X-178 REPLACEMENT PROJECT

SUMMARY TECHNICAL REPORT

DECEMBER 10, 2024

Prepared by:

Public Service of New Hampshire doing business as Eversource Energy

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY 1

I. BACKGROUND 4

II. PURPOSE OF THE PROJECT 6

III. PROJECT COMPONENTS 8

A. Structures 8

B. Conductor 9

C. Optical Ground Wire (OPGW) 11

IV. ENVIRONMENTAL EFFECTS AND MITIGATION 13

A. Water Resources 15

B. Wildlife 17

C. Vegetation Removal 18

D. Air Quality 18

V. CULTURAL RESOURCES 19

VI. VISUAL COMPARISONS 20

VII. CONSTRUCTION ACTIVITIES AND SEQUENCE 21

A. Establishing Staging Areas 22

B. Soil Erosion & Sediment Controls Installation 22

C. Tree Clearing and Vegetation Management Methods 23

D. Access Roads and Work Pads 24

E. Foundation Installation and Excavated Soil Management 25

F. Structure Assembly/Installation 26

G. Conductor / OPGW Installation and Conductor/Shield Wire Removal 26

H. Existing Structure Removal 26

I. Restoration 27

J. Waste Management 28

K. Construction Work Hours 28

VIII. INDEPENDENT SYSTEM OPERATOR – NEW ENGLAND 28

IX. PROJECT OUTREACH 29

A. Town Meetings 29

B. Landowner Mailings and Outreach 31

EXECUTIVE SUMMARY

The X-178 Line (the "Line") is an existing 115 kilovolt transmission line that traverses 49 miles within a long-established electric utility right-of way ("ROW") through nine towns in central New Hampshire, a portion of which includes the White Mountain National Forest. The Line, originally constructed in the 1950's, with portions reconstructed in 1969 and in the 1980's, currently consists of 594, primarily wood, structures. The Line plays a crucial role as a source or transmission supply to the North Country, serving approximately 30,000 customers.

Following recent routine inspections, approximately 158 structures have been designated as high risk for failure due to severe degradation and need to be replaced. These degraded structures are interspersed throughout all nine towns and in a remote ROW with difficult terrain, thereby increasing the physical challenges associated with replacing this critical infrastructure. Eversource has leveraged the scope of work to include replacement of similarly aged and aging structures as well as replacing the existing, aging conductor and static wire (the "Project"). This "full rebuild" approach will avoid the higher costs associated with piecemeal replacement of failing structures and repeated mobilization and ROW re-entry, as well as limit environmental impacts and disruption to abutters, including building/restoring access roads in remote areas.

Execution of the work will utilize existing access roads to the extent possible but will also require the installation of new in-ROW and off-ROW access, as well as the creation of work pads to establish a safe, level work surface. Some access roads and work pads may be temporary and may be matted or graveled, depending on location.

The width and maintained corridor of the ROW varies. Some limited tree removal may be necessary to maintain required safety clearances. Some clearing (less than an acre) is also required at the Streeter Pond Switchyard in Sugar Hill.

The work requires State and federal environmental permits or authorizations, most of which have been issued, along with some local permitting. Federal and State agencies issuing these permits or authorizations include but are not limited to the U.S. Forest Service, the Army Corps of Engineers, the U.S. Environmental Protection Agency, the New Hampshire Department of Environmental Services, the New Hampshire Natural Heritage Bureau, the New Hampshire Fish and Game Department, the New Hampshire Department of Energy, and the New Hampshire Department of Transportation. Notifications were also submitted to the Wampanoag Tribe of Aquinnah and Narragansett Indian Tribe. Although Eversource has designed the Project to minimize environmental effects to the extent practicable, the work will result in some temporary and permanent impacts to wetlands. There will be no adverse effects on rare, threatened, or endangered species or cultural resources.

Although the replacement structures will have a generally small to modest increase in height, that height change will not result in a material increase in visibility of the rebuilt transmission line as compared to current visibility of the existing X-178 transmission line. The height increase is primarily due to the need to meet current National Electrical Safety Code clearance requirements and ice loading. Other factors influence the proposed structure heights as well such as the need for increased span lengths to reduce the number of structures in wetlands, and the need for higher, stronger structures at road crossings to provide adequate clearance from distribution lines and to correct for uplift (which, under certain conditions, imposes upward force on structures). Visual effects will be mitigated by utilizing a similar structure design for the replacement structures and a weathering steel finish.

Extensive outreach to the host communities and abutters began in 2023. Eversource hosted multiple meetings and presentations with the municipalities, including several local

commissions, conducted open houses for the communities (affording opportunities for individuals to ask questions about the project), and conducted individual outreach to abutters involving door hangers, mailings, and targeted door-to-door outreach. Eversource has made over 70 construction-specific commitments with property owners to minimize or mitigate construction-related impacts which include, but are not limited to, specific restoration requests, gate installations, advance notification requests, coordination of activities during construction, and conducting EMF measurements. Eversource will continue to work with municipalities and abutters throughout the Project until restoration is complete.

I. BACKGROUND

The X-178 electric transmission line ("X-178 Line" or "Line"), owned and operated by Public Service Company of New Hampshire doing business as Eversource Energy ("Eversource" or the "Company"), is a 115-kilovolt ("kV") line that extends approximately 49 miles from the Beebe River Substation in Campton, New Hampshire to the Whitefield Substation in Whitefield, New Hampshire.[1] It passes through existing rights-of-way ("ROW") in the towns of Campton, Thornton, Woodstock, Lincoln, Easton, Sugar Hill, Bethlehem, Dalton, and Whitefield. The ROW width ranges from 150 to 265 feet with the majority of the width at 225 feet. The maintained corridor width also varies within the ROW. Land use proximate to the ROW consists primarily of forested/undeveloped lands, including the White Mountain National Forest, with some limited residential and commercial land use. The ROW traverses a number of trails used for hiking, and for snowmobile and off-road vehicle use. Three recreational developments adjacent to the ROW are the Owl's Nest Resort in Thornton, the Lincoln/Woodstock KOA Holiday campground in Woodstock and the Presidential Mountain Retreat in Bethlehem. The ROW also crosses the Thornton Transfer Station/Landfill.

The X-178 Line is located in a long-established ROW committed to the purpose of electric transmission and distribution. The X-178 Line was originally constructed in the early 1950s, with the first segment (from Beebe River Substation in Campton to North Woodstock Substation in Woodstock) reconstructed in 1969 and the other two segments reconstructed in 1985[2]. The Line plays a critical role as a source of transmission supply to meet the energy needs of the North Country, serving approximately 30,000 customers. The X-178 Line currently

[1] A map of the Eversource transmission system is provided in Appendix 6.
[2] The segments were not rebuilt in their entirety. For example, the X178-1 segment, which included reconstruction work in 1985, still has 49 structures that are from 1953 and/or 1971.

consists of 594 structures, of which 580 are wood "H-Frame" structures and 14 are weathering steel[3]. Of these, 117 structures are located within the White Mountain National Forest, a remote isolated area frequently exposed to severe weather. Several long stretches of the Line have no access points, challenging terrain and pass though high elevations. The range of the structure heights is 40.1 feet to 70 feet with an average height of 50.6 feet.

Project scope will include the replacement of Line components (structures) determined to be at risk of failure, as well as the timely replacement of aging conductor. In addition, the existing aging static wire will be replaced with Optical Ground Wire ("OPGW") to improve system communications. The asset condition structure replacements combined with the additional timely infrastructure replacements, will strengthen the resiliency and safety of the transmission system. When the X-178 Replacement Project is complete, the Line will consist of 591 weathering steel structures. Three structures will be eliminated to avoid impacts to wetlands and other resources. The Project will also require the installation of a temporary line at Streeter Pond Tap in Sugar Hill that will facilitate replacement of the existing 115-kV switches at Streeter Pond Tap.[4]

The associated land disturbance that is required to construct the X-178 Replacement Project is consistent with current standards and construction methods for electric transmission line rebuild projects across the Eversource system and transmission utilities nationwide. In order for equipment and personnel to safely access work areas, gravel access roads and flat gravel work pad areas at each structure location to facilitate structure replacement are required.

[3] This total was recently updated after an additional wood H-frame structure was replaced with a weathering steel structure of similar design due the criticality of the structure degradation following recent inspection.
[4] As part of the X-178 and U-199 replacement projects the 115-kV switches at the Tap will be replaced. The temporary line is necessary to create a safe work zone from energized lines for the work.

Due to sparseness of existing access roads, the Project will require construction of new access roads within the ROW to access work locations. Existing access roads will be utilized to the extent possible. Existing access roads may need to be improved (hardened with gravel and/or widened) to accommodate the safe passage of construction vehicles. Off-ROW access roads are also needed due to the terrain and long distances where there are no road crossings or other readily available access points, and in most cases to avoid impact to environmental resources in ROW. Eversource is in discussion with underlying landowners for the use of some of these existing off-ROW access roads. Eversource is also in discussion with the U.S. Forest Service ("USFS") to extend an existing access road within the White Mountain National Forest ("WMNF").[5] Where access roads cross resources such as wetlands and water crossings, temporary timber matting will be placed to minimize impacts.

The majority of the Project does not entail significant vegetation clearing beyond Eversource's standard vegetation management practices. Some areas of clearing and/or limited tree removal will be required, including in a forested wetland area.

At the completion of the Project all matted access roads and work pads will be removed. Gravel access roads and work pads will remain to facilitate future maintenance or emergency work. Work pads will be reduced to a smaller pad size (approximately 30 feet by 60 feet) and native vegetation succession will occur in these areas and visibly obscure these features over time.

II. PURPOSE OF THE PROJECT

The primary purpose of the X-178 Replacement Project ("Project") is to conduct needed replacement of wood structures that have been inspected and identified as degraded to a point

[5] The USFS is supportive of the creation of the access road and intends to utilize the access road for its own needs.

where they are at risk for failure. Eversource has an obligation to maintain system reliability for its customers, and routinely inspects its transmission lines to assess the condition of its infrastructure. Structures or line components that are degraded to an extent that they are considered at risk for failure are replaced. Replacing these structures or line components is commonly referred to as asset condition replacements. After the 2022 inspection of the Line revealed significant structure deterioration, Eversource began planning the Project in anticipation of further decline over the planning and permitting period. The recently completed 2024 inspection has confirmed that further decline has occurred, and a significant number of additional structures have been identified that are at risk of failure and require replacement. The 2022 and 2024 inspection reports for the X-178 line are attached as Appendices 7 and 8.

The locations of these degraded structures are not confined to a single geographic area or municipality but are interspersed throughout a ROW with challenging terrain. This terrain increases the physical challenges associated with replacing needed infrastructure, especially in predominately remote areas. As a consequence, Eversource has leveraged the scope of work to include replacement of similarly aged and aging structures as well as replacing the existing, aging Aluminum Conductor, Steel Reinforced ("ACSR") conductor with Aluminum Conductor, Steel Supported ("ACSS") conductor.[6]

The Project scope will also include replacing the existing static wire with Optical Ground Wire ("OPGW") to improve system communications to reduce outages, enhance reliability, and promote grid modernization.

A full rebuild of the X-178 Line will not only address needed asset condition replacements but will, in one, efficient and less impactful sequence, also:

[6] ACSS was selected as Eversource's current standard conductor approximately 15 years ago. As the existing conductor is of similar age as the structure components a full rebuild has been recommended.

- Replace all aging infrastructure to significantly reduce reliability risks to customers;
- Avoid the higher costs associated with piecemeal replacement of failing structures and repeated mobilization and ROW re-entry:[7] and
- Limit environmental impacts and disruption to abutters from repeated ROW re-entry, including building/restoring access roads to hard-to-reach areas.

Eversource has planned the Project in three segments to support scheduled outages, reduce risk of customer outages and enable a contracting strategy that manages resources efficiently. The X-178 Line is classified as a Single Contingency Load Loss (SCLL) line, meaning that only one segment can be worked under de-energized conditions at a time without creating an unacceptable risk for customer outages[8]. Furthermore, outages on this line can only occur during low loading times of the year (generally March through May and September through November). From a system perspective the X178 serves a critical function as it ties the North Country to the bulk power system. The three segments include (1) Beebe River Substation to North Woodstock Substation, 14.1 miles, (2) North Woodstock Substation to the Streeter Pond Tap, 20.8 miles, and (3) the Streeter Pond Tap to Whitefield Substation, 14.1 miles.

III. PROJECT COMPONENTS

A. Structures

Of the 578 structures proposed to be replaced, 158 will be replaced due to asset condition,[9] 82 structures will be replaced due to engineering design requirements, such as uplift,

[7] Additional benefits include the rating of the proposed ACSS conductor that will be sufficient to eliminate potential overload of the X178 line. In addition, the X178 line is one of the two transmission lines that are on the Whitefield – South interface. The replacement conductor may increase the transfer capability of the Whitefield – South interface and enable further load growth in northern New Hampshire, including load resulting from electrification and renewable energy resources.
[8] A SCLL event can also occur with a structure failure resulting in the line faulting out of service.
[9] The asset condition structure replacements are not confined to a specific area but interspersed throughout the 49 mile ROW.

147 will be replaced because they cannot withstand the additional structural loading associated with OPGW and 191 are rapidly aging structures at increased risk of deterioration.

