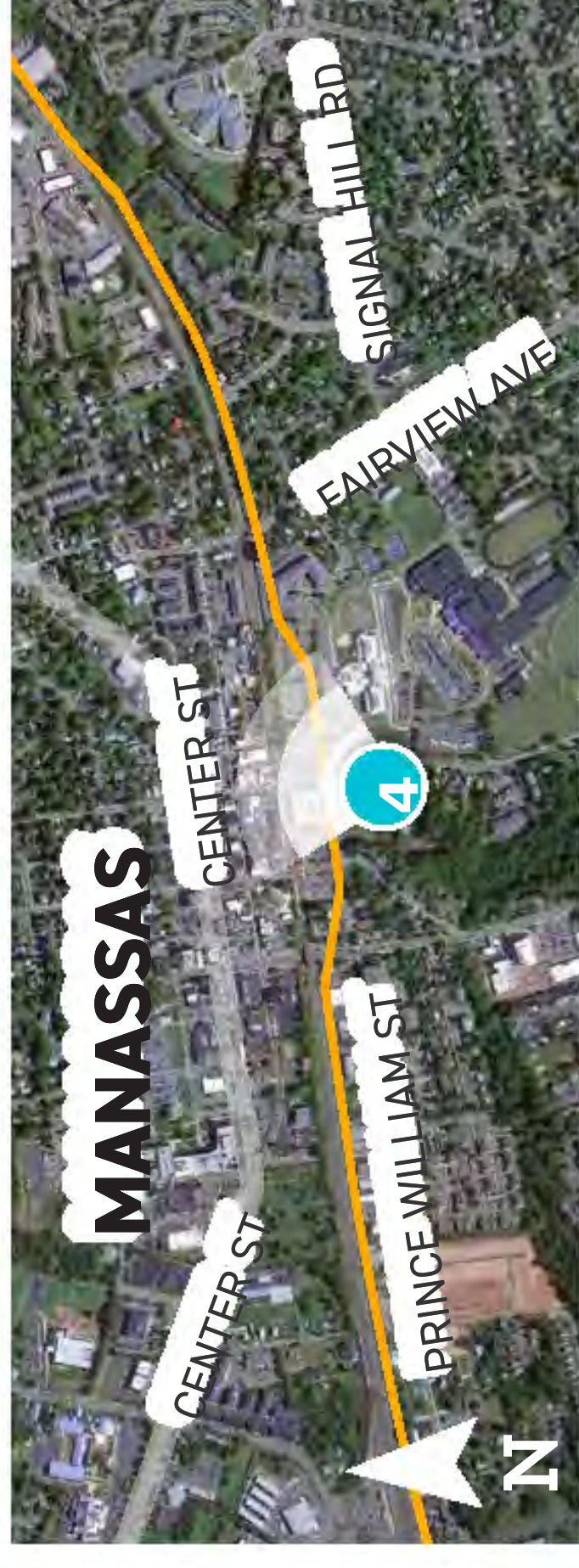
PROPOSED CONDITIONS

Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

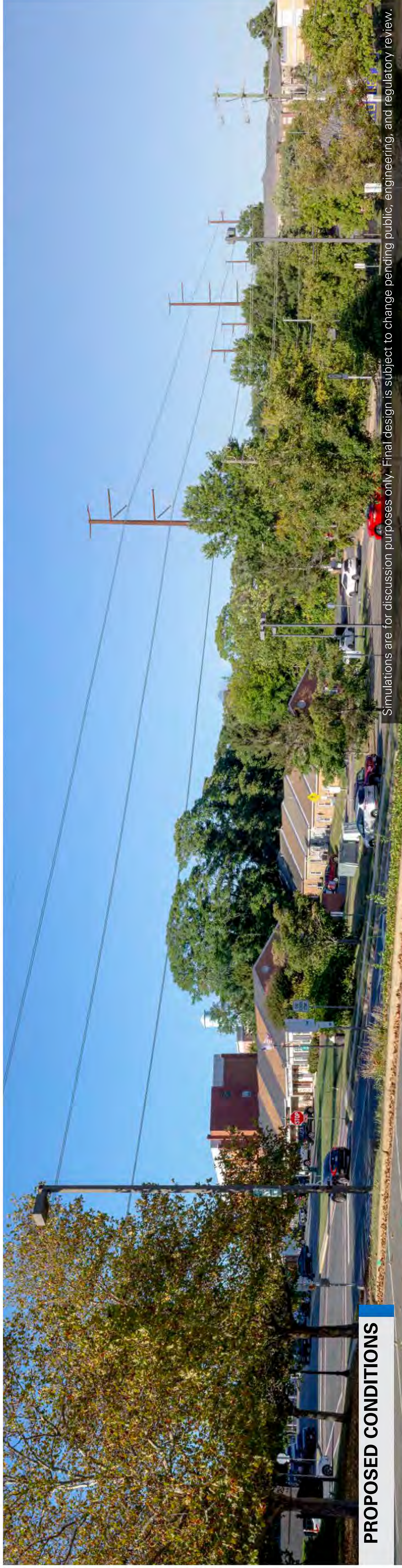
CLIFTON TO WINTERS BRANCH

Viewpoint 4

Date: 09/01/2022 Time: 5:43 pm Viewing Direction: Northeast
 Viewpoint Location  Proposed Transmission Line



EXISTING CONDITIONS

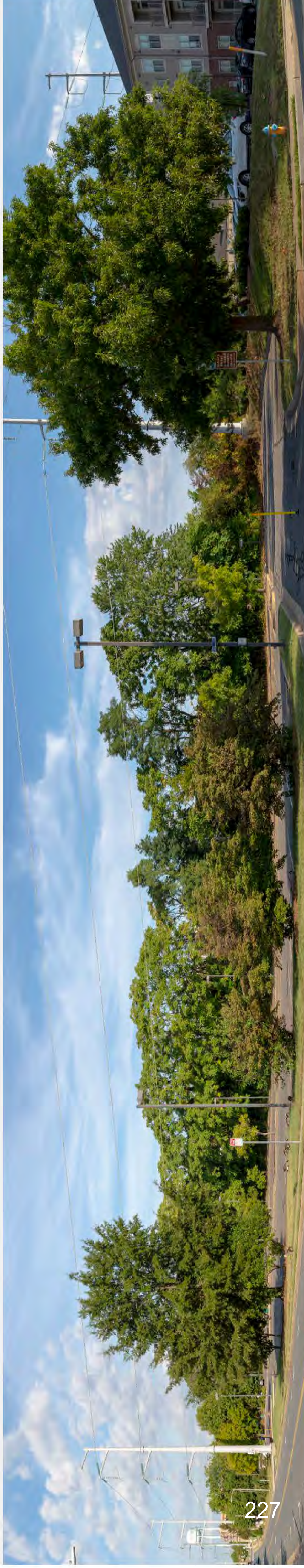
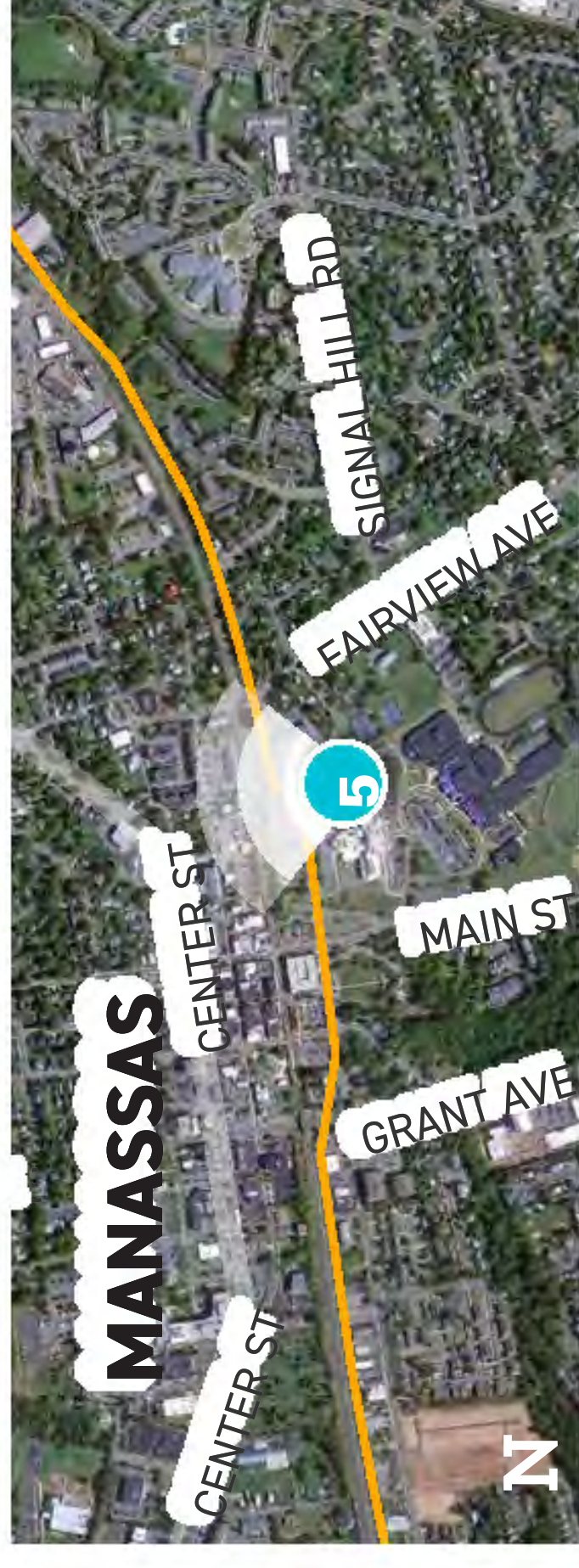


PROPOSED CONDITIONS

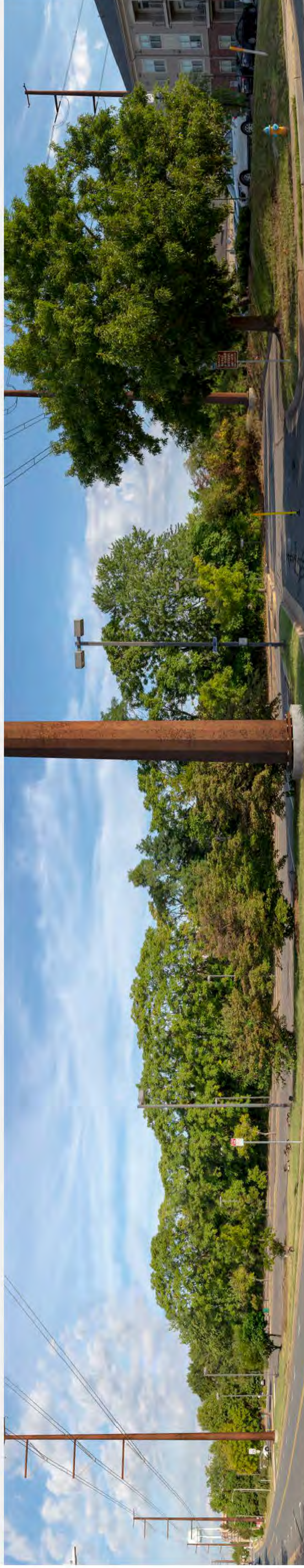
CLIFTON TO WINTERS BRANCH

Viewpoint 5

Date: 09/02/2022 Time: 8:41 am Viewing Direction: Northwest
Viewpoint Location Proposed Transmission Line



EXISTING CONDITIONS



PROPOSED CONDITIONS

Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

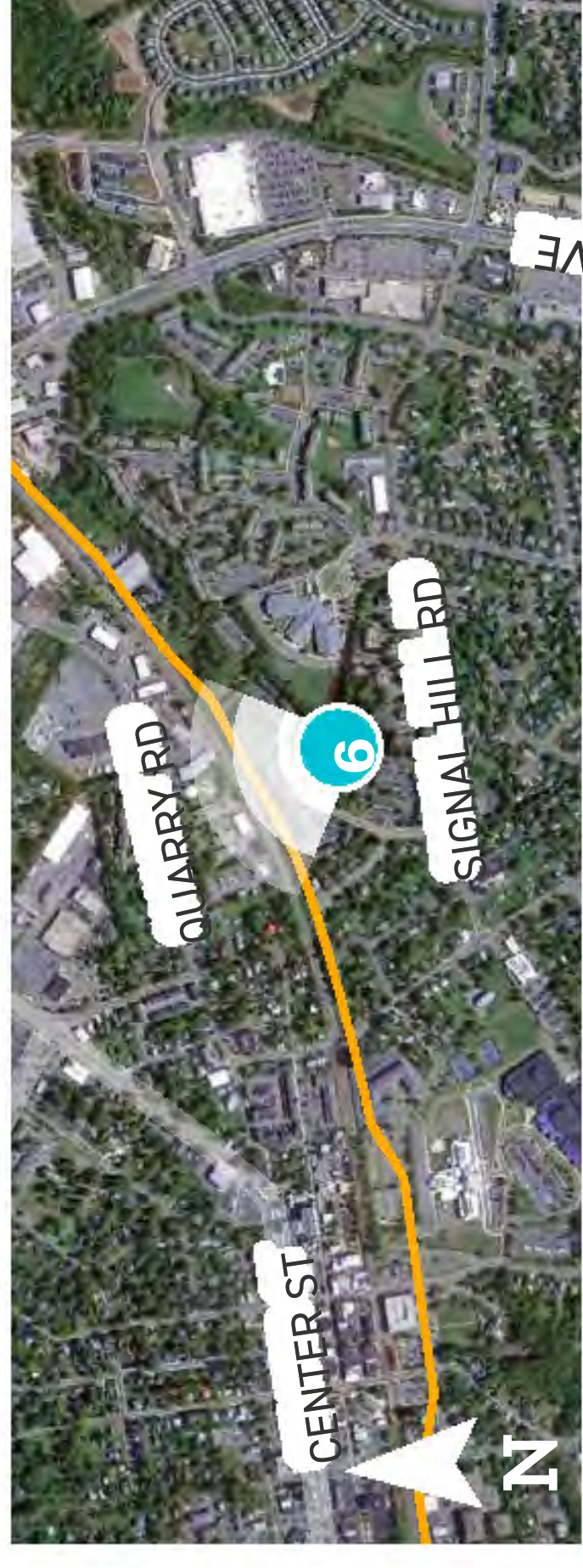
CLIFTON TO WINTERS BRANCH

Viewpoint 6

Date: 09/02/2022 Time: 9:23 am Viewing Direction: Northwest

 Viewpoint Location

 Proposed Transmission Line



EXISTING CONDITIONS



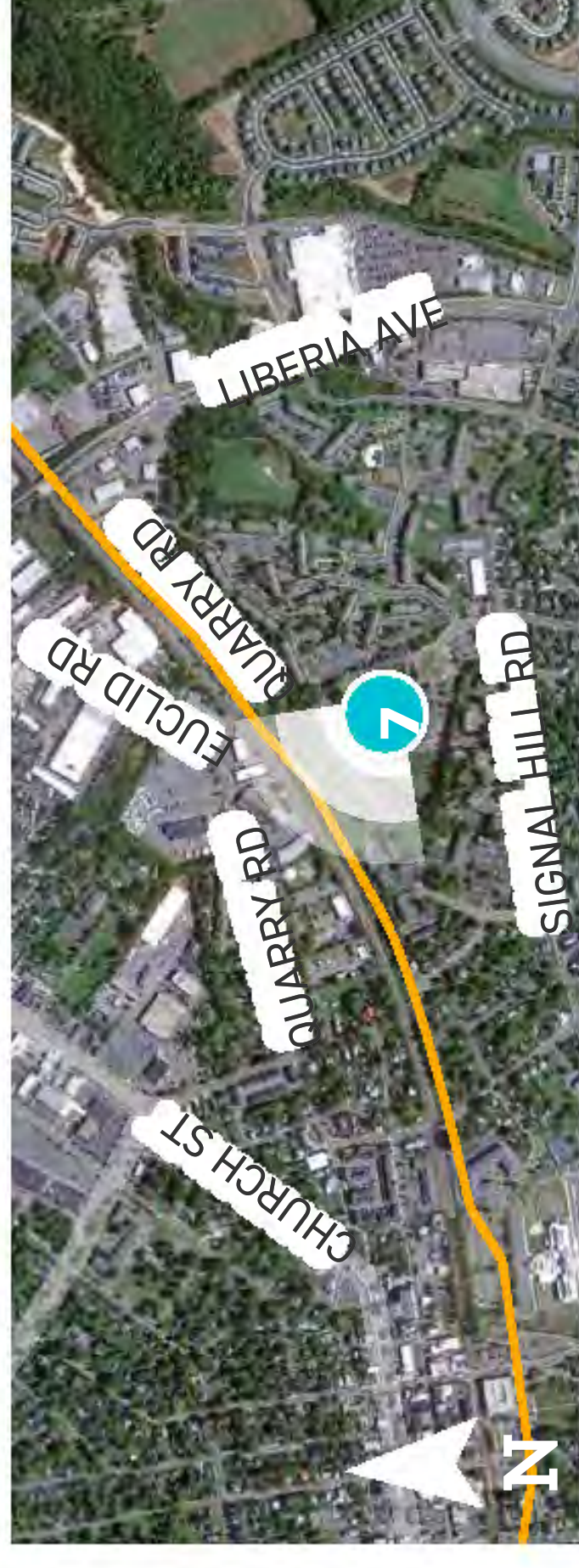
PROPOSED CONDITIONS

CLIFTON TO WINTERS BRANCH

Viewpoint 7

Date: 09/02/2022 Time: 9:33 am Viewing Direction: Northwest

 Viewpoint Location  Proposed Transmission Line

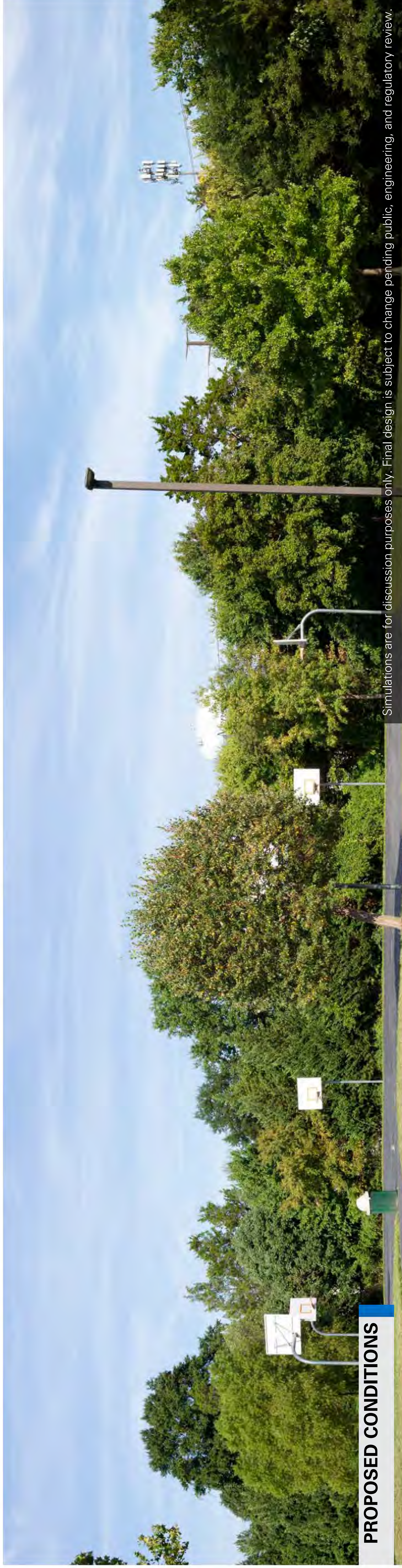


229

EXISTING CONDITIONS



PROPOSED CONDITIONS

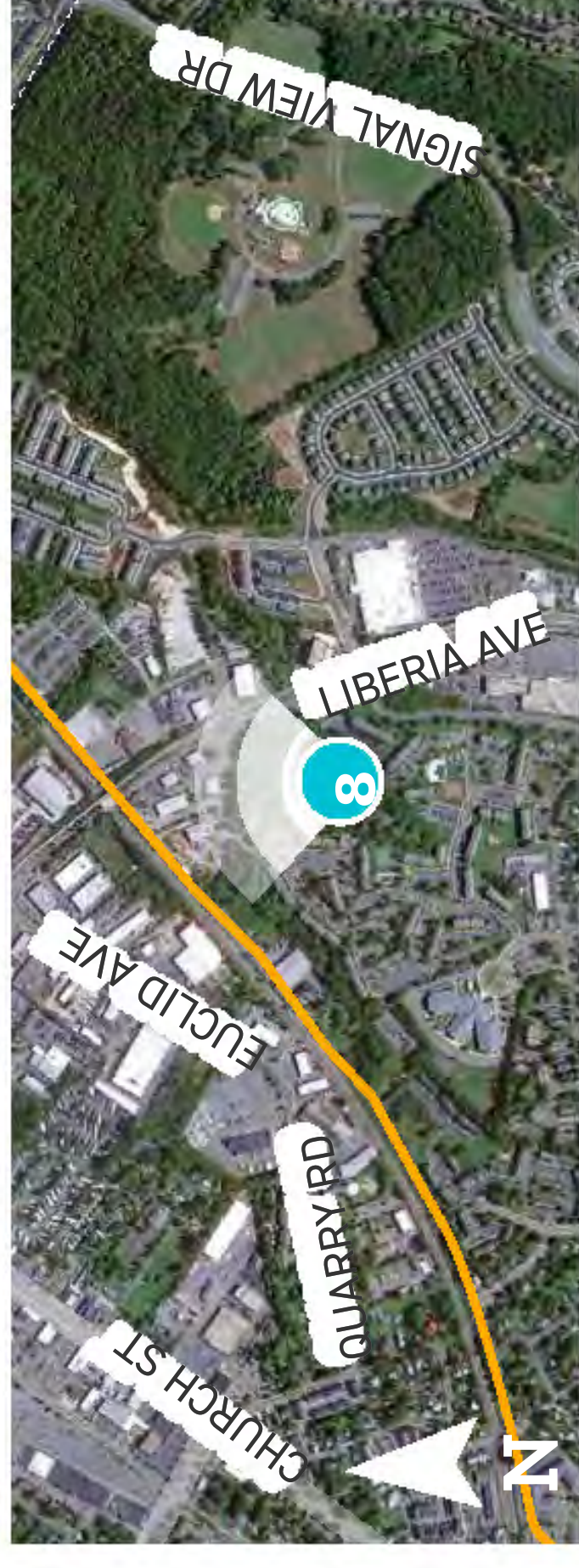


Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

CLIFTON TO WINTERS BRANCH

Viewpoint 8

Date: 09/02/2022 Time: 9:59 am Viewing Direction: North
Viewpoint Location Proposed Transmission Line



