

**Attachment G**

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Onshore Substation Visibility Assessment Report

NEW ENGLAND WIND 2 CONNECTOR  
275/345KV GIS SUBSTATION

WEST BARNSTABLE, MA

VISIBILITY ASSESSMENT

Prepared for:  
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and

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March 2, 2023

## *Introduction*

Commonwealth Wind, LLC, a wholly owned subsidiary of Avangrid Renewables, LLC (the “Company”) proposes to construct, operate, and maintain the Commonwealth Wind Project, an offshore wind project located within Lease Area OCS-A 0534 in federal waters under the jurisdiction of the Bureau of Ocean Energy Management (BOEM). The New England Wind 2 Connector or “the Project” will deliver more than 1,200 megawatts (MW) of carbon-free energy from the Commonwealth Wind Project to the ISO-New England (ISO-NE) electrical grid. At its nearest point, the portion of Lease Area OCS-A 0534 that will be utilized for the Commonwealth Wind Project is just over 20 miles (32 kilometers [km]) from the southwest corner of Martha’s Vineyard, approximately 24 miles (38 km) from Nantucket, and approximately 37 miles (60 km) south of the Cape Cod mainland. New England Wind 2 Connector is the Massachusetts-jurisdictional elements of the Commonwealth Wind Project.

Major elements of the Commonwealth Wind Project will include wind turbine generators (WTGs) and foundations, offshore electrical service platforms (ESPs) and foundations, inter-array cables<sup>1</sup>, offshore export cables, onshore export cables, and an onshore substation that will step up transmission voltage to 345 kilovolts (kV) for interconnection with the regional power grid at the existing Eversource 345-kV West Barnstable Substation.

Saratoga Associates, Landscape Architects, Architects, Engineers, and Planners, P.C. was retained by the Company to conduct a visibility assessment of the proposed new onshore substation for the Project. The visual assessment included a viewshed analysis, photographic simulations, and line-of-sight profiles which identify the degree and character of potential visibility of the proposed onshore substation from off-site vantage points.

The Project’s proposed new onshore substation is located west of Oak Street near the Oak Street Bridge overpass of U.S. Route 6 (Mid-Cape Highway), approximately 0.25 miles west of the interconnection location at the existing Eversource West Barnstable Substation as measured in a straight line. The onshore substation site includes eight privately owned parcels totaling approximately 29.01 acres. Of the eight parcels, four of the parcels (Parcels 195-007, 195-006, 195-005, and 195-037) will be developed with the new onshore substation. Of the four parcels to be developed, three of the parcels are undeveloped wooded lots with the fourth parcel developed with a single-family residence (Parcel 195-007) that will be removed. The proposed onshore substation will be sited primarily in the southern and central portions of the four parcels that will be developed with the new onshore substation.

The proposed onshore substation is a gas-insulated substation (GIS) design with primary electrical equipment occupying the central part of the parcel. The design includes several equipment and GIS enclosures as well as a perimeter access road and a full-perimeter security

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<sup>1</sup> Inter-array cables connect several WTGs to a single ESP.

fence. The equipment complement includes main transformers, shunt reactors, 275 kV switchgear, 345 kV switchgear, and STATCOMs. The necessary stormwater facilities are located on the northern portion of the site.

Substation electrical equipment and buildings are generally lower than 30 feet in height above finished grade. All electrical interconnects will be installed underground. The proposed onshore substation does not include tall take-off structures or transmission towers, however, the substation will require lightning masts approximately 80-feet in height. This analysis assumes the lightning mast will be approximately 3 feet in diameter at the base tapering to 2 feet in diameter at the top.

The four parcels that will be developed for the proposed onshore substation will be partially cleared as a result of Project development. Land and tree clearing will be minimized to the extent practicable. The proposed onshore substation (area inside the perimeter security fence) will occupy approximately 9.9 acres and development of the proposed onshore substation will disturb a total of 14.5 acres. An on-site existing forested buffer will be maintained around the substation with the exception of the northeast corner where the stormwater infiltration basin is proposed within an existing natural depression. The undisturbed woodland areas will provide near complete visual screening of the proposed onshore substation from adjacent properties and nearby vantage points.

The preliminary substation engineering plan is provided in Appendix A.

As described in further detail below, the results of this assessment indicate that due to dense intervening woodland vegetation to remain, the proposed onshore substation will be screened from view from all nearby residential properties and public roadways. The proposed onshore substation will have little to no visual impact on the visual character of the surrounding landscape.

### *Existing Visual Conditions*

The Project's proposed onshore substation is located west of Oak Street near the Oak Street Bridge overpass of Route 6 in the Town of Barnstable, MA (2021 estimated population 49,583).<sup>2</sup> The onshore substation site includes eight privately owned parcels totaling approximately 29.01 acres. Surrounding land uses include the Department of Conservation and Recreation (DCR) Fire Tower parcel and Route 6 State Highway Layout (SHLO) managed by the Massachusetts Department of Transportation (MassDOT) to the south. To the west, the proposed onshore substation parcels are bordered by undeveloped Article 97 protected land owned by the Town of Barnstable and managed by the Conservation Commission. To the north, the site, including a

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<sup>2</sup> United States Census Bureau - Quick Facts

<https://www.census.gov/quickfacts/fact/table/barnstabletowncitymassachusetts,barnstablecountymassachusetts/PST045222,PST045221>



40-foot-wide “panhandle,” partially occupied by a clearcut electrical easement that extends from the north of Parcel 195-006, is bordered by Article 97 protected parcels that are part of the Spruce Pond Conservation Area owned by the Town of Barnstable and managed by the Conservation Commission and Falcon Road Conservation Area. The existing Eversource right-of-way (ROW) #342 and Spruce Pond Road are located in the Spruce Pond Conservation Area. To the east, the site is also bordered by undeveloped Article 97 protected land owned by the Town of Barnstable and managed by the Conservation Commission (Kuhn Property).