Existing structure heights range from 40.1 feet to 70 feet with an average of 50.6 feet. The majority of the proposed structure heights will range from 52 feet to 98 feet, with increases from 2.25 feet to 47.86 feet compared to existing structures. Structure height changes can be grouped as follows; 234 structures will increase in height by less than 10 feet, 256 structures will increase in height between 10 and 20 feet, 76 structures will increase in height between 20 and 30 feet and 13 structures will increase in height by 30 feet or greater.

Height increases are due to a combination of factors, but primarily to meet current National Electrical Safety Code ("NESC") clearance requirements, which have changed since the line was constructed. Uplift is also a factor contributing to height increases, as well as crossings over other energized lines and other factors.[10] Further, additional height increases result from relocating structures out of wetlands. An additional 5-15 feet of height increase is associated with approximately one third of the structures removed from wetlands.

B. Conductor

Project design decisions, such as conductor installation and selection, are affected by numerous factors, including, material cost, tensile strength, electrical characteristics, product availability, capacity, line loading, clearance requirements and availability/cost of replacement parts and equipment. For most projects, Eversource uses widely available standard conductor sizes and technologies in order to take advantage of supply chain efficiencies, simplify designs, and lower long-term maintenance costs. Conductors typically evaluated include:

[10] In order to comply with NESC Rule 250D, adopted in 2007, transmission lines in northern New Hampshire are required to be designed to withstand 1 inch of radial ice with 40-mile-per-hour-winds. Uplift imposes stresses on the structure and hardware from being pulled up, resulting in forces that the structures were not designed to withstand.

- ACSR (Aluminum Conductor, Steel Reinforced). This conductor uses a stranded steel core to help support several outer layers of aluminum stranding, which carry most of the electrical current in the line. ACSR was the standard conductor type for Eversource for many decades.

- ACSS (Aluminum Conductor, Steel Supported). This conductor uses a stranded steel core similar to ACSR but uses *annealed* [11] aluminum stranding to allow operation at higher temperatures, and with lower sag, compared to ACSR. This has been Eversource's standard conductor for over a decade.

- ACCC (Aluminum Conductor, Composite Core). This conductor uses a carbon fiber composite core surrounded by annealed aluminum stranding similar to ACSS. This wire type has a higher material unit cost compared to ACSS because of the proprietary composite core and annealed aluminum. The high strength of this wire and lighter weight allows for increased span lengths.

- ACCR (Aluminum Conductor, Composite Reinforced). This conductor makes use of alumina oxide strands suspended in an aluminum zirconium matrix to make up the core strands. The outer strands are made up of a hardened aluminum dope[12] with zirconium to make the hardened aluminum thermally stable allowing for very high operating temperatures without losing strength to annealing. This conductor has the highest cost of any of the commercially available conductor technologies because of the doping elements used in the production.

- TS Conductor. This conductor is similar to ACCC conductor in that the conductor has a carbon fiber core, but the entire core is encapsulated in aluminum. Also similar to ACCC, the outer strands are completely annealed and provide little strength to the overall conductor. This conductor also has a higher cost relative to ACSS.

As part of the development and design phase of this Project, Eversource evaluated several options for conductor replacement and concluded that, for a number of reasons, the Eversource standard ACSS conductor is the best choice.

ACSS has similar sag and conductor spacing compared to the existing line which will improve construction efficiency.[13] New structures can be placed near existing structures using shared construction pads, which reduces cost and the overall construction footprint. Also, use of

[11] The result of heating and then cooling a material which changes the physical and chemical properties resulting in a material with improved conductivity that is less brittle and more malleable.
[12] Adding impurities to a conductor to modify electrical and or thermal properties.
[13] The material cost of ACSS is $6.04 per foot and weighs 1.631 pounds per foot, as compared to the existing conductor which is $3.90 per foot and weighs 1.094 pounds per foot.

ACSS allows more construction to be performed using live-line methods, minimizing the number of line outages that will be required. ACCC conductor has different mechanical properties and would result in some new structures being placed at locations that may be mid-span on the existing line.

It is important to note that all of the evaluated conductor types would increase the average structure heights on the line. The average existing structure height for the X-178 line is 50 feet and the proposed average structure height is 63 feet when utilizing ACSS. This results in an average height increase of just under 13 feet. As referenced above, the primary driver of the height increase is the NESC requirement that transmission lines in this area of New Hampshire be designed to withstand 1-inch of radial ice with 40 mile-per-hour winds.

While many other conductors, including ACCC, ACCR and TS, offer lower sag at higher temperatures,[14] the maximum sag evaluated for the X-178 Line design is governed by ice loading, not the conductor temperature. Under ice load, the maximum sag of high temperature conductors is similar to ACSS. For most portions of the X-178 Line, no reductions in structure height would be possible with the use of a high temperature conductor, as compared to the use of ACSS.

C. Optical Ground Wire (OPGW)

Communications between substations play a critical role in maintaining a safe and reliable transmission system. When identifying needs related to existing or legacy communications infrastructure, Eversource considers the following:

1) Mandatory standards and requirements. Key standards include:

[14] These types of conductors are referred to as High Temperature Low Sag conductors.

(a) North American Electric Reliability Corporation ("NERC") Critical Infrastructure Protection ("CIP") standards and Protection and Control ("PRC") standards

(b) Northeast Power Coordinating Council ("NPCC") Directory D4 – Bulk Power System Protection Criteria

(c) ISO-NE[15] Operating Procedure No. 18 (OP-18)

2) Industry and Eversource best practices and standards. Key standards include:

(a) IEEE[16] C37.113 IEEE Guide for Protective Relay Applications to Transmission Lines

(b) IEEE 1613 – Consideration of Service Provider Infrastructure

3) Bulk Electric System classification and impact rating of the associated substations

4) Availability of equipment and potential end-of-life issues

5) Reliability of equipment and communication channels

6) Added value benefits of communications infrastructure upgrades, such as more independent communication paths to allow for high-speed protection schemes and high-capacity communications and is a critical path to the North Country.

Seven transmission substations in northern New Hampshire will be connected to Eversource's fiber communications network once OPGW[17] is installed on the X-178 Line. Today, each of these seven substations is dependent on 3rd party leased line services. This means that communications to support the metering and telemetry required by ISO-NE, control and security systems needed to comply with the NERC CIP standards, and, in some cases, system fault protection (relaying) are being carried over "land line" services leased from a third-party telecommunication provider. These leased lines have become increasingly unreliable over the

[15] Independent System Operator – New England.
[16] The Institute of Electrical and Electronics Engineers, a professional organization for engineers, scientists, and professionals in related fields.
[17] The material cost of OPGW is $1.65 per foot and it weighs 0.476 pounds per foot, as compared to static wire which is $0.91 per foot and weighs 0.2618 pounds per foot.

past 10 years.[18] Furthermore, some services may be discontinued before the end of the decade. Specific to the X-178 Line, Eversource has experienced performance issues affecting telemetry, relay protection and fault detection, all of which affect reliability. The reliance on third-party providers also results in delays for troubleshooting service disruptions and making necessary repairs to restore service. And, finally, the use of third-party fiber increases risk of disruption caused by multiple clients accessing the fiber network. The installation of OPGW technology will improve communications and eliminate reliance on these 3rd party leased line services.

IV. ENVIRONMENTAL EFFECTS AND MITIGATION

The Project will result in minimal permanent effects to environmental resources and has been designed to avoid, minimize, or mitigate impacts to the extent practicable.

In the planning and design stages of the Project, Eversource conducted thorough field constructability reviews to avoid and minimize impacts to the extent practicable. Access routes are planned to utilize existing access ways to the extent possible, considering topography, and the presence of wetlands and waterways, ecologically sensitive areas and cultural resource sensitivity areas with the goal of minimizing impacts to these resource areas as well as overall land disturbance. Where possible and access permission is granted, Eversource utilizes off-ROW access routes that can avoid and minimize environmental impacts in the ROW corridor.

Replacement structures are typically designed to be placed in close proximity to the existing structures to minimize work pad size and impacts to resources. Where feasible, replacement structure locations are shifted to avoid and minimize impacts to wetlands. The distance a structure can be shifted is constrained by the conductor span length or other factors.

[18] There are two third-party provider systems that were/are used for protective relaying on the X-178. One consists of obsolete analog audio tone circuits that have failed repeatedly and have never been reliable. The second is the audio tone system via power line carrier. The shield wire, itself, has not failed.

Shifting a replacement structure a greater distance from its original location to area, can increase the conductor span length and results in significantly taller transmission structures or the installation of mid-span structures.

The X-178 Project is subject to significant Federal, state, and local environmental land use permitting that is protective of water quality, landscape ecological integrity, rare, threatened, and endangered species, and cultural resources. The X-178-1, X-178-2 and X-178-3 segments were permitted individually, and the X-178-2 segment was further segmented from a permitting standpoint into two phases. The X-178-2, Phase 1, included sections of the Project that did not fall within or require crossing through the White Mountain National Forest while X-178-2, Phase 2, included areas within or required crossing through the WMNF. The reason for phasing the X-178-2 segment was predicated on maintaining construction continuity understanding the anticipated long lead permitting timeframes associated with the National Environmental Policy Act ("NEPA") administered through the U.S. Forest Service ("USFS").

The environmental land use permitting required for the Project is summarized below as well as in Appendix 1[19]:

Federal

- Army Corps of Engineers Project Construction Notice ("PCN") under the New Hampshire State General Permit (wetlands, waterways, cultural resources)
- Consultation with the United States Fish and Wildlife Service
- Consultation with the New Hampshire Division of Historic Resources
- Notification to the Wampanoag Tribe of Aquinnah and Narragansett Indian Tribe
- USFS National Environmental Policy Act Review (comprehensive review of environmental impacts within the WMNF)
- United States Environmental Protection Agency NPDES Construction General Permit (stormwater quality)

[19] One structure was subject to notice to the Federal Aviation Administration. No lighting or special accommodations are required.

State

- New Hampshire Department of Energy (License to Construct and Maintain Electric Lines Over and Across State Owned Land and Public Waters)
- New Hampshire Department of Environmental Services ("DES") Wetlands Bureau Major Dredge and Fill (wetlands, waterways, rare species consultation)
- New Hampshire Fish and Game Department State listed rare species consultation.
- New Hampshire Natural Heritage Bureau State listed rare plant species consultation.
- NHDES Alteration of Terrain Bureau (land disturbance,[20] water, and stormwater quality)
- NHDES Shoreland Protection Program (shoreland areas)
- New Hampshire Department of Transportation (temporary driveways and aerial crossings)

Local

- Town of Bethlehem – Structure Height Waiver Request (structure heights)
- Town of Easton
    - Site Plan Review
    - Conditional Use (work in wetland buffers and in steep slope areas)
    - Zoning Variance Requests (work in extremely steep slope areas, structure heights)
    - Temporary Driveway Permits
- Town of Sugar Hill
    - Temporary Driveway Permits
    - Building Permits (for foundation structures
- Town of Woodstock
    - Temporary Driveway Permits

The permitting status for the three segments of the X-178 Reconstruction Project is provided in the table included as Appendix 1. Specific environmental effects and mitigation are provided below.

A. Water Resources

Constructability field reviews were conducted to optimize work pad locations and access routes that will safely allow equipment to access the work areas as well as minimize wetland

[20] A Land Disturbance Summary Table by town is attached as Appendix 2.

impacts. For example, the evaluation and selection of stream crossing locations generally correspond to the narrowest area of the stream within the ROW and/or where the banks and the surrounding ground is solid and stable for constructing a temporary crossing. No new permanent stream crossings are planned for the construction.

The Project will result in limited permanent and some temporary impacts to jurisdictional wetlands (Appendix 2), including a temporary forested wetland conversion. Temporary impacts within wetlands account for approximately 99.6% of overall wetland disturbances and are associated with the placement of construction mats within wetlands to create 100 feet by 100 feet work pads and approximately 16 feet wide access ways needed to reach structure locations and enable reconductoring activities. Permanent impacts in wetlands are associated with the replacement of 78 existing structures within wetlands, locations where grading in steep slope wetlands is required, and permanent gravel fill to maintain some access roads[21]. Eleven existing structures have been relocated out of wetlands to minimize impacts.

The New Hampshire Department of Environmental Services ("DES") Wetlands Bureau has granted the Project Major Standard Dredge and Fill Permits ("SDF") following the Project's demonstration that potential impacts to jurisdictional areas have been avoided to the maximum extent practicable and that any unavoidable impacts have been minimized. As part of the permitting process DES has imposed compensatory mitigation for each of the permits.[22] Construction practices will follow the New Hampshire Best Management Practices for Utility Maintenance Manual, March 2019 ("Utility Maintenance Manual" or "BMP Manual") and all conditions specified in the SDF permits.

[21] Final quantification of wetland impacts for X-178 segment 2 is still pending.
[22] Eversource has made and will make the required compensatory mitigation payments commensurate with the issuance of the individual SDF permit and prior to construction.

During construction, Eversource will have an environmental monitor present to perform routine construction observation visits. The environmental monitor will inspect the Project area for maintenance of erosion and sediment controls, and compliance with the Utility Maintenance Manual and applicable Project permits and conditions. Construction observation visits will occur at least once per week and/or after a significant rainfall (0.5 inches or greater) or snowmelt event. The contractor will also be required to have a qualified dedicated environmental monitor on site throughout construction and restoration.