230

EXISTING CONDITIONS



PROPOSED CONDITIONS

Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

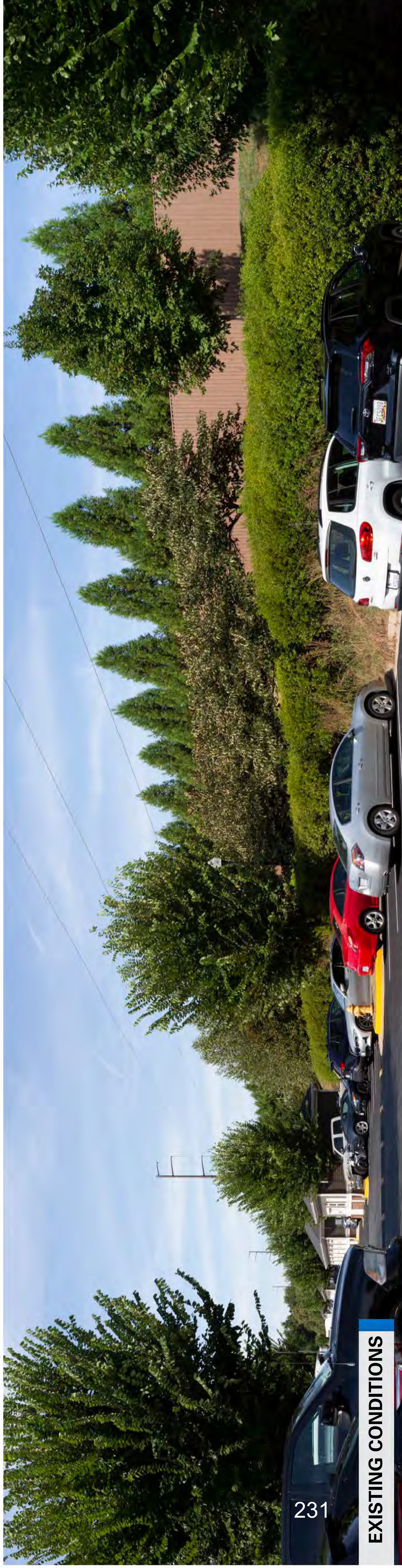
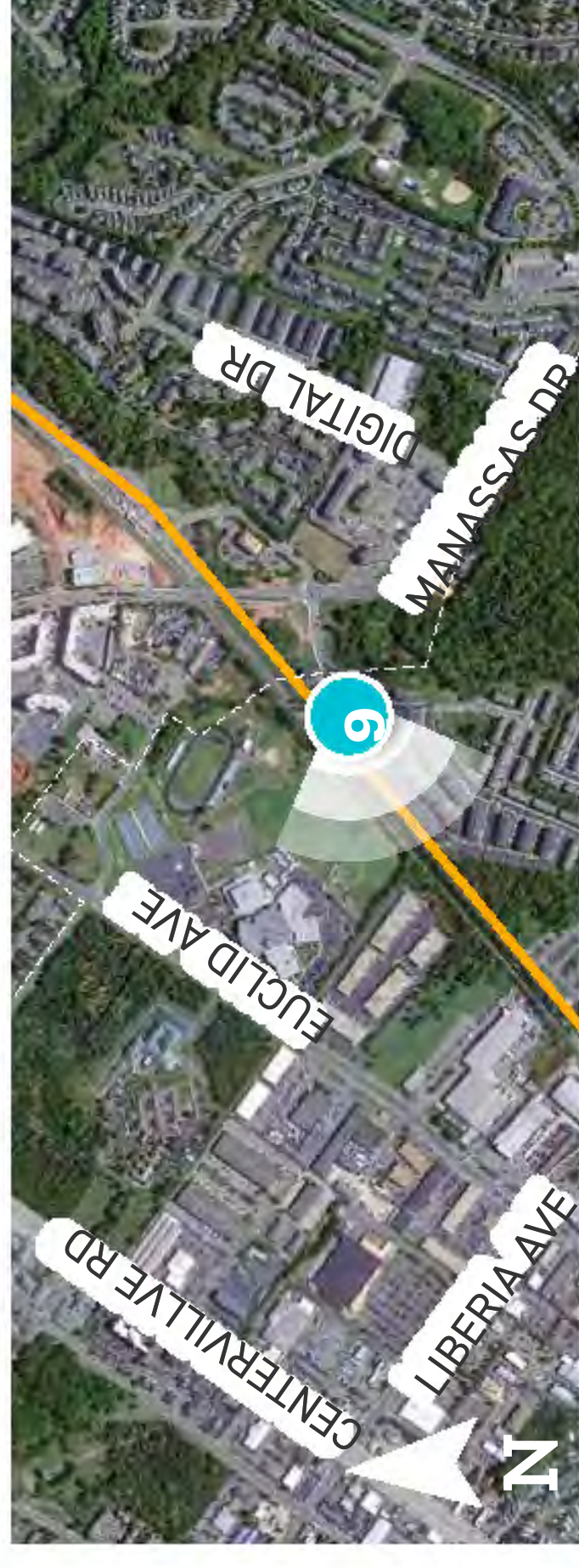
CLIFTON TO WINTERS BRANCH

Viewpoint 9

Date: 09/02/2022 Time: 10:30 am Viewing Direction: West

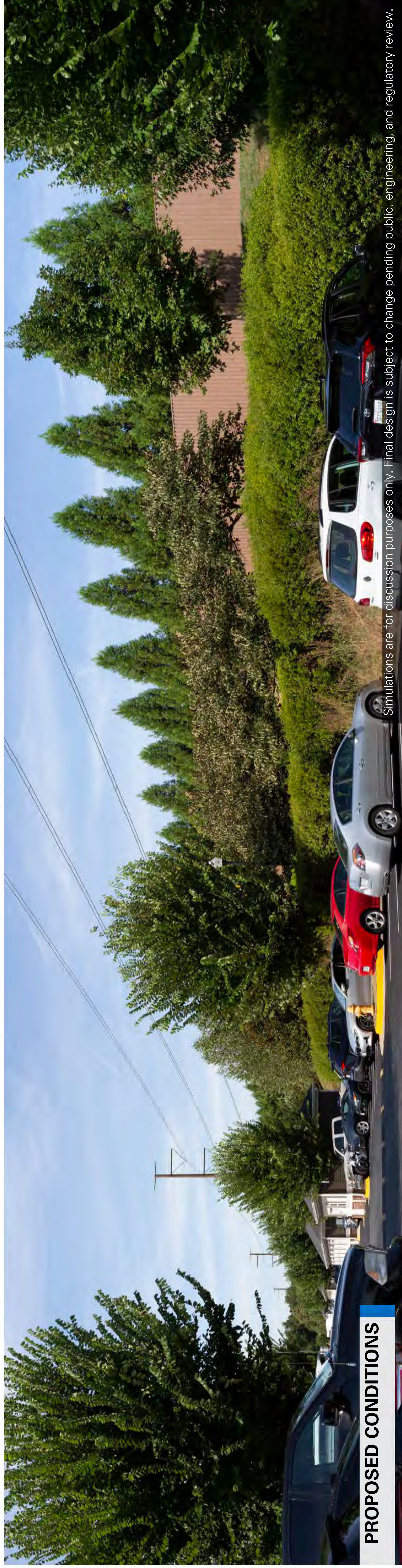
 Viewpoint Location

 Proposed Transmission Line



231

EXISTING CONDITIONS



PROPOSED CONDITIONS

Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

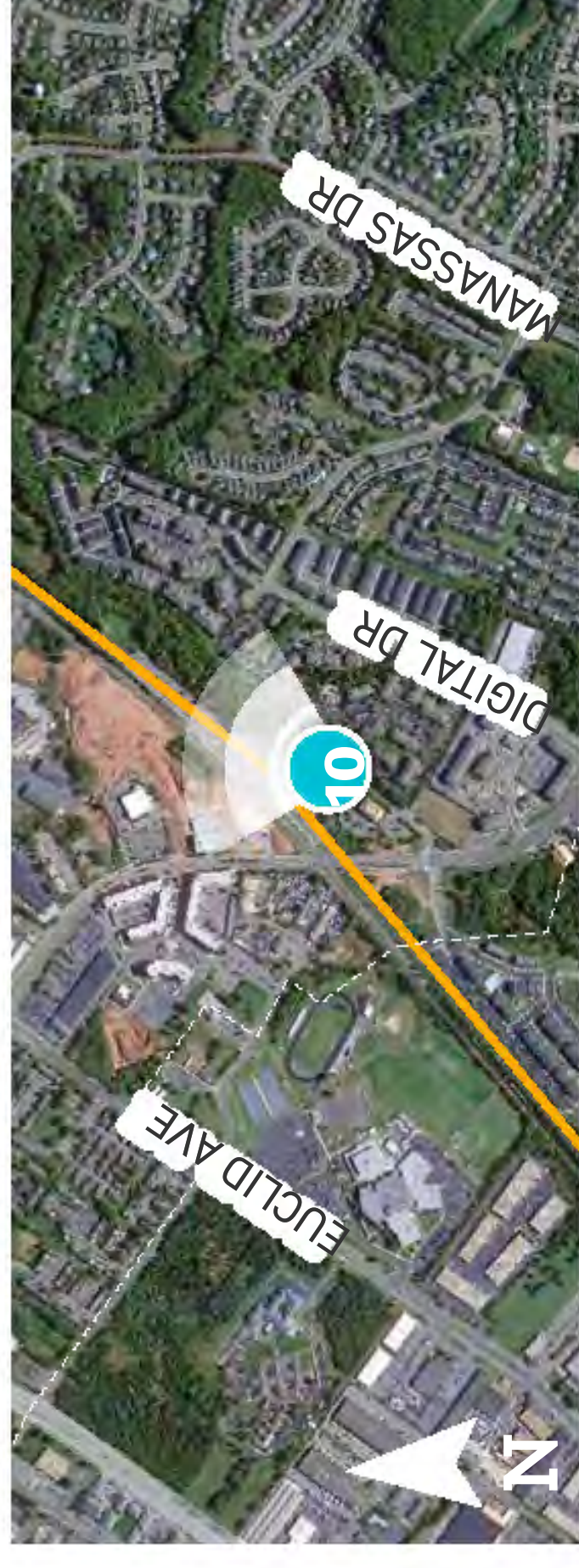
CLIFTON TO WINTERS BRANCH

Viewpoint 10

Date: 09/02/2022 Time: 10:42 am Viewing Direction: Northeast

 Viewpoint Location

 Proposed Transmission Line



EXISTING CONDITIONS



PROPOSED CONDITIONS

Simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.



Environmental Justice: Ongoing Commitment to Our Communities

At Dominion Energy, we are committed to providing reliable, affordable, clean energy in accordance with our values of safety, ethics, excellence, embrace change and team work. This includes listening to and learning all we can from the communities we are privileged to serve.

Our values also recognize that environmental justice considerations must be part of our everyday decisions, community outreach and evaluations as we move forward with projects to modernize the generation and delivery of energy.

To that end, communities should have a meaningful voice in our planning and development process, regardless of race, color, national origin, or income. Our neighbors should have early and continuing opportunities to work with us. We pledge to undertake collaborative efforts to work to resolve issues. We will advance purposeful inclusion to ensure a diversity of views in our public engagement processes.

Dominion Energy will be guided in meeting environmental justice expectations of fair treatment and sincere involvement by being inclusive, understanding, dedicated to finding solutions, and effectively communicating with our customers and our neighbors. We pledge to be a positive catalyst in our communities.

November 2018

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

C. Detail the nature, location, and ownership of each building that would have to be demolished or relocated if the project is built as proposed.

Response: During the Company's review of the existing transmission line corridor, no unauthorized encroachments were identified within the Partial Rebuild Project right-of-way. No buildings will have to be demolished or relocated to construct the proposed Partial Rebuild Project. See Section III.A.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

- D. Identify existing physical facilities that the line will parallel, if any, such as existing transmission lines, railroad tracks, highways, pipelines, etc. Describe the current use and physical appearance and characteristics of the existing ROW that would be paralleled, as well as the length of time the transmission ROW has been in use.**

Response: The Partial Rebuild Project does not currently parallel any other transmission lines, pipeline corridors, highways or major roadways. The Partial Rebuild Project directly parallels the Norfolk Southern Railroad for approximately 6.46 miles, primarily along the southern side of the railroad before crossing north over the railroad between Structure #2011/14 and Structure #2011/15. The Partial Rebuild Project transmission corridor has been in use for at least 30 years. See Section II.A.4.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

- E. Indicate whether the Applicant has investigated land use plans in the areas of the proposed route and indicate how the building of the proposed line would affect any proposed land use.**

Response: The Company reviewed *The Adopted 2040 Comprehensive Plan* for the City of Manassas, *The Comprehensive Plan* (2017) for Prince William County, *The Comprehensive Plan – Pohick District* (2017) for Fairfax County, and *The Comprehensive Plan* (2012) for the City of Manassas Park to evaluate the potential effect the Partial Rebuild Project could have on future development. The placement and construction of the electric transmission lines is not addressed within *The Adopted 2040 Comprehensive Plan* for the City of Manassas, *The Comprehensive Plan* (2017) for Prince William County, or *The Comprehensive Plan – Pohick District* (2017) for Fairfax County. Prince William County is in the process of updating its Comprehensive Plan. The Company reviewed the draft Land Use section of the Comprehensive Plan dated January 31, 2022, and the draft Future Land Use Map dated February 1, 2022. There are no updates in the draft plans that would change any conclusions derived from the effective plans.

The Comprehensive Plan (2012) for the City of Manassas Park encourages the minimization of visual impacts from utilities and related buildings on neighboring properties by placing above-ground transmission lines along railroad rights-of-way and placing utility structures, such as electrical transmission poles, in the same location. The Partial Rebuild Project is not expected to affect any surrounding proposed land use since the transmission corridor has been in use for at least 30 years. Additionally, a large majority of the Partial Rebuild Project right-of-way runs parallel to the Norfolk Southern Railroad.

The Partial Rebuild Project is not expected to impact the character of these localities or future land use. Visual impacts to neighboring properties have been minimized by utilizing existing right-of-way and areas adjacent to the existing Norfolk Southern Railroad.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

F. Government Bodies

J. Indicate if the Applicant determined from the governing bodies of each county, city and town in which the proposed facilities will be located whether those bodies have designated the important farmlands within their jurisdictions, as required by § 3.2-205 B of the Code.

2. If so, and if any portion of the proposed facilities will be located on any such important farmland:

J. Include maps and other evidence showing the nature and extent of the impact on such farmlands;

b. Describe what alternatives exist to locating the proposed facilities on the affected farmlands, and why those alternatives are not suitable; and

c. Describe the Applicant's proposals to minimize the impact of the facilities on the affected farmland.

Response: 1. Prince William and Fairfax Counties and the Cities of Manassas and Manassas Park have no designated important farmlands within their jurisdiction.

2. Not applicable.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

G. Identify the following that lie within or adjacent to the proposed ROW:

- 1. Any district, site, building, structure, or other object included in the National Register of Historic Places maintained by the U.S. Secretary of the Interior;**
- 2. Any historic architectural, archeological, and cultural resources, such as historic landmarks, battlefields, sites, buildings, structures, districts or objects listed or determined eligible by the Virginia Department of Historic Resources (“DHR”);**
- 3. Any historic district designated by the governing body of any city or county;**
- 4. Any state archaeological site or zone designated by the Director of the DHR, or its predecessor, and any site designated by a local archaeological commission, or similar body;**
- 5. Any underwater historic assets designated by the DHR, or predecessor agency or board;**
- 6. Any National Natural Landmark designated by the U.S. Secretary of the Interior;**
- 7. Any area or feature included in the Virginia Registry of Natural Areas maintained by the Virginia Department of Conservation and Recreation (“DCR”);**
- 8. Any area accepted by the Director of the DCR for the Virginia Natural Area Preserves System;**
- 9. Any conservation easement or open space easement qualifying under §§ 10.1-1009 – 1016, or §§ 10.1-1700 – 1705, of the Code (or a comparable prior or subsequent provision of the Code);**
- 10. Any state scenic river;**
- 11. Any lands owned by a municipality or school district; and**
- 12. Any federal, state or local battlefield, park, forest, game or wildlife preserve, recreational area, or similar facility. Features, sites, and the like listed in 1 through 11 above need not be identified again.**

Response:

1. NRHP-listed resources that are within and adjacent to the Partial Rebuild Project are provided in Table 4 of the DEQ Supplement. Section 2.I of the DEQ Supplement provides additional discussion.
2. Resources that are eligible or potentially eligible for listing in the NRHP that are within and adjacent to the Partial Rebuild Project are provided in Table 4 of the DEQ Supplement. Section 2.I of the DEQ Supplement provides additional discussion.
3. The Partial Rebuild Project crosses through two NRHP listed historic districts, including the Manassas Historic District (VDHR ID# 155-0161) and Union Hills Historic District (VDHR ID# 029-0410), and is located within 0.5 mile of the Clifton Historic District (DHR ID# 194-0003).
4. As discussed in Section 2.I of the DEQ Supplement, eleven archaeological sites have been identified within and adjacent to the existing right-of-way. See Table 5 of the DEQ Supplement.
5. None.
6. None.
7. A Project Review Request was submitted to DCR Division of Natural Heritage in October 2022. The DCR Division of Natural Heritage completed this request on October 27, 2022. The results of the agency's official review are provided in Attachment 2.G.2 of the DEQ Supplement.
8. None.
9. The existing right-of-way crosses Northern Virginia Regional Park Authority land, including 0.44 mile of Bull Run Regional Park, and Fairfax County Park Authority land, including 0.69 mile of Johnny Moore Stream Valley Park. The existing right-of-way also intersects a small portion of Hemlock Overlook Regional Park, managed by the Northern Virginia Regional Park Authority, and runs parallel to the northern border of the Hemlock Overlook Regional Park for approximately 1.44 miles. See Attachment II.A.6. No additional right-of-way will be obtained within these properties.

Additionally, five VDHR conservation easements, one conservation easement managed by the Northern Virginia Conservation Trust, and one non-profit fee simple holding easement managed by the Audubon Naturalist Society are located within 1.0 mile of the Partial Rebuild Project right-of-way. Table 6 and Section 2.L of the DEQ Supplement provide additional information regarding recreation, agricultural and forest resources potentially crossed by the Partial Rebuild Project.
10. The Partial Rebuild Project crosses over Bull Run, a state scenic river, near the western border of Bull Run Regional Park and directly east of the Fairfax County line.
11. The Partial Rebuild Project is within 500 feet of lands owned by the Northern Virginia Regional Park Authority, the Fairfax County Park Authority, Prince

William County, and the Cities of Manassas and Manassas Park as indicated in the below table.

