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April 17, 2026

Via PRCe360 e-Filing and Case Management System

Ms. Melanie Sandoval
Bureau Chief of Records Management
New Mexico Public Regulation Commission
P.O. Box 1269
Santa Fe, NM 87504-1269
prc.records@prc.nm.gov

Re: El Paso Electric Company's Application for Determination of Right-of-Way Width for the Lava In and Out Transmission Line

Dear Ms. Sandoval:

El Paso Electric Company ("EPE") hereby files for Commission approval of right-of-way greater than 100 feet related to the construction and maintenance of a new, 345 kV side-by-side transmission line located outside of La Mesa, New Mexico.

This filing includes the direct testimony of three EPE witnesses and contains the following components:

- Application, and
- Direct Testimony and Exhibits of Edmundo Salazar, Michelle Veloz, and Alejandro Galvis.

This Application will be emailed to the New Mexico Public Regulation Commission ("NMPRC") Staff. EPE respectfully requests that the Commission act upon its application within six months of this filing (by October 17, 2026).

This Application is being filed electronically and a check in the amount of $25.00 for the Application will be mailed to the Commission. A copy of the check will be e-mailed to NMPRC Records separately.

Thank you for your assistance in this matter.

Very truly yours,

/s/ Jeffrey J. Wechsler
Jeffrey J. Wechsler

Enclosures

Cc: John Bogatko, NMPRC
John Kreienkamp, NMPRC
Jack Sidler, NMPRC
Orland Whitney, NMPRC

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE APPLICATION OF EL PASO ELECTRIC COMPANY FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE	))))))	**Case No. 26-00___**
EL PASO ELECTRIC COMPANY, Applicant	)))	

APPLICATION FOR DETERMINATION OF RIGHT-OF-WAY WIDTH
FOR THE LAVA IN AND OUT TRANSMISSION LINE

COMES NOW Applicant El Paso Electric Company ("EPE" or "Applicant"), by and through undersigned counsel, with its Application for Determination of Right-of-Way Width for the Lava In and Out Transmission Line and supporting testimony. This Application is brought pursuant to NMSA 1978 § 62-9-3.2, providing that a determination of right-of-way ("ROW") width shall be obtained from the New Mexico Public Regulation Commission ("Commission") prior to the construction of electrical transmission requiring a right-of-way width in excess of 100 feet.

The Lava In and Out Transmission Line is needed in order to deliver electricity generated from a new planned generation and energy storage facility called the Black Mountain Project to the electrical transmission grid via new electrical transmission lines which will be approximately one-half mile long. The new transmission lines will connect a planned 100-megawatt (MW) photovoltaic solar array and a proposed 50-MW battery energy storage system, both located in

New Mexico, on EPE-owned private property, into the existing power grid.[1] The Black Mountain Project is intended to provide electric service to EPE's Texas customers pursuant to Texas rates and tariffs and was selected through EPE's 2025 All Source Request for Proposal competitive solicitation process.

The Lava In and Out Transmission Line includes two new overhead single-circuit 345 kilo-volt (kV) transmission lines that are side by side. This creates an "in and out" circuit for power to travel from the new planned Black Mountain Project to the grid. The two new Lava In and Out transmission lines will be constructed within a ROW corridor that is 2,539 feet long by 300 feet wide. Within that corridor, 2,199.4 feet of the ROW will be located on lands managed by the federal Bureau of Land Management ("BLM") Las Cruces District Office. The remaining 339.6 feet of the ROW corridor will be located on EPE's privately owned land.

EPE has determined through engineering studies that a right-of-way width of 300 feet (150 feet for each line) is required for the Lava In and Out Transmission Line, and hereby applies for approval of such a right-of-way width. Because the Lava In and Out Transmission Line is not being constructed in connection with, or to transmit electricity from, a generating plant capable of operation at a capacity equal to or greater than 300 megawatts, location control for the line is not required pursuant to NMSA 1978, Section 62-9-3(B).

This Application provides a summary below, along with further details in accompanying testimonies and exhibits, regarding the Applicant, the Black Mountain Project, ROW width statute requirements and compliance, and other matters related to this Application.

[1] The planned Black Mountain generation and energy storage facility is located entirely on EPE's private land and is not located within the ROW.

BACKGROUND

1. EPE is an investor-owned public utility company providing electricity in portions of Texas and New Mexico. EPE is the project developer and owner of the planned Black Mountain Project. EPE will own the associated photovoltaic solar panels, battery energy storage system, ten transmission structures, and transmission lines.