B. Wildlife

The Project also undertook the required consultation with the New Hampshire Natural Heritage Bureau ("NHB") and New Hampshire Fish and Game ("NHFG"), as well as US Fish and Wildlife Service ("USFWS") to ensure impacts to State and federally listed species would be avoided and minimized to the greatest extent possible.

As a result of these consultations, the Project's construction sequence, wetland restoration plan, and time of year restrictions conditional with Project permits will ensure that construction will be undertaken in the least environmentally impactful manner. For example, the proposed project intentionally avoids impacts to vernal pools and protected species habitat. Vernal pools were identified as part of data collection during wetland delineation and avoided as part of constructability reviews. Where vernal pool depression avoidance is not feasible due to design limitations, agreed upon best management practices and recommendations provided by NHFG will be implemented to limit impacts during the inactive season for vernal pool species (December 1 through March 1).

In general, wildlife may temporarily avoid areas of active construction, but the Project is not expected to have a long-term or negative effect on wildlife. All operators and personnel working on or entering the site will be made aware of the potential presence of protected species

and provided flyers that help to identify these species, along with NHFG contact information for reporting observations.

C. Vegetation Removal

The majority of the Project will not involve significant vegetation clearing beyond Eversource's routine vegetation management practices. However, in some locations additional clearing within the easement corridor may be necessary to achieve required safety clearances. Additionally, some limited tree removal or tree clearing, in the case of the new off-ROW access road, and/or side trimming of off-ROW access roads may be required.[23]

The Project will require temporary clearing of less than an acre of forested wetland at the Streeter Pond Switchyard to allow for installation of the temporary tap infrastructure. After construction is complete and the temporary tap structure is removed, the cleared area will be restored and allowed to revegetate.

Contractors will follow the invasive species recommendations in the Utility Maintenance Manual to help prevent the spread of invasive species, including inspection and cleaning of equipment and contractor training. Equipment, including construction mats, brought to the Project area will be inspected by the contractor and/or environmental monitor, and if plant material or soil is present, the equipment will be cleaned and dried prior to use on the Project.

D. Air Quality

Once the rebuild is complete, the Project will operate in the same manner as the existing X-178 Line and will not impact air quality. The air quality impacts associated with construction will be negligible. No air permits are required for the Project. Contractors will adhere to New Hampshire state law relative to idling of vehicles.

[23] Due to the remoteness of much of the terrain, estimates within the ROW are being derived from aerial imagery and will be field verified before construction.

The potential for fugitive dust resulting from construction activity will be controlled in accordance with conditions of the National Pollutant Discharge Elimination System ("NPDES") Construction General Permit ("CGP") (Section 2.2.6 Minimize Dust). Contractors will also be adding tracking pads at access points from town roads to prevent tracking and becoming a source of fugitive dust. Roads will also be swept periodically, as needed. During rock drilling operations, water buffaloes will be utilized for dust suppression during this activity, as needed.

In accordance with erosion and sediment control requirements of the CGP, the generation of dust is to be minimized through the appropriate application of water or other approved dust suppression techniques. Best management practices to control fugitive dust will be addressed in the Stormwater Pollution Prevention Plan ("SWPPP") developed for the Project as required under the CGP.

V. CULTURAL RESOURCES

Full above and below ground cultural resource surveys have been conducted pursuant to Section 106 of the National Historic Preservation Act for all three segments of the Project. The entire length of the X-178 ROW corridor has been subject to a Phase 1A/1B Archeological Survey. The survey work was performed in the summer and fall of 2023 in consultation with the New Hampshire Division of Historic Resources ("DHR") and also included the results of previous survey work performed in connection with another project. The survey work concluded that the Project would avoid any impacts to below ground cultural resources. DHR concurs with this finding.

Above ground historic resource surveys and assessment of effects also were conducted for all three segments of the X-178 Line in consultation with DHR. Architectural Historians were contracted by Eversource to examine project plans, current aerial images, and the DHR's Enhanced Mapping & Management Information Tool ("EMMIT") database to determine the

presence of any historic buildings, structures, or districts within the Area of Potential Effects ("APE") that have been previously determined to be eligible for or listed in the National Register of Historic Places ("NRHP").

Within the APE, ½ mile from the ROW centerline, a field survey of the resources that potentially retained integrity and had the potential to fall within the corridor viewshed was conducted. This windshield survey included photographic documentation of these resources, confirmed research, and visually determined the viewshed and anticipated impact from the Project. This field work eliminated some of the remaining resources for future survey, either because there was no view of the corridor or because visual inspection showed the potential properties were altered and lacked integrity.

Ultimately, the surveys of impacts to above ground historic properties concluded that the Project will not result in adverse effects to above ground historic resources. DHR has concurred with this finding.

VI. VISUAL COMPARISONS

A preliminary computer-based visibility analysis relying for both topography and surface features (vegetation and buildings) was conducted within a 3-mile radius of the X-178 corridor in the towns of Bethlehem and Easton. The analysis determined the potential areas of visibility for both the existing wood X-178 structures and the proposed weathering steel structures. Based on this mapping analysis, the existing wood X-178 structures or the very top of the existing wood structures are visible from 1.5% of the town of Easton within a 3-mile radius of those structures. Following completion of the X-178 Project, the structures or structure elements will be visible from 1.57% of the town of Easton within a 3-mile radius of the existing structures, which represents the total land area included in the analysis.

Similarly, in the town of Bethlehem the existing structures are visible from 0.66% of the town within a 3-mile radius of the existing structures. Following completion of the X-178 Project, the structures will be visible from 0.78% of the town within a 3-mile radius of the new structures. The majority of this potential visibility is located within the corridor clearing itself, and these percentages only consider the top point of any structure as visible. Additional technical details about the analysis process, data, and limitations, as well as the results and analysis maps are provided in Appendix 3. The analysis maps are provided in Exhibit D of the Appendix 3.

Representative visual comparisons are provided in Appendix 3 to demonstrate the extent of visual change that may result from the structure replacements. The exhibits represent the existing and proposed physical X-178 transmission line components and change in the landscape that may result from the proposed Project. Appendix 3 and associated exhibits include visual comparisons between the wood H-Frame structures and the proposed weathering steel H-Frame structures using photographs of existing conditions, cross sections, 3D model photo overlays, and the computer-based visibility analysis (referenced above). The visual exhibits were not developed as part of a full visual impact assessment and were not used to develop overall findings or a formal determination of the visual impact of the Project, but to illustrate that the proposed structures do not result in a "substantial change or addition."

VII. CONSTRUCTION ACTIVITIES AND SEQUENCE

Before the start of Project construction, contractors will be made aware of sensitive environmental and resources along the ROW that require certain protective work procedures, including the locations of invasive species. Project construction would include the following activities in approximately the sequence as presented below:

A. Establishing Staging Areas

During Project construction, Eversource proposes to use two existing large staging areas that have been used often for transmission projects. One is located in Campton and the other is located in Carroll. Additional staging areas may be established, including by the Project contractor(s) which would be responsible for identifying and managing other staging areas as may be needed for the Project work.

Staging areas would be used for storing or staging Project construction materials, equipment, tools, and supplies (including cable reels, insulators, hardware, poles, and construction mats). Office trailers and Conex storage containers may also be located at the staging sites. Components removed during the work (structures, hardware, and insulators) may be accumulated and stored temporarily at the staging area prior to removal off-site for salvage and/or disposal. In addition, the staging area may also be used by construction crews and other Project personnel for parking personal vehicles, construction vehicles and equipment storage, and for performing minor maintenance, on construction equipment. Vehicles or equipment also may be refueled at the staging areas.

Appropriate soil erosion and sedimentation ("E&S") controls would be installed at the staging areas, as required, and maintained until completion of the work in accordance with Project permits and applicable BMPs.

B. Soil Erosion & Sediment Controls Installation

Project construction activities would conform to NH BMPs for E&S control. Typical E&S control measures include, but are not limited to, straw blankets, silt fencing, gravel anti-tracking pads, soil and slope protection, water bars, check dams, berms, swales, plunge pools, and sediment basins. Silt fence would be installed as needed prior to construction to intercept and retain sediment and/or construction materials from disturbed areas and minimize the potential for

sedimentation outside of the Project work areas. Temporary E&S control measures would be installed prior to site disturbances and maintained and inspected for the duration of the Project to ensure their integrity and effectiveness.

Temporary E&S control measures would be maintained and inspected by an Eversource appointed environmental inspector on a weekly basis throughout the Project construction to ensure their integrity and effectiveness and for conformance to BMPs.

Disturbed areas would be stabilized by seeding and mulching or hydroseeding to both temporarily and permanently stabilize the areas of the ROW disturbed by the work. Temporary E&S control measures would remain in place and be inspected periodically until all disturbed areas have been deemed stabilized after which they would be removed.

C. Tree Clearing and Vegetation Management Methods

Tree clearing and vegetation removal would be accomplished using mechanical methods and typically requires the use of, but not limited to, flat-bed trucks, brush hogs or other types of mowing equipment, skidders, forwarders, bucket trucks for canopy trimming, feller bunchers for mechanical tree cutting, woodchippers, log trucks, and chip vans. Eversource would conduct vegetation removal activities in accordance with its BMPs. Trees, where designated to be removed, shall be cut parallel to and close to the ground. Limited, if any, stump removal may be conducted in consultation with an affected property owner.

In sensitive environmental resource areas Eversource would require the contractor to use low-impact methods for vegetation removal and clearing. Low-impact methods incorporate a variety of approaches, techniques, and equipment to minimize site disturbance, depending on the specific settings and situations:

- Consider soil and weather conditions when scheduling vegetation removal activities, such as during periods of heavy rainfall;

- Maximize the use of uplands for clearing access routes;
- Utilize hand clearing methods for vegetation removal work within and around sensitive resource areas;
- Use appropriately sized equipment for site conditions, where possible, to minimize impacts; and
- Where practical, cut brush close to the ground, leaving root systems and stumps, to retain soil stability.

D. Access Roads and Work Pads

Access to each proposed transmission replacement structure location will be required during Project construction. As a result of recent projects and the operation and maintenance of the existing lines within the ROW, some access roads are already established and Eversource will utilize these existing access roads to the extent possible. However, some new access roads will be required within and off the ROW.[24] Construction timber matting will be used to install temporary access roads through environmentally sensitive to reach certain structure locations.

Existing access roads may need to be improved (graded, widened, and/or reinforced with additional stone and/or gravel material) to accommodate the safe passage of construction vehicles and equipment. Access road improvements typically include trimming adjacent vegetation and widening roads, as needed, to provide a maximum travel surface that is approximately 16 feet wide (additional width may be needed at turning or passing locations). E&S controls would be installed as necessary before the commencement of any improvements to or development of access roads.

[24] As a follow up to the November 20, 2024 technical session, Eversource has confirmed that all off-ROW access in Bethlehem has been acquired.

At each transmission line structure location, a work pad is required to stage material for final on-site assembly and/or removal of structures, to install OPGW and new conductor, and to provide a safe, level work base for the construction equipment.

Typical work pads are 100 feet by 100 feet but may vary slightly, due to terrain and spacing between the existing and proposed structures. In areas where machinery is needed for pulling OPGW or conductor through an angled structure, longer work/pull pads feet are required. These locations may also be used to facilitate temporary laydown areas for equipment and materials. Most work pads will be graveled, though some will use temporary matting to protect sensitive resource areas.

To facilitate future transmission line maintenance and emergency work, access roads and structure work pads in uplands, would be left in place. In addition to the need for these features to remain, removal of gravel access would add significant cost, would extend the construction timeframe considerably, and essentially double the number of truck trips required in the ROW corridor.

E. Foundation Installation and Excavated Soil Management

The majority of the proposed replacement structures would be directly embedded within 4-foot diameter corrugated metal caissons backfilled with gravel material. Based on structural needs, a smaller number of structures would have a poured concrete foundation. The work would require the use of equipment such as mechanical excavators (drill rigs), pneumatic hammers, augers, drill rigs, dump trucks, concrete trucks, grapple trucks and light duty trucks. If groundwater is encountered, pumping (vacuum) trucks or other suitable equipment would be used to pump water from the excavated areas as the shaft is being drilled or as the structure is being set. The water would then be managed in accordance with applicable BMPs including

those set forth in the EPA Construction General Permit, New Hampshire Utility Maintenance Manual.

Excavated soils that are generated during construction activities would not be temporarily stored or stockpiled in wetlands or watercourses. Temporarily stored or stockpiled soils will be managed during restoration activities (See *Restoration* section below).

F. Structure Assembly/Installation

Structure sections, structure components and hardware would be delivered to the individual structure locations using flat-bed trucks and assembled on-site using a crane, bucket trucks and excavator. Helicopters may also be used at some structure locations. After assembly, the area around the directly embedded structures would be backfilled with processed gravel.

Depending on site-specific soil conductivity, supplemental grounding (counterpoise, in uplands only) would be installed. A quad "ditch-witch" plow-cable trencher, or equivalent/similar type of equipment, would be used to install the counterpoise after the proposed structures are constructed.