Lands owned by a municipality or school district within the vicinity of the Partial Rebuild Project right-of-way

Parcel ID	Name/Description	Managing Entity	Distance to Line
7795-16-1230	Jennie Dean Elementary School	The School Board of the City of Manassas	Within project right-of-way
7795-07-5100	9723 Dean Drive	City of Manassas	Within 500 feet of project right-of-way
7695-95-8396	9911 Godwin Drive	City of Manassas	Within 500 feet of project right-of-way
7795-06-5677	9727 Dean Drive	City of Manassas	Within 500 feet of project right-of-way
7795-06-6180	9725 Dean Drive	City of Manassas	Within 500 feet of project right-of-way
7695-94-1074	9911 Godwin Drive	City of Manassas	Within 500 feet of project right-of-way
7695-85-7430	Dean Park	City of Manassas	Within project right-of-way
7695-86-2919	Animal Adoption Center	City of Manassas	Within 500 feet of project right-of-way
7795-26-0614	9550 School Street	City of Manassas	Within 500 feet of project right-of-way
7795-37-6790	Manassas Cemetery	City of Manassas	Within 500 feet of project right-of-way
7795-47-1486 and 7795-47-2784	Prince William County Probation	City of Manassas	Within 500 feet of project right-of-way
7795-58-3421	9210 Center Street	City of Manassas	Within 500 feet of project right-of-way
7795-57-5371	Prince William DP and Manassas Water Tower	City of Manassas	Within project right-of-way
7795-58-5401	Harris Pavilion Event Center	City of Manassas	Within 500 feet of project right-of-way
7795-57-8587	Manassas Station	City of Manassas	Within 500 feet of project right-of-way
7795-	City of Manassas	City of Manassas	Within project right-of-way

Parcel ID	Name/Description	Managing Entity	Distance to Line
77-0396	Farmers Market		
7795-67-7390	City of Manassas Farmers Market	City of Manassas	Within project right-of-way
7795-67-3545	Manassas Veterans Memorial and Manassas Museum	City of Manassas	Within 500 feet of project right-of-way
7795-67-3755	Manassas Veterans Memorial and Manassas Museum	City of Manassas	Within 500 feet of project right-of-way
7795-67-3640	Manassas Veterans Memorial and Manassas Museum	City of Manassas	Within 500 feet of project right-of-way
7795-67-3363	Manassas Veterans Memorial and Manassas Museum	City of Manassas	Within 500 feet of project right-of-way
7795-68-1005	Candy Factory Parking Lot	City of Manassas	Within 500 feet of project right-of-way
7795-67-0528	Baldwin Park	City of Manassas	Within 500 feet of project right-of-way
7795-68-0500	Candy Factory	City of Manassas	Within 500 feet of project right-of-way
7795-77-0150	Baldwin Intermediate School	The School Board of the City of Manassas	Within 500 feet of project right-of-way
7795-68-5716	Manassas City Hall	City of Manassas	Within 500 feet of project right-of-way
7795-88-6878	City of Manassas Electric Utility Facility – 8885 Church Street	City of Manassas	Within 500 feet of project right-of-way
7795-99-2211	8731C Quarry Road	City of Manassas	Within 500 feet of project right-of-way
7795-99-1709	8731A Quarry Road	City of Manassas	Within 500 feet of project right-of-way
7795-99-2213	8731B Quarry Road	City of Manassas	Within 500 feet of project right-of-way
7896-00-9025	9109A Euclid Road	City of Manassas	Within 500 feet of project right-of-way

Parcel ID	Name/Description	Managing Entity	Distance to Line
7895-19-5624	Mayfield Earthwork Fort (Manassas Battlefield)	City of Manassas	Within 500 feet of project right-of-way
7896-10-1853	9090 Jerrys Circuit	City of Manassas	Within 500 feet of project right-of-way
7895-08-1489	Battery Heights DP	City of Manassas	Within project right-of-way
7895-08-2039	Mayfield Intermediate School	The School Board of the City of Manassas	Within 500 feet of project right-of-way
2592 and 366	Manassas Park City Library	City of Manassas Park	Within 500 feet of project right-of-way
1551 and 1552	Manassas Park City Manager's Office	City of Manassas Park	Within 500 feet of project right-of-way
462	Manassas Park Train Station	City of Manassas Park	Within project right-of-way
458	Blooms Park	City of Manassas Park	Within project right-of-way
7996-16-4841	Hemlock Overlook Regional Park	Northern Virginia Regional Park Authority	Within project right-of-way
7896-78-8096	Bull Run Regional Park	Northern Virginia Regional Park Authority	Within project right-of-way
7896-33-2693	Osborn Park High School	Prince William County School Board	Within 500 feet of project right-of-way
7795-48-2430	Prince William County General District Court, Circuit Court, Juvenile & Domestic Court, Magistrate Office, and Health District Office	Prince William County Board of County Supervisors	Within 500 feet of project right-of-way
0851 01 0011	Hemlock Overlook Regional Park	Northern Virginia Regional Park Authority	Within 500 feet of project right-of-way
0851 01	Hemlock Overlook	Northern Virginia	Within 500 feet of project

Parcel ID	Name/Description	Managing Entity	Distance to Line
0002	Regional Park	Regional Park Authority	right-of-way
0744 01 0001	Bull Run Regional Park	Northern Virginia Regional Park Authority	Within project right-of-way
0851 07 G	Johnny Moore Stream Valley Park	Fairfax County Park Authority	Within project right-of-way

12. None.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

- H. List any registered aeronautical facilities (airports, helipads) where the proposed route would place a structure or conductor within the federally-defined airspace of the facilities. Advise of contacts, and results of contacts, made with appropriate officials regarding the effect on the facilities' operations.**

Response: The Federal Aviation Administration (“FAA”) is responsible for overseeing air transportation in the United States. The FAA manages air traffic in the United States and evaluates physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. The prime objective of the FAA in conducting an obstruction evaluation is to ensure the safety of air navigation and the efficient utilization of navigable airspace by aircraft.

The FAA’s website¹⁹ was reviewed to identify airports within 10.0 nautical miles of the proposed Partial Rebuild Project. Based on this review, the following airport were identified:

- Manassas Regional Airport, approximately 1.6 miles west-southwest of Line #2011;
- Valley View Airport, approximately 4.4 miles southwest of Line #2011;
- Skyview Airport, approximately 7.3 miles west of Line #2011;
- Aden Field Airport, approximately 6.7 miles south of Line #2011;
- Breeden Airport, approximately 9.9 miles south-southwest of Line #2011;
- Maples Field Airport, approximately 10.0 miles south-southwest of Line #2011;
- Centreville Airport, approximately 7.5 miles north of Line #2011; and
- Washington Dulles International Airport, approximately 10.0 miles north of Line #2011.

Additionally, there are several heliports in the vicinity of the Partial Rebuild Project, including the following:

- IBM Building 110 Heliport, approximately 0.6 mile north of Line #2011;
- IBM Building 250 Heliport, approximately 1.1 miles north of Line #2011;
- Prince William Hospital Heliport, approximately 1.2 miles north of Line #2011;
- Fairfax County Police Heliport, approximately 5.2 miles north of Line #2011; and

¹⁹ See <https://oecaaa.faa.gov/oecaaa/external/portal.jsp>.

- Inova Fair Oaks Hospital Heliport, approximately 7.2 miles north of Line #2011.

Based on a preliminary review, impacts to air navigation are not anticipated but FAA filings are required for construction cranes. The Company will apply for obstruction evaluation determinations for these structures. No structures exceed obstruction standards, but all require submission of Form 7460-2 Part 2 within five days of construction reaching its greatest height.

In an email dated October 20, 2022, the Company solicited comments from the FAA regarding the proposed Partial Rebuild Project. In an email dated October 21, 2022, the FAA stated that if the Partial Rebuild Project requires structures to be moved or raised, *and* it meets notice requirements in 14 CFR Part 77.9, notice will be required through the FAA's obstruction evaluation website (<https://oeaaa.faa.gov>). Also, any construction equipment that exceeds the height of the structure may need to be filed. This email is included as Attachment 2.O.1 to the DEQ Supplement. The Company will file Form 7460 with the FAA as requested. The Company will work with the private entities as appropriate.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

- I. Advise of any scenic byways that are in close proximity to or that will be crossed by the proposed transmission line and describe what steps will be taken to mitigate any visual impacts on such byways. Describe typical mitigation techniques for other highways' crossings.**

Response: The Partial Rebuild Project does not cross any scenic byways. Use of the existing right-of-way minimizes additional impacts at any road crossings.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

J. Identify coordination with appropriate municipal, state, and federal agencies.

Response: Below is a list of coordination that has occurred with municipal, state, and federal agencies:

As described in detail in Sections III.B and V.D of the Appendix, the Company solicited feedback from Fairfax County, Prince William County, the City of Manassas, and the City of Manassas Park regarding the proposed Partial Rebuild Project. Below is a list of coordination that has occurred with municipal, state, and federal agencies:

- Coordination with the Corps, DEQ, and the Virginia Department of Transportation (“VDOT”) will take place as appropriate to obtain necessary approvals for the proposed Partial Rebuild Project.
- Letters dated October 20, 2022, were submitted to Fairfax County, Prince William County, the City of Manassas, the City of Manassas Park to describe the Partial Rebuild Project and to request comment. See Section V.D.
- The Company held two meetings with representatives from the City of Manassas on August 31, 2022 and October 20, 2022 to discuss the proposed Partial Rebuild Project overall, and, more specifically, discuss easements and structure placements located within the City.
- The Company held a meeting with Mr. Mike DePue from the Fairfax County Park Authority on January 5, 2023, to discuss the proposed Partial Rebuild Project, and, more specifically, conduct an in-field review of the right-of-way and potential construction access routes within Bull Run Regional Park.
- The Company held a meeting with representatives from the City of Manassas Park on January 5, 2023, to discuss the proposed Partial Rebuild Project, and, more specifically, conduct an in-field review of the right-of-way and potential construction access routes within Blooms Park.
- The Company held a meeting with representatives from the Northern Virginia Regional Park Authority on January 24, 2023, to discuss the proposed Partial Rebuild Project, and, more specifically, conduct an in-field review of the right-of-way of the right-of-way and potential construction access routes within Johnny Moore Stream Valley Regional Park.
- On October 4, 2022 the Company participated in a public meeting of the Clifton Town Council to discuss the Partial Rebuild Project and provided a

presentation. A copy of this presentation is included as Attachment III.J.1.

- A Stage I Analysis was submitted to VDHR on March 6, 2023. See Attachment 2.I.1 to the DEQ Supplement.
- Letters were submitted to the agencies listed in Section V.C on October 20, 2022, describing the Partial Rebuild Project and requesting comment. See Attachment 2 to the DEQ Supplement: Virginia Department of Wildlife Resources
 - Virginia Marine Resources Commission – Habitat Management Division
 - Virginia Department of Conservation and Recreation
 - Department of Environmental Quality – Office of Environmental Impact Review
 - Virginia Department of Forestry – Forestland Conservation Division
 - U.S. Army Corps of Engineers
 - Department of Conservation and Recreation
 - U.S. Fish and Wildlife Services
 - Virginia Department of Agriculture and Consumer Affairs – Endangered Plant and Insect Species Program
- On October 14, 2022, the Company solicited comments via letter from several federal and state-recognized Native American tribes, including Cheroenhaka (Nottoway) Indian Tribe, Chickahominy Indian Tribe, Chickahominy Indian Tribe Eastern Division, Mattaponi Tribe, Monacan Indian Nation, Nansemond Indian Nation, Nottoway Indian Tribe of Virginia, Pamunkey Indian Tribe, Patawomeck Indian Tribe of Virginia, Rappahannock Tribe, Upper Mattaponi Indian Tribe, Catawba Indian Nation, and the Delaware Nation, Oklahoma. A copy of the letter template, which included an overview map, is included as Attachment III.J.2.²⁰

See also Sections III.B, III.K and V.D of this Appendix, and the DEQ Supplement.

²⁰ The letter indicates that the Company planned to submit an application to the Commission in fall 2022. The application referenced in that letter is the Application submitted with this Appendix to the Commission on March 31, 2023.

Clifton-Winters Branch 230 kV Partial Transmission Line Rebuild Project

**Clifton Town Council Meeting
October 4, 2022**

Project Need

- This project will rebuild a portion of an existing 230 kilovolt transmission line from just outside a substation in Prince William County, through Manassas, and into Fairfax County, ending at the Clifton substation
- Required to maintain area reliability and strengthen the existing infrastructure
- We will replace the conductor, or wire, with new material, which requires us to rebuild the structures which carry it – no new ROW needed and structures in same general vicinity as existing
- Work at the Clifton substation will include equipment replacement and updates

Map of Transmission Line Rebuild



This map is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

October 4, 2022

Clifton Area Map



Schedule

Public Engagement – We will hold a virtual community meeting in early November to discuss the project and answer questions from residents who live near the transmission line.



Filing with the State Corporation Commission (SCC) – We anticipate filing an application with the SCC later this year.

Construction – Pending approval from the SCC, we anticipate construction in the Clifton area to begin in Spring 2024 and conclude by late 2024. We will coordinate closely with the Town in advance of any work and throughout.

Questions?

October 14, 2022

Clifton-Winters Branch 230 kV Transmission Line Partial Rebuild (Prince William and Fairfax Counties, VA)

Dear _____:

At Dominion Energy, we are dedicated to maintaining reliable and secure electric service in the communities we serve. As a valued stakeholder with a vested interest in the community, we would like to inform you of the need for an electric transmission line infrastructure project in Prince William and Fairfax Counties, Virginia.

The Clifton-Winters Branch 230 kV Transmission Line Partial Rebuild project proposes to rebuild and reconductor 7.25 miles of existing 230 kV transmission line that runs from our Clifton Substation on Clifton Creek Drive in Fairfax County, through the City of Manassas, to just outside our Cannon Branch Substation, south of Nokesville Road in Prince William County. This portion of line to be rebuilt is adjacent to a new section of line which will soon be under construction between Cannon Branch and Winters Branch Substations.

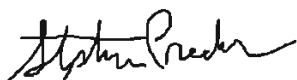
Due to continued economic growth in the area, we need to replace the current 230 kV conductor with one capable of carrying a higher amount of electric current, or ampacity. While the new conductor will remain 230 kV, it is a heavier wire which requires us to also replace the structures which carry it. The line will be rebuilt within the existing right of way; therefore, no new right of way is required. The new structures will remain single-circuit monopoles, though they will be, on average, approximately five feet taller than the existing monopoles. This project will strengthen electric reliability and service in the area.

We plan to file this proposed project with the State Corporation Commission later this fall and will host a virtual community meeting prior to doing so. We will post status updates to project's website at DominionEnergy.com/cliftonwintersbranch.

Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, recipients of this letter include other county and statewide historic, cultural and scenic organizations and Native American Tribes.

If you would like to meet to discuss, or if you have any initial questions, please do not hesitate to contact us by sending an email to Stephen.S.Precker@dominionenergy.com or calling 888-291-0190. You may also contact Tribal Relations Manager Ken Custalow by sending an email to Ken.Custalow@dominionenergy.com or calling 804-837-2067.

Sincerely,



Steve Precker
The Electric Transmission Project Team



This map is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

K. Identify coordination with any non-governmental organizations or private citizen groups.

Response: On October 13, 2022, the Company solicited comments via letter from the non-governmental organizations and private citizen groups identified below. A copy of the letter template, which included an overview map, is included as Attachment III.K.1.²¹

Name	Organization
Ms. Elizabeth S. Kostelny	Preservation Virginia
Mr. Thomas Gilmore	American Battlefield Trust
Mr. Jim Campi	American Battlefield Trust
Mr. Max Hokit	American Battlefield Trust
Mr. Steven Williams	Colonial National Historical Park
Ms. Eleanor Breen, PhD, RPA	Council of Virginia Archaeologists
Ms. Leighton Powell	Scenic Virginia
Ms. Elaine Chang	National Trust for Historic Preservation
Ms. Julie Bolthouse	Piedmont Environmental Council
Mr. John McCarthy	Piedmont Environmental Council
Dr. Cassandra Newby-Alexander, Dean	Norfolk State University
Ms. Adrienne Birge-Wilson	Virginia Department of Historic Resources
Mr. Dave Dutton	Dutton + Associates, LLC
Mr. Roger Kirchen, Archaeologist	Virginia Department of Historic Resources

²¹ The letter indicates that the Company planned to submit an application to the Commission in fall 2022. The application referenced in that letter is the Application submitted with this Appendix to the Commission on March 31, 2023.

October 13, 2022

Clifton-Winters Branch 230 kV Transmission Line Partial Rebuild (Prince William and Fairfax Counties, VA)

Dear _____:

At Dominion Energy, we are dedicated to maintaining reliable and secure electric service in the communities we serve. As a valued stakeholder with a vested interest in the community, we would like to inform you of the need for an electric transmission line infrastructure project in Prince William and Fairfax Counties, Virginia.

The Clifton-Winters Branch 230 kV Transmission Line Partial Rebuild project proposes to rebuild and reconductor 7.25 miles of existing 230 kV transmission line that runs from our Clifton Substation on Clifton Creek Drive in Fairfax County, through the City of Manassas, to just outside our Cannon Branch Substation, south of Nokesville Road in Prince William County. This portion of line to be rebuilt is adjacent to a new section of line which will soon be under construction between Cannon Branch and Winters Branch Substations.

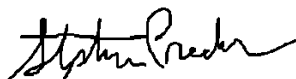
Due to continued economic growth in the area, we need to replace the current 230 kV conductor with one capable of carrying a higher amount of electric current, or ampacity. While the new conductor will remain 230 kV, it is a heavier wire which requires us to also replace the structures which carry it. The line will be rebuilt within the existing right of way; therefore, no new right of way is required. The new structures will remain single-circuit monopoles, though they will be, on average, approximately five feet taller than the existing monopoles. This project will strengthen electric reliability and service in the area.

We plan to file this proposed project with the State Corporation Commission later this fall and will host a virtual community meeting prior to doing so. We will post status updates to project's website at DominionEnergy.com/cliftonwintersbranch.

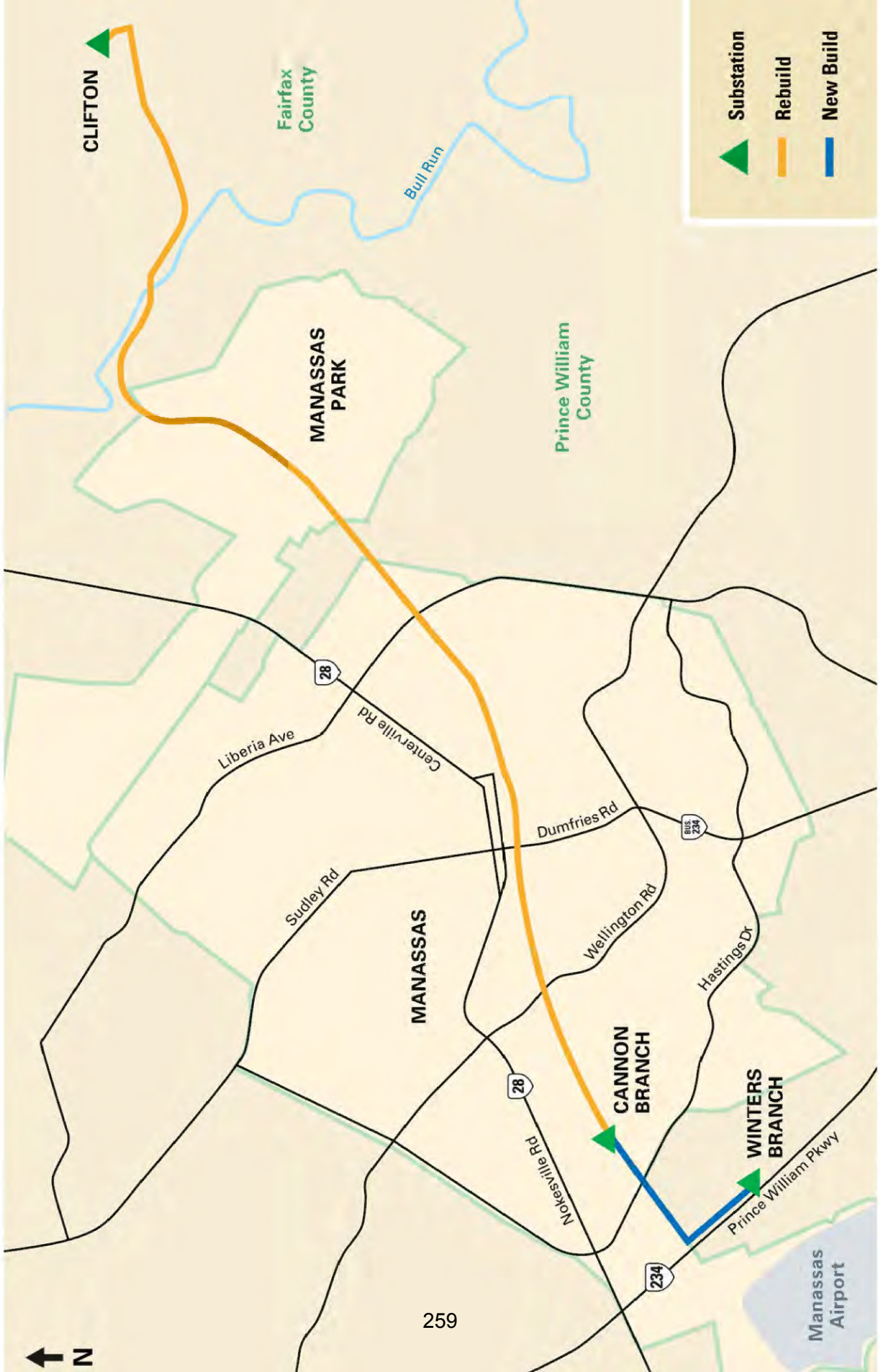
Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, recipients of this letter include other county and statewide historic, cultural and scenic organizations and Native American Tribes.