2. EPE proposes to construct, operate and maintain these transmission lines to connect the planned Black Mountain Project to the existing Afton-to-Newman transmission line,[2] thereby transmitting electricity generated by the new generation and energy storage facility to the grid. The new transmission lines will originate from a point of interconnection at the generation and energy storage facility's new planned Lava substation and run North to connect to EPE's existing Afton - Newman transmission line. In other words, the new lines will create an in-and-out transmission circuit from the existing Afton - Newman transmission line to the Black Mountain Project and then lead back out from the Black Mountain Project to the existing Afton - Newman transmission line. The two new 345 kV side-by-side lines will each be approximately half a mile long.

3. The ROW corridor will be located on a single project site in Doña Ana County, NM, approximately 8 miles west of La Mesa, New Mexico. The proposed location for the ROW is shown in Exhibit ES-1 to the Direct Testimony of Edmundo Salazar and Exhibit MAV-1 to the Direct Testimony of Michelle A. Veloz, which are submitted with this Application.

4. EPE has not yet obtained all land rights required for the ROW, however, the Bureau of Land Management ("BLM") has issued a Decision Record to grant a new ROW on the relevant portion of land that is owned by the United States federal government. *See*

[2] The Afton – Newman transmission line runs between EPE's existing Afton and Newman substations.

Exhibit ES-3 to the Direct Testimony of Edmundo Salazar. EPE is working with the BLM to obtain a final permit.

5. EPE has completed initial project design and initiated environmental studies and permitting for this endeavor. Pursuant to the National Environmental Policy Act, the BLM conducted an Environmental Assessment which resulted in a Finding of No Significant Impact. Exhibit ES-2 to the Direct Testimony of Edmundo Salazar.

6. The Lava In and Out Transmission Line is planned to be constructed in 2026.

RIGHT OF WAY WIDTH

7. EPE requests a 300-foot ROW width, which is required for compliance with electric and safety codes, for construction and maintenance logistics, and route design flexibility over local terrain features. EPE requests the Commission's ROW width determination pursuant to New Mexico's Right-of-Way width statute, NMSA 1978, § 62-9-3.2.

8. New Mexico's ROW width statute provides:

> Unless otherwise agreed to by the parties, no person shall begin the construction of any transmission line requiring a width for right of way of greater than one hundred feet without first obtaining from the commission a determination of the necessary right-of-way width to construct and maintain the transmission line. Construction does not include acquisition of rights of way, preparation of surveys or ordering of equipment.

NMSA 1978, § 62-9-3.2(A). The ROW width statute requires applications to contain, in writing, all information required for the Commission to make its determination, and to set forth the facts involved. NMSA 1978, 8 62-9-3.2(C). The statute also requires the applicant to cause notice of the time and place of hearing on the application to be given to any owner of "property to be taken" and to any person in actual occupancy of such property. Notice shall be given by first class mail at least 20 days before the time set for hearing, and the applicant shall file proof of notice on or before the hearing. NMSA 1978, 8 62-9-3.2(D). The BLM is the only other landowner besides EPE. The statute further provides the Commission shall act upon the application, after public hearing, within six months of the date the application was filed, and failure to do so is deemed to be approval of the application. NMSA 1978, §§ 62-9-3.2(E) & (F).

9. The ROW corridor for the Lava In and Out Transmission Line encompasses the two side-by-side overhead circuits, a 14-foot-wide permanent access road, ten steel transmission structures, ten permanent structure work areas, and two 150 x 400 feet pulling and tensioning sites.

10. The BLM is the only other landowner of the underlying lands for the ROW besides EPE, and the BLM has preliminarily indicated its agreement to implement the issuance of a new ROW grant. *See* Exhibit ES-3 (Decision Record) to the Direct Testimony of Edmundo Salazar. All affected landowners will be provided with notice of the proposed ROW.

11. EPE requests the Commission's approval of the requested ROW width pursuant to NMSA 1978, Section 62-9-3.2.

THE RIGHT OF WAY DETERMINATION SHOULD BE APPROVED

12. As explained herein and in the accompanying testimonies and exhibits that support this Application, the 300-foot ROW width is necessary to connect the new generation and energy storage facility to the electric transmission grid.