G. Conductor / OPGW Installation and Conductor/Shield Wire Removal

The installation of the new conductors and OPGW would occur after the new structures have been erected. The equipment required for these activities would include conductor reels, conductor pulling and tensioning rigs, guard trucks or structures and bucket trucks. Helicopters may also be used for this purpose in remote areas. The removal of the existing conductor and shield wire may take place during the active installation of the new conductor and OPGW as the existing conductor and static wire would be used as pulling lines, if possible.

H. Existing Structure Removal

After the replacement structures, conductor and OPGW are in place, the existing structures would be removed. Structure removal work would be staged from the work pads. The

existing poles and hardware would be removed from the ROW and recycled, or otherwise disposed of properly. Although no specific data is available, it is likely that the wood H-frame structures were chemically treated prior to installation and will be managed as such, removed completely from the ground, and disposed of properly.

I. Restoration

ROW restoration activities would include the removal of construction debris, signage, flagging, and temporary fencing, as well as the removal of construction mats and structure work pads that are designated for removal. Areas affected by construction would be re-graded as practical and stabilized using revegetation or other measures before removing temporary E&S controls. Eversource would perform ROW restoration in accordance with the protocols specified in the BMPs and in consultation with affected property owners.

Excavated soils from the Project that cannot be used as backfill in the vicinity of where they were excavated would be used for the restoration/reduction of gravel work pads or regraded into adjacent uplands within the ROW and stabilized. Any excavated soils that cannot be reused in such a manner would be properly managed in accordance with Eversource BMPs and any applicable local, state, or federal laws.

For work within sensitive environmental resource areas, work pad restoration measures will be implemented to mitigate impacts, which includes the amendment of the work pad surface with stockpiled topsoil or fine process gravel (whichever is applicable), application of a native warm season seed mix, and installation of temporary erosion and sediment controls (e.g., straw mulch, compost filters, biodegradable erosion control blankets, etc.), which will be regularly inspected and maintained until final stabilization has been achieved.

J. Waste Management

Waste materials, such as structure components (i.e., wood and steel from the removed structures, conductor, shield wire, associated hardware, etc.) and any other construction debris would be reclaimed through the Eversource investment recovery system and/or managed/disposed of in accordance with Eversource's BMPs, applicable regulations or recycled consistent with applicable rules and regulations and Eversource policies. Treated wood pole butts shall be removed completely from the ground and properly disposed at an off-site location.

K. Construction Work Hours

Work hours would vary dependent on individual town requirements. However, E&S control and other inspections may occur outside of these standard hours, as necessary, to comply with BMP and permit requirements. Sunday work hours or evening work hours may also be necessary due to delays caused by unforeseen circumstances, inclement weather and/or outage constraints and will be coordinated with the individual towns, as needed.

In addition, much of the construction is required to be performed energized due to the SCLL conditions of the line and limited availability for line outages. These crews are specialized resources that have been trained in bare hand work practices and are supported by specialized equipment to perform this work. Resources to perform this work are a constraint for the Project as there are a limited number of contractors/crews that are able to perform this work.

VIII. INDEPENDENT SYSTEM OPERATOR – NEW ENGLAND

In addition to the Project permitting, the Project has also been reviewed by the ISO- New England, Inc. ("ISO-NE") Planning Advisory Committee ("PAC"). The PAC is a public committee organized by ISO-NE and attended primarily by policymakers, regulators, industry representatives, ISO-NE staff and other stakeholders involved with regional wholesale electricity market and transmission matters. All transmission projects (upgrades, modifications, repairs,

etc.) with estimated costs of $5 million or greater must be presented to the PAC. Eversource projects routinely undertake this review. The purpose of these presentations is to give regional stakeholders, including members of the public, transparency, and information on upcoming transmission investments, including the needs and drivers for a project, the alternatives considered with estimated costs, and estimated in-service dates. PAC members are also invited to ask questions and/or provide comments on proposed projects. There have been over 400 projects to address aging and/or deteriorating equipment presented to PAC since 2015, the majority of which involve replacing transmission structures or rebuilding transmission lines.

The Company believes that the X-178 Replacement Project is, on balance, the most cost effective and least impactful approach for rebuilding this aged and aging infrastructure. Accordingly, Eversource provided informational presentations regarding the Project to the PAC on February 28, June 20 and October 23, 2024. On June 12, prior to the June 20 PAC meeting, the Company also provided a detailed memo responding to stakeholder feedback. Furthermore, Eversource continues to seek feedback from PAC members on the Project and has requested that any additional feedback be submitted in writing by November 13, 2024.

IX. PROJECT OUTREACH

Beginning in the spring of 2023, Eversource has engaged in consistent communication with each of the host communities and abutting landowners to keep them informed of Project details and updates. Below is a summary of these efforts.

A. Town Meetings

Eversource initially introduced all host communities to the X-178 Project in April 2023. This initial engagement included the opportunity to attend an introductory presentation either in-person or remote video conference meetings with each of the host communities. Eversource met with representatives from the towns of Sugar Hill, Bethlehem, and Lincoln, and copies of the

Project introduction presentations were provided to all host communities, regardless of their response to the offer of a meeting. Municipal officials were also provided a copy of the Project introduction letter to abutters, the accompanying factsheet and when abutters in their individual communities were notified of the Project.

In August 2023, Eversource hosted two open houses, one in Sugar Hill and the other in Campton. This was followed up with another round of open houses in September 2024 in Campton and Bethlehem. The open houses provided an opportunity for stakeholders, including municipal officials and abutters, to engage with Eversource subject matter experts and learn about the Project.

Additionally, Eversource met with several of the conservation commissions in the host communities throughout 2023 and 2024 to discuss Eversource's NHDES SDF application and provided a comprehensive overview of the permitting process. On these occasions commission members and the public were invited to ask questions about the Project. Conservation commission briefings were held in Sugar Hill, Bethlehem, Easton and Woodstock.

Subsequently, the Bethlehem Conservation Commission submitted comments on the SDF application to the DES on March 11, 2024, and April 29, 2024, and participated in the DES held public hearing on May 29, 2024. A more detailed summary of these comments as well as Eversource's responses can be found in the DES approval letter dated July 23, 2024[25].

Additionally, the Easton Conservation Commission submitted multiple comments on the SDF application to the DES on February 27, 2024, March 23, 2024, April 10, 2024, and June 21, 2024, and participated in the DES held public hearing on June 21, 2024.

[25] Both DES approval letters for Bethlehem and Easton are included as Appendices 4 and 5 and are representative of the oversight and conditions of approval typically issued in project permits. All such permits are publicly available.

B. Landowner Mailings and Outreach

Outreach activities have included the dedicated outreach team engaging in over 200 direct interactions with abutting landowners either through e-mail, phone, or in-person visits to answer questions and address concerns, in addition to five mailings to all 375 abutting property owners, and targeted door-to-door outreach. As part of the outreach effort and its responsiveness to customer concerns, Eversource has also made over 73 unique construction-specific commitments with property owners to minimize or mitigate construction-related impacts, which include, but are not limited to, specific restoration requests, gate installations, advance notification requests, coordination of activities during construction, and conducting EMF measurements.

End of Document

Appendix 1

Land Use Environmental Permitting Summary X-178 Transmission Line Project

Federal		
Permits	**File Nos.**	**Status**
Army Corp of Engieers - State General Permit Project Construction Notice (PCN)	X178-1: NAE-2023-00909 X178-2 Phase 1: NAE-2023-00910 X178-2 Phase 2: pending X178-3: NAE-2023-00911	X178-1: approved 10/21/2024 X178-2 Phase 1: pending X178-2 Phase 2: pending X178-3: approved 8/6/2024
United States Forest Service National Environmental Policy Act (NEPA)	X178-1: pending X178-2 Phase 2: pending	X178-1: pending X178-2 Phase 2: pending
United States Environmental Protection Agency (EPA) National Polllution Discharge Elimination System (NPDES) Construction General Permit	X178-1: pending X178-2: pending X178-3: NHR1001YO	X178-1: pending X178-2: pending X178-3: approved 7/1/2024
State		
Permits	**File Nos.**	**Status**
NHDES Standard Drege & Fill Major Permit	X178-1: 2024-00475 X178-2 Phase 1: 2024-00468 X178-2 Phase 2: pending X178-3: 2024-00297	X178-1: approved 8/5/2024 X178-2 Phase 1: approved 8/29/2024 X178-2 Phase 2: pending X178-3: approved 7/23/2024
NHDES Alteration of Terrain Permit	X178-1: AoT-2642 X178-2 Phase 1: AoT-2597 X178-2 Phase 2: pending X178-3: AoT-2583	X178-1: approved 8/7/2024 X178-2 Phase 1: approved 5/28/2024 X178-2 Phase 2: pending X178-3: approved 4/29/2024
NHDES Shoreland Permit	X178-1: 2024-01121, 2024-1125 X178-2 Phase 1: 2024-1405, 2024-01406 X178-2 Phase 2: pending X178-3: 2024-00631, 2024-00633	X178-1: approved 8/30/2024 X178-2 Phase 1: 5/22/2024 X178-2 Phase 2: pending X178-3: approved 3/19/2024

NHDOT Temporary Construction/Driveway Permits	X178-1: 03-495-0097, -0098, -0099, -0100; 03-449-0208, 0209, -0210, -0211, -0212; 03-067-0338, -0339 X178-2 Phase 1: 03-495-0095, -0096, 01-495-6355 X178-2 Phase 2: pending X178-3: 01-109-6339-T; 01-047-6340-T, -6342T, -6343-T, -6344-T, -6345-T, -6346-T, -6347T, 01-499-6349-T, -6350-T	X178-1: 5/29/24 & 5/31/24 X178-2 Phase 1: approved 5/17/2024 X178-2 Phase 2: pending X178-3: approved 4/3/2024
NHDOT Aerial Permit	X178-2: Rt 116 Easton, Rt 117 Sugar Hill	X178-2: approved 4/30/2024
Local		
Permits	**File Nos.**	**Status**
Bethlehem - Height waiver request	X178-3: pending	X178-3: pending
Sugar Hill- Building Permits	X178-3 & X178-2: 24-09	X178-3 & X178-2: approved 5/6/2024
Sugar Hill- Driveway Permits	X178-2 Phase 1: pending	X178-2 Phase 1: pending
Easton - Site Plan Review	X178-2: pending	X178-2: pending
Easton - Conditional Use - Wetlands	X178-2: pending	X178-2: pending
Easton - Variance Request - Extremely Steep Slope	X178-2: pending	X178-2: pending
Easton Variance Request - Height	X178-2: pending	X178-2: pending
Easton - Driveway Permits	X178-2 Phase 2: pending	X178-2 Phase 2: pending
Woodstock - Driveway Permits	X178-1: pending	X178-1: pending

Appendix 2

X-178 Land Disturbance Summary Table by Town

Town	Approximate ROW Length sf	Approximate ROW Length Miles	Number of Replacement Structures	Approximate ROW Area Acre	Upland disturbance sf	Upland Disturbance Acre	% Upland Disturbance in ROW	Temporary wetland disturbance sf	Temporary Wetland Disturbance Acre	% Temporary Wetland Disturbance	Permanent Wetland Disturbance sf	Total Wetlands Disturbance sf	% Permanent of Total Wetland Disturbance
Campton	16,508	3.1	37	86	746,963	17.1	20%	52,857	1.2	1.4%	80	52,937	0.2%
Thornton	40,215	7.6	82	209	1,636,822	37.6	18%	141,907	3.3	1.6%	1392	143,299	1.0%
Woodstock	41,681	7.9	84	194	1,729,702	39.7	20%	213,359	4.9	2.5%	1961	215,320	0.9%
Lincoln	20,775	4.0	53	99	833,805	19.1	19%	300,606	6.9	7.0%	700	301,306	0.2%
Easton	33,308	6.3	76	154	1,199,567	27.5	18%	248,167	5.7	3.7%	750	248,917	0.3%
Sugar Hill	38,609	7.3	81	209	942,814	21.6	10%	795,830	18.3	8.7%	1720	797,550	0.2%
Bethlehem	38,659	7.4	94	235	1,241,839	28.5	12%	138,660	3.2	1.4%	660	139,320	0.5%
Dalton	13,573	2.6	29	91	347,759	8.0	9%	157,330	3.6	4.0%	380	157,710	0.2%
Whitefield	14,841	2.8	43	84	557,394	12.8	15%	142,222	3.3	3.9%	260	142,482	0.2%
Totals/Averages	**258,169**	**49**	**579**	**1,361**	**9,236,665**	**212.0**	**16%**	**2,190,938**	**50.3**	**3.7%**	**7,903**	**2,198,841**	**0.4%**

Notes:

1. Disturbance totals are approximate based on GIS permit plan calculations for Alteration of Terrain (uplands) and the Major Standard Dredge & Fill (wetlands) applications.

2. Disturbance totals for Phase 2 of the X-178-2 Segment, which includes work in the Towns of Woodstock, Lincoln and Easton are approximate pending futher consultation with the United States Forest Service and NHDES and may be reduced in the Towns of Lincoln and Easton with implementation of helicopter installation methods within the WMNF.