The local landscape is characterized by a gently rolling glacial moraine outwash topography typical of this portion of Cape Cod. Except for minor areas around the DCR fire tower and existing residential structures (to be removed), the Substation Site and all adjacent properties to the north, east and west are densely wooded with mature pitch pine and scrub oak vegetation. A 100-foot-wide densely wooded buffer also exists within the Route 6 SHLO along the southern boundary of the Substation Site.

The existing Eversource West Barnstable and Oak Street Substations are located along Oak Street approximately 0.25 miles east of the Substation Site adjacent to the existing Eversource ROW #342. These facilities are a visually complex grouping of electric utility infrastructure ranging in height from approximately 30 feet for most ground level equipment to 60-140 feet for transition structures. The existing Oak Street Substation is within 140 feet and directly visible from Oak Street. The existing Eversource West Barnstable Substation is within 425 feet and directly visible from Oak Street.

Approximately 50 existing transition/transmission and distribution structures ranging from approximately 60 to 140 feet in height are within 1,500 feet of Oak Street at the existing transmission line crossing. These multiple wooden distribution poles and steel transmission monopoles support multiple overhead conductors and shield wires. Several of these existing structures are immediately adjacent to and directly visible from Oak Street.

Route 6 is the primary transportation corridor connecting mainland Massachusetts with destinations throughout Cape Cod. This four-lane median separated highway has an average annual daily traffic volume (AADT) of approximately 52,000 vehicles per day with individual daily traffic volumes exceeding 70,000 vehicles per day during peak summer vacation periods.<sup>3</sup>

The wider project area is generally suburban in character comprised of low to moderate density (i.e., 1 to 5+ acre) single-family residential lots and undeveloped woodland open space. Approximately 22 single family residential structures are within 1,000 feet of the Substation Site. 17 of these residential structures are in residential neighborhoods to the south of Route 6. Two residential structures (56 Plum Street and 141 Plum Street) are north of the existing

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<sup>3</sup> Mass DOT Transportation Data Management System  
<https://mhd.public.ms2soft.com/tcds/tsearch.asp?loc=Mhd&mod=>

Eversource ROW #342. Three existing residential structures are located along Oak Steet between Route 6 and the existing Eversource ROW #342 (35 Plum Street, 550 Oak Street, and 575 Oak Street).

### *Zone of Visual Influence Mapping*

Zone of Visual Influence (ZVI) analysis identifies the geographic area within which some portion of the proposed onshore substation could potentially be visible based on geographic information system (GIS) generated viewshed analysis. The ZVI extends to a 2-mile radius from the proposed onshore substation.

For this analysis, two ZVI conditions are identified:

- Zone of Theoretical Visibility (ZTV) – The ZTV defines the theoretical worst-case area of potential visual effect considering only the screening effect of existing topography and earth curvature (i.e., “bare earth” condition).
- Zone of Likely Visibility (ZLV) – The ZLV presents the more realistic case area of potential visual effect including the real-world screening elements of existing intervening vegetation and structures (i.e., “land cover” condition).

Topographic, vegetation, and built structure elevations are based on 2011–2013 Light Detection and Ranging (Lidar) surveys obtained from the United States Geological Survey (USGS) “The National Map” data download<sup>4</sup>. Using the Lidar data, a highly detailed digital terrain model (DTM) was created at a horizontal resolution of less than 2 meters representing bare earth conditions of all land surface areas within the 2-mile radius study area. The DTM was adjusted to account for proposed site grading (see Appendix A, Preliminary Substation Engineering Plan).

Additionally, a digital surface model (DSM) was created at the same resolution representing the more realistic land cover condition incorporating all existing surface features including land surface areas, as well as vertical elements such as existing buildings and vegetation which may result in visual screening. The DSM was also adjusted to account for proposed vegetative clearing.

The ZVI calculation is based on 23 control points representing electrical equipment and building high points within the proposed onshore substation. The 23 viewshed control points are conservatively established at 30 feet above finished grade. Eight control points were used to represent the approximate 80-foot-tall lightning masts.

Separate ZVI overlays were generated to identify the visible areas of the eight 80-foot-tall lightning mast control points and the lower height electrical equipment and buildings.

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<sup>4</sup> <https://apps.nationalmap.gov/downloader/>

All viewshed calculations were generated using a horizontal resolution of 5 meters. Viewshed calculations are based on a 5.75-foot observer height above existing grade. Viewshed analyses were conducted using Global Mapper Pro v23.0 software.

Zone of Visual Influence maps (including ZTV and ZLV overlays) are provided in Appendix B.

ZVI analysis demonstrates that within ½ mile of the proposed onshore substation visibility of substation equipment will be limited to small isolated pockets. Due to existing intervening vegetation, predicted views from these small, isolated areas are expected to be limited to the upper portion of one or more lightning mast, visible above the intervening vegetation. These isolated views are primarily found within cleared areas of the existing Eversource ROW #342 and Route 6. Areas with isolated views along Route 6 are generally on the west bound side of Route 6 with one location along the east bound side of Route 6 and will likely go unnoticed by motorists travelling at highway speed (Route 6 has a speed limit of 55 mph).

Beyond ½ mile of the proposed onshore substation, the viewshed analysis indicates that a line-of-sight to lower height electrical structures (30 feet tall) and one or more lightning mast (80 feet tall) may occur approximately 1.25 miles to north of the Substation Site in areas of Barnstable Harbor. Potential views from this area will be distant and low to the intervening tree line and will likely go unnoticed.

Predicted visibility of one or more lightning mast is also found on the southern half of Wequaquet Lake, approximately one mile southeast of the Substation Site. Affected viewers may include boaters and shoreline residential properties with open water vistas to the northwest. Potential views from the southern half of Wequaquet Lake will be distant and low to the intervening tree line and will likely go unnoticed.

## *Photographic Simulations*

### *Existing Condition Photography*

On December 2, 2022, an experienced visual analyst visited the Project area to photograph locations where the proposed onshore substation may be visible. Ordinarily photographs are taken from places where potential project visibility is identified by viewshed analysis. However, as demonstrated by viewshed analysis (refer to Appendix B), identified areas of likely visibility within a one-mile radius of the proposed onshore substation are highly limited due to intervening woodland vegetation to remain. In this case photographs were taken from locations along local roadways near the Substation Site where potential views above or through intervening vegetation were deemed most likely in the informed opinion of the visual analyst.