If you would like to meet to discuss, or if you have any initial questions, please do not hesitate to contact us by sending an email to Stephen.S.Precker@dominionenergy.com or calling 888-291-0190.

Sincerely,



Steve Precker
The Electric Transmission Project Team



This map is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

L. Identify any environmental permits or special permissions anticipated to be needed.

Response: The permits or special permissions that are likely to be required for the proposed Partial Rebuild Project are listed below.

Potential Permits

Activity	Permit	Agency
Impacts to wetlands and waters of the U.S.	Nationwide Permit 57	U.S. Army Corps of Engineers
Impacts to wetlands and waters of the state	Virginia Water Protection Permit	Virginia Department of Environmental Quality
Encroachment over subaqueous bottom (Bull Run)	VMRC Permit	Virginia Marine Resources Commission
Discharge of Stormwater from Construction	Construction General Permit	Virginia Department of Environmental Quality
Work within VDOT right-of-way	Land Use Permit	Virginia Department of Transportation
Work within City of Manassas right-of-way	Use of Right-Of-Way Permit	City of Manassas Department of Planning and Development
Work within City of Manassas Park right-of-way	Use of Right-Of-Way Permit	City of Manassas Park Public Works Division
Work within Norfolk Southern Railroad right-of-way	Railroad Permit	Norfolk Southern Railroad
Construction within 5,000 feet of helipads associated buildings and Construction within 20,000 feet of an airport with a runway greater than 3,200 feet in length	Notice of Proposed Construction or Alteration	Federal Aviation Administration
Construction Activities in Johnny Moore Stream Valley Park	Special Use Permit	Fairfax County Park Authority
Construction Activities in Bull Run Regional Park and Hemlock Overlook Regional Park	Special Use Permit	Northern Virginia Regional Park Authority

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS (“EMF”)

- A. Provide the calculated maximum electric and magnetic field levels that are expected to occur at the edge of the ROW. If the new transmission line is to be constructed on an existing electric transmission line ROW, provide the present levels as well as the maximum levels calculated at the edge of ROW after the new line is operational.**

Response: Public exposure to magnetic fields is best estimated by field levels from power lines calculated at annual average loading. For any day of the year, the EMF levels associated with average conditions provide the best estimate of potential exposure. Maximum (peak) values are less relevant as they may occur for only a few minutes or hours each year.

This section describes the levels of EMF associated with the existing transmission lines. EMF levels are provided for both historical (2022) and future (2027) annual average and maximum (peak) loading conditions.

Existing Lines – Historical Average Loading

EMF levels were calculated for the existing lines at the *historical average* load condition of **308 amps** for Line #2011. Line #2011 has a maximum operating voltage of 241.5 kV. See Attachments II.A.5.i, iii and vi.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a historical average load operating temperature.

EMF levels at the edge of the right-of-way for the existing lines at the historical average loading:

Existing Lines - Historic Average Loading				
Attachment	Left Edge Looking per Drawing		Right Edge Looking per Drawing	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
<u>II.A.5.i</u>	0.940	25.861	1.800	32.215
<u>II.A.5.iii</u>	0.861	25.452	0.595	22.946
<u>II.A.5.vi</u>	0.729	23.915	2.141	34.265

Existing Lines – Historical Peak Loading

EMF levels were calculated for the existing lines at the *historical peak* load condition of **730 amps** for Line #2011. Line #2011 has a maximum operating voltage of 241.5 kV. See Attachments II.A.5.i, iii and vi.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a historical peak load operating temperature.

EMF levels at the edge of the right-of-way for the existing lines at the historical peak loading:

Existing Lines - Historic Peak Loading				
Attachment	Left Edge Looking per Drawing		Right Edge Looking per Drawing	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
<u>II.A.5.i</u>	0.937	61.897	1.813	77.334
<u>II.A.5.iii</u>	0.856	60.928	0.588	54.865
<u>II.A.5.vi</u>	0.723	57.208	2.163	82.383

Proposed Partial Rebuild Project – Projected Average Loading in 2027

EMF levels were calculated for the proposed Partial Rebuild Project at the *projected average* load condition of **654 amps** for Line #2011. Line #2011 has a maximum operating voltage of 241.5 kV. See Attachments II.A.5.ii, iv, v (see below) and vii.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a projected average load operating temperature.

EMF levels at the edge of the right-of-way for the proposed Partial Rebuild Project at the projected average loading:

Proposed Lines - Projected Average Loading				
Attachment	Left Edge Looking per Drawing		Right Edge Looking per Drawing	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
II.A.5.ii	1.250	28.761	2.472	36.322
II.A.5.iv	1.145	27.999	0.785	25.144
II.A.5.vii	2.472	36.322	1.250	28.791

EMF levels were calculated only for under the conductor for the structures depicted in Attachment II.A.5.v because the Company does not have a uniform right-of-way width in this section of the Partial Rebuild Project.

Proposed Lines - Projected Average Loading		
Attachment	Under Conductor	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
II.A.5.v	4.523	46.095

Proposed Partial Rebuild Project – Projected Peak Loading in 2027

EMF levels were calculated for the proposed Partial Rebuild Project at the *projected peak* load condition of **731 amps** for Line #2011. Line #2011 has a maximum operating voltage of 241.5 kV. See Attachments II.A.5.ii, iv, v (see below) and vii.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a projected peak load operating temperature.

EMF levels at the edge of the right-of-way for the proposed Partial Rebuild Project at the projected peak loading:

Proposed Lines - Projected Peak Loading				
Attachment	Left Edge Looking per Drawing		Right Edge Looking per Drawing	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
II.A.5.ii	1.249	32.171	2.473	40.635
II.A.5.iv	1.145	31.319	0.785	28.123
II.A.5.vii	2.473	40.635	1.249	32.171

EMF levels were calculated only for under the conductor for the structures depicted in Attachment II.A.5.v because the Company does not have a uniform right-of-way width in this section of the Partial Rebuild Project.

Proposed Lines - Projected Peak Loading		
Attachment	Under Conductor	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
II.A.5.v	4.527	51.580

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS (“EMF”)

- B. If the Applicant is of the opinion that no significant health effects will result from the construction and operation of the line, describe in detail the reasons for that opinion and provide references or citations to supporting documentation.**

Response: The conclusions of multidisciplinary scientific review panels assembled by national and international scientific agencies during the past two decades are the foundation of the Company’s opinion that no adverse health effects will result from the operation of the proposed Partial Rebuild Project. Each of these panels has evaluated the scientific research related to health and power-frequency EMF and provided conclusions that form the basis of guidance to governments and industries. The Company regularly monitors the recommendations of these expert panels to guide their approach to EMF.

Research on EMF and human health varies widely in approach. Some studies evaluate the effects of high, short-term EMF exposures not typically found in people’s day-to-day lives on biological responses, while others evaluate the effects of common, lower EMF exposures found throughout communities. Studies also have evaluated the possibility of effects (e.g., cancer, neurodegenerative diseases, reproductive effects) of long-term exposure. Altogether, this research includes well over a hundred epidemiologic studies of people in their natural environment and many more laboratory studies of animals (*in vivo*) and isolated cells and tissues (*in vitro*). Standard scientific procedures, such as weight-of-evidence methods, were used by the expert panels assembled by agencies to identify, review, and summarize the results of this large and diverse research.

The reviews of EMF biological and health research have been conducted by numerous scientific and health agencies, including the European Health Risk Assessment Network on Electromagnetic Fields Exposure (“EFHRAN”), the International Commission on Non-Ionizing Radiation Protection (“ICNIRP”), the World Health Organization (“WHO”), the International Committee on Electromagnetic Safety (“ICES”), the Scientific Committee on Emerging and Newly Identified Health Risks (“SCENIHR”) of the European Commission, and the Swedish Radiation Safety Authority (“SSM”) [formerly the Swedish Radiation Protection Authority (“SSI”)] (EFHRAN, 2010, 2012; ICNIRP, 2010; WHO, 2007; SCENIHR, 2009, 2015; SSM, 2015, 2016, 2018, 2019; ICES, 2019). The general scientific consensus of the agencies that have reviewed this research, relying on generally accepted scientific methods, is that the scientific evidence does not show that common sources of EMF in the environment, including transmission lines and other parts of the electric system, appliances, etc., are a cause of any adverse health effects. The WHO, for example, states on their website: “Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields” (WHO, 2020).

The most recent reviews on this topic include the 2015 report by SCENIHR and annual reviews published by SSM (e.g., for the years 2015, 2016, 2018, and 2019). These reports, similar to previous reviews, found that the scientific evidence does not confirm the existence of any adverse health effects caused by environmental or community exposure to EMF.

The WHO has recommended that countries adopt recognized international standards published by the International Commission on Non-ionizing Radiation (ICNIRP) and the IEEE's International Committee on Electromagnetic Safety (ICES). Typical levels of EMF from Dominion's power lines outside its property and rights-of-way are far below the screening reference levels of EMF recommended for the general public and still lower than exposures equivalent to restrictions to limits on fields within the body (ICNIRP, 2010; ICES, 2019).

Thus, based on the conclusions of scientific reviews and the levels of EMF associated with the proposed Partial Rebuild Project, the Company has determined that no adverse health effects are anticipated to result from the operation of the proposed Partial Rebuild Project.

References

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Report on the Analysis of Risks Associated to Exposure to EMF: *In Vitro* and *In Vivo* (Animals) Studies. Milan, Italy: EFHRAN, 2010.

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Risk Analysis of Human Exposure to Electromagnetic Fields (Revised). Report D2 of the EFHRAN Project. Milan, Italy: EFHRAN, 2012.

International Commission on Non-ionizing Radiation Protection (ICNIRP). Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). *Health Phys* 99: 818-36, 2010.

International Committee on Electromagnetic Safety (ICES). IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields 0 to 300 GHz. IEEE Std C95.1-2019. New York, NY: IEEE, 2019.

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Health Effects of Exposure to EMF. Brussels, Belgium: European Commission, 2009.

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF). Brussels, Belgium: European Commission, 2015.

Swedish Radiation Safety Authority (SSM). Research 2015:19. Recent Research on EMF and Health Risk - Tenth report from SSM's Scientific Council on Electromagnetic Fields. Stockholm, Sweden: Swedish Radiation Safety Authority

(SSM), 2015.

Swedish Radiation Safety Authority (SSM). Research 2016:15. Recent Research on EMF and Health Risk - Eleventh report from SSM's Scientific Council on Electromagnetic Fields, 2016. Including Thirteen years of electromagnetic field research monitored by SSM's Scientific Council on EMF and health: How has the evidence changed over time? Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2016.

Swedish Radiation Safety Authority (SSM). Research 2018:09. Recent Research on EMF and Health Risk - Twelfth report from SSM's Scientific Council on Electromagnetic Fields, 2017. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2018.

Swedish Radiation Safety Authority (SSM). Research 2019:08. Recent Research on EMF and Health Risk – Thirteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2018. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2019.

World Health Organization (WHO). Environmental Health Criteria 238: Extremely Low Frequency (ELF) Fields. Geneva, Switzerland: World Health Organization, 2007.

World Health Organization (WHO). Electromagnetic fields (EMF). World Health Organization, 2020.

<http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html> (last accessed March 23, 2020).

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS (“EMF”)

C. Describe and cite any research studies on EMF the Applicant is aware of that meet the following criteria:

1. **Became available for consideration since the completion of the Virginia Department of Health’s most recent review of studies on EMF and its subsequent report to the Virginia General Assembly in compliance with 1985 Senate Joint Resolution No. 126;**
2. **Include findings regarding EMF that have not been reported previously and/or provide substantial additional insight into findings; and**
3. **Have been subjected to peer review.**

Response: The Virginia Department of Health (“VDH”) conducted its most recent review and issued its report on the scientific evidence on potential health effects of extremely low frequency (“ELF”) EMF in 2000: “[T]he Virginia Department of Health is of the opinion that there is no conclusive and convincing evidence that exposure to extremely low frequency EMF emanated from nearby high voltage transmission lines is causally associated with an increased incidence of cancer or other detrimental health effects in humans.”²²

The continuing scientific research on EMF exposure and health has resulted in many peer-reviewed publications since 2000. The accumulating research results have been regularly and repeatedly reviewed and evaluated by national and international health, scientific, and government agencies. One of the most comprehensive and detailed reviews of the relevant scientific peer-reviewed literature was published by the WHO in 2007. The conclusion of the WHO, as currently expressed on its website, is consistent with the earlier VDH conclusions: “Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields.”²³

Research published in the peer-reviewed literature subsequent to the WHO report has been reviewed by several scientific organizations, including most notably:

- SCENIHR, a committee of the European Commission, that published its assessments in 2009 and 2015;
- The Swedish Radiation Safety Authority (“SSM”), formerly the Swedish Radiation Protection Authority (“SSI”), that has published annual reviews of the relevant peer-reviewed scientific literature since 2003, with its most recent

²² See <http://www.vdh.virginia.gov/content/uploads/sites/12/2016/02/highfinal.pdf>.

²³ See <http://www.who.int/peh-emf/about/WhatIsEMF/en/index1.html>.

review published in 2019; and,

- EFHRAN, that published its reviews in 2010 and 2012.

The above reviews provide detailed analyses and summaries of relevant recent peer-reviewed scientific publications. The conclusions of these reviews that the evidence overall does not confirm the existence of any adverse health effects due to exposure to EMF are consistent with the conclusions of the VDH and the WHO reports. With respect to the statistical association observed in some of the childhood leukemia epidemiologic studies, the most recent comprehensive review of the literature by SCENIHR, published in 2015, concluded that “no mechanisms have been identified and no support is existing [*sic*] from experimental studies that could explain these findings, which, together with shortcomings of the epidemiological studies prevent a causal interpretation” (SCENIHR, 2015, p. 16).

While research is continuing on multiple aspects of EMF exposure and health, many of the recent publications have focused on an epidemiologic assessment of the relationship between EMF exposure and childhood leukemia and neurodegenerative diseases. Of these, the following recent publications, published following the inclusion date (June 2014) for the SCENIHR (2015) report, provided additional evidence and contributed to clarification of previous findings. Overall, new research studies have not provided evidence to alter the previous conclusions of scientific and health organizations, including the WHO and SCENIHR.

Recent epidemiologic studies of EMF and childhood leukemia include:

- Bunch et al. (2015) assessed the potential association between residential proximity to high-voltage underground cables and development of childhood cancer in the United Kingdom largely using the same epidemiologic data as in a previously published study on overhead transmission lines (Bunch et al., 2014). No statistically significant associations or trends were reported with either distance to underground cables or calculated magnetic fields from underground cables for any type of childhood cancers.
- Pedersen et al. (2015) published a case-control study that investigated the potential association between residential proximity to power lines and childhood cancer in Denmark. The study included all cases of leukemia (n=1,536), central nervous system tumor, and malignant lymphoma (n=417) diagnosed before the age of 15 between 1968 and 2003 in Denmark, along with 9,129 healthy control children matched on sex and year of birth. Considering the entire study period, no statistically significant increases were reported for any of the childhood cancer types.
- Salvan et al. (2015) compared measured magnetic-field levels in the bedroom for 412 cases of childhood leukemia under the age of 10 and 587 healthy control children in Italy. Although the statistical power of the study was limited because of the small number of highly exposed subjects, no consistent statistical

associations or trends were reported between measured magnetic-field levels and the occurrence of leukemia among children in the study.

- Bunch et al. (2016) and Swanson and Bunch (2018) published additional analyses using data from an earlier study (Bunch et al., 2014). Bunch et al. (2016) reported that the association with distance to power lines observed in earlier years was linked to calendar year of birth or year of cancer diagnosis, rather than the age of the power lines. Swanson and Bunch (2018) re-analyzed data using finer exposure categories (e.g., cut-points of every 50-meter distance) and broader groupings of diagnosis date (e.g., 1960-1979, 1980-1999, and 2000-on) and reported no overall associations between exposure categories and childhood leukemia for the later time periods (1980 and on), and consistent pattern for time periods prior to 1980.
- Crespi et al. (2016) conducted a case-control epidemiologic study of childhood cancers and residential proximity to high-voltage power lines (60 kilovolts [“kV”] to 500 kV) in California. Childhood cancer cases, including 5,788 cases of leukemia and 3,308 cases of brain tumor, diagnosed under the age of 16 between 1986 and 2008, were identified from the California Cancer Registry. Controls, matched on age and sex, were selected from the California Birth Registry. Overall, no consistent statistically significant associations for leukemia or brain tumor and residential distance to power lines were reported.
- Kheifets et al. (2017) assessed the relationship between calculated magnetic-field levels from power lines and development of childhood leukemia within the same study population evaluated in Crespi et al. (2016). In the main analyses, which included 4,824 cases of leukemia and 4,782 controls matched on age and sex, the authors reported no consistent patterns, or statistically significant associations between calculated magnetic-field levels and childhood leukemia development. Similar results were reported in subgroup and sensitivity analyses. In two subsequent studies (Amoon et al., 2018a, 2019), the potential impact of residential mobility (i.e., moving residences between birth and diagnosis) on the associations reported in Crespi et al. (2016) and Kheifets et al. (2017) were examined. Amoon et al. (2019) concluded that while uncontrolled confounding by residential mobility had some impact on the association between EMF exposure and childhood leukemia, it was unlikely to be the primary driving force behind the previously reported associations.
- Amoon et al. (2018b) conducted a pooled analysis of 29,049 cases and 68,231 controls from 11 epidemiologic studies of childhood leukemia and residential distance from high-voltage power lines. The authors reported no statistically-significant association between childhood leukemia and proximity to transmission lines of any voltage. Among subgroup analyses, the reported associations were slightly stronger for leukemia cases diagnosed before 5 years of age and in study periods prior to 1980. Adjustment for various potential confounders (e.g., socioeconomic status, dwelling type, residential mobility) had little effect on the estimated associations.

- Kyriakopoulou et al. (2018) assessed the association between childhood acute leukemia and parental occupational exposure to social contacts, chemicals, and electromagnetic fields. The study was conducted at a major pediatric hospital in Greece and included 108 cases and 108 controls matched for age, gender, and ethnicity. Statistically non-significant associations were observed between paternal exposure to magnetic fields and childhood acute leukemia for any of the exposure periods examined (1 year before conception; during pregnancy; during breastfeeding; and from birth until diagnosis); maternal exposure was not assessed due to the limited sample size. No associations were observed between childhood acute leukemia and exposure to social contacts or chemicals.
- Auger et al. (2019) examined the relationship between exposure to EMF during pregnancy and risk of childhood cancer in a cohort of 784,000 children born in Québec. Exposure was defined using residential distance to the nearest high-voltage transmission line or transformer station. The authors reported statistically non-significant associations between proximity to transformer stations and any cancer, hematopoietic cancer, or solid tumors. No associations were reported with distance to transmission lines.
- Crespi et al. (2019) investigated the relationship between childhood leukemia and distance from high-voltage lines and calculated magnetic-field exposure, separately and combined, within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors reported that neither close proximity to high-voltage lines nor exposure to calculated magnetic fields alone were associated with childhood leukemia; an association was observed only for those participants who were both close to high-voltage lines (< 50 meters) and had high calculated magnetic fields (≥ 0.4 microtesla [i.e., 4 milligauss]). No associations were observed with low-voltage power lines (< 200 kV).
- Talibov et al. (2019) conducted a pooled analysis of 9,723 cases and 17,099 controls from 11 epidemiologic studies to examine the relationship between parental occupational exposure to magnetic fields and childhood leukemia. No statistically significant association was found between either paternal or maternal exposure and leukemia (overall or by subtype). No associations were observed in the meta-analyses.

Recent epidemiologic studies of EMF and neurodegenerative diseases include:

- Seelen et al. (2014) conducted a population-based case-control study in the Netherlands and included 1,139 cases diagnosed with amyotrophic lateral sclerosis (“ALS”) between 2006 and 2013 and 2,864 frequency-matched controls. The shortest distance from the case’ and control residences to the nearest high-voltage power line (50 kV to 380 kV) was determined by geocoding. No statistically significant associations between residential proximity to power lines with voltages of either 50 to 150 kV or 220 to 380 kV

and ALS were reported.