13. The ROW width statute, NMSA 1978, Section 62-9-3.2, requires Commission approval of ROW widths greater than 100 feet "unless otherwise agreed to by the parties." As explained in the Direct Testimony of Edmundo Salazar, the Lava In and Out Transmission Line will be located entirely on private and federal land for which EPE has or will have obtained

necessary land rights. The Direct Testimonies of Michelle A. Veloz and Alejandro Galvis and their respective accompanying exhibits demonstrate that a ROW width of 300 feet is necessary to provide sufficient space for construction and ongoing maintenance, while addressing electrical safety code requirements and construction and operational considerations according to industry standard practice.

WITNESSES

14. The Application is supported by the direct testimony of three witnesses, as follows:

Edmundo Salazar	Lava In and Out Transmission Line overview and background, land-owner approvals
Michelle A. Veloz	Overview of engineering design and need for 300' ROW
Alejandro Galvis	New Mexico Licensed Engineer analysis of transmission line including the project-specific conductor blowout, safe operating corridor, clearance, and vegetation-management considerations for the Project, confirming that the Project's design and proposed ROW corridor provide sufficient space for safe construction, operation, inspection, and maintenance

PROCEDURAL MATTERS

15. The Right-of-Way Width statute requires that an applicant provide notice of the hearing to "to any owner of property proposed to be taken and, if applicable, to the person in actual occupancy of the property." EPE will provide such persons with required notice. Notice to other persons, including the general public, is not required.

16. EPE requests that the Commission assign the matter to a hearing examiner and cause a public hearing to be timely held on this Application, or alternatively, waive the requirement for a hearing.

WHEREFORE, for the foregoing reasons, El Paso Electric Company respectfully requests that the Commission grant the requested ROW width determination to the extent required by law.

DATED April 17, 2026

Respectfully submitted,

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BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE APPLICATION OF EL PASO ELECTRIC COMPANY FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE	))))	**Case No. 26-00___**
EL PASO ELECTRIC COMPANY, Applicant	)))))	

DIRECT TESTIMONY OF

EDMUNDO SALAZAR

ON BEHALF OF

EL PASO ELECTRIC COMPANY

April 17, 2026

EL PASO ELECTRIC COMPANY
DIRECT TESTIMONY OF
EDMUNDO SALAZAR

TABLE OF CONTENTS

EXHIBITS

EL PASO ELECTRIC COMPANY
DIRECT TESTIMONY OF
EDMUNDO SALAZAR

I. INTRODUCTION AND QUALIFICATIONS

Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Edmundo Salazar. My business address is 100 North Stanton Street, El Paso, Texas 79901.

Q2. WHO IS YOUR CURRENT EMPLOYER AND WHAT POSITION DO YOU HOLD?

A. I am employed by El Paso Electric Company ("EPE" or the "Company") as Director of Project Development for the Energy Solutions and Business Development Department.

Q3. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I have a Bachelor of Business Administration degree with a concentration in Accounting and a Master of Accountancy from The University of Texas at El Paso in 2008, and a Graduate Certificate of Public Utility Regulations and Economics from New Mexico State University in 2015.

Before my current position, I worked as a Financial Accountant, Volume Control Analyst, Senior Gas Supply Accountant and Process Improvement Analyst for Texas Gas Service, a division of OneGas. From 2012 to 2020, I worked as a Senior Financial Forecasting Analyst in EPE's Treasury Department. In 2021, I worked as a Senior Financial Analyst in EPE's Resource Planning Management

("RPM") Department. In January 2022, I accepted my current position with EPE.

Prior to joining the Energy Solutions and Business Development Department, I provided support for RPM functions including Request for Proposals, Capital Budget for planned generation additions, Fuel & Purchased Power Budget, Energy Market and Fuel Interconnection studies, and Renewable Integration studies, amongst others. As a Senior Financial Forecasting Analyst for the Treasury Department, my main responsibility was to prepare, review, and analyze long-term and short-term financial forecasts. I also coordinated, maintained, and monitored the capital budget planning process and documentation.

Q4. WHAT ARE YOUR CURRENT RESPONSIBILITIES WITH EPE?

A. In my role I provide technical, financial, and qualitative analyses to align Environmental, Social, and Governance initiatives with business planning. I also direct and assist in the oversight and development of long-term and short-term project forecasts used for pro-forma financial documents, financial analyses, and the preparation of cost/benefit analyses. Most recently, I have been assigned to project development of renewable power facilities in EPE's service territory, and I have provided testimony in regulatory proceedings to support these projects.

Q5. HAVE YOU PREVIOUSLY PRESENTED TESTIMONY IN REGULATORY PROCEEDINGS?