Photographs were taken using a Canon 6D Mark II digital single lens reflex (“DSLR”) 26-mega pixel camera. The precise coordinates of each photo location were recorded in the field using a handheld global positioning system (GPS) unit. Photographs were taken by a standing photographer with an eye level of approximately 5.75 feet above ground.

Photographs taken during field reconnaissance are provided in Appendix C.

### *Photo Simulation Methodology*

Photo simulations were developed by superimposing a rendering of a 3D computer model of the proposed 345-kV Substation into the existing condition photograph taken from each vantage point. The 3D computer model was developed using *Autodesk Civil 3D*® and *3D Studio Max Design*® software (3D Studio Max) based on drawings provided by the project engineer.

Camera Alignment - To accurately superimpose the 3D computer model within the existing condition photograph, a virtual camera was created in *3D Studio Max Design*® to precisely match the geographic coordinates (latitude/longitude), height above ground (photographer’s eye level), and lens focal length setting (i.e., 24mm) of the field camera used to take each existing conditions photograph. Precisely matching these conditions assures location and scale accuracy between the base photograph and the subsequent simulated view. The virtual camera’s target position was also set to match the bearing of the corresponding existing condition photograph.

To assist with camera alignment, existing elements visible in existing condition photographs (i.e., utility poles, buildings, road signs, pavement edges, etc.) were manually digitized from high resolution digital ortho imagery. Each element was assigned an elevation (“Z” value) based on Lidar data and then imported to *3D Studio Max* for use as fixed benchmarks. In addition, a 3D digital terrain model (DTM) and digital surface model (DSM) were generated (using Lidar point cloud data) in *Global Mapper Pro v23.0*® software to create a 3D model of the existing ground surface and vegetative and building masses. DTM and DSM elements were then

exported as an elevation grid and imported into the 3D model. The digitized elements and Lidar based DTM and DSM provide clearly identifiable benchmarks which are also used to accurately align the virtual image of the 3D model with the actual photographed image.

With the existing condition photograph displayed as a “viewport background”, and the viewport properties set to match the photograph’s pixel dimensions, minor camera adjustments were made (horizontal and vertical positioning, and camera roll) to align benchmark elements in the background photograph with corresponding features of the 3D model.

Once the camera alignment was verified, a to-scale 3D model of the proposed onshore substation was merged into the model space. To the extent practicable, and to the extent necessary to convey visual character and reveal impacts, design details of the proposed onshore substation were built into the 3D model and incorporated into the photo simulation. As a result, the scale, alignment, elevations, and location of the visible elements of the proposed substation are true to the conceptual design.

Six (6) representative key observation points were selected for photo simulation. These are:

- Photo 17 – Parker Road at Eversource ROW #342
- Photo 19 – Service Road at Biltmore Place
- Photo 21 – U.S. Route 6 (Mid-Cape Highway)
- Photo 23 – Oak Street at U.S. Route 6 Overpass
- Photo 26 – Oak Street Near 550 Oak Street
- Photo 29 – Within Eversource ROW #342 near 50 Plum Street

Based on accurate camera alignment, the 3D model of the proposed onshore substation falls behind foreground vegetation as viewed from all 6 representative key observation points. To illustrate where the proposed substation falls within each photo frame an outline of major substation structures is provided in each simulated view. This graphic outline is not meant to imply visibility but is provided for reference to show the scale and position of the proposed onshore substation behind intervening foreground woodland vegetation.

Photo simulations are provided in Appendix D.

In all photo simulations lower height electrical structures and buildings (30 feet tall) fall below the intervening tree line and are screened or obscured from view. The upper limits of one lightning mast (80 feet tall) may be visible low within the tree line to eastbound motorists on Route 6 (*refer* to Figure D6 in Appendix D). However, such visibility would be perpendicular to the direction of travel and limited to a momentary glimpse and will likely go unnoticed by motorists travelling at highway speed.

The upper limits of one or more lighting masts may be visible low to the tree line from Plum Street within the existing Eversource ROW #342 (refer to Figure D12 in Appendix D). Such visibility is consistent with existing visual elements on the landscape (e.g., the approximately 50 existing transition/transmission and distribution structures ranging from approximately 60 to 140 feet in height which dominate the landscape in this area) and will not alter the viewshed.

### Photo Simulation Viewing Instructions

Due to the proximity of photographed locations to the proposed onshore substation, existing condition photographs were taken using a 24mm wide-angle lens to capture as much local context within the field of view as practicable. A wide-angle image has a degree of optical distortion that makes the image appear to curve slightly outward toward the edge of the image frame. Optical distortion in these photo simulations has been minimized using the lens correction function of *Adobe Lightroom*® image processing software.

The single frame photo simulations included in Appendix D have been formatted to be printed on an 11 x 17-inch page format. At this image size, the page should be held at a distance of approximately 11 inches from the reader's eye to appear at the correct scale. Viewing the image closer would make the scene appear too large and viewing the image from a greater distance would make the scene appear too small compared to what an observer would actually see in the field.

### Line-of-Sight Profiles

Line-of-sight (LOS) profiles are provided to illustrate the potential screening effects of topography, vegetation, and structures from the six (6) representative observation points.

LOS profiles were generated using *Global Mapper Pro v23.0*® software based on DTM and DSM surfaces generated from 2011–2013 Light Detection and Ranging (Lidar) surveys.

LOS profiles are placed to intersect with residential structures and the nearest substation components. The software sampled DTM and DSM elevations along the profile line to depict a bare earth profile line and a separate line demonstrating additional screening provided by trees and structures.

Each generated LOS profile was exported as vector linework from Global Mapper into AutoDesk AutoCAD® software to insert to-scale graphic representations of the substation structures, interconnect towers and adjacent transmission structures.

The LOS cross sections are included in Appendix E.