- Sorahan and Mohammed (2014) analyzed mortality from neurodegenerative diseases in a cohort of approximately 73,000 electricity supply workers in the United Kingdom. Cumulative occupational exposure to magnetic-fields was calculated for each worker in the cohort based on their job titles and job locations. Death certificates were used to identify deaths from neurodegenerative diseases. No associations or trends for any of the included neurodegenerative diseases (Alzheimer's disease, Parkinson's disease, and ALS) were observed with various measures of calculated magnetic fields.
- Koeman et al. (2015, 2017) analyzed data from the Netherlands Cohort Study of approximately 120,000 men and women who were enrolled in the cohort in 1986 and followed up until 2003. Lifetime occupational history, obtained through questionnaires, and job-exposure matrices on ELF magnetic fields and other occupational exposures were used to assign exposure to study subjects. Based on 1,552 deaths from vascular dementia, the researchers reported a statistically not significant association of vascular dementia with estimated exposure to metals, chlorinated solvents, and ELF magnetic fields. However, because no exposure-response relationship for cumulative exposure was observed and because magnetic fields and solvent exposures were highly correlated with exposure to metals, the authors attributed the association with ELF magnetic fields and solvents to confounding by exposure to metals (Koeman et al., 2015). Based on a total of 136 deaths from ALS among the cohort members, the authors reported a statistically significant, approximately two-fold association with ELF magnetic fields in the highest exposure category. This association, however, was no longer statistically significant when adjusted for exposure to insecticides (Koeman et al., 2017).
- Fischer et al. (2015) conducted a population-based case-control study that included 4,709 cases of ALS diagnosed between 1990 and 2010 in Sweden and 23,335 controls matched to cases on year of birth and sex. The study subjects' occupational exposures to ELF magnetic fields and electric shocks were classified based on their occupations, as recorded in the censuses and corresponding job-exposure matrices. Overall, neither magnetic fields nor electric shocks were related to ALS.
- Vergara et al. (2015) conducted a mortality case-control study of occupational exposure to electric shock and magnetic fields and ALS. They analyzed data on 5,886 deaths due to ALS and over 58,000 deaths from other causes in the United States between 1991 and 1999. Information on occupation was obtained from death certificates and job-exposure matrices were used to categorize exposure to electric shocks and magnetic fields. Occupations classified as "electric occupations" were moderately associated with ALS. The authors reported no consistent associations for ALS, however, with either electric shocks or magnetic fields, and they concluded that their findings did not support the hypothesis that exposure to either electric shocks or magnetic fields

explained the observed association of ALS with “electric occupations.”

- Pedersen et al. (2017) investigated the occurrence of central nervous system diseases among approximately 32,000 male Danish electric power company workers. Cases were identified through the national patient registry between 1982 and 2010. Exposure to ELF magnetic fields was determined for each worker based on their job titles and area of work. A statistically significant increase was reported for dementia in the high exposure category when compared to the general population, but no exposure-response pattern was identified, and no similar increase was reported in the internal comparisons among the workers. No other statistically significant increases among workers were reported for the incidence of Alzheimer’s disease, Parkinson’s disease, motor neuron disease, multiple sclerosis, or epilepsy, when compared to the general population, or when incidence among workers was analyzed across estimated exposure levels.
- Vinceti et al. (2017) examined the association between ALS and calculated magnetic-field levels from high-voltage power lines in Italy. The authors included 703 ALS cases and 2,737 controls; exposure was assessed based on residential proximity to high-voltage power lines. No statistically significant associations were reported and no exposure-response trend was observed. Similar results were reported in subgroup analyses by age, calendar period of disease diagnosis, and study area.
- Checkoway et al. (2018) investigated the association between Parkinsonism²⁴ and occupational exposure to magnetic fields and several other agents (endotoxins, solvents, shift work) among 800 female textile workers in Shanghai. Exposure to magnetic fields was assessed based on the participants’ work histories. The authors reported no statistically significant associations between Parkinsonism and occupational exposure to any of the agents under study, including magnetic fields.
- Jalilian et al. (2018) conducted a meta-analysis of 20 epidemiologic studies of occupational exposure to magnetic fields and Alzheimer’s disease. The authors reported a moderate, statistically significant overall association; however, they noted substantial heterogeneity among studies and evidence for publication bias.
- Gervasi et al. (2019) assessed the relationship between residential distance to overhead power lines in Italy and risk of Alzheimer’s dementia and Parkinson’s disease. The authors included 9,835 cases of Alzheimer’s dementia and 6,810 cases of Parkinson’s disease; controls were matched by sex, year of birth, and municipality of residence. A weak, statistically non-significant association was

²⁴ Parkinsonism is defined by Checkoway et al. (2018) as “a syndrome whose cardinal clinical features are bradykinesia, rest tremor, muscle rigidity, and postural instability. Parkinson disease is the most common neurodegenerative form of [parkinsonism]” (p. 887).

observed between residences within 50 meters of overhead power lines and both Alzheimer's dementia and Parkinson's disease, compared to distances of over 600 meters.

- Peters et al. (2019) examined the relationship between ALS and occupational exposure to both magnetic fields and electric shock in a pooled study of data from three European countries. The study included 1,323 ALS cases and 2,704 controls matched for sex, age, and geographic location; exposure was assessed based on occupational title and defined as low (background), medium, or high. Statistically significant associations were observed between ALS and ever having been exposed above background levels to either magnetic fields or electric shocks; however, no clear exposure-response trends were observed with exposure duration or cumulative exposure. The authors also noted significant heterogeneity in risk by study location.
- Huss et al. (2018) conducted a meta-analysis of 20 epidemiologic studies of ALS and occupational exposure to magnetic fields. The authors reported a weak overall association; a slightly stronger association was observed in a subset analysis of six studies with full occupational histories available. The authors noted substantial heterogeneity among studies, evidence for publication bias, and a lack of a clear exposure-response relationship between exposure and ALS.
- Rössli and Jalilian (2018) performed a meta-analysis using data from five epidemiologic studies examining residential exposure to magnetic fields and ALS. A statistically non-significant negative association was reported between ALS and the highest exposed group, where exposure was defined based on distance from power lines or calculated magnetic-field level.

References

Amoon AT, Oksuzyan S, Crespi CM, Arah OA, Cockburn M, Vergara X, Kheifets L. Residential mobility and childhood leukemia. *Environ Res* 164: 459-466, 2018a.

Amoon AT, Crespi CM, Ahlbom A, Bhatnagar M, Bray I, Bunch KJ, Clavel J, Feychting M, Hemon D, Johansen C, Kreis C, Malagoli C, Marquant F, Pedersen C, Raaschou-Nielsen O, Rössli M, Spycher BD, Sudan M, Swanson J, Tittarelli A, Tuck DM, Tynes T, Vergara X, Vinceti M, Wunsch-Filho V, Kheifets L. Proximity to overhead power lines and childhood leukaemia: an international pooled analysis. *Br J Cancer* 119: 364-373, 2018b.

Amoon AT, Arah OA, Kheifets L. The sensitivity of reported effects of EMF on childhood leukemia to uncontrolled confounding by residential mobility: a hybrid simulation study and an empirical analysis using CAPS data. *Cancer Causes Control* 30: 901-908, 2019.

Auger N, Bilodeau-Bertrand M, Marcoux S, Kosatsky T. Residential exposure to electromagnetic fields during pregnancy and risk of child cancer: A longitudinal cohort study. *Environ Res* 176: 108524, 2019.

Bunch KJ, Keegan TJ, Swanson J, Vincent TJ, Murphy MF. Residential distance at birth from overhead high-voltage powerlines: childhood cancer risk in Britain 1962-2008. *Br J Cancer* 110: 1402-1408, 2014.

Bunch KJ, Swanson J, Vincent TJ, Murphy MF. Magnetic fields and childhood cancer: an epidemiological investigation of the effects of high-voltage underground cables. *J Radiol Prot* 35: 695-705, 2015.

Bunch KJ, Swanson J, Vincent TJ, Murphy MF. Epidemiological study of power lines and childhood cancer in the UK: further analyses. *J Radiol Prot* 36: 437-455, 2016.

Checkoway H, Ilango S, Li W, Ray RM, Tanner CM, Hu SC, Wang X, Nielsen S, Gao DL, Thomas DB. Occupational exposures and parkinsonism among Shanghai women textile workers. *Am J Ind Med* 61: 886-892, 2018.

Crespi CM, Vergara XP, Hooper C, Oksuzyan S, Wu S, Cockburn M, Kheifets L. Childhood leukaemia and distance from power lines in California: a population-based case-control study. *Br J Cancer* 115: 122-128, 2016.

Crespi CM, Swanson J, Vergara XP, Kheifets L. Childhood leukemia risk in the California Power Line Study: Magnetic fields versus distance from power lines. *Environ Res* 171: 530-535, 2019.

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Report on the Analysis of Risks Associated to Exposure to EMF: *In Vitro* and *In Vivo* (Animals) Studies. Milan, Italy: EFHRAN, 2010.

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Risk Analysis of Human Exposure to Electromagnetic Fields (Revised). Report D2 of the EFHRAN Project. Milan, Italy: EFHRAN, 2012.

Fischer H, Kheifets L, Huss A, Peters TL, Vermeulen R, Ye W, Fang F, Wiebert P, Vergara XP, Feychting M. Occupational Exposure to Electric Shocks and Magnetic Fields and Amyotrophic Lateral Sclerosis in Sweden. *Epidemiology* 26: 824-830, 2015.

Gervasi F, Murtas R, Decarli A, Giampiero Russo A. Residential distance from high-voltage overhead power lines and risk of Alzheimer's dementia and Parkinson's disease: a population-based case-control study in a metropolitan area of Northern Italy. *Int J Epidemiol*, 2019.

Huss A, Peters S, Vermeulen R. Occupational exposure to extremely low-frequency magnetic fields and the risk of ALS: A systematic review and meta-analysis. *Bioelectromagnetics* 39: 156-163, 2018.

Jalilian H, Teshnizi SH, Rööslı M, Neghab M. Occupational exposure to extremely low frequency magnetic fields and risk of Alzheimer disease: A systematic review and meta-analysis. *Neurotoxicology* 69: 242-252, 2018.

Kheifets L, Crespi CM, Hooper C, Cockburn M, Amoon AT, Vergara XP. Residential magnetic fields exposure and childhood leukemia: a population-based case-control study in California. *Cancer Causes Control* 28: 1117-1123, 2017.

Koeman T, Schouten LJ, van den Brandt PA, Slottje P, Huss A, Peters S, Kromhout H, Vermeulen R. Occupational exposures and risk of dementia-related mortality in the prospective Netherlands Cohort Study. *Am J Ind Med* 58: 625-635, 2015.

Koeman T, Slottje P, Schouten LJ, Peters S, Huss A, Veldink JH, Kromhout H, van den Brandt PA, Vermeulen R. Occupational exposure and amyotrophic lateral sclerosis in a prospective cohort. *Occup Environ Med* 74: 578-585, 2017.

Kyriakopoulou A, Meimeti E, Moisoglou I, Psarrou A, Provatopoulou X, Dounias G. Parental Occupational Exposures and Risk of Childhood Acute Leukemia. *Mater Sociomed* 30: 209-214, 2018.

Pedersen C, Johansen C, Schüz J, Olsen JH, Raaschou-Nielsen O. Residential exposure to extremely low-frequency magnetic fields and risk of childhood leukaemia, CNS tumour and lymphoma in Denmark. *Br J Cancer* 113: 1370-1374, 2015.

Pedersen C, Poulsen AH, Rod NH, Frei P, Hansen J, Grell K, Raaschou-Nielsen O, Schüz J, Johansen C. Occupational exposure to extremely low-frequency magnetic fields and risk for central nervous system disease: an update of a Danish cohort study among utility workers. *Int Arch Occup Environ Health* 90: 619-628, 2017.

Peters S, Visser AE, D'Ovidio F, Beghi E, Chio A, Logroscino G, Hardiman O, Kromhout H, Huss A, Veldink J, Vermeulen R, van den Berg LH. Associations of Electric Shock and Extremely Low-Frequency Magnetic Field Exposure With the Risk of Amyotrophic Lateral Sclerosis. *Am J Epidemiol* 188: 796-805, 2019.

Rööslı M and Jalilian H. A meta-analysis on residential exposure to magnetic fields and the risk of amyotrophic lateral sclerosis. *Rev Environ Health* 33: 295-299, 2018.

Salvan A, Ranucci A, Lagorio S, Magnani C. Childhood leukemia and 50 Hz magnetic fields: findings from the Italian SETIL case-control study. *Int J Environ Res Public Health* 12: 2184-2204, 2015.

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Health Effects of Exposure to EMF. Brussels, Belgium: European Commission, 2009.

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF). Brussels, Belgium: European Commission, 2015.

Seelen M, Vermeulen RC, van Dillen LS, van der Kooij AJ, Huss A, de Visser M, van den Berg LH, Veldink JH. Residential exposure to extremely low frequency electromagnetic fields and the risk of ALS. *Neurology* 83: 1767-1769, 2014.

Sorahan T and Mohammed N. Neurodegenerative disease and magnetic field exposure in UK electricity supply workers. *Occup Med (Lond)* 64: 454-460, 2014.

Swanson J and Bunch KJ. Reanalysis of risks of childhood leukaemia with distance from overhead power lines in the UK. *J Radiol Prot* 38: N30-N35, 2018.

Swedish Radiation Safety Authority (SSM). Research 2019:08. Recent Research on EMF and Health Risk – Thirteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2018. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2019.

Talibov M, Olsson A, Bailey H, Erdmann F, Metayer C, Magnani C, Petridou E, Auvinen A, Spector L, Clavel J, Roman E, Dockerty J, Nikkila A, Lohi O, Kang A, Psaltopoulou T, Miligi L, Vila J, Cardis E, Schüz J. Parental occupational exposure to low-frequency magnetic fields and risk of leukaemia in the offspring: findings from the Childhood Leukaemia International Consortium (CLIC). *Occup Environ Med* 76:746-753, 2019.

Vergara X, Mezei G, Kheifets L. Case-control study of occupational exposure to electric shocks and magnetic fields and mortality from amyotrophic lateral sclerosis in the US, 1991-1999. *J Expo Sci Environ Epidemiol* 25: 65-71, 2015.

Vinceti M, Malagoli C, Fabbi S, Kheifets L, Violi F, Poli M, Caldara S, Sesti D, Violanti S, Zanichelli P, Notari B, Fava R, Arena A, Calzolari R, Filippini T, Iacuzio L, Arcolin E, Mandrioli J, Fini N, Odone A, Signorelli C, Patti F, Zappia M, Pietrini V, Oleari P, Teggi S, Ghermandi G, Dimartino A, Ledda C, Mauceri C, Sciacca S, Fiore M, Ferrante M. Magnetic fields exposure from high-voltage power lines and risk of amyotrophic lateral sclerosis in two Italian populations. *Amyotroph Lateral Scler Frontotemporal Degener* 18: 583-589, 2017.

World Health Organization (WHO). Environmental Health Criteria 238: Extremely Low Frequency (ELF) Fields. Geneva, Switzerland: World Health Organization, 2007.

V. NOTICE

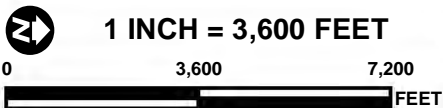
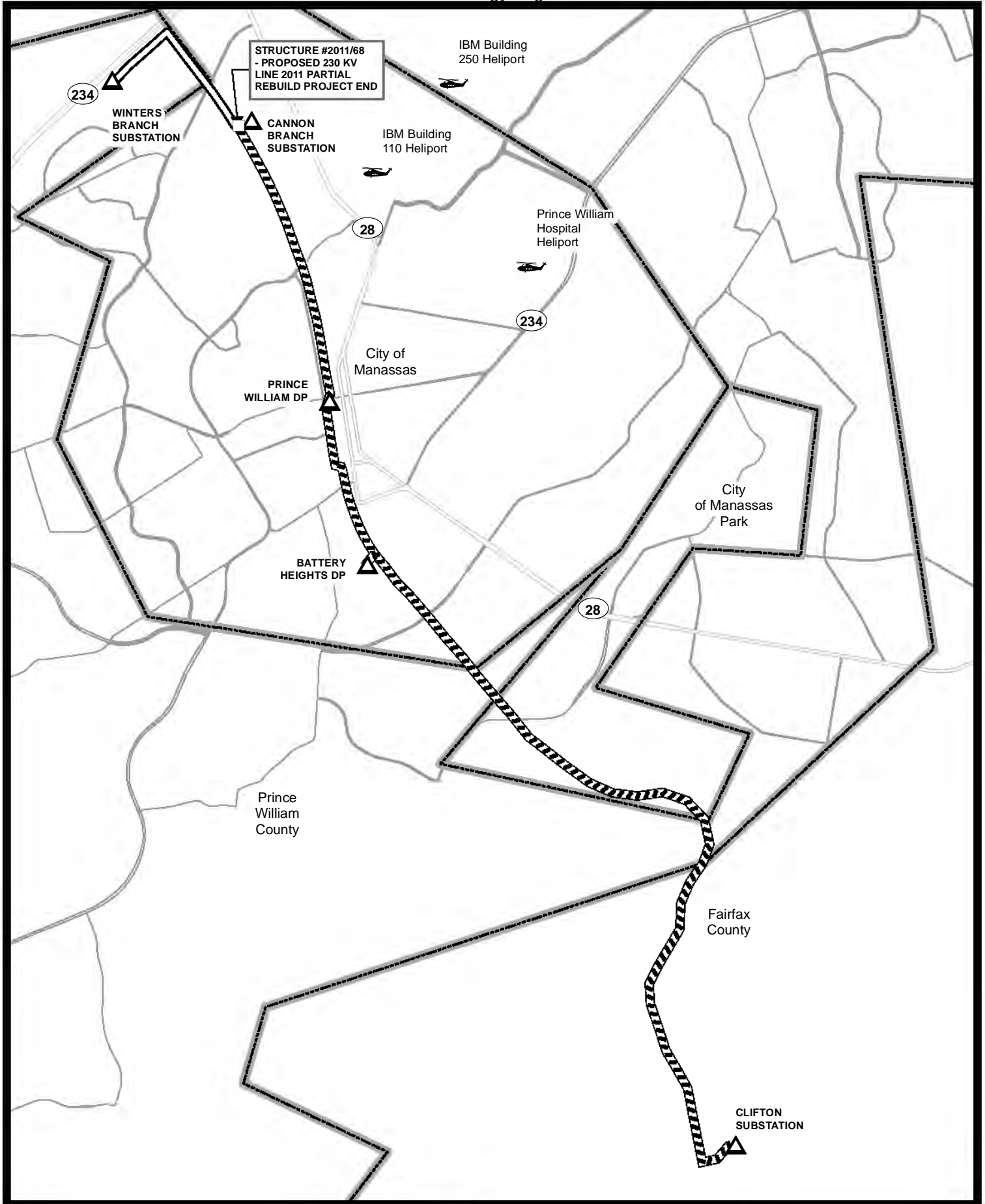
- A. Furnish a proposed route description to be used for public notice purposes. Provide a map of suitable scale showing the route of the proposed project. For all routes that the Applicant proposed to be noticed, provide minimum, maximum and average structure heights.**

Response: A map showing the route to be used for the Partial Rebuild Project is provided as Attachment V.A. A written description of the route is as follows:

The proposed route for the Partial Rebuild Project is located within an approximately 7.25-mile existing transmission line corridor, which includes the 230 kV Line #2011. The existing transmission line corridor for the proposed route of the Partial Rebuild Project originates at Structure #2011/68, one span southeast of the Cannon Branch Substation, which is located directly south of Foster Drive in the City of Manassas. The route then continues northeast for approximately 5.30 miles through Prince William County and the Cities of Manassas and Manassas Park paralleling the Norfolk Southern Railroad to the Prince William County and Fairfax County line. From this point, the Partial Rebuild Project continues easterly along the Norfolk Southern Railroad for approximately 1.76 miles to Structure #2011/3 in Fairfax County before turning north and terminating at the Clifton Substation, which is located at the end of Clifton Creek Drive in Fairfax County.

For the proposed Partial Rebuild Project, the existing engineered steel monopole structures, which are primarily weathering steel, are proposed to be replaced with new weathering steel monopole structures. The minimum proposed structure height is approximately 80 feet, the maximum proposed structure height is approximately 145 feet, and the average proposed structure height is approximately 116 feet, based on preliminary conceptual design, excluding foundation reveal and subject to change based on final engineering design.

NOTICE MAP
 Line #2011 230 kV Partial Rebuild Project
 Dominion Energy Virginia



LEGEND

- EXISTING SUBSTATION/DP
- HELIPORT
- COUNTY/CITY LINES
- PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
- APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)

V. NOTICE

- B. List Applicant offices where members of the public may inspect the application. If applicable, provide a link to website(s) where the application may be found.**

Response: The Application will be made available electronically for public inspection at: www.dominionenergy.com/cliftonwintersbranch.

V. NOTICE

- C. **List all federal, state, and local agencies and/or officials that may reasonably be expected to have an interest in the proposed construction and to whom the Applicant has furnished or will furnish a copy of the application.**

Response: The following agency representatives may reasonably be expected to have an interest in the Partial Rebuild Project. Instead of furnishing a copy of the Application to these parties, the Company has sent a letter noting the availability of the Application for the Partial Rebuild Project on the Company's website.