A. Yes, I have filed testimony in proceedings before the Public Utility Commission of

Texas and the New Mexico Public Regulation Commission ("New Mexico PRC" or the "Commission").

II. PURPOSE OF DIRECT TESTIMONY

Q6. WHAT IS EPE SEEKING IN THIS CASE?

A. EPE is seeking to obtain approval from the Commission for a right-of-way width greater than 100 feet related to EPE's plan to connect the planned Black Mountain Project into EPE's grid.

Q7. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to support EPE's Application for Determination of Right-of-Way Width for the Lava In and Out Transmission Line ("Application"). I provide background information about the Black Mountain Project as well as the related transmission lines, and explain the property ownership for the ROW corridor, development of the project, and right of way approvals obtained by site owners to support the transmission lines.

Q8. ARE YOU SPONSORING ANY EXHIBITS IN SUPPORT OF YOUR TESTIMONY?

A. Yes, I am sponsoring the exhibits listed in the Table of Contents. Specifically, those include the following exhibits:

- Exhibit ES-1: Lava In and out Proposed Interconnection Design

- Exhibit ES-2: Executed FONSI report
- Exhibit ES-3: Executed Decision Record report

Q9. PLEASE IDENTIFY THE OTHER WITNESSES TESTIFYING ON BEHALF OF EPE AND THE SUBJECTS THEY ADDRESS.

A. Ms. Michelle Veloz from EPE's Transmission, Substation and Relay department will provide an overview of the engineering design. Mr. Alejandro Galvis, a New Mexico Licensed Engineer, explains his analysis of the transmission line including the project-specific conductor blowout, safe operating corridor, clearance, and vegetation-management considerations for the Project, which confirm that the Project's design and proposed ROW corridor provide sufficient space for safe construction, operation, inspection, and maintenance.

Q10. PLEASE DESCRIBE THE BLACK MOUNTAIN PROJECT

A. The Black Mountain Project is a planned100 MW Photovoltaic (PV) solar facility with a 50 MW 4-hour battery energy storage system (BESS) facility located at the EPE-owned 640-acre site in Afton, NM with an expected 2028 commercial operation. The project has two executed large generator interconnection agreements (LGIA) – one for the PV facility and the other for the BESS facility, interconnecting to EPE's system in a single point of interconnection (POI) designated at the new Lava Substation. The Black Mountain Project will have a collector substation with a collector step-up (CSU) transformer converting the 34.5kV alternative current

(AC) electricity at the project's side to the 345 kV level at the utility side, with a gen tie to the Lava Substation. The purpose of the collector substation is to gather (collect) the energy from the power conversion systems located throughout the project with inverters converting direct current (DC) energy from the equipment to alternative current (AC) required at the utility's grid. Both the collector substation and the Lava Substation will also be located at the EPE owned land in Afton, NM along with the Black Mountain Project. Although the project is located approximately three and a half miles east of the existing Afton North substation, through studies and analysis it was determined that building the new Lava Substation would be the most cost efficient and advantageous to support reliability efforts to serve increasing load and demand in the area.

There will be a 345 kV transmission line built with approximate length of about half a mile to connect the Lava Substation to existing the 345 kV Afton – Newman transmission line. Most of the line will be going through the Bureau of Land Management (BLM) property with the remainder going through EPE owned property. As further discussed below, EPE anticipates receiving the approved right of way grant from the BLM to build the half mile transmission line.

Q11. WHAT IS THE INTENDED USE OF THE PROJECT?

A. EPE plans to use this project to provide service to EPE's Texas customers pursuant to Texas rates and tariffs. It is an EPE self-build project which was selected through EPE's 2025 All Source Request for Proposal competitive solicitation process.

III. LAND OWNERSHIP AND AGREEMENT FOR THE REQUESTED RIGHT OF WAY

Q12. PLEASE EXPLAIN THE OWNERSHIP OF THE LAND THAT THE TRANSMISSION LINES WILL CROSS.

A. EPE owns the property where the Black Mountain generation and energy storage facility will be developed and constructed. The collector substation with the collector step-up transformer will be built on EPE's land, adjacent to the utility switchyard (Lava Substation). From the Lava Substation located on EPE's property, a 2,539-foot-long transmission line of which 339 feet will be built on EPE's property, and 2,200 feet will be built on BLM property. This transmission line will tap into the existing Afton-Newman 345 kV transmission line. Please refer to Exhibit ES-1 for a map of the proposed design.

Q13. HAS EPE OBTAINED THE RIGHT TO CROSS THE LANDS OF THE BLM?