Line of sight-profiles further reinforce the effectiveness of intervening woodland vegetation to remain in providing visual screening from nearby residential properties and public roadways.

## *Results*

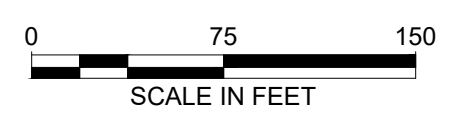
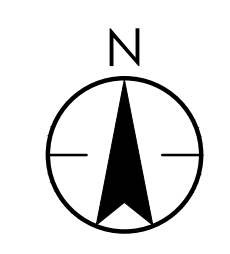
ZVI analysis demonstrates that within ½ mile of the proposed onshore substation, views of the substation equipment will be limited and occur in small isolated geographic pockets. Beyond ½ mile of the proposed onshore substation a line-of-sight to lower height electrical structures (30 feet tall) and one or more lightning masts (80 feet tall) may occur in distant areas approximately 1.25 miles to north of the Substation Site. Distant visibility of one or more lightning masts is also found on the southern half of Wequaquet Lake approximately one mile southeast of the Substation Site. In all cases, visibility of proposed onshore substation components will be low within the existing tree line, distant, and away from residential properties and areas commonly visited by the public.

Photo simulations demonstrate that lower height electrical equipment and buildings (30 feet tall) fall well below the intervening tree line from all studied vantage points. The upper portion of one or more lightning mast (80 feet tall) may be visible low within the existing tree line from isolated locations along Route 6 and from near Plum Street within the existing Eversource ROW #342. In both cases, the predicted visibility is minor in nature and is anticipated to go unnoticed by observers.

The proposed onshore substation is located within a densely wooded area. Considerable existing woodland vegetation will remain on the Substation Site and will provide substantial visual screen. Lower height electrical equipment and buildings associated with the proposed onshore substation will not be directly visible from any off-site vantage point. In areas where lightning masts are predicted to be visible; the lightning masts will be low within the intervening tree line and represent a de minimis alteration to the existing visual character of the local landscape.

Appendix A  
PRELIMINARY SUBSTATION ENGINEERING PLAN





REV.	DATE	REVISION DESCRIPTION	STATUS	DRAWN	CHKD	APPRVD
D	2022-12-15	REVISED SITING - PARCELS 2-5	IFI	MDC	JDT	KEF
C	2022-10-26	ISSUED FOR STATE PERMITTING	IFI	MDC	JDT	KEF
B	2022-09-28	ISSUED FOR STATE PERMITTING	IFI	DRM	JDT	KEF
A	2022-09-14	ISSUED FOR CLIENT REVIEW	IFCR	DRM	JDT	KEF

CONTRACTOR:

**Stantec**  
 Stantec Consulting Services Inc.  
 400 Crown Colony Drive Suite 200  
 Quincy, MA U.S.A. 02169-0982

CLIENT:

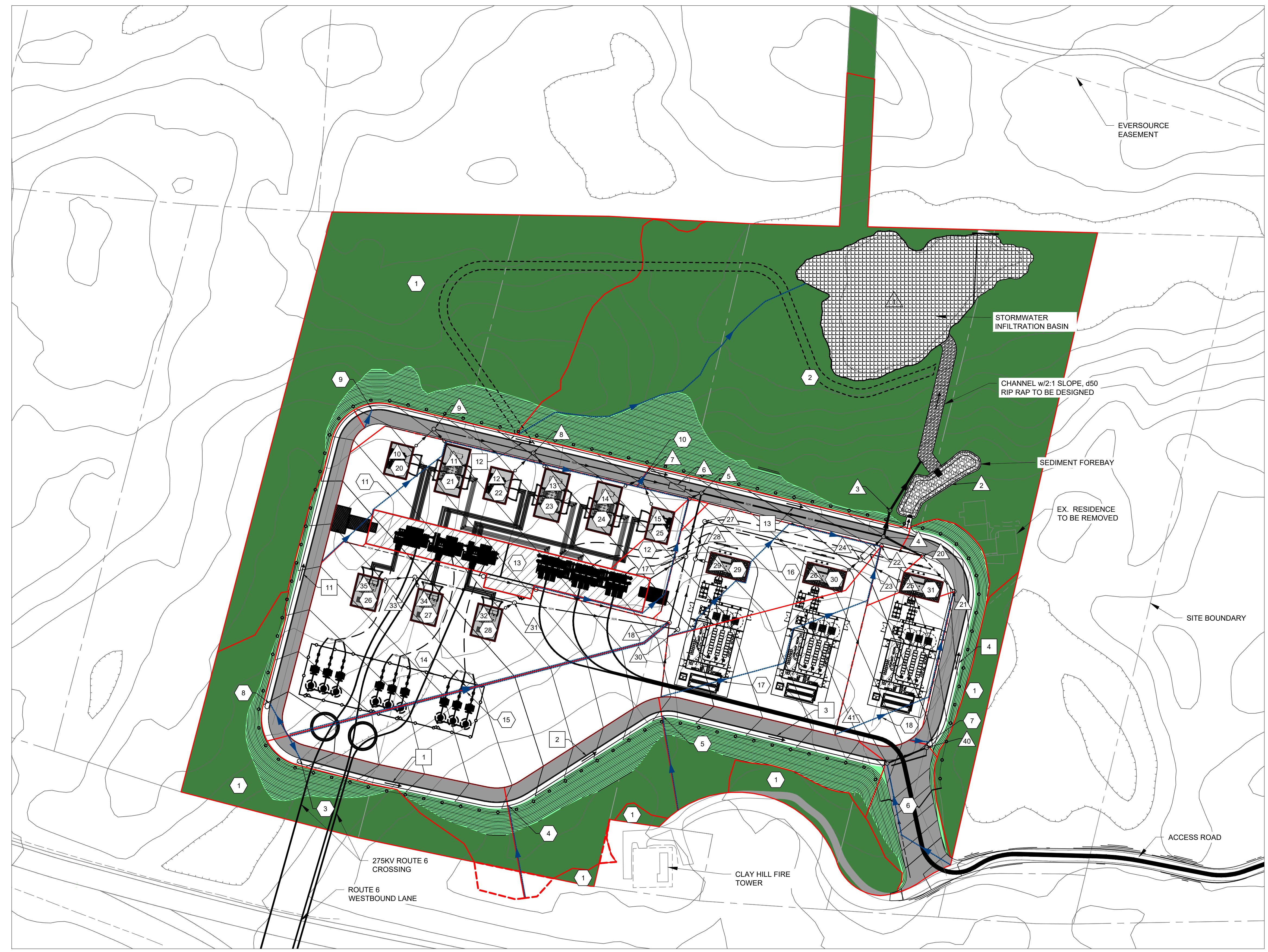
**AVANGRID** **Offshore Wind**  
 125 High Street  
 Boston, MA 02110