Ms. Michelle Henicheck
Department of Environmental Quality
Office of Wetlands and Stream Protection
1111 East Main Street
Suite 1400
Richmond, Virginia 23219

Ms. Bettina Rayfield, Manager
Department of Environmental Quality
Office of Environmental Impact Review
P.O. Box 1105
Richmond, Virginia 23218

Ms. Rene Hypes
Virginia Department of Conservation and Recreation
Division of Natural Heritage
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Ms. Krystal Mckelvey
Department of Conservation and Recreation
Planning & Recreation Bureau
600 East Main Street, 17th Floor
Richmond, Virginia 23219

Mr. Roger Kirchen, Director
Department of Historic Resources
Review and Compliance Division
2801 Kensington Avenue
Richmond, Virginia 23221

Ms. Amy M. Ewing
Virginia Department of Wildlife Resources
7870 Villa Park, Suite 400
Henrico, Virginia 23228

Mr. Keith Tignor
Endangered Species Coordinator
Virginia Department of Agriculture and Consumer Services
102 Governor Street
Richmond, Virginia 23219

Mr. Terry Lasher
Virginia Department of Forestry
Forestland Conservation Division
900 Natural Resources Drive, Suite 800
Charlottesville, Virginia 22903

Mr. Mark Eversole
Virginia Marine Resources Commission
Habitat Management Division
380 Fenwick Road, Building 96
Ft. Monroe, Virginia 23651

Mr. Troy Andersen
US Fish and Wildlife Service
Ecological Services Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061

ROD
US Army Corps of Engineers
Norfolk District, Northern Section
803 Front St.
Norfolk, Virginia 23510

Ms. Martha Little, Deputy Director
Virginia Outdoors Foundation
600 East Main Street, Suite 402
Richmond, Virginia 23219

Mr. Mike Helvey, Manager
Federal Aviation Administration
FAA Eastern Regional Office, Obstruction Evaluation Group
800 Independence Ave, SW
Room 400 East
Washington, D.C. 20591

Mr. Scott Denny
Virginia Department of Aviation
Airport Services Division
5702 Gulfstream Road
Richmond, Virginia 23250-2422

Mr. John D. Lynch, P.E., Northern Virginia District Engineer
Virginia Department of Transportation
Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

Mr. Kamal Suliman, Regional Operations Director
Virginia Department of Transportation
Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

Mr. Brian Nolan, Director
Northern Virginia Regional Park Authority
Planning & Development
5400 Ox Road
Fairfax Station, Virginia 22039

Mr. Jason Shepard, Property Manager
Norfolk Southern Railroad
Roanoke Region
209 Shenandoah Ave NE
Roanoke, Virginia 24016

Mr. Mike DePue, Land Manager
Northern Virginia Regional Park Authority
5400 Ox Road
Fairfax Station, Virginia 22039-7000

Ms. Jai Cole, Executive Director
Fairfax County Park Authority
12055 Government Center Parkway
Fairfax, Virginia 22035

Ms. Rebecca Horner, Acting Director of Planning
Prince William County Planning Office
5 County Complex Court, Suite 210
Prince William, Virginia 22192

Ms. Yesli Vega, Coles District Supervisor
Prince William County Board of Supervisors
9400 Innovation Drive, Suite 130
Manassas, Virginia 20110

Mr. William Patrick Pate, Manassas City Manager
City of Manassas Manager's Office
9027 Center Street
Manassas, Virginia 20110

Mr. Matt Arcieri, Director
City of Manassas Planning and Development
9027 Center Street
Manassas, Virginia 20110

Ms. Tracy Strunk, Director
Department of Development and Planning
12055 Government Center Parkway
Fairfax, Virginia 22035

Mr. Patrick Herrity, Springfield District Supervisor
Fairfax County Board of Supervisors
West Springfield Government Center
6140 Rolling Road, Springfield, Virginia 22152

Mr. Laszlo Palko, City Manager
City of Manassas Park
Office of the City Manager
100 Park Central Plaza
Manassas Park, Virginia 20111

Ms. Michelle Barry, Planning and Zoning Administrator
City of Manassas Park
Office of Planning and Development Services Division & City Assessors
9701 Manassas Drive
Manassas Park, Virginia 20111

V. NOTICE

- D. If the application is for a transmission line with a voltage of 138 kV or greater, provide a statement and any associated correspondence indicating that prior to the filing of the application with the SCC the Applicant has notified the chief administrative officer of every locality in which it plans to undertake construction of the proposed line of its intention to file such an application, and that the Applicant gave the locality a reasonable opportunity for consultation about the proposed line (similar to the requirements of § 15.2-2202 of the Code for electric transmission lines of 150 kV or more).**

Response: In accordance with Va. Code § 15.2-2202 E, letters dated October 20, 2022, were delivered to Ms. Rebecca Horner, Acting Director of Planning for the Prince William County Planning Office; Ms. Yesli Vega, the Prince William County Coles District Supervisor; Mr. William Patrick Pate, the Manassas City Manager; Mr. Matt Arcieri, Director of the City of Manassas Planning Department; Ms. Stacey Strunk, Director of the Fairfax County Department of Development and Planning; Mr. Patrick Herrity, the Fairfax County Springfield District Supervisor; Mr. Laszlo Palko, the Manassas Park City Manager; and Ms. Michelle Barry, the City of Manassas Park Planning and Zoning Administrator, where the Partial Rebuild Project is located. The letter stated the Company's intention to file this Application and invited the locality to consult with the Company about the Partial Rebuild Project. These letters and overview map are included as Attachment V.D.1.

October 20, 2022

BY EMAIL

Ms. Rebecca Horner, Acting Director of Planning
Prince William County Planning Office
5 County Complex Court, Suite 210
Prince William, Virginia 22192

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Ms. Horner,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

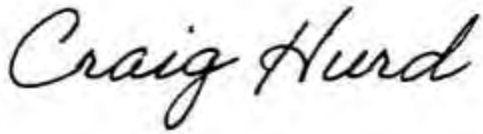
The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

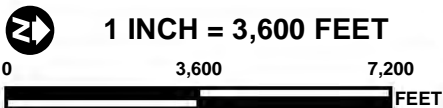
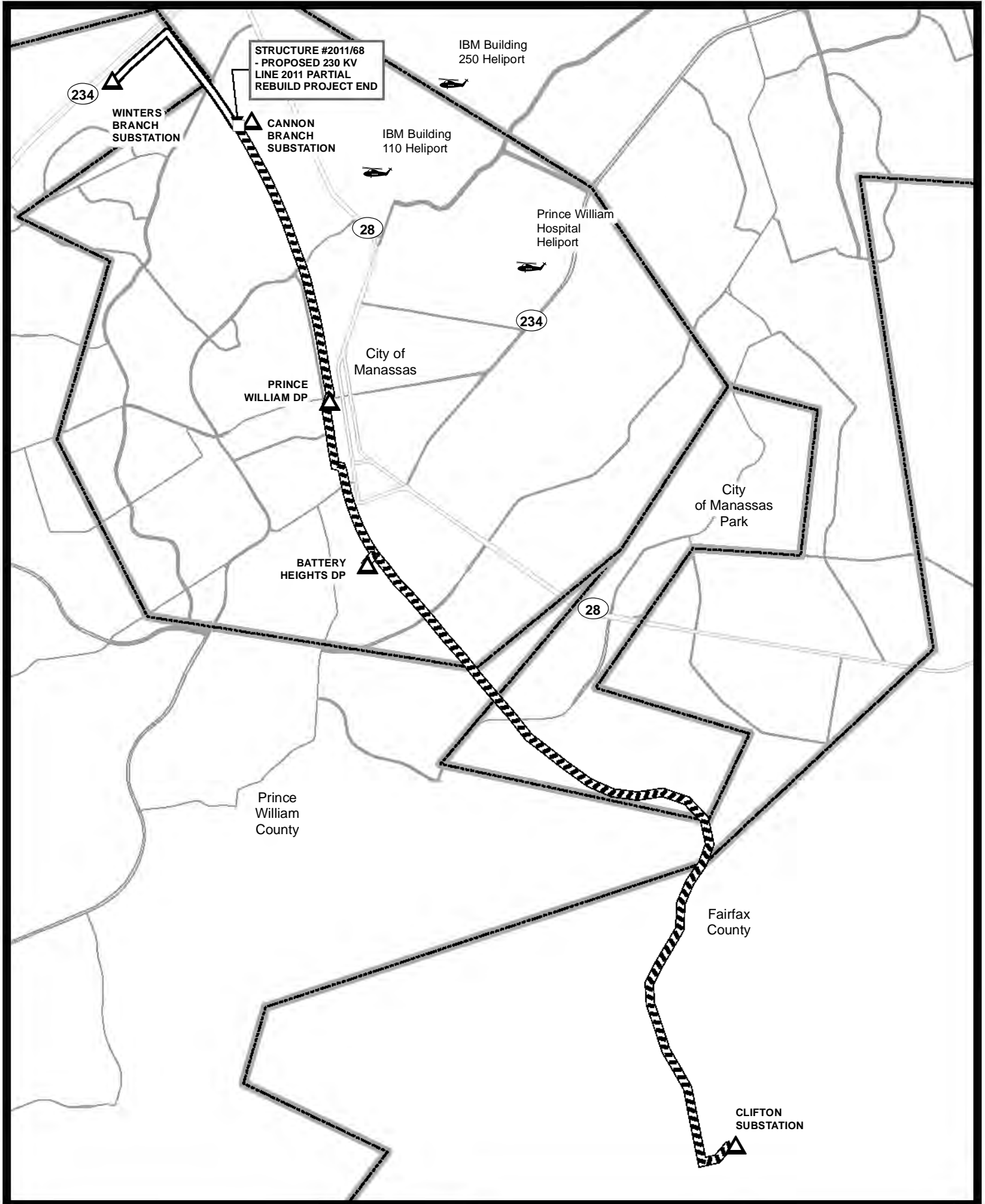
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive, flowing style.






Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



LEGEND

-  EXISTING SUBSTATION/DP
-  HELIPORT
-  COUNTY/CITY LINES
-  PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
-  APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)

October 20, 2022

BY EMAIL

Ms. Yesli Vega, Coles District Supervisor
Prince William County Board of Supervisors
9400 Innovation Drive, Suite 130
Manassas, Virginia 20110

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Ms. Vega,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

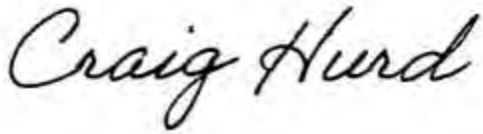
The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

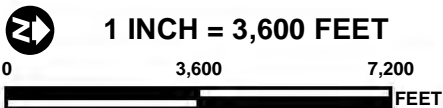
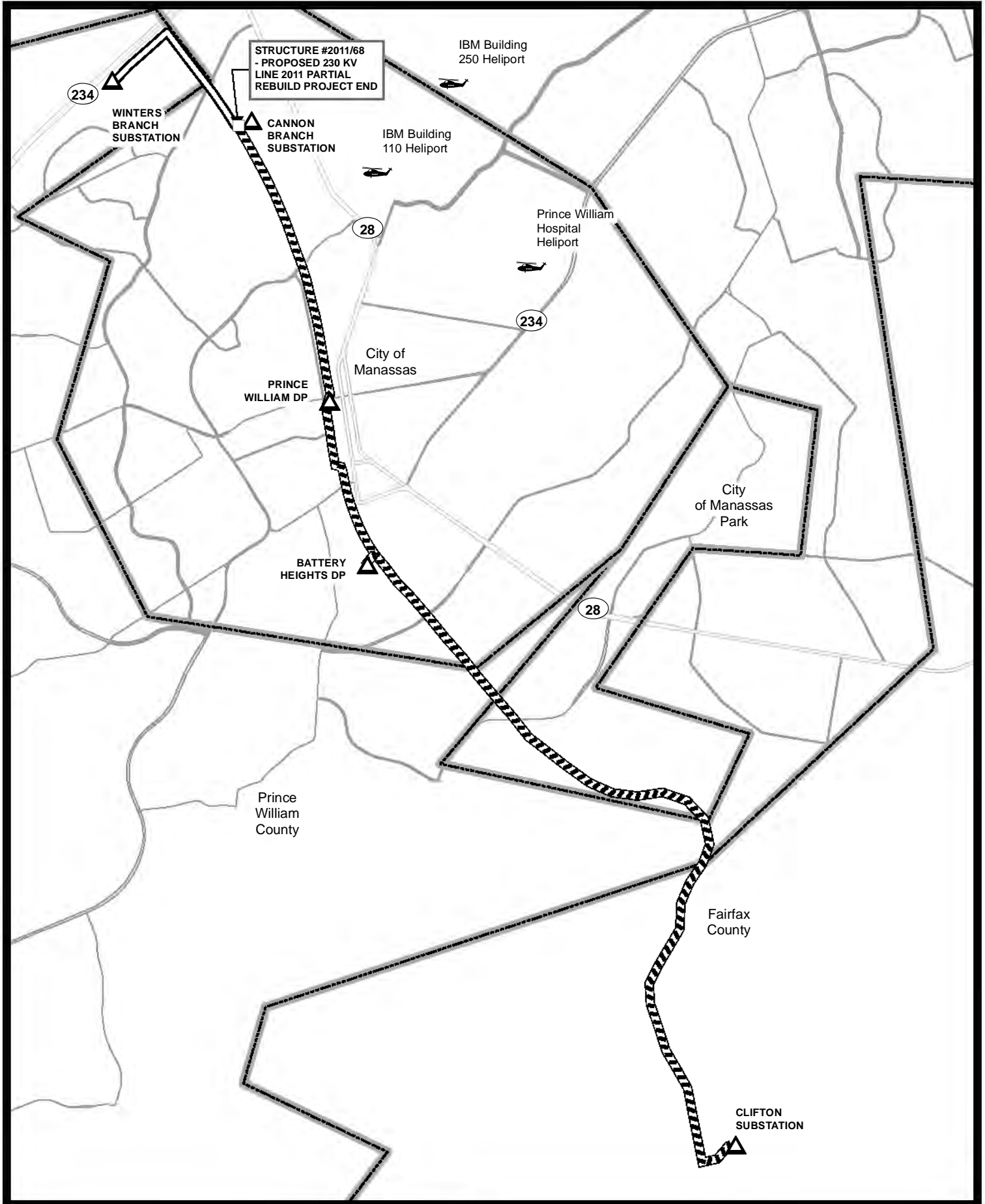
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive, flowing style.

Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



LEGEND

- EXISTING SUBSTATION/DP
- HELIPORT
- COUNTY/CITY LINES
- PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
- APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)



October 20, 2022

BY EMAIL

Mr. William Patrick Pate, Manassas City Manager
City of Manassas Manager's Office
9027 Center Street
Manassas, Virginia 20110

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Mr. Pate,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

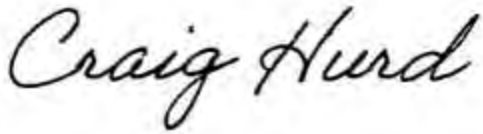
The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

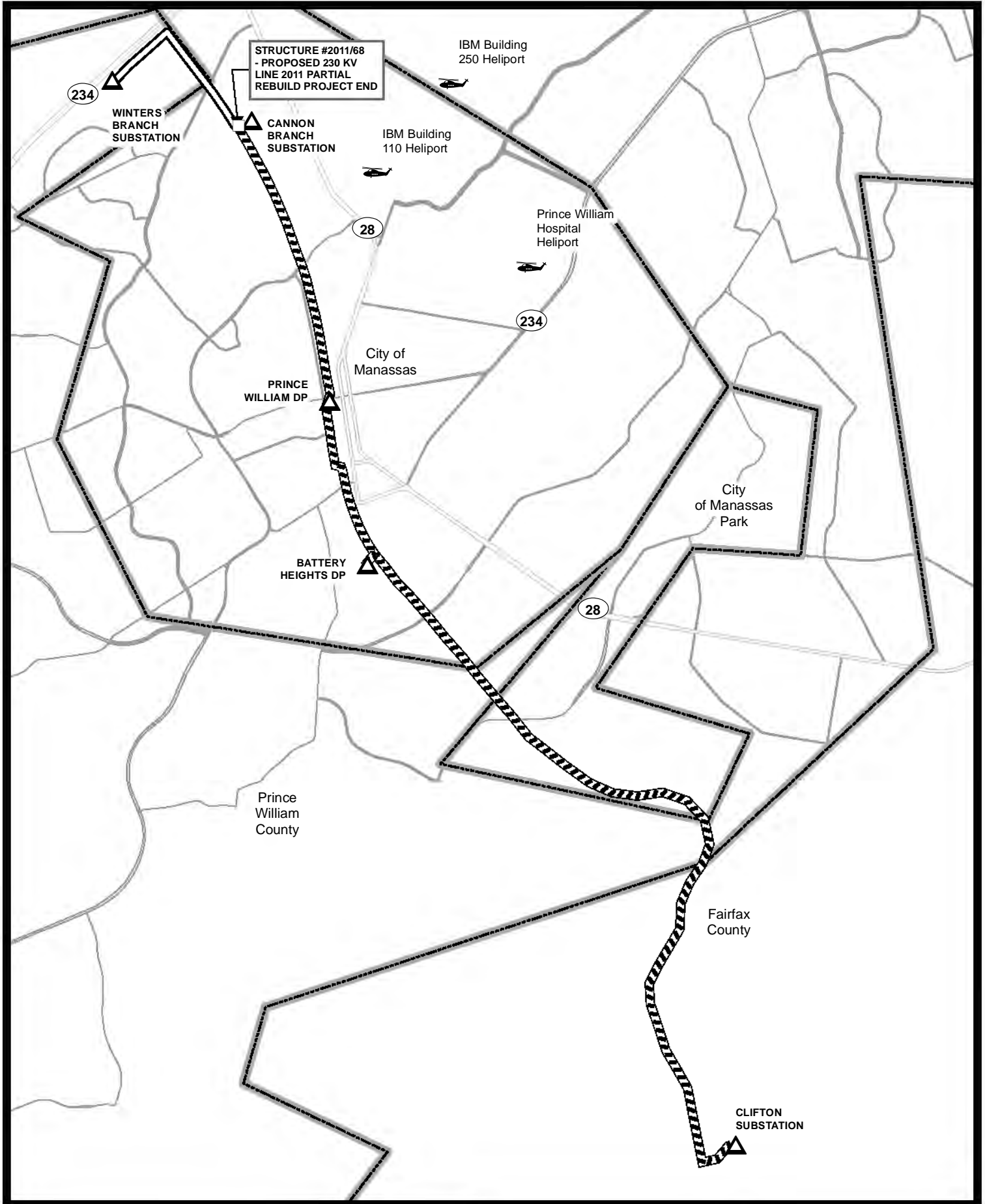
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive, flowing style.

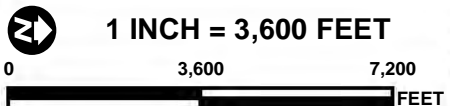
Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



**STRUCTURE #2011/68
- PROPOSED 230 KV
LINE 2011 PARTIAL
REBUILD PROJECT END**



LEGEND	
	EXISTING SUBSTATION/DP
	HELIPORT
	COUNTY/CITY LINES
	PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
	APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)



October 20, 2022

BY EMAIL

Mr. Matt Arcieri, Director
City of Manassas Planning and Development
9027 Center Street
Manassas, Virginia 20110

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Mr. Arcieri,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

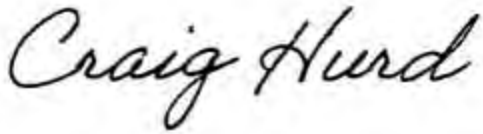
The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

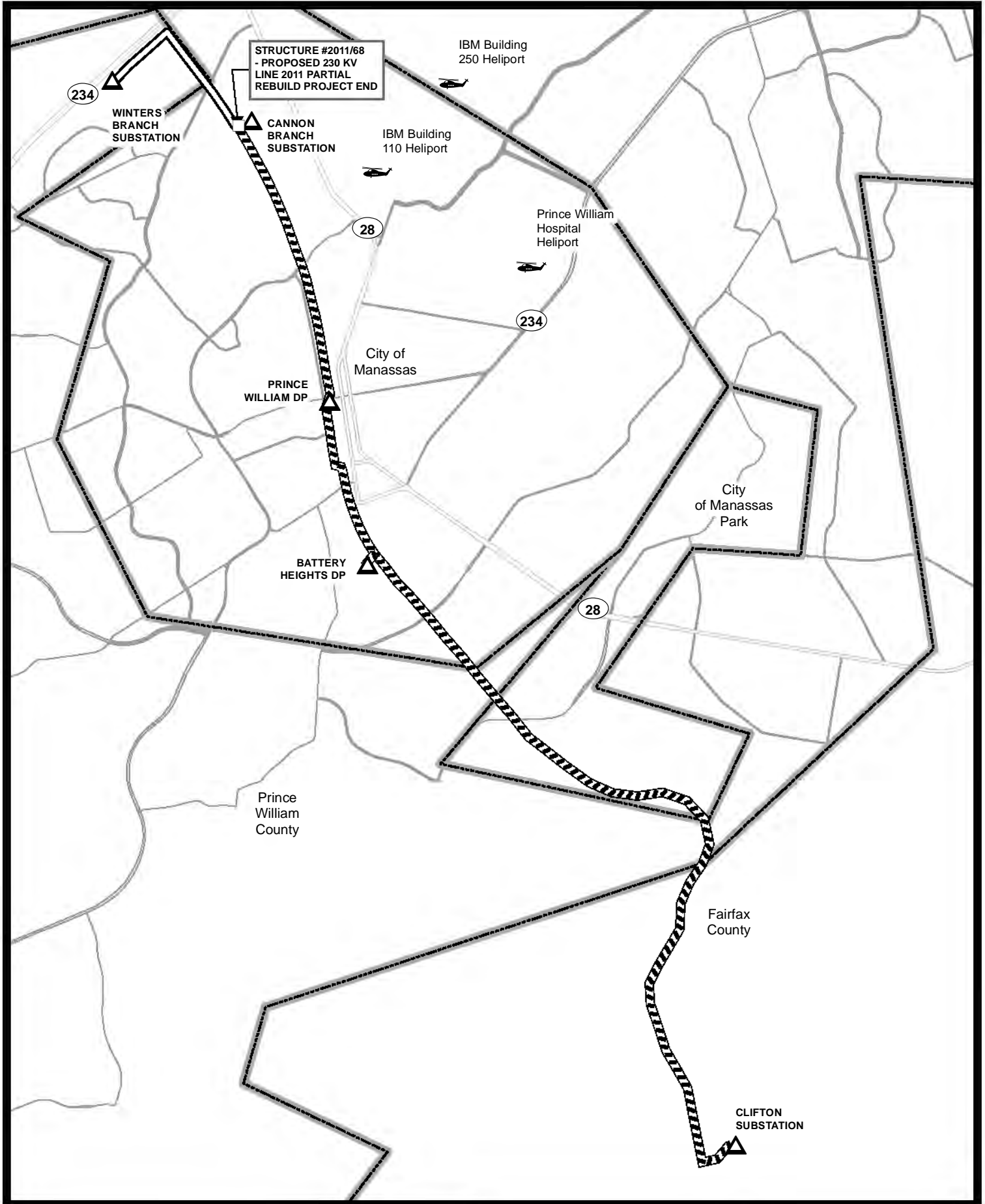
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive, flowing style.