Comparison of X-178 Land Disturbance to Similar Eversource Line Rebuild Projects

Transmission Line Rebuild Project	Status	Length Miles	Number of Structures	ROW Area Acre	Upland disturbance sf	Upland Disturbance Acre	% Upland Disturbance	Temporary wetland disturbance sf	Temporary Wetland Disturbance Acre	% Temporary Wetland Disturbance	Permanent wetland disturbance sf	Total Wetlands Disturbance sf	% Permanent of Total Wetland Disturbance
X-178-1	preconstruction	14.1	162	384	3,294,635	75.6	20%	235,181	5.4	1.4%	3,258	238,439	1.4%
X-178-2	preconstruction	20.8	235	518	3,538,422	81.2	16%	1,091,621	23.2	4.5%	3,025	1,094,646	0.3%
X-178-3	preconstruction	14.1	188	459	2,403,608	55.2	12%	864,137	19.8	4.3%	1,620	865,757	0.2%
X-178 (total)	**preconstruction**	**49**	**585**	**1,361**	**9,236,665**	**212.0**	**16%**	**2,190,939**	**50.3**	**3.7%**	**7,903**	2,198,842	0.4%
A-111	complete	10.6	118	287	2,190,665	50	18%	59,261	1.4	0.5%		59,261	
B-112	complete	22.9	271	416	4,481,415	102.9	25%	564,399	13.0	3.1%		564,399	
D-142	complete	18.1	203	321	1,475,030	33.9	11%	949,519	21.8	6.8%	2,850	952,369	0.3%
E-115	complete	16	179	426	2,560,742	58.8	14%	112,607	2.6	0.6%		112,607	
F-139 & V182	In construction	14.6	190	401	2,660,546	61.1	15%	450,461	10.3	2.6%		450,461	
O-154	complete	12.7	139	229	2,186,999	50.2	22%	568,014	13.0	5.7%		568,014	
P-145	complete	12.5	164	382	1,873,553	43.0	11%	279,680	6.4	1.7%		279,680	
U-199	In construction	9.7	113	176	1,732,996	39.8	23%	349,742	8.0	4.6%	30,994	380,736	8.1%
S-136	In construction	26	204	660	2,899,999	66.6	10%	1,244,658	28.6	4.3%	2,760	1,247,418	0.2%
W-179	complete	15.5	173	398	1,899,999	43.6	11%	279,680	6.4	1.6%		279,680	
Z-180	complete	3.4	38	90	940,600	21.6	24%	13,444	0.3	0.3%		13,444	
Average							17%			3.0%			2.3%

Notes:

1. Disturbance totals are approximate based on GIS permit plan calculations for Alteration of Terrain (uplands) and the Major Standard Dredge & Fill (wetlands) applications.

2. Permanent wetlands impacts are reported for projects that that were permitted under a Major Dredge & Fill application

Appendix 3

Appendix 3: Visual Comparisons

This Visual Comparison is provided to demonstrate the scope and scale of visual change that may result from the 115-kV structure upgrades included in the X178 Project (Project). The narrative is accompanied by visual exhibits to show the potential visual change in the landscape with photographs of existing conditions, cross sections, 3D model imagery, and computer-based visibility analysis. The narrative should be reviewed in the context of the following visual exhibits:

- Exhibit A: Photographs
- Exhibit B: Cross Sections
- Exhibit C: 3D Model Photo Overlays
- Exhibit D: Viewshed Analysis for Easton and Bethlehem

The visual exhibits were not developed as part of a full visual impact assessment (VIA) and were not used to develop overall findings or a formal determination of the visual impact of the Project.

Images from Exhibits A and B are included in the body of this narrative. Maps and images in Exhibits C and D are only presented in the visual exhibit documents.

EXHIBIT A: Photographs

Exhibit A provides a collection of photographs of existing conditions in the Project corridor, in areas where the weathering steel H-Frame structures included in the Project have already been constructed. The photographs show structures of the same design and material as those proposed to be installed for the balance of the Project. The photographs provide a visual comparison between the existing wood H-Frame structures and the proposed weathering steel H-Frame Project structures.

Existing weathering steel H-Frame structures – representative of the design and construction of the proposed Project structures have been constructed adjacent to wood H-Frame structures at two locations in the existing transmission corridor:

- Site A: Crane Hill Road in Sugar Hill
- Site B: Owls Nest in Thornton

Fieldwork and photography at both sites were collected on October 18, 2024, using a Nikon Z6 with a fixed 50mm focal length and an iPhone 14 Max Pro camera with varying focal lengths. GPS coordinates were recorded with each photograph. The specific location, focal length, and distance from the nearest structure are identified in each photograph. All photographs were taken from roadways accessible to the public.

SITE A: Crane Hill Road, Sugar Hill

There is one replacement structure on the south side of Crane Hill Road in Sugar Hill that serves as a representative example of the design and construction of the proposed Project structures. This structure is #393 – a weathering steel H-Frame structure with a height of 65.5 ft. It is located approximately 70 ft south of the roadway.

From Crane Hill Road, structure #393 is visible in the context of existing wood H-Frame structures within the corridor. The photographs collected at Site A: Crane Hill Road provide a collection of visual comparisons between the existing wood structures and the proposed Project structure design and scale, represented in Structure #393.

The comparison between **Photo A1** (Exhibit A, page 2) and **Photo A2** (Exhibit A, page 3) represents the view from Crane Hill Road facing north and south within the existing transmission corridor. Both photos were taken from the same location, using a fixed 50mm focal length lens (equivalent to 'normal' lens in a film camera). When the photographs are viewed at the appropriate distance from the eye (approximately 1.5x the image width), they accurately replicate the real-world conditions the viewer would see in the field.

- Photo A1 faces northwest within the transmission corridor toward wood H-frame structure #394. The structure is visible at a distance of 125 ft from the viewpoint and has a height of 48.3 ft. This photograph is representative of the existing wood structures to be replaced.
- Photo A2 faces southwest within the transmission corridor toward the weathering steel structure #393. This structure is visible at a distance of 155 ft from the viewpoint and has a height of 65.5 ft. The photograph is representative of the design and material of the proposed Project structures.

The same structures (#393 weathering steel structure and #394 wood structure) are presented as a side-side comparison in **Photo A3** and **Photo A4** (Exhibit A, page 4). Both photos were taken from the same viewpoint, exactly halfway between the two structures within the corridor, at a distance of approximately 140 ft. They were also taken with the same camera and focal length for an accurate comparison. Photo A3 (left side of Exhibit A, Page 4) shows wood structure #393, and Photo A4 (right side of Exhibit A, Page 4) shows weathering steel structure #393.

When comparing Photos A1/A2 and Photos A3/A4, note that the sunlight is coming from the south. Since the photos were taken at the same time of day in opposite viewing directions, the sun illuminates the front of the wood H-Frame structure (#394) in the view to the northeast and creates a backlight effect of the steel H-Frame structure (#393) in the view to the southwest. While the lighting on the structures is different between the photographs, they serve as a comparison between the existing and proposed structure types and scale.

A visual comparison of the two structures on either side of the corridor crossing at Crane Hill Road, demonstrates the visual appearance and scale of the two structure types (wood H-Frame vs weathering steel H-Frame) is not substantially different. The typical motorist or walker passing through the corridor on Crane Hill Road would not immediately notice the difference between the two structure types, unless stopping to study the difference in material and H-Frame design. While the weathering steel structure #393

is approximately 17 ft taller than wood structure #394, the visible topographic change and surrounding landscape context does not make difference in structure height easily discernable.

Photo A1 and Photo A2 are presented below. Photo A3 and Photo A4 are presented side-by-side on the following page. All images are included with technical information in Exhibit A.

Photo A1: wood H-Frame structure #394, 48.3 ft tall, viewing distance 125 ft (50mm focal length)

Photo A2: weathering steel H-Frame structure #393, 65.5 ft tall, viewing distance 155 ft (50mm focal length)

Photo A3: wood H-Frame structure #394, 48.3 ft tall, viewing distance 140 ft (24mm focal length)

Photo A2: weathering steel H-Frame structure #393, 65.5 ft tall, viewing distance 140 ft (24mm focal length)

Photo A5 (Exhibit A, Page 5) shows five visible structures within the existing corridor. This single photograph offers a direct visual comparison between the existing and proposed structure types.

The structure in the foreground is #393, the weathering steel H-Frame with a height of 65.5 ft, at a viewing distance of 90 ft from the viewpoint. As noted above, structure #393 is comparable to the design and material of the proposed Project structures. The next four structures in the corridor (#389-392) are wood H-Frame structures, ranging in height from 45.8 to 58.2 ft, at a viewing distance of 700 ft to 2,300 ft. These structures are representative of the existing structures located within the corridor.

From this viewpoint, the difference in design and scale between the two structure types is not easily identifiable. While the height of structure #393 is approximately 7 ft taller than the next structure in the corridor (#392), the scale of the weathering steel structure is comparable to the visible wood structures . The difference in material is only evident when studying the difference between structures.

Photo A5 described above is presented below:

Photo A5: weathering steel H-Frame structure #393, height of 65.5 ft, viewing distance of 90 ft / wood H-Frame structures #389 to 392, height range 45.8 to 58.2 ft, viewing distance of 700 ft to 2,300 ft (37mm focal length)

SITE B: Owls Nest, Thornton

There are two replacement structures visible from a viewpoint at the Owls Nest Resort in Thornton, which serve as a representative example of the proposed Project structures in relation to the existing structure design.

Photo B1 (Exhibit A, Page 6) shows three visible structures within the existing corridor. The photograph provides a comparison between the weathering steel H-Frame structure (representative of the design and material proposed in the Project) and wood H-frame structures that currently occupy the corridor.

The structure in the foreground is the weathering steel H-Frame structure #41 with a height of 51 ft, at a viewing distance of 310 ft. The two structures beyond are wood H-Frame structures: structure #40 has a height of 52 ft shown at a distance of 655 ft, and structure #39, has a height of 56.8 ft shown at a distance of 960 ft.

This single photograph offers a direct visual comparison between the existing and proposed structure types. In this particular location, the replacement weathering steel structure is the shortest height in the sequence. There is a contrast in color and texture evident when comparing the wood and weathering steel structures in the image, however the structure height, scale, and overall form are relatively minor between the two structure types.

Photo B1 described above is presented below:

Photo B1: weathering steel H-Frame structure #41, height of 51 ft, viewing distance of 315 ft / wood H-Frame structures #39 and #40, height range 52 to 56.8 ft, viewing distance of 655 ft to 960 ft (47mm focal length)

Photo B2 and **Photo B3** (Exhibit A, Page 6-7) are photographs of single structures reflective of the design and material of the proposed Project structures. Photo B2 (below left) shows structure #41, a weathering steel H-Frame structure, 50.2 ft in height. The viewpoint faces northeast, illuminating the front of the structure in view. Photo B3 (below right) shows structure #40, a weathering steel H-Frame structure, 51 ft in height. The viewpoint faces southwest, causing a back-light effect in the view of the structure in view.

While these structures do not provide a direct comparison with the existing wood H-Frame structures, they are representative of the proposed Project structure material and design. Both structures are weathering steel and of the same design and approximate scale. The two images next to each other demonstrate the effects of sun angle and lighting on the appearance of the weathering material surface that would be used in the proposed Project structures.

Photo B3: weathering steel H-Frame structure #42, 50.2 ft tall, viewing distance 265 ft

Photo B4: weathering steel H-Frame structure #41, 51.0 ft tall, viewing distance 325 ft

EXHIBIT B: Cross Sections

Exhibit B provides representative cross sections through the transmission line corridor. The collection of cross sections represents the full range of transmission line configurations included in the Project corridor. The structure numbers representing the configuration range are provided on each page.

On each page, the top section represents the existing typical corridor condition, and the bottom section represents the proposed typical corridor condition. The structure height range for each corridor configuration is listed next to the existing and proposed structures. The structure height visually represented in the section is the most frequent structure height within that corridor configuration.

The cross sections demonstrate that the corridor width and the typical structure location within the corridor would remain unchanged. They also show that the typical structure type and width between existing and proposed Project structures is unchanged. There would be x-shaped cross supports added in the proposed weathering steel H-Frame design, but the overall width of the typical H-Frame structure design would remain unchanged.

The sections allow for direct visual comparison between the typical (or most frequent) structure heights within each corridor configuration. While the range of structure heights varies within each configuration, this provides a benchmark for scale comparison.

An example cross section in Exhibit B is presented on the next page.