PROJECT: **NEW ENGLAND WIND 2 CONNECTOR**

TITLE: **275/345 KV GIS SUBSTATION PROPOSED SUBCATCHMENT AREAS**

DOCID: **CWW-OSP-STC-DW-0003**

SHEET OF	DWG. NO.	SCALE	FORMAT/SIZE	REV.
8 OF 9	SHEET - 8	AS SHOWN	ANSI D	D



BUILDING	CONTAINMENT AREA	STORMWATER FLOW DIRECTION	<b>NODES USED WITHIN HYDROCAD MODEL</b>
GRAVEL ROADS	WOODS	TRIBUTARY BOUNDARY	SUBCATCHMENT
CRUSHED ROCK AREA	DETENTION BASIN	TIME OF CONCENTRATION LINE	POND / STRUCTURE
GRADED EXTERNAL AREA - GRASS SEEDED			REACH

ALL UNITS SHOWN ARE 'ENGLISH UNITS' (FEET AND INCHES)

THIS PLAN SET IS PRELIMINARY AND HAS BEEN ISSUED FOR PERMITTING PURPOSES ONLY; AND, IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

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 2022/12/30/10:41:00 AM  
 jg04481



Appendix B  
ZONE OF VISUAL INFLUENCE MAPS



# Visibility Assessment

Figure B1  
Zone of Visual Influence (ZVI) Map  
1:24,000 Scale

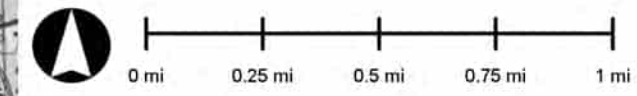
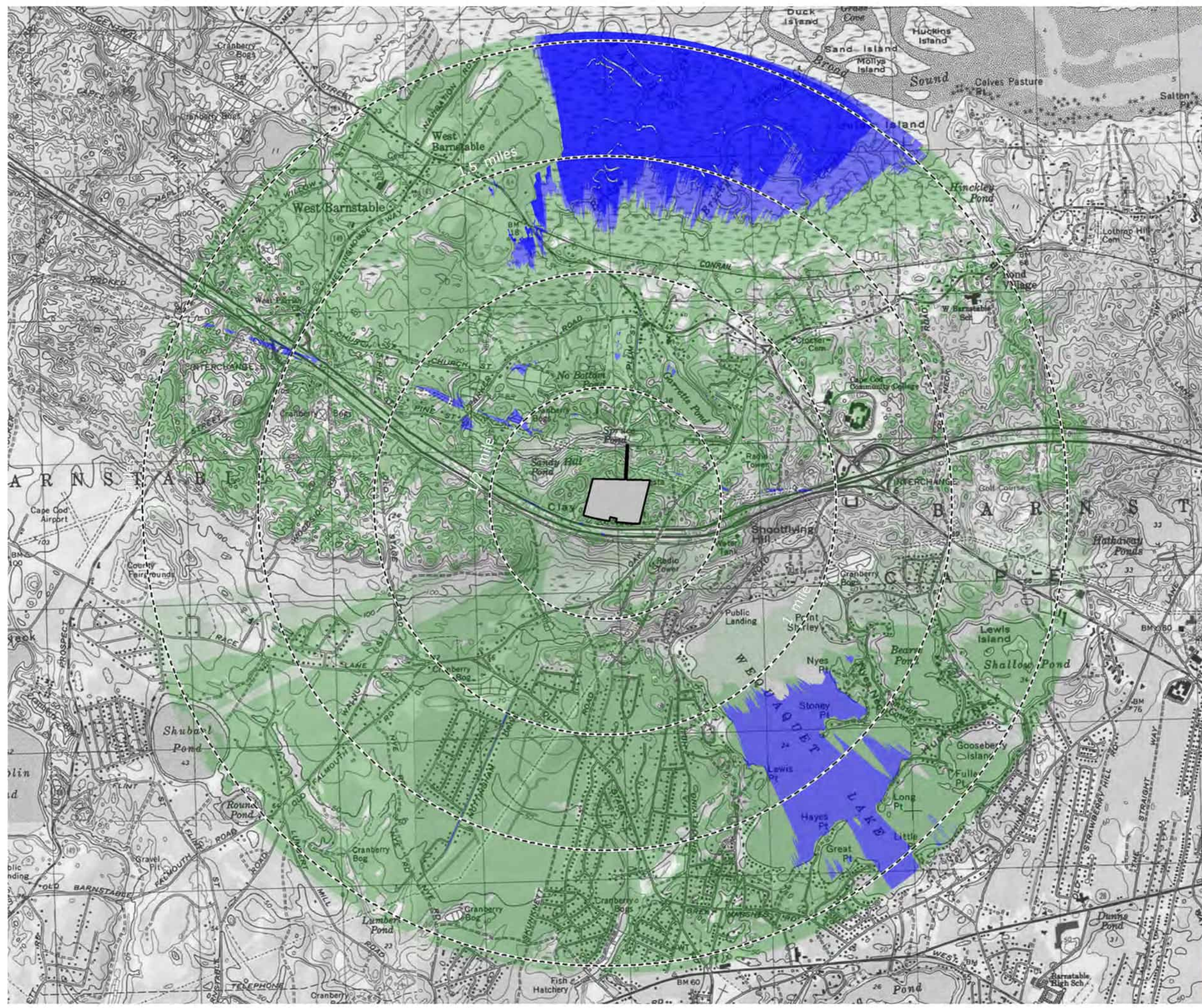
**Zone of Theoretical Visibility**  
(Excludes screening by existing vegetation and structures)