A. Through the collaboration of the selected Engineer, Procure and Construct (EPC) provider, which is named EDF Power Solutions DSP Inc., and services from SWCA

Environmental Consultants, the National Environmental Policy Act (NEPA) process was successfully completed through the execution of the Decision Record (DR) and the Finding Of No Significant Impact (FONSI) through the BLM's environmental assessment (EA). Please refer to Exhibit ES-2 for the executed FONSI report and Exhibit ES-3 for the executed DR

Q14. WHAT DOES THE DECISION RECORD PROVIDE WITH RESPECT TO THE RIGHT-OF-WAY WIDTH?

A. The completion of the NEPA process concluded with the approval of the right of way by BLM without need for an Environmental Impact Statement (EIS) with consent to construct the required transmission line.

Q15. ALTHOUGH EPE HAS OBTAINED CONSENT FOR THE RIGHT-OF-WAY WIDTH REQUESTED, WILL EPE COMPLY WITH THE STATUTORY NOTICE REQUIREMENTS?

A. Yes. EPE will comply with the notice provisions of NMSA Section 62-9-3.2(D).

IV. RIGHT OF WAY WIDTH REQUEST

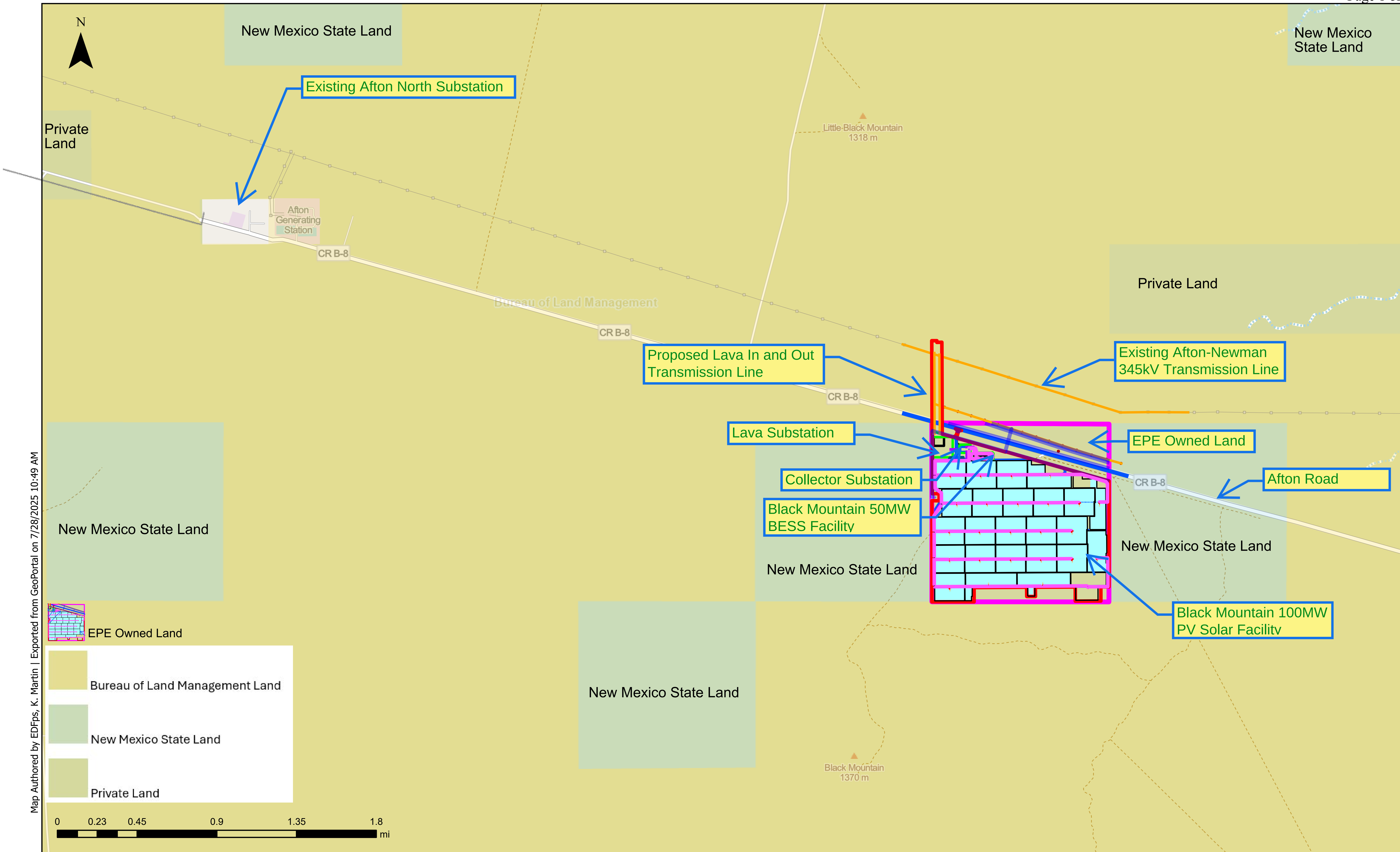
Q16. WHAT RIGHT OF WAY WIDTH IS EPE REQUESTING FOR THE TRANSMISSION LINES?