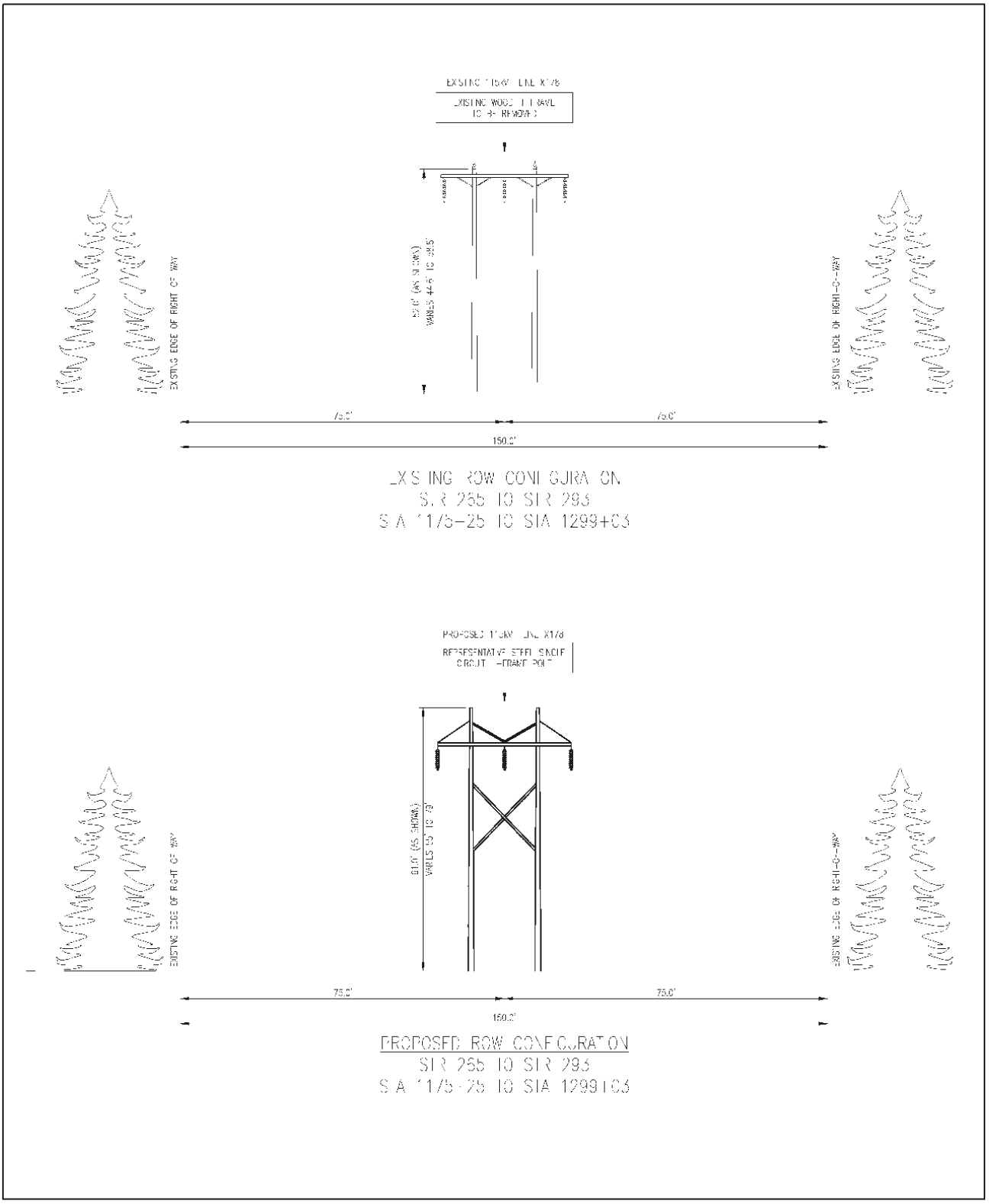


Exhibit B (page11) – Cross Section Example

SITE A
Crane Hill Road, Sugar Hill

SITE A: Crane Hill Road, Sugar Hill
CONTEXT PLAN

500 FT

SITE B
Owls Nest Resort, Thornton

SITE B: Owl's Nest Resort, Thornton
CONTEXT PLAN

800 FT

LEGEND

- Viewpoint Location
- Existing Wood H-Frame Structure (to be replaced with proposed Project)
- Existing Weathering Steel H-Frame Structure (to remain with proposed Project)

Tandem

Exhibit A
Photographs

November 1, 2024

EXHIBIT C: 3D Model Photo Overlays

Exhibit C provides 3D model photo overlays from a representative sample of viewpoints. These images provide a visual comparison between existing and proposed conditions using photography combined with 3D models of the proposed Project structures. The following narrative provides information about the development process used to generate the overlay images, identifies the representative sample of viewpoints, and describes anticipated visual changes represented in each viewpoint.

Technical Photo Overlay Production

The following provides basic technical information about the 3D model photo overlay development process:

Photography

The photographs were collected on October 18, 2024, using a Nikon Z6 camera with a fixed 50mm focal length lens (equivalent to 'normal' lens in a film camera). Photographs were set to record the highest resolution (large) and GPS coordinates of the photographs were recorded with a camera-mounted GPS unit. When the photographs are viewed at the appropriate distance from the eye (approximately 1.5x the image width), they accurately replicate the real-world conditions the viewer would see in the field. Technical information about viewing distance is provided next to each image in Exhibit C.

3D Model Photo Overlay

The generation of a 3D model photo overlay is the first step used in the development of a photosimulation. A photosimulation, typically submitted as part of a VIA, provides a photorealistic representation of the Project within the landscape. A photosimulation uses a rendering software to show materials, texture, sunlight, shadow, and detailed finishes.

A 3D model photo overlay aligns a 3D model of the Project components with an existing conditions photograph to accurately place the Project model within the photograph. This relies on a 3D model of the Project components and the topographic model available in Google Earth to establish an alignment between model and photograph. A combination of control points are used to generate the alignment between model and photograph, including the existing corridor clearing, topography, and existing structures in the landscape.

Once the photograph-model alignment is complete, the image is exported and brought into Photoshop for final representation. Final post-production includes editing the existing photograph to eliminate existing structures and refining the representation of the proposed Project components.

The result provides a representation of the location and scale of the proposed Project components. The 3D Model Overlay provides a visual reference for structure relocation, height, scale, and general color of weathering steel structures from representative viewpoints.

Viewpoint Selection and Description

Fieldwork and photography were completed along 24-miles of the Project corridor in the towns of Whitefield, Dalton, Bethlehem, Sugar Hill, and Easton. All fieldwork was conducted on public roadways and locations with public access.

Three locations were selected to provide a representative sample of viewpoints. The viewpoints were selected to show various ways in which the Project would be visible within the landscape, varying in viewing distance, viewer orientation in relation to the Project, and extent of Project visibility.

The three viewpoints included in Exhibit C are listed in the following table. The description of each viewpoint is described below.

#	Viewpoint	Town	View Distance	View Type
1	Route 116 / Ammonoosuc River	Bethlehem	within corridor	Immediate foreground at road crossing
2	The Rocks	Bethlehem	0.5 mi (3,000 ft)	Midground from higher vantage point
3	Jesseman Road	Sugar Hill	0.2 mi (870 ft)	Foreground from higher vantage point

Viewpoint 1: Route 116 / Ammonoosuc River Crossing, Bethlehem

Viewpoint 1 represents the view from the Route 116 roadway in Bethlehem, facing southeast within the corridor where the Project crosses the roadway and the Ammonoosuc River. The existing conditions image and photo overlay image for Viewpoint 1 are provided on pages 2-3 in Exhibit C.

Within the corridor crossing, views of the Project structures would be visible facing southwest overlooking the Ammonoosuc River (see Viewpoint 1), and views to the northeast from the roadway face uphill toward structures. Motorists pass through the corridor crossing on Route 116 at a speed of approximately 50 mph and may capture the view in one direction for a brief moment. A contractor storage yard is located adjacent to the road crossing on the northeast side of Route 116 (Del R. Gilbert & Son Block Co, Inc.). Employees at this facility may have a different vantage point and view with the Project corridor in the vicinity of the viewpoint.

Under current conditions from this viewpoint, there are eight visible wood H-Frame structures ranging in height from 43 to 53.1 ft. The existing wood H-Frame structure closest to the roadway is 48 ft tall and located approximately 140 ft from the viewpoint, between the roadway and the river.

With the proposed Project, the wood H-Frame structures would be eliminated and replaced with eight visible weathering steel H-Frame structures. The two Project structures closest to the viewpoint are 92.2 ft in height to span the roadway and river corridors, and the remaining six structures range in height from 52 to 61 ft. The closest 92.2 ft structure would be relocated away from the roadway to the opposite side of the Ammonoosuc River, at a distance of approximately 550 feet from the viewpoint.

While there is a height difference of approximately 44 ft between the existing and proposed structures closest to the viewpoint, the viewing distance to the nearest structure from this viewpoint would increase by 410 ft. The increased viewing distance to the nearest structure aids in reducing the potential visual

effects associated with the increase in structure height. The elimination of the structure between the roadway and the river also eliminates the visual obstruction caused by the existing structure between the roadway and river.

Viewpoint 2: The Rocks Estate, Bethlehem

Viewpoint 2 represents the view from an overlook at the Rocks Estate in Bethlehem. The existing conditions image and photo overlay image for Viewpoint 2 are provided on pages 4-5 in Exhibit C.

The Rocks Estate is a designated scenic resource, owned and managed by the Society for the Protection of New Hampshire Forests. The property is located on a high point of land, providing viewers with a panoramic view of the mountains to the north and northeast.

Those visiting the rocks estate include tourists and locals who visit the property for events, tours, hikes, educational activities, Christmas tree harvesting, and other recreational activities. Visitors to The Rocks Estate may stop at this viewpoint to take in the scenic view for several minutes as they observe the landscape to the north.

The existing transmission corridor is visible at approximately 0.5 to 1.0 miles north-northeast. The viewpoint is elevated above the corridor, allowing the viewer to see the cleared land within the corridor. In existing conditions, the cleared corridor and seven wood H-frame structures are visible, ranging in height from 42.9 to 65.5 ft. The existing visible structure closest to the viewpoint (right side of image) is limited to the top of the structure visible just at the top of the tree line.

With the proposed Project, these structures would be eliminated and replaced with nine visible weathering steel H-Frame structures, ranging in height from 52 to 79 ft. The three visible structures closest to the viewpoint (right side of image) are limited to the top of the structures visible just at the top of the tree line. The two additional structures visible with this proposed Project would be limited to the structure tops at the tree line. There would be no visible change in the corridor width or clearing.

The most substantial visual element of the corridor is the clearing itself, which will not be impacted by the proposed Project. The proposed weathering steel structures would be seen against the forested backdrop, with a low visual contrast between the structures and the adjacent tree line.

Viewpoint 3: Jesseman Road, Sugar Hill

Viewpoint 3 represents the view from Jesseman Road in Sugar Hill. The existing conditions image and photo overlay image for Viewpoint 3 are provided on pages 6-7 in Exhibit C.

Jesseman Road is a local road in a rural area characterized by agricultural clearings, fields, and rural residential development. Jesseman Road is a continuation from Crane Hill Road. The viewpoint is located approximately 560 ft southeast of the intersection with Blake Road (and transition to Crane Hill Road to Jesseman Road).

The view from Jesseman Road faces east toward the Project corridor. This viewpoint is representative of a view over a field from a public roadway that is traveled primarily by residents. It is an example of a slightly

elevated vantage point facing the Project corridor as it runs perpendicular to the viewpoint. Viewers may experience this view from their car or while walking, as distant views toward Mount Washington attract visual attention.

In existing conditions, two structures are visible above vegetation at approximately 870 to 1,170 ft from the viewpoint. The two structures range in height from 45.9 to 60.5 ft (the structure on the right side of the image is the taller structure). Both structures are visible over vegetation located immediately adjacent to the corridor.

With the proposed Project, these structures would be eliminated and replaced with two weathering steel structures, each with a height of 70 ft. There would be no additional clearing to expose more of the Project structures or corridor. The contrast in color, form, line, and texture would not differ substantially between the existing wood and proposed weathering steel and wood H-Frame.

EXHIBIT D: Computer-Based Visibility Analysis

A preliminary computer-based visibility analysis was conducted within the towns of Easton and Bethlehem. The analysis was limited to these two communities because it was done as a part of an initial response to the petition filed by the two towns.

A computer-based visibility analysis is a predictive screening tool, used to illustrate where the tops of structures are potentially visible in the landscape. This is typically the first step in determining the areas of potential visibility of an existing or proposed project. As part of a VIA, it should be followed up with field investigations and additional visualization techniques. This follow-up field investigation was not performed for purposes of this preliminary analysis.

Technical Process

The computer-based visibility analysis utilized ESRI ArcMap Pro software to complete a technical analysis, intended to identify areas of potential visibility within a set three-mile radius from the Project corridor. The following provides technical information on the viewshed analysis process and outlines the findings.

Structure Data

Eversource provided geospatial point data for both the existing and proposed Project structures. The geospatial point data included the following for both existing and proposed Project structures:

- Structure location (latitude and longitude)
- Structure elevation (ground level above MSL)
- Structure height above ground (measured in feet)

Surface Data

The computer-based viewshed analysis relied on surface data based on first-return LiDAR point cloud data collected USGS National Map. The LiDAR data was processed to establish a digital surface model (DSM).

The DSM includes both topography and surface data (accounting for vegetation and structures), processed at 3-foot resolution.

Viewer Height

The viewshed analysis was based on a viewer height set at 5.9 feet (1.8 meters) above ground level elevation. In other words, the analysis indicates where in the landscape a viewer (with an eye level at 5.9 feet above the ground elevation) may see the top of a single structure.

Three-Mile Radius

The analysis relied on a three-mile area from the centerline of the Project corridor within the towns of Bethlehem and Easton. The analysis included structures located within three miles of both the Bethlehem and Easton town boundaries. For example, there may be areas that show potential visibility in Bethlehem due only to the potential visibility of structures in Sugar Hill (located within three miles of the town boundary).