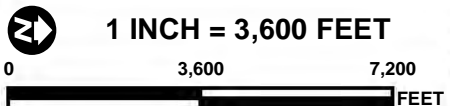
Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



**STRUCTURE #2011/68
- PROPOSED 230 KV
LINE 2011 PARTIAL
REBUILD PROJECT END**



1 INCH = 3,600 FEET



LEGEND

- EXISTING SUBSTATION/DP
- HELIPORT
- COUNTY/CITY LINES
- PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
- APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)



October 20, 2022

BY EMAIL

Ms. Tracy Strunk, Director
Department of Development and Planning
12055 Government Center Parkway
Fairfax, Virginia 22035

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Ms. Strunk,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

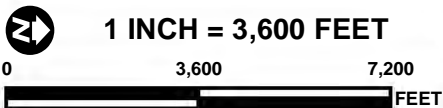
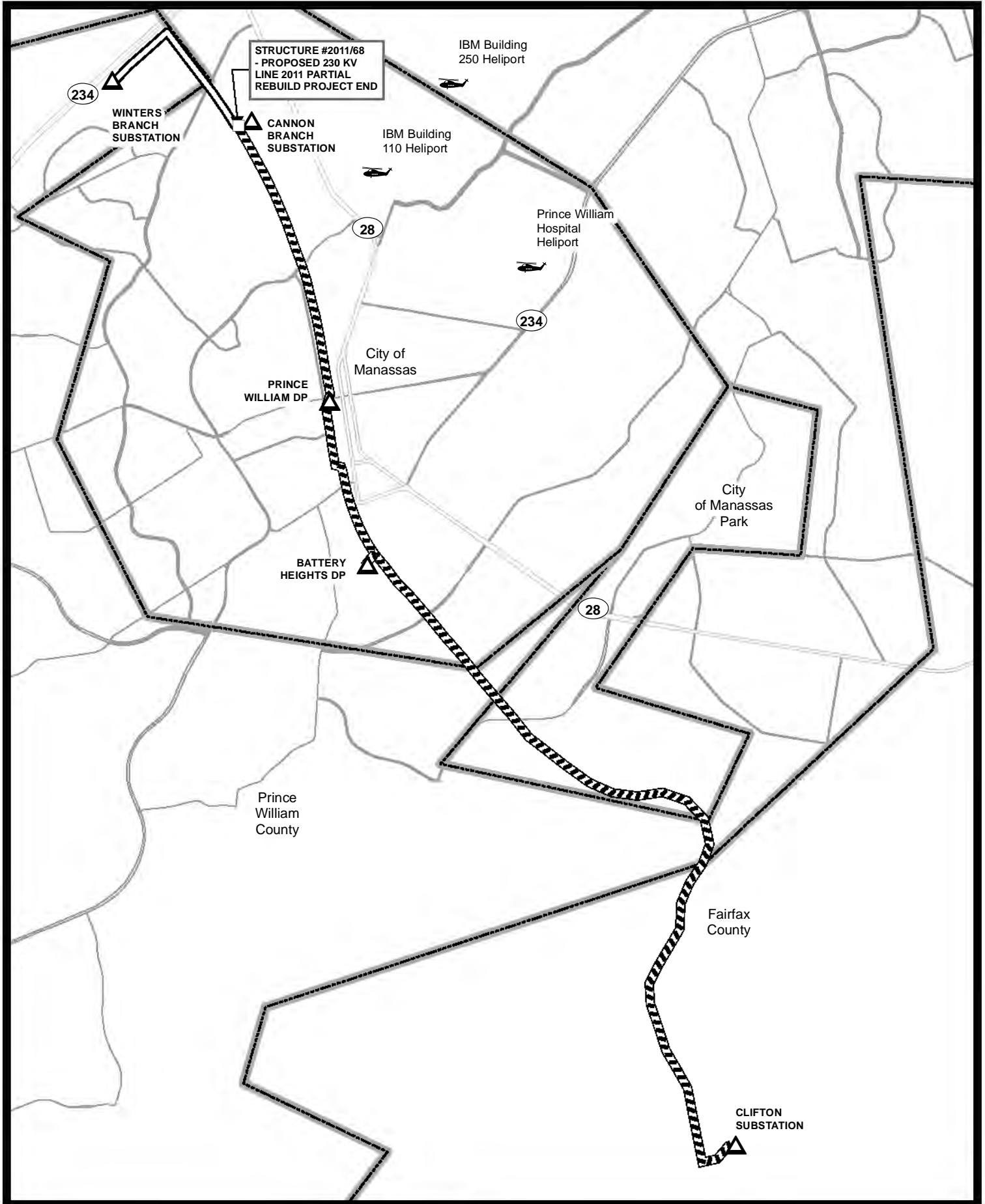
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive, flowing style.

Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



LEGEND

- EXISTING SUBSTATION/DP
- HELIPORT
- COUNTY/CITY LINES
- PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
- APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)



October 20, 2022

BY EMAIL

Mr. Patrick Herrity, Springfield District Supervisor
Fairfax County Board of Supervisors
West Springfield Government Center
6140 Rolling Road
Springfield, VA 22152

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Mr. Herrity,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

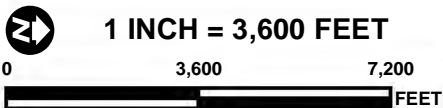
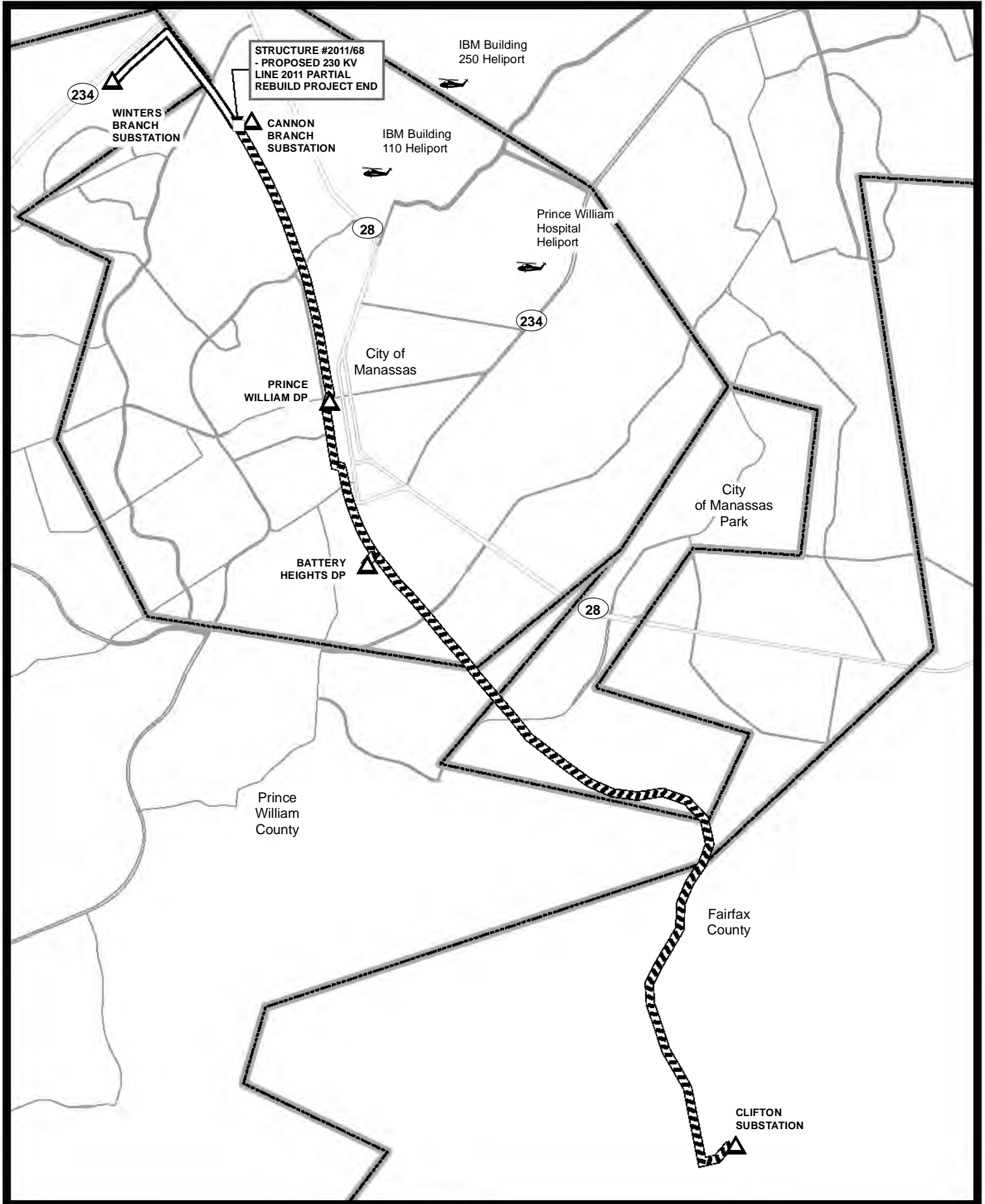
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive, flowing style.

Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



LEGEND

- EXISTING SUBSTATION/DP
- HELIPORT
- COUNTY/CITY LINES
- PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
- APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)



October 20, 2022

BY EMAIL

Mr. Laszlo Palko, City Manager
City of Manassas Park
Office of the City Manager
100 Park Center Plaza
Manassas Park, VA 20111

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Mr. Palko,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

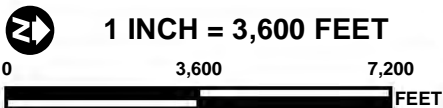
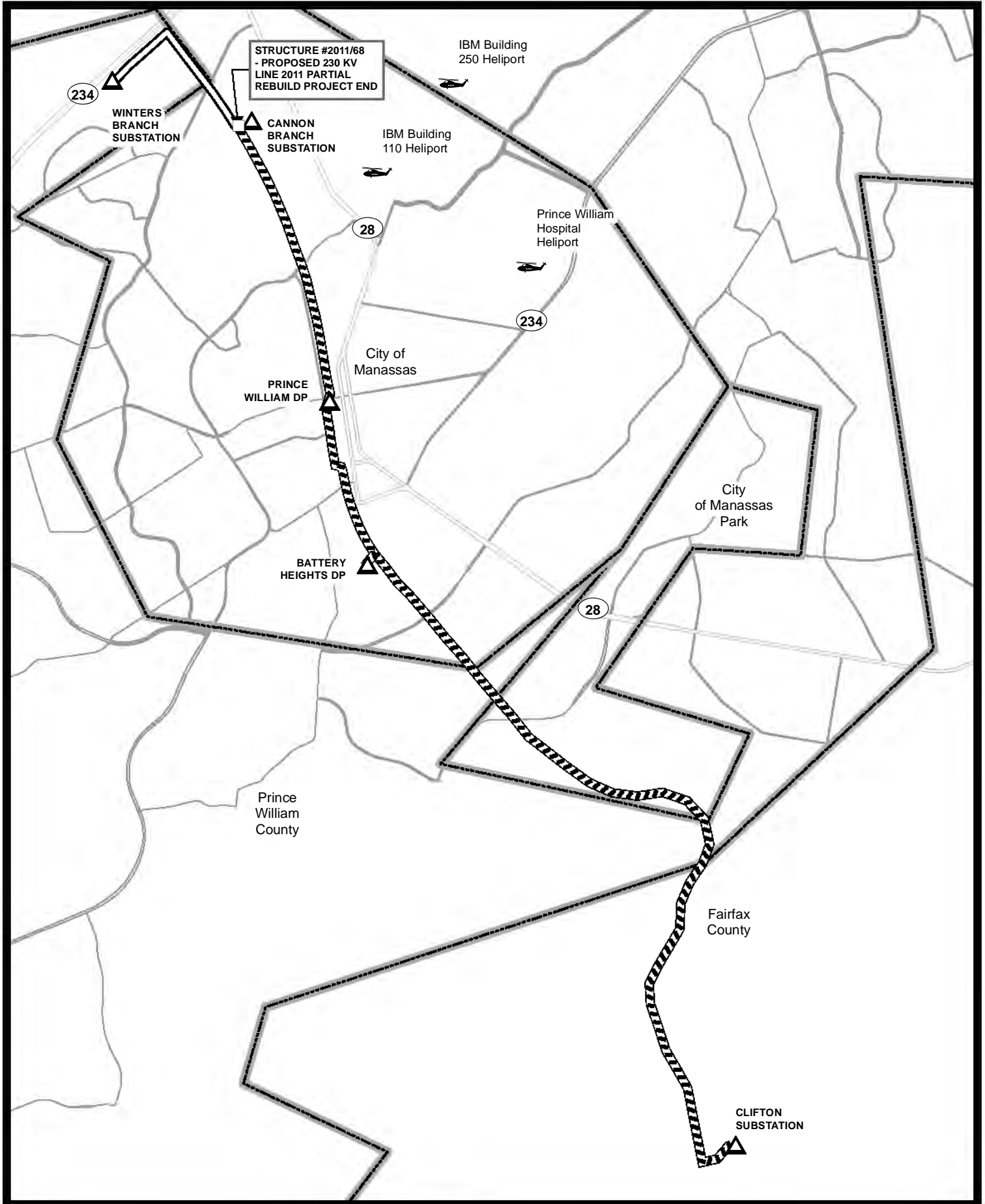
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive, flowing style.

Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



LEGEND

- EXISTING SUBSTATION/DP
- HELIPORT
- COUNTY/CITY LINES
- PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
- APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)



October 20, 2022

BY EMAIL

Ms. Michelle Barry, Planning and Zoning Administrator
City of Manassas Park
Office of Planning and Development Services Division & City Assessors
9701 Manassas Drive
Manassas Park, Virginia 20111

**RE: Dominion Energy Virginia's Proposed Line #2011 230 kV Partial Rebuild Project
Notice Pursuant to Va. Code § 15.2-2202**

Dear Ms. Barry,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing overhead 230 kV Cannon Branch-Clifton Line #2011 (the "Partial Rebuild Project") in the City of Manassas, Prince William County and Fairfax County, Virginia. Specifically, as part of the Partial Rebuild Project, the Company proposes to rebuild approximately 7.25 miles of the Cannon Branch-Clifton Line #2011 predominantly within existing right-of-way, existing easements and Company-owned property. The Partial Rebuild Project will include replacement of structures, conductors and shield wire along this rebuilt segment of Line #2011.

The Partial Rebuild Project is needed to maintain reliable service for the overall growth in the area and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Partial Rebuild Project within 30 days of the date of this letter.

Enclosed is a preliminary Project Overview Map depicting the proposed route and Partial Rebuild Project location. All final materials, including maps, will be available in the application filing to the Commission. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Craig R. Hurd at (804) 771-6489 or craig.r.hurd@dominionenergy.com.

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

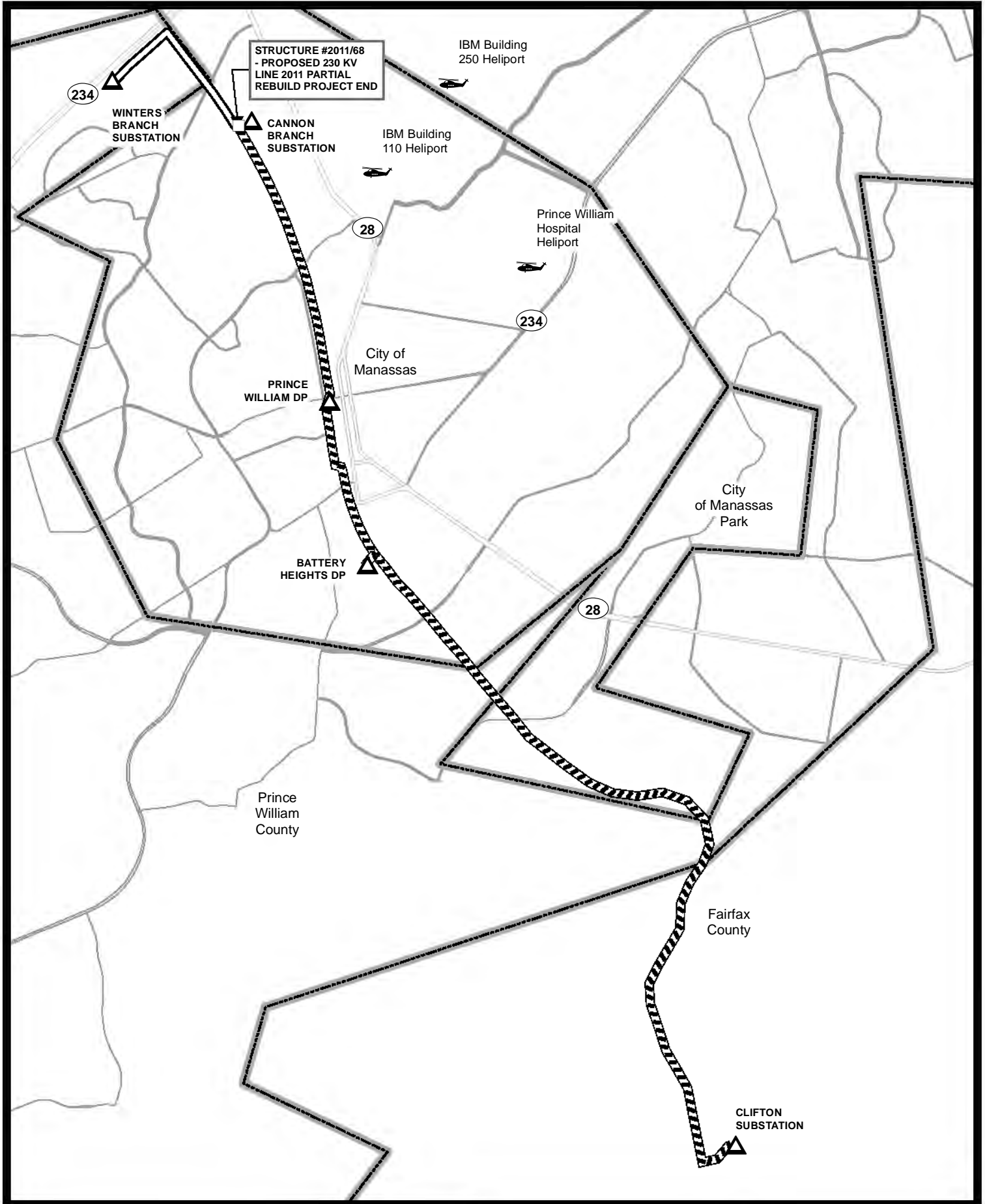
Dominion Energy Virginia

A handwritten signature in black ink that reads "Craig Hurd". The signature is written in a cursive style with a large, prominent 'C' and 'H'.