- Theoretical Viewshed Area Lighting Masts (80 ft tall)
- Theoretical Viewshed Area Substation Structures (30 ft tall)

**Zone of Likely Visibility**  
(Includes screening by existing vegetation and structures)

- Likely Viewshed Area Lighting Masts (80 ft tall)
- Likely Viewshed Area Substation Structures (30 ft tall)

**Proposed Substation**  
Project Site





# Visibility Assessment

Figure B2  
Zone of Visual Influence (ZVI) Map  
1:6,000 Scale

**Zone of Likely Visibility**  
(Includes screening by existing vegetation and structures)

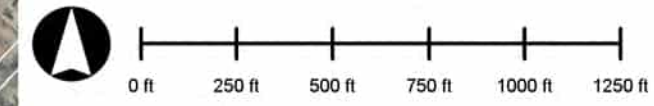
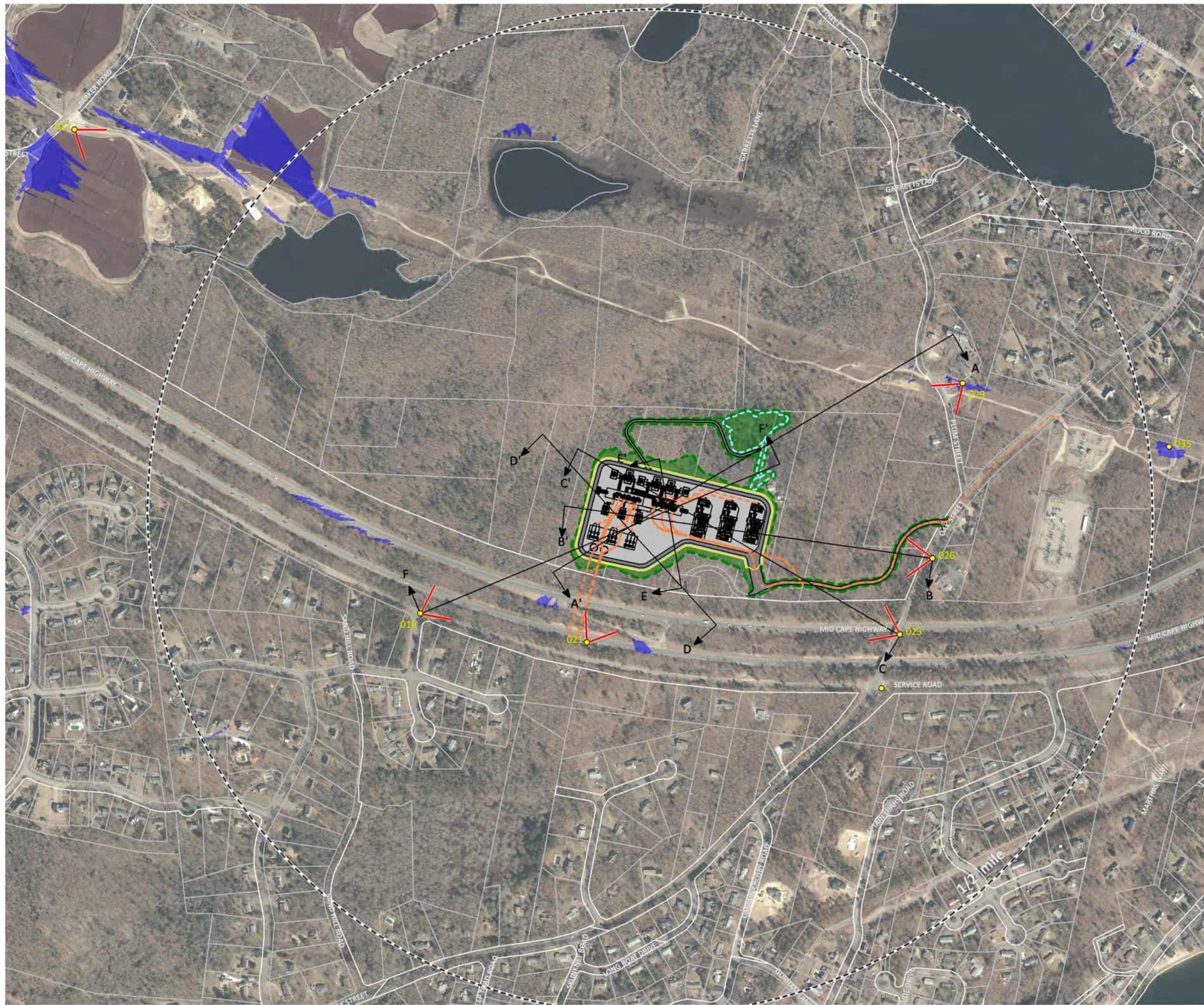
- Likely Viewshed Area Lighting Masts (80 ft tall)
- Likely Viewshed Area Substation Structures (30 ft tall)

### Photographs

- Line-of-Sight Profile Lines (See Appendix E)
- Photo Locations (See Appendix C)
- Photo Simulations (See Appendix D)

### Proposed Substation

- Drainage Basin
- Substation Equipment Pad
- Tree Clearing Area
- Underground Cables





Appendix C  
PHOTO LOG



Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
17	Parker Road at Eversource ROW #342	Town of Barnstable	3,260 ft	Not Visible



Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
18	Service Road at Saddle Lane	Town of Barnstable	3,240 ft	Not Visible

PHOTO LOG

Figure B1

Visibility Assessment  
**NEW ENGLAND WIND 2 CONNECTOR**  
 275/345kV GIS SUBSTATION





Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
19	Service Road at Biltmore Place	Town of Barnstable	880 ft	Not Visible



Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
20	Oak Street at Service Road	Town of Barnstable	960 ft	Not Visible

PHOTO LOG

Figure B2

Visibility Assessment  
**NEW ENGLAND WIND 2 CONNECTOR**  
 275/345kV GIS SUBSTATION





Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
21	US Route 6 (Mid-Cape Highway)	Town of Barnstable	410 ft	Not Visible



Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
23	Oak Street at US Route 6 Overpass	Town of Barnstable	820 ft	Not Visible

PHOTO LOG

Figure B3

Visibility Assessment  
**NEW ENGLAND WIND 2 CONNECTOR**  
 275/345kV GIS SUBSTATION





Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
26	Oak Street Near 550 Oak Street	Town of Barnstable	860 ft	Not Visible



Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
29	Within Eversource ROW #342 Near 50 Plum Street	Town of Barnstable	1,140 ft	Not Visible

PHOTO LOG

Figure B4

Visibility Assessment  
**NEW ENGLAND WIND 2 CONNECTOR**  
 275/345kV GIS SUBSTATION





Existing View

Photo	Location	Municipality	Distance to Site	Facility Visible
35	Within Eversource ROW #342 Near 675 Oak Street	Town of Barnstable	2,080 ft	Not Visible

PHOTO LOG

Figure B5

Visibility Assessment

**NEW ENGLAND WIND 2 CONNECTOR**  
275/345kV GIS SUBSTATION

Appendix D  
PHOTOGRAPHIC SIMULATIONS





EXISTING CONDITION VIEW  
Photo 17: Parker Road at Eversource ROW #342

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 12:53 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 30.7428" N  
70° 22' 09.2028" W  
Distance: 3,260 feet



**Figure-D1**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





SIMULATED CONDITION  
Photo 17: Parker Road at Eversource ROW #342

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 12:53 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 30.7428" N  
70° 22' 09.2028" W  
Distance: 3,260 feet



**Figure-D2**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





EXISTING CONDITION VIEW  
Photo 19: Service Road at Biltmore Place

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:03 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 05.4060" N  
70° 21' 45.7308" W  
Distance: 880 feet



**Figure-D3**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





SIMULATED CONDITION  
 Photo 19: Service Road at Biltmore Place

SARATOGA ASSOCIATES

Photograph Information

Date: December 2, 2022  
 Time: 1:03 pm  
 Focal Length: 24 mm  
 Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 05.4060" N  
 70° 21' 45.7308" W  
 Distance: 880 feet



**Figure-D4**  
 Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
 Substation





EXISTING CONDITION VIEW  
Photo 21: U.S. Route 6 (Mid-Cape Highway)

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:11 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 03.7896" N  
70° 21' 34.2216" W  
Distance: 410 feet



**Figure-D5**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





Proposed substation screened by foreground landform & vegetation

SIMULATED CONDITION  
Photo 21: U.S. Route 6 (Mid-Cape Highway)

SARATOGA ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:11 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 03.7896" N  
70° 21' 34.2216" W  
Distance: 410 feet



**Figure-D6**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





EXISTING CONDITION VIEW  
Photo 23: Oak Street at U.S. Route 6 Overpass

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:21 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 03.9768" N  
70° 21' 12.5316" W  
Distance: 820 feet



**Figure-D7**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





Proposed substation screened by foreground vegetation

SIMULATED CONDITION  
Photo 23: Oak Street at U.S. Route 6 Overpass

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:21 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 03.9768" N  
70° 21' 12.5316" W  
Distance: 820 feet



**Figure-D8**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





EXISTING CONDITION VIEW  
Photo 26: Oak Street Near 550 Oak Street

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:28 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 07.9152" N  
70° 21' 10.2096" W  
Distance: 860 feet



**Figure-D9**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





SIMULATED CONDITION  
Photo 26: Oak Street Near 550 Oak Street

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:28 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 07.9152" N  
70° 21' 10.2096" W  
Distance: 860 feet



**Figure-D10**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





EXISTING CONDITION VIEW  
Photo 29: Within Eversource ROW #343 near 50 Plum Street

SARATOGA  
ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:42 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 16.9584" N  
70° 21' 07.9560" W  
Distance: 1,140 feet



**Figure-D11**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation





Proposed substation screened by foreground vegetation

SIMULATED CONDITION

Photo 29: Within Eversource ROW #343 near 50 Plum Street

SARATOGA ASSOCIATES

Photograph Information

Date: December 2, 2022  
Time: 1:42 pm  
Focal Length: 24 mm  
Camera: Canon EOS 6D Mark II