A three-mile radius around the Project corridor was selected for this preliminary analysis because it allowed for a reasonable assessment of the potential areas of visibility of transmission structures in the landscape. At distances greater than three miles, transmission structures are not likely to be readily apparent because of visual acuity and atmospheric conditions. While the structures may be technically visible at distances greater than three miles, the potential for visual impact is diminished as greater distances.

This radius was also informed by the three-mile distance benchmark provided in Section 301.05 (b)(4)(d)(1) of the SEC regulations. In a full VIA to the SEC, this analysis would rely on a 10-mile radius. However, three miles is a reasonable distance to use in this preliminary analysis.

Analysis Limitations

The analysis accounts for the screening effects of topography and surface features, including vegetation and structures. It does not indicate how many structures are visible or how much of each structure is visible from particular viewpoints. It simply indicates if a point at the top of an electrical structure is visible from a particular point in the landscape. The analysis does not consider visual acuity or the effects of atmospheric conditions.

Existing vs. Proposed Structures

The computer-based visibility was conducted twice: (1) existing wood H-Frame structures currently in the corridor, and (2) proposed weathering steel H-Frame structures proposed to replace the existing structures. The two analyses overlaid on the same map demonstrate areas of new visibility that may see Project structures that do not have visibility of existing transmission structures (also referred to as the delta between the two analyses).

The maps presented in Exhibit D represent the findings of the visibility analysis. The colored areas on the map indicate areas of potential visibility (also referred to as the viewshed area). The maps are composed of an overlay of the two analyses. The analyses overlay is represented using two colors:

- **Orange**: indicates where both the existing structures and proposed Project structures may both be partially or fully visible within three miles.
- **Purple**: indicates where proposed Project structures may be partially or fully visible within three miles, where there is currently no visibility of existing structures.

Analysis Results

The following table provides the results of the computer-based visibility analysis (visually represented on the maps in Exhibit D). The statistical findings are provided separately for both Bethlehem and Easton. The statistical findings are presented twice. The top portion of the table (**Total Area**) provides a statistical analysis for the entire area within the three-mile radius in each community, including the area within the transmission corridor clearing. The bottom portion of the table (**Area Outside Project Corridor**) provides a statistical analysis for the area within the three-mile radius, excluding the area within the transmission corridor clearing.

	BETHLEHEM	EASTON
TOTAL AREA		
Total area of town (acres)	58,206	19,934
Total area of existing visibility (acres)	385	300
Total area of proposed Project visibility (acres)	453	313
Total area of town with new visibility (delta between existing and proposed) (acres)	68	13
Percentage of town with existing visibility (%)	0.66%	1.50%
Percentage of town with proposed Project visibility (%)	0.78%	1.57%
Percentage of town in the delta between existing and proposed (%)	0.12%	0.07%
AREA OUTSIDE PROJECT CORRIDOR		
Total area of project corridor in town	205	181
Total area of existing visibility when project corridor visibility is removed (acres)	180	119
Total area of proposed Project visibility when project corridor visibility is removed (acres)	248	132
Total area of town with new visibility (delta between existing and proposed) when visibility area within the corridor is removed (acres)	68	13
Percentage of town with existing visibility outside of project corridor (%)	0.31%	0.60%
Percentage of town with proposed visibility outside of project corridor (%)	0.43%	0.66%
Percentage of town with new visibility (delta between existing and proposed) when visibility area within the corridor is removed (%)	0.12%	0.07%

The computer-based visibility analysis results summarized in the table above and mapped in Exhibit D were compared with potential scenic resources in Bethlehem and Easton. The potential scenic resources included do not represent a complete inventory of scenic resources. The potential scenic resources were collected from databases available at the New Hampshire Geodata Portal available at NH Granite. The databases used included conservation lands, scenic byways, trails, designated scenic rivers, and sites on the National Register of Historic Places.

A computer analysis was run to determine if any potential scenic resources (listed in the above geodatabases) had visibility of the proposed Project structures that did not previously have visibility of the existing transmission structures. The results of this analysis indicated there were no potential scenic resources with visibility of the proposed Project that did not previously have visibility of the existing transmission structures.

SITE A
Crane Hill Road, Sugar Hill

SITE A: Crane Hill Road, Sugar Hill
CONTEXT PLAN

500 FT

N

SITE B
Owls Nest Resort, Thornton

SITE B: Owl's Nest Resort, Thornton
CONTEXT PLAN

800 FT

N

LEGEND

- Viewpoint Location
- Existing Wood H-Frame Structure (to be replaced with proposed Project)
- Existing Weathering Steel H-Frame Structure (to remain with proposed Project)

Tandem

Exhibit A
Photographs

November 1, 2024

SITE A: Crane Hill Road, Sugar Hill
PHOTO A1

PHOTO A1

DATE	10/18/2024
TIME	11:35 am
LATITUDE LONGITUDE	44°14'40.95"N 71°47'34.36"W
VIEW DIRECTION	Northeast
CAMERA	Nikon Z6
FOCAL LENGTH	50 mm

SITE A: Crane Hill Road, Sugar Hill
PHOTO A2

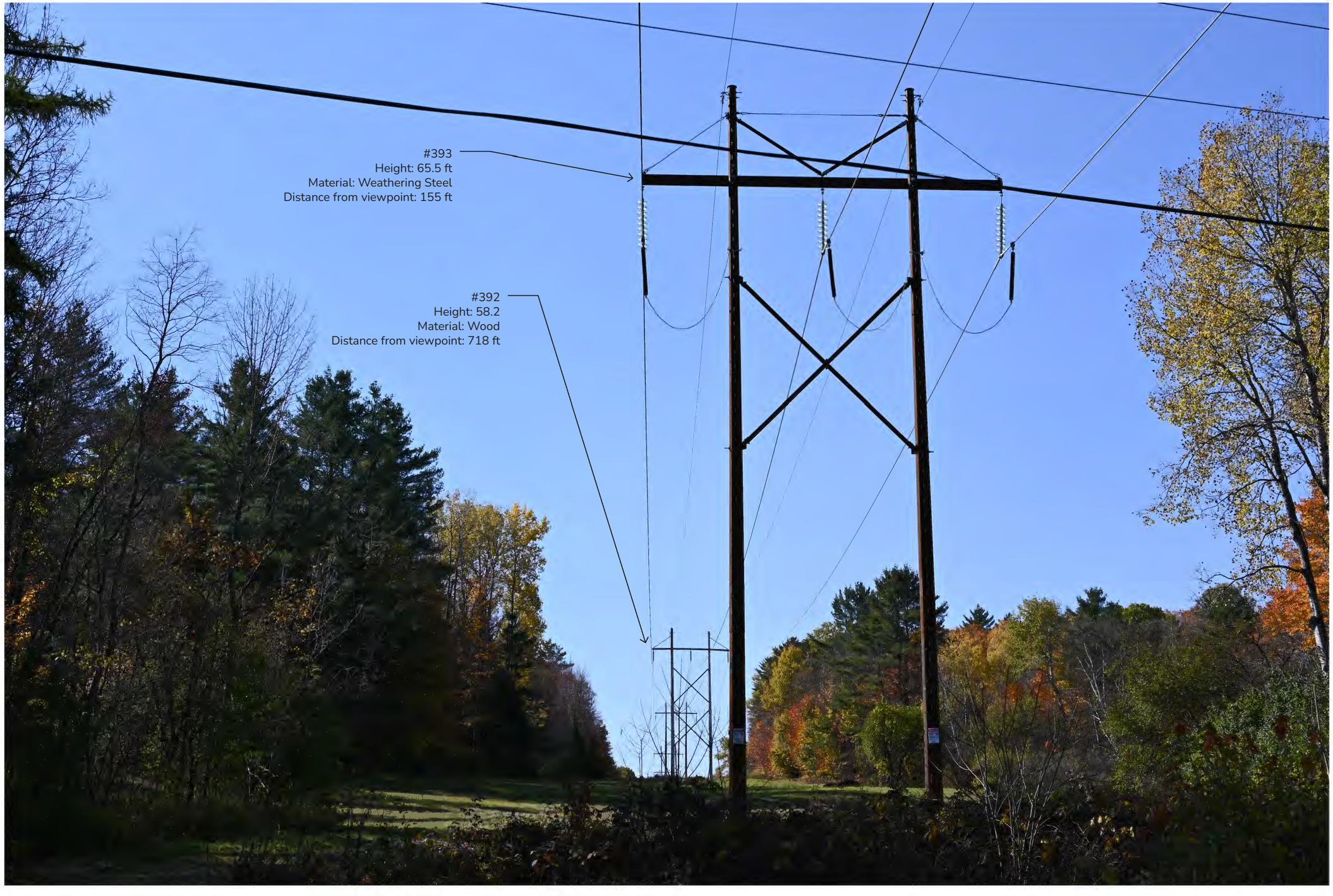
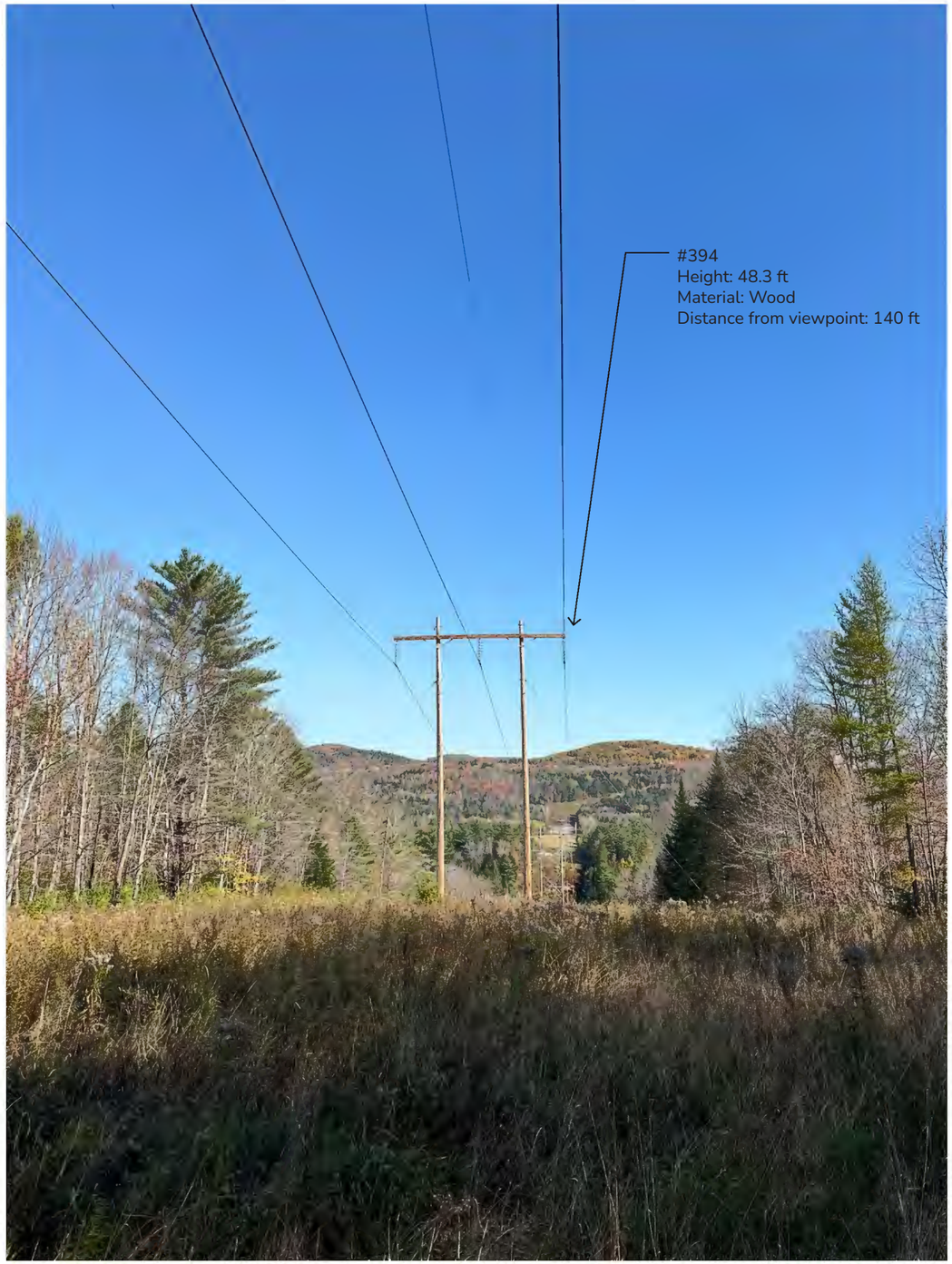


PHOTO A2

DATE	10/18/2024
TIME	11:35 am
LATITUDE LONGITUDE	44°14'40.95"N 71°47'34.36"W
VIEW DIRECTION	Southwest
CAMERA	Nikon Z6
FOCAL LENGTH	50 mm