A. The right of way width consists of 150 feet for each of the two transmission lines, side by side, connecting from the new Lava Substation to the Afton-Newman 345 kV transmission line, for a total of 300 feet wide. The lines consist of parallel overhead single-circuit 345 kV transmission lines. There will be one 14-foot-wide permanent access road within the right of way corridor, used for inspections, operations, and maintenance of the transmission lines. Additionally, there will be ten 150 x 300 foot permanent work areas around each of the ten transmission structures to be used during inspection and maintenance activities, with the structures spread apart by approximately 450 feet. Ten new structures will be installed, two of which will be placed within the existing Afton-Newman 345 kV transmission line.

V. CONCLUSION

Q17. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.


N
New Mexico State Land
Existing Afton North Substation
Private Land
Afton Generating Station
CR B-8
Little Black Mountain 1318 m
New Mexico State Land
Private Land
Bureau of Land Management
Proposed Lava In and Out Transmission Line
Existing Afton-Newman 345kV Transmission Line
Lava Substation
EPE Owned Land
Collector Substation
Afton Road
Black Mountain 50MW BESS Facility
New Mexico State Land
New Mexico State Land
New Mexico State Land
Black Mountain 100MW PV Solar Facility
New Mexico State Land
Black Mountain 1370 m
EPE Owned Land
Bureau of Land Management Land
New Mexico State Land
Private Land
0 0.23 0.45 0.9 1.35 1.8 mi
Map Authored by EDFps, K. Martin | Exported from GeoPortal on 7/28/2025 10:49 AM

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FINDING OF NO SIGNIFICANT IMPACT
for Black Mountain Solar Interconnection Project
DOI-BLM-NM-L000-2025-0008-EA
May 9, 2025

INTRODUCTION

The Bureau of Land Management (BLM) prepared an environmental assessment (EA) DOI-BLM-NM-L000-2025-0008-EA analyzing the effects of El Paso Electric (EPE) constructing, operating, and maintaining two overhead single-circuit 345-kV gen-tie transmission lines in Doña Ana County New Mexico. The EA analyzed site-specific effects associated with implementing the Proposed Action (Preferred Alternative) and the No Action Alternative.

Constructing, operating and maintaining the two-transmission lines, with design features is analyzed in Chapter 2 of the EA under the Proposed Action which includes:

- Constructing, operating and maintaining two transmission lines consisting of two overhead single-circuit 345-kV gen-tie transmission lines constructed within a 2,539-foot-long × 300-foot-wide ROW corridor. 2,199.413 feet of the ROW corridor would occur on BLM-administered land.
- Constructing, operating and maintaining one 14-foot-wide permanent access road within the ROW corridor, used for inspections, operations, and maintenance of the gen-tie transmission lines.
- Constructing, operating and maintaining ten 150 × 300–foot permanent work areas around each transmission structure to be used during inspection and maintenance activities. The structures will be spaced approximately 450 feet apart. Two of the 10 structures will be a structure replacement on the existing line authorized by NMNM 029898.
- Constructing and operating two temporary 150 × 400–foot Pulling and Tensioning (P/T) sites at the Point of Interconnection (POI).

El Paso Electric's goal of the proposed action is to connect to and support the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property directly south of the Proposed Action. El Paso Electric owns a 640-acre parcel of private land, south of West Afton Road and about 4.5 miles west of La Mesa, New Mexico. This location was selected because it provides a large, continuous flat area suitable for solar development within proximity to the existing transmission grid infrastructure and the Afton North substation that is owned by EPE. Based on the analysis of the potential impacts presented in the EA, the BLM Authorized Officer has the authority to issue a ROW grant for 30 years with the option of renewal.

This Finding of No Significant Impact has been prepared for the Proposed Action.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the attached Environmental Assessment (