Photo Location: 41° 41' 16.9584" N  
70° 21' 07.9560" W  
Distance: 1,140 feet

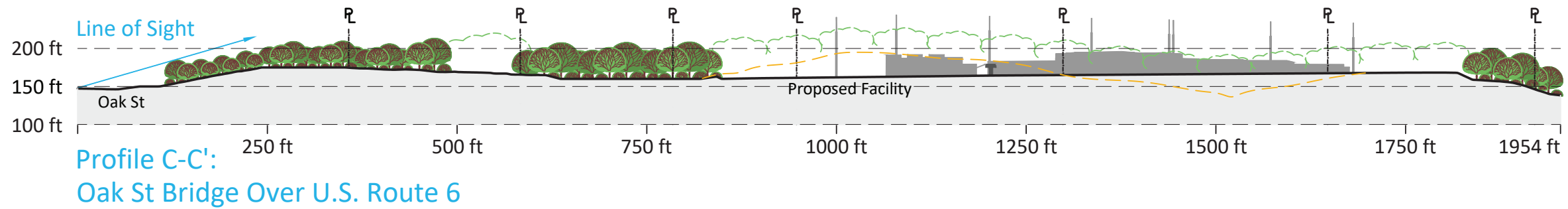
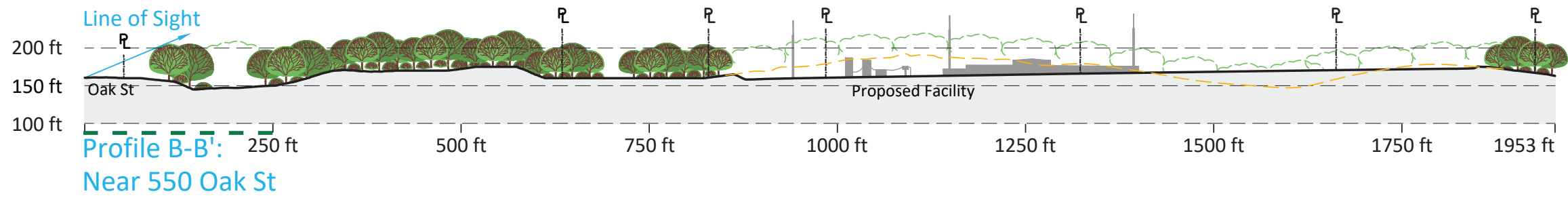
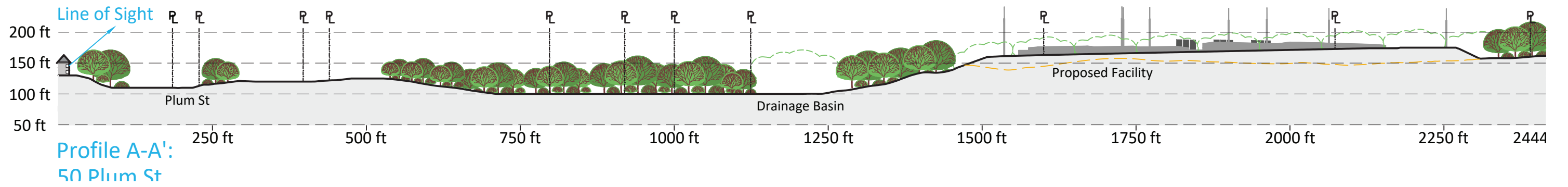


**Figure-D12**  
Project Visualizations  
**NEW ENGLAND WIND 2**  
**CONNECTOR 275/345kV GIS**  
Substation



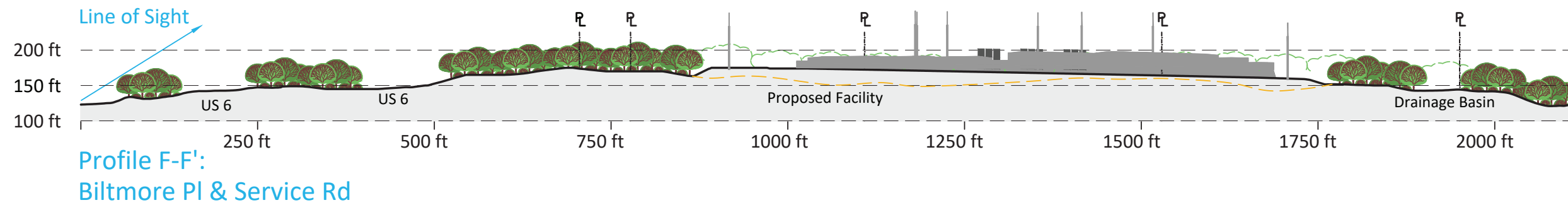
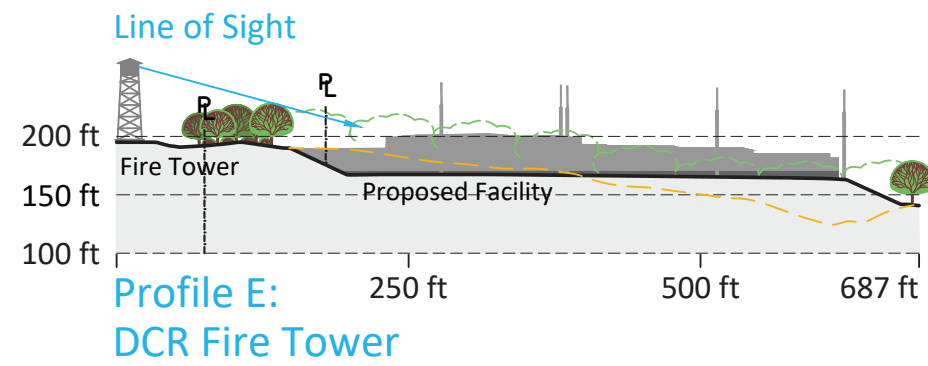
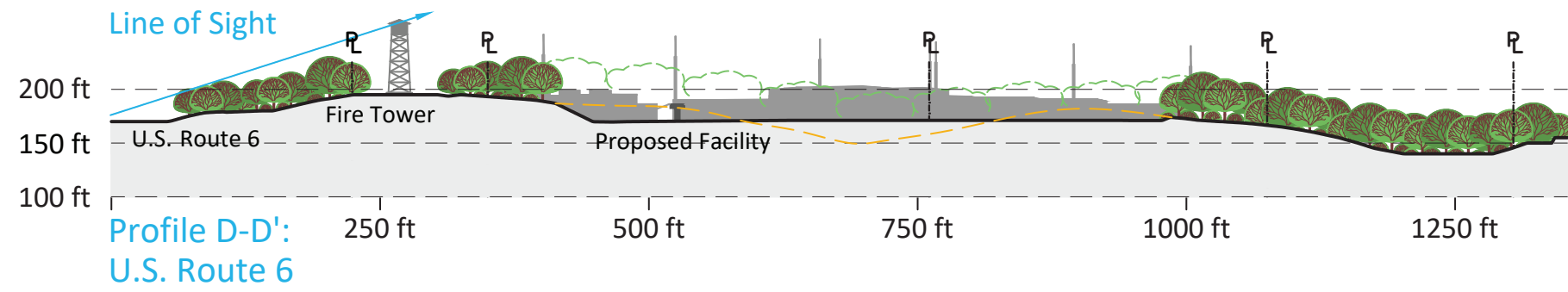
Appendix E  
LINE-OF-SIGHT PROFILES





**LEGEND**

- Existing trees to be removed
- Existing grade



LEGEND

- Existing trees to be removed
- Existing grade