SITE A: Crane Hill Road, Sugar Hill
PHOTO A3



SITE A: Crane Hill Road, Sugar Hill
PHOTO A4

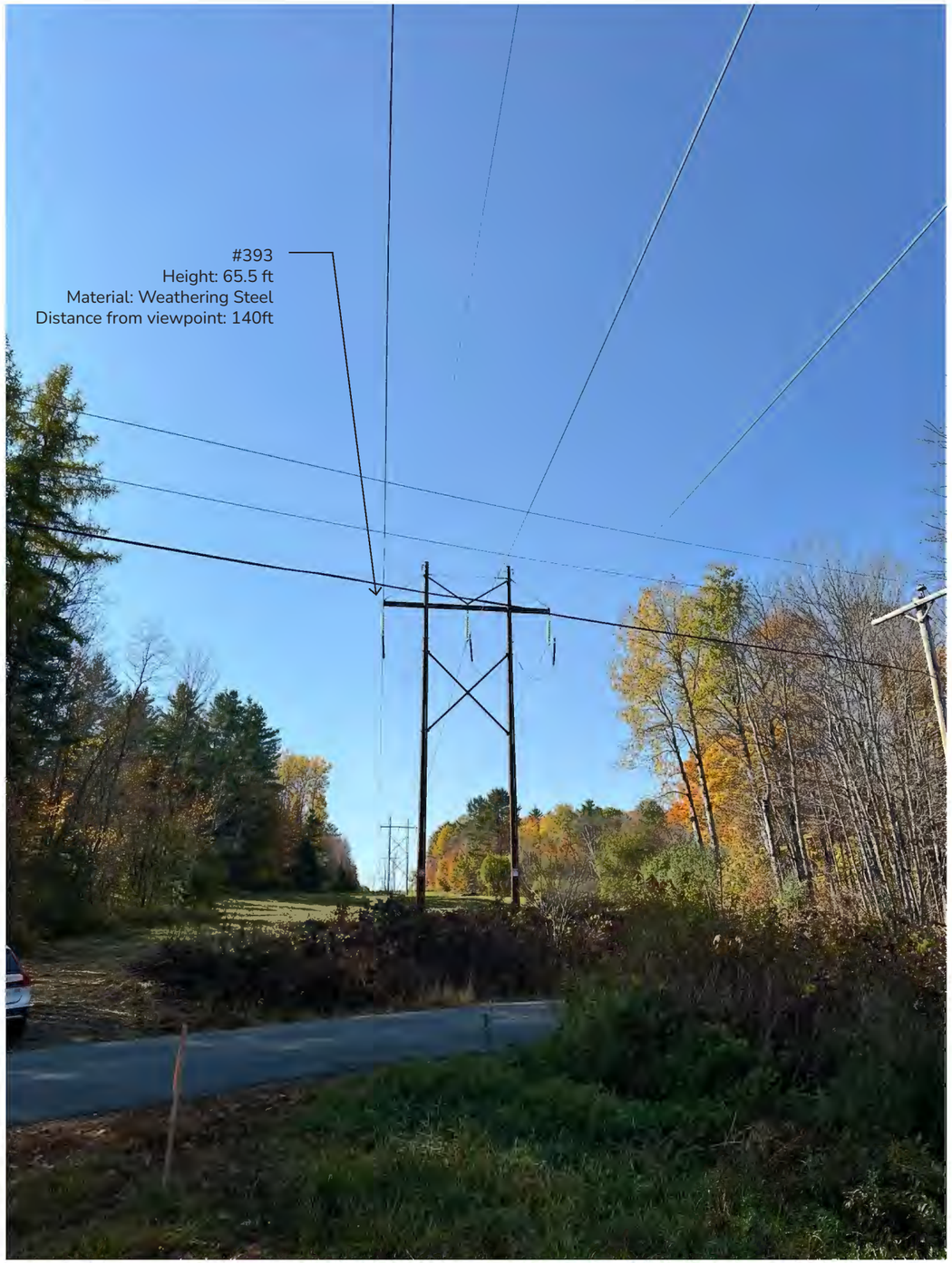


PHOTO A3 (left)

DATE	10/18/2024
TIME	11:34 am
LATITUDE LONGITUDE	44°14'40.95"N 71°47'34.36"W
VIEW DIRECTION	Northeast
CAMERA	iPhone 14
FOCAL LENGTH	24 mm no digital zoom

PHOTO A4 (right)

DATE	10/18/2024
TIME	11:34 am
LATITUDE LONGITUDE	44°14'40.95"N 71°47'34.36"W
VIEW DIRECTION	Southwest
CAMERA	iPhone 14
FOCAL LENGTH	24 mm no digital zoom

Tandem

Exhibit A
Photographs

November 1, 2024

SITE A: Crane Hill Road, Sugar Hill
PHOTO A5

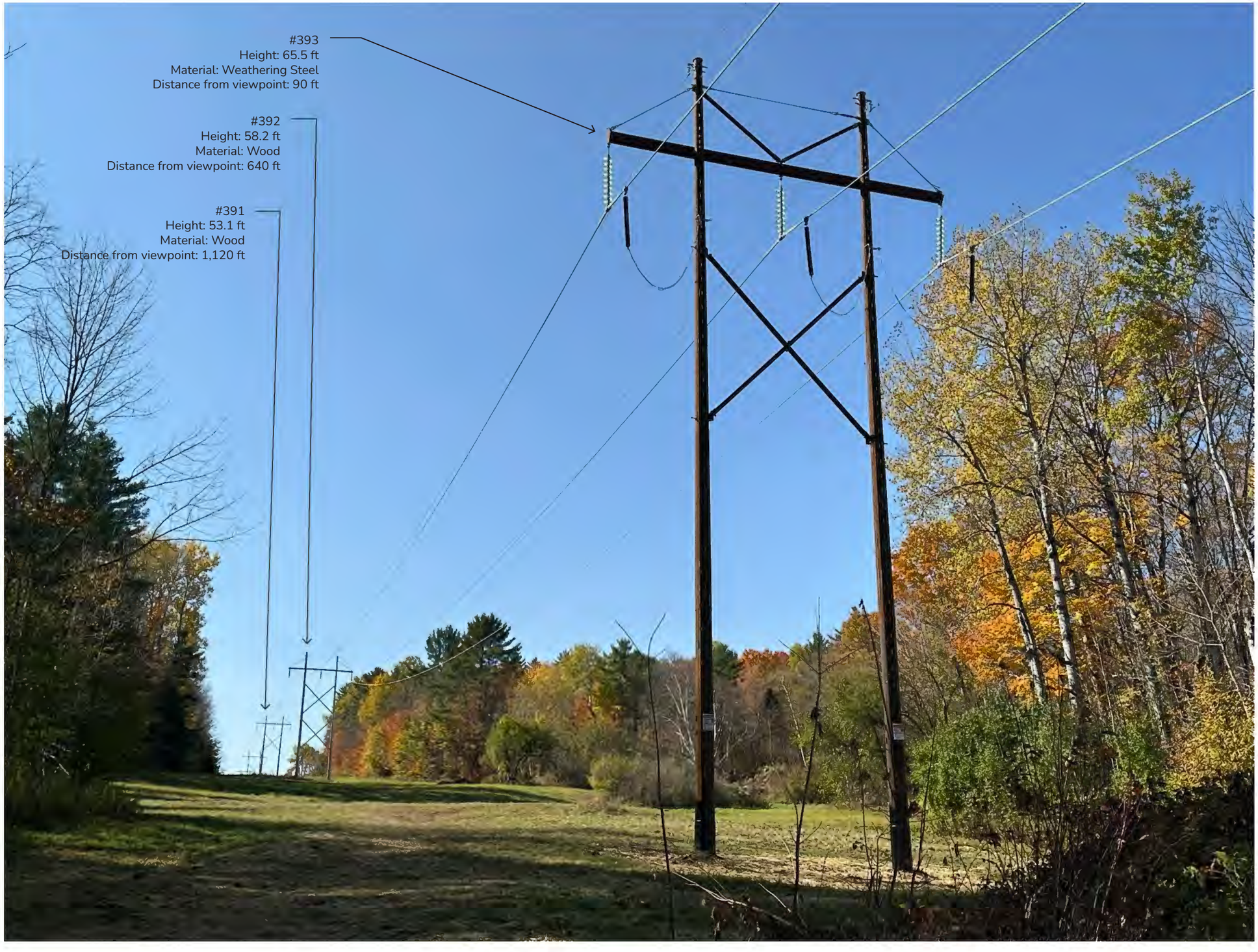


PHOTO A5

DATE	10/18/2024
TIME	11:38 am
LATITUDE LONGITUDE	44°14’40.07”N 71°47’34.60”W
VIEW DIRECTION	Southwest
CAMERA	iPhone 14
FOCAL LENGTH	37 mm 1.5x digital zoom

SITE B: OWL'S NEST RESORT, THORNTON
PHOTO B1

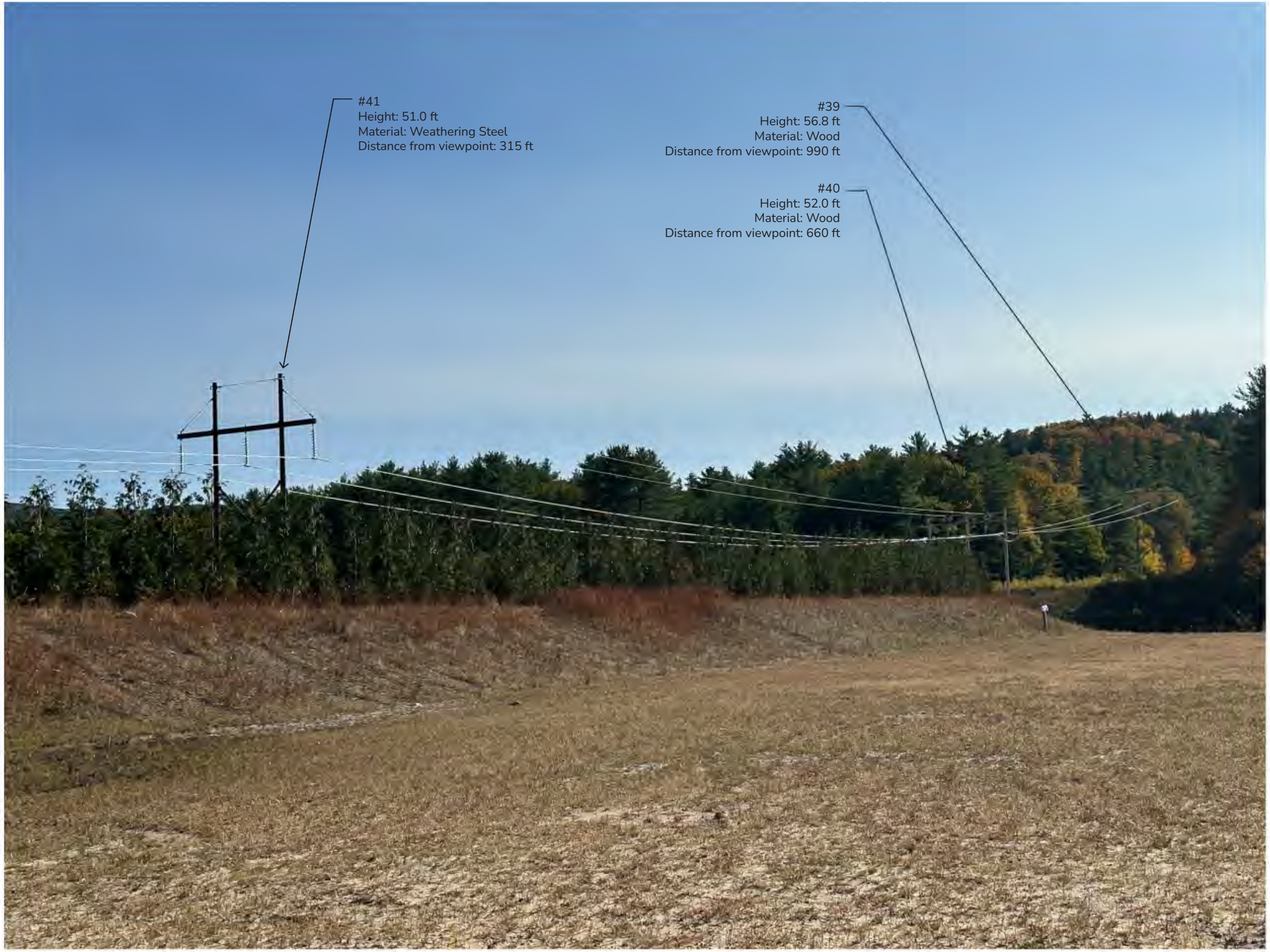


PHOTO B1

DATE	10/18/2024
TIME	1:59 pm
LATITUDE LONGITUDE	43°52'13.26"N 71°38'46.99"W
VIEW DIRECTION	Southeast
CAMERA	iPhone 14
FOCAL LENGTH	47 mm 1.9x digital zoom

SITE B: OWL'S NEST RESORT, THORNTON
PHOTO B2

SITE B: OWL'S NEST RESORT, THORNTON
PHOTO B3

PHOTO B2 (left)

DATE	10/18/2024
TIME	1:59 pm
LATITUDE LONGITUDE	43°52'13.26"N 71°38'46.99"W
VIEW DIRECTION	Northeast
CAMERA	iPhone 14
FOCAL LENGTH	129 mm 1.9x digital zoom

PHOTO B3 (right)

DATE	10/18/2024
TIME	2:00 pm
LATITUDE LONGITUDE	43°52'12.38"N 71°38'47.92"W
VIEW DIRECTION	East
CAMERA	iPhone 14
FOCAL LENGTH	120 mm 2.5x digital zoom cropped image