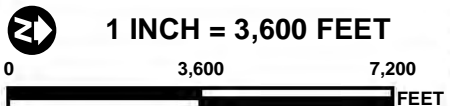
Craig R. Hurd
Siting and Permitting

Attachment: Project Overview Map

PROJECT OVERVIEW MAP



**STRUCTURE #2011/68
- PROPOSED 230 KV
LINE 2011 PARTIAL
REBUILD PROJECT END**



LEGEND	
	EXISTING SUBSTATION/DP
	HELIPORT
	COUNTY/CITY LINES
	PROPOSED 230 KV LINE 2011 PARTIAL REBUILD
	APPROVED 230 KV LINE 2011 EXTENSION (CASE NO. PUR-2021-00291)

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF)

VIRGINIA ELECTRIC AND POWER COMPANY)

Case No. PUR-2023-00049

For approval and certification of electric)
transmission facilities: Line #2011 230 kV)
Partial Rebuild Project)

**IDENTIFICATION, SUMMARIES AND TESTIMONY OF DIRECT WITNESSES OF
VIRGINIA ELECTRIC AND POWER COMPANY**

Steven J. Schweiger

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Chloe A. Genova

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Aaron C. Kuhn

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Craig R. Hurd

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Steven J. Schweiger

Title: Area Planning Engineer

Summary:

Company Witness Steven J. Schweiger sponsors those portions of the Appendix describing the Company's transmission system and need for, and benefits of, the proposed Partial Rebuild Project, as follows:

- Section I.B: This section details the engineering justifications for the proposed project.
- Section I.C: This section describes the present system and details how the proposed project will effectively satisfy present and projected future load demand requirements.
- Section I.D: This section describes critical contingencies and associated violations due to the inadequacy of the existing system.
- Section I.E: This section explains feasible project alternatives.
- Section I.H: This section provides the desired in-service date of the proposed project and the estimated construction time.
- Section I.J: This section provides information about the project if approved by the RTO.
- Section I.K: This section when applicable provides outage history and maintenance history for existing transmission lines if the proposed project is a rebuild and is due in part to reliability issues.
- Section I.M: This section when applicable contains information for transmission lines interconnecting a non-utility generator.
- Section I.N: This section when applicable provides the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations, and other ground facilities associated with the proposed project.
- Section II.A.10: This section provides details of the construction plans for the proposed project, including requested and approved line outage schedules.

Additionally, Company Witness Schweiger co-sponsors the following portions of the Appendix:

- Section I.A (co-sponsored with Company Witness Chloe A. Genova): This section details the primary justifications for the proposed project.
- Section I.F (co-sponsored with Company Witness Chloe A. Genova): This section describes any lines or facilities that will be removed, replaced or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.
- Section I.G (co-sponsored with Company Witness Craig R. Hurd): This section provides a system map for the affected area.
- Section II.A.3 (co-sponsored with Company Witness Craig R. Hurd): This section provides color maps of existing or proposed rights-of-way in the vicinity of the project.

A statement of Mr. Schweiger's background and qualifications is attached to his testimony as Appendix A.

**DIRECT TESTIMONY
OF
STEVEN J. SCHWEIGER
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2023-00049**

1 **Q. Please state your name, position with Virginia Electric and Power Company**
2 **(“Dominion Energy Virginia” or the “Company”), and business address.**

3 A. My name is Steven J. Schweiger, and I am an Area Planning Engineer in the Electric
4 Transmission Planning Department for the Company. My business address is 10900
5 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and
6 background is provided as Appendix A.

7 **Q. Please describe your areas of responsibility with the Company.**

8 A. I am responsible for planning the Company’s electric transmission system for voltages of
9 69 kilovolt (“kV”) through 500 kV.

10 **Q. What is the purpose of your testimony in this proceeding?**

11 A. In order to maintain reliable service for the overall growth in the area and to comply with
12 mandatory North American Electric Reliability Corporation (“NERC”) Reliability
13 Standards, Dominion Energy Virginia proposes in the City of Manassas, Manassas Park,
14 Prince William County and Fairfax County, Virginia (the “Manassas Airport Area”) the
15 following (collectively, the “Partial Rebuild Project”):

- 16 • Rebuild approximately 7.25 miles of the existing overhead 230 kV Cannon
17 Branch-Clifton Line #2011 from existing Structure #2011/68, which is located
18 one span outside of the Company’s existing Cannon Branch Substation and is not
19 being replaced, to the Clifton Substation. Specifically, the Company proposes to
20 replace the existing Line #2011 1590 ACSR (45/7) conductor from Structure
21 #2011/68 to Clifton Substation with three-phase twin-bundled 768.2 ACSS/TW

1 type conductor, designed for a maximum operating temperature (“MOT”) of 250
2 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA. In
3 order to accommodate the higher capacity of the uprated conductor, the Company
4 additionally proposes to replace the existing single circuit 230 kV monopoles,
5 which are primarily weathering steel monopoles, with single circuit 230 kV
6 weathering steel monopoles.

- 7 • Replace all substation equipment at the Clifton Substation that is associated with
8 Line #2011 and not currently rated for 4000 ampere (“amp” or “A”) to provide a
9 4000A single breaker rating.
- 10 • Uprate the Company’s line switches to 4000A at the Prince William Delivery
11 Point (“DP”) and Battery Heights DP, both of which are the City of Manassas’s
12 DPs tapped from Line #2011.

13 The purpose of my testimony is to describe the Company’s transmission system and the
14 need for, and benefits of, the proposed Partial Rebuild Project. I am sponsoring Sections
15 I.B, I.C, I.D, I.E, I.H, I.J, I.K, I.M, I.N, and II.A.10 of the Appendix. Additionally, I co-
16 sponsor the Executive Summary with Company Witnesses Chloe A. Genova, Aaron C.
17 Kuhn, and Craig R. Hurd; Sections I.A and I.F with Company Chloe A. Genova; and
18 Sections I.G and II.A.3 with Company Witness Craig R. Hurd.

19 **Q. Does this conclude your pre-filed direct testimony?**

20 **A.** Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
STEVEN J. SCHWEIGER**

Steven J. Schweiger received a Bachelor of Science degree in Electrical Engineering from Hofstra University in Hempstead, New York. Before joining Dominion Energy Virginia in 2021, Mr. Schweiger worked with multiple electric utility companies in the Northeast, Midwest, and Southern regions from 2017 to 2021 as a Transmission Planning Consultant for Burns & McDonnell.

Mr. Schweiger has previously submitted pre-filed testimony to the State Corporation Commission of Virginia.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Chloe A. Genova

Title: Engineering Technical Specialist II

Summary:

Company Witness Chloe A. Genova sponsors those portions of the Appendix providing an overview of the design characteristics of the transmission facilities for the proposed Partial Rebuild Project, and discussing electric and magnetic field levels, as follows:

- Section I.L: This section provides photographs illustrating the deterioration of structures and associated equipment as applicable.
- Section II.A.5: This section provides drawings of the right-of-way cross section showing typical transmission lines structure placements.
- Sections II.B.1 to II.B.3: These sections provide the line design and operational features of the proposed project.
- Section II.B.4: This section when applicable normally provides the line design and operational features of a proposed project.
- Section IV: This section provides analysis on the health aspects of electric and magnetic field levels.

Additionally, Company Witness Genova co-sponsors the following portions of the Appendix:

- Section I.A (co-sponsored with Company Witness Steven J. Schweiger): This section details the primary justifications for the proposed project.
- Section I.F (co-sponsored with Company Witness Steven J. Schweiger): This section describes any lines or facilities that will be removed, replaced or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.
- Section I.I (co-sponsored with Company Witness Aaron C. Kuhn): This section provides the estimated total cost of the proposed project.
- Section II.B.5 (co-sponsored with Company Witness Craig R. Hurd): This section provides the mapping and structure heights for the existing overhead structures.
- Section V.A (co-sponsored with Company Witness Craig R. Hurd): This section provides information related to public notice of the proposed project

A statement of Ms. Genova's background and qualifications is attached to her testimony as Appendix A.

**DIRECT TESTIMONY
OF
CHLOE A. GENOVA
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2023-00049**

1 **Q. Please state your name, position with Virginia Electric and Power Company**
2 **(“Dominion Energy Virginia” or the “Company”), and business address.**

3 A. My name is Chloe A. Genova, and I am an Engineering Technical Specialist II in the
4 Electric Transmission Line Engineering Department of the Company. My business
5 address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my
6 qualifications and background is provided as Appendix A.

7 **Q. Please describe your responsibilities as an Associate Transmission Line Engineer.**

8 A. I am responsible for the estimating, conceptual, and final design of high voltage
9 transmission line projects from 69 kilovolt (“kV”) to 500 kV.

10 **Q. What is the purpose of your testimony in this proceeding?**

11 A. In order to maintain reliable service for the overall growth in the area and to comply with
12 mandatory North American Electric Reliability Corporation (“NERC”) Reliability
13 Standards, Dominion Energy Virginia proposes in the City of Manassas, Manassas Park,
14 Prince William County and Fairfax County, Virginia (the “Manassas Airport Area”) the
15 following (collectively, the “Partial Rebuild Project”):

- 16 • Rebuild approximately 7.25 miles of the existing overhead 230 kV Cannon
17 Branch-Clifton Line #2011 from existing Structure #2011/68, which is located
18 one span outside of the Company’s existing Cannon Branch Substation and is not
19 being replaced, to the Clifton Substation. Specifically, the Company proposes to
20 replace the existing Line #2011 1590 ACSR (45/7) conductor from Structure
21 #2011/68 to Clifton Substation with three-phase twin-bundled 768.2 ACSS/TW

1 type conductor, designed for a maximum operating temperature (“MOT”) of 250
2 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA. In
3 order to accommodate the higher capacity of the uprated conductor, the Company
4 additionally proposes to replace the existing single circuit 230 kV monopoles,
5 which are primarily weathering steel monopoles, with single circuit 230 kV
6 weathering steel monopoles.

- 7 • Replace all substation equipment at the Clifton Substation that is associated with
8 Line #2011 and not currently rated for 4000 ampere (“amp” or “A”) to provide a
9 4000A single breaker rating.
- 10 • Uprate the Company’s line switches to 4000A at the Prince William Delivery Point
11 (“DP”) and Battery Heights DP, both of which are the City of Manassas’s DPs
12 tapped from Line #2011.

13 The purpose of my testimony is to describe the design characteristics of the transmission
14 facilities for the proposed Partial Rebuild Project, and also to discuss electric and
15 magnetic field levels. I sponsor Sections I.L, II.A.5, II.B.1 to II.B.4, and IV of the
16 Appendix. I also co-sponsor the Executive Summary with Company Witnesses Steven J.
17 Schweiger, Aaron C. Kuhn, and Craig R. Hurd; Sections I.A and I.F of the Appendix
18 with Company Witness Steven J. Schweiger; Section I.I of the Appendix with Company
19 Witness Aaron C. Kuhn; and Sections II.B.5 and V.A with Company Witness Craig R.
20 Hurd.

21 **Q. Does this conclude your pre-filed direct testimony?**

22 **A.** Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
CHLOE A. GENOVA**

Chloe A. Genova received a Bachelor of Science degree in Civil Engineering Technology from the Pennsylvania College of Technology in 2018. She currently possesses an Engineer-in-Training certification in Virginia. She worked as a contractor for Dominion Energy Virginia for three years before being hired as a full-time employee in July 2021. Mrs. Genova's experience with the Company includes Overhead Electric Transmission Line Design (July 2018-Present).

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Aaron C. Kuhn

Title: Contractor – Substation Engineering

Summary:

Company Witness Aaron C. Kuhn sponsors or co-sponsors the following portions of the Appendix describing the work to be performed at an existing substation for the proposed Partial Rebuild Project, as follows:

- Section I.I (co-sponsored with Company Witness Chloe A. Genova): This section provides the estimated total cost of the proposed project.
- Section II.C: This section describes and furnishes a one-line diagram of the substation(s) associated with the proposed project.

A statement of Mr. Kuhn's background and qualifications is attached to his testimony as Appendix A.

**DIRECT TESTIMONY
OF
AARON C. KUHN
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2023-00049**

1 **Q. Please state your name, position of employment, and business address.**

2 A. My name is Aaron C. Kuhn. I am employed by Burns and McDonnell; however, I am a
3 Contractor for Virginia Electric and Power Company's ("Dominion Energy Virginia" or
4 the "Company") Substation Engineering section of the Electric Transmission group. My
5 business address is 9400 Ward Parkway, Kansas City, Missouri 64114. A statement of
6 my qualifications and background is provided as Appendix A.

7 **Q. Please describe your area of responsibility on behalf of the Company.**

8 A. I am responsible for the substation project requirements, feasibility studies, conceptual
9 physical design, scope development, preliminary engineering, and cost estimating for
10 high voltage transmission and distribution substations.

11 **Q. What is the purpose of your testimony in this proceeding?**

12 A. In order to maintain reliable service for the overall growth in the area and to comply with
13 mandatory North American Electric Reliability Corporation ("NERC") Reliability
14 Standards, Dominion Energy Virginia proposes in the City of Manassas, Manassas Park,
15 Prince William County and Fairfax County, Virginia (the "Manassas Airport Area") the
16 following (collectively, the "Partial Rebuild Project"):

- 17 • Rebuild approximately 7.25 miles of the existing overhead 230 kV Cannon
18 Branch-Clifton Line #2011 from existing Structure #2011/68, which is located
19 one span outside of the Company's existing Cannon Branch Substation and is not
20 being replaced, to the Clifton Substation. Specifically, the Company proposes to

1 replace the existing Line #2011 1590 ACSR (45/7) conductor from Structure
2 #2011/68 to Clifton Substation with three-phase twin-bundled 768.2 ACSS/TW
3 type conductor, designed for a maximum operating temperature (“MOT”) of 250
4 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA. In
5 order to accommodate the higher capacity of the uprated conductor, the Company
6 additionally proposes to replace the existing single circuit 230 kV monopoles,
7 which are primarily weathering steel monopoles, with single circuit 230 kV
8 weathering steel monopoles.

- 9 • Replace all substation equipment at the Clifton Substation that is associated with
10 Line #2011 and not currently rated for 4000 ampere (“amp” or “A”) to provide a
11 4000A single breaker rating.
- 12 • Uprate the Company’s line switches to 4000A at the Prince William Delivery
13 Point (“DP”) and Battery Heights DP, both of which are the City of Manassas’s
14 DPs tapped from Line #2011.

15 The purpose of my testimony is to describe the work to be performed at the Cannon
16 Branch and Clifton Substations. I sponsor Section II.C of the Appendix and co-sponsor
17 the Executive Summary with Company Witnesses Steven J. Schweiger, Chloe A.
18 Genova, and Craig Hurd, and Section I.I of the Appendix with Company Witness Chloe
19 A. Genova, specifically, as those sections pertain to substation work.

20 **Q. Does this conclude your pre-filed direct testimony?**

21 **A.** Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
AARON C. KUHN**

Aaron C. Kuhn received a Bachelor of Science degree in Electrical Engineering from the University of Missouri – Columbia in 2014. Mr. Kuhn is a contractor for the Company and has been employed by Burns & McDonnell since 2015. His previous job duties included developing detailed physical construction drawings, bill of materials, grounding studies, electrical schematics and wiring diagrams for the Company. He has been licensed as a Professional Engineer in the State of Missouri since 2019.

Mr. Kuhn has previously submitted pre-filed testimony to the State Corporation Commission of Virginia.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Craig R. Hurd

Title: Siting and Permitting Specialist - Siting and Permitting Group

Summary:

Company Witness Craig R. Hurd sponsors those portions of the Appendix providing an overview of the design of the route for the proposed Rebuild Project, and related permitting, as follows:

- Section II.A.1: This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2: This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4: This section explains why the existing right-of-way is not adequate to serve the need, to the extent applicable.
- Sections II.A.6 to II.A.8: These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9: This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11: This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Section II.A.12: This section identifies the counties and localities through which the proposed project will pass and provides General Highway Maps for these localities.
- Section II.B.6: This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III: This section details the impact of the proposed project on scenic, environmental, and historic features.

Additionally, Mr. Hurd co-sponsors the following portions of the Appendix:

- Section I.G (co-sponsored with Company Witness Steven J. Schweiger): This section provides a system map for the affected area.
- Section II.A.3 (co-sponsored with Company Witness Steven J. Schweiger): This section provides color maps of existing or proposed rights-of-way in the vicinity of the proposed project.
- Section II.B.5 (co-sponsored with Company Witness Chloe A. Genova): This section provides the mapping and structure heights for the existing overhead structures.
- Section V.A (co-sponsored with Company Witness Chloe A. Genova): This section provides information related to public notice of the proposed project.

Finally, Mr. Hurd sponsors the DEQ Supplement filed with the Application.

A statement of Mr. Hurd's background and qualifications is attached to his testimony as Appendix A.

**DIRECT TESTIMONY
OF
CRAIG R. HURD
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2023-00049**

1 **Q. Please state your name, position with Virginia Electric and Power Company**
2 **(“Dominion Energy Virginia” or the “Company”), and business address.**

3 A. My name is Craig R. Hurd, and I serve as a Siting and Permitting Specialist in the Siting
4 and Permitting Group for the Company. My business address is 10900 Nuckols Road,
5 Glen Allen, Virginia 23060. A statement of my qualifications and background is
6 provided as Appendix A.

7 **Q. Please describe your areas of responsibility with the Company.**

8 A. I am responsible for identifying appropriate routes for transmission lines and obtaining
9 necessary federal, state, and local approvals and environmental permits for those
10 facilities. In this position, I work closely with government officials, permitting agencies,
11 property owners, and other interested parties, as well as with other Company personnel,
12 to develop facilities needed by the public so as to reasonably minimize environmental
13 and other impacts on the public in a reliable, cost-effective manner.

14 **Q. What is the purpose of your testimony in this proceeding?**

15 A. In order to maintain reliable service for the overall growth in the area and to comply with
16 mandatory North American Electric Reliability Corporation (“NERC”) Reliability
17 Standards, Dominion Energy Virginia proposes in the City of Manassas, Manassas Park,
18 Prince William County and Fairfax County, Virginia (the “Manassas Airport Area”) the

1 following (collectively, the “Partial Rebuild Project”):

- 2 • Rebuild approximately 7.25 miles of the existing overhead 230 kV Cannon
3 Branch-Clifton Line #2011 from existing Structure #2011/68, which is located
4 one span outside of the Company’s existing Cannon Branch Substation and is not
5 being replaced, to the Clifton Substation. Specifically, the Company proposes to
6 replace the existing Line #2011 1590 ACSR (45/7) conductor from Structure
7 #2011/68 to Clifton Substation with three-phase twin-bundled 768.2 ACSS/TW
8 type conductor, designed for a maximum operating temperature (“MOT”) of 250
9 degrees Celsius and a minimum summer transfer capacity of 1,573 MVA. In
10 order to accommodate the higher capacity of the uprated conductor, the Company
11 additionally proposes to replace the existing single circuit 230 kV monopoles,
12 which are primarily weathering steel monopoles, with single circuit 230 kV
13 weathering steel monopoles.
- 14 • Replace all substation equipment at the Clifton Substation that is associated with
15 Line #2011 and not currently rated for 4000 ampere (“amp” or “A”) to provide a
16 4000A single breaker rating.
- 17 • Uprate the Company’s line switches to 4000A at the Prince William Delivery
18 Point (“DP”) and Battery Heights DP, both of which are the City of Manassas’s
19 DPs tapped from Line #2011.

20 The purpose of my testimony is to provide an overview of the route and permitting for
21 the proposed Partial Rebuild Project. As it pertains to routing and permitting, I sponsor
22 Sections II.A.1, II.A.2, II.A.4, II.A.6, II.A.7, II.A.8, II.A.9, II.A.11, II.A.12, II.B.6, III,
23 and V of the Appendix. I also sponsor the DEQ Supplement filed with the Application,
24 and co-sponsor the Executive Summary with Company Witnesses Steven J. Schweiger,
25 Chloe A. Genova, and Aaron C. Kuhn; Sections I.G and II.A.3 with Company Witness
26 Steven J. Schweiger; and Sections II.B.5 and V.A of the Appendix with Company
27 Witness Chloe A. Genova.

28 **Q. Has the Company complied with Va. Code § 15.2-2202 E?**

29 A. Yes. In accordance with Va. Code § 15.2-2202 E, letters dated October 20, 2022, were
30 sent to Ms. Rebecca Horner, Acting Director of Planning for the Prince William County

1 Planning Office; Ms. Yesli Vega, the Prince William County Coles District Supervisor;
2 Mr. William Patrick Pate, the Manassas City Manager; Mr. Matt Arcieri, Director of the
3 City of Manassas Planning Department; Ms. Stacey Strunk, Director of the Fairfax
4 County Department of Development and Planning; Mr. Patrick Herrity, the Fairfax
5 County Springfield District Supervisor; Mr. Laszlo Palko, the Manassas Park City
6 Manager; and Ms. Michelle Barry, the City of Manassas Park Planning and Zoning
7 Administrator, where the Partial Rebuild Project is located. The letters stated the
8 Company's intention to file this Application and invited the Counties to consult with the
9 Company about the Partial Rebuild Project. Copies of the letters are included as
10 Appendix Attachment V.D.1.

11 **Q. Does this conclude your pre-filed direct testimony?**

12 A. Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
CRAIG R. HURD**

Craig R. Hurd received a Bachelor of Science degree in Business Administration and an Associate of Science degree in Civil Engineering Technology from Fairmont State University in 2005. He has been employed by the Company since 2014. Mr. Hurd's experience with the Company includes Survey Contractor (2014-2016), Survey Tech I - II (2016-2019), and Siting and Permitting Specialist (2019-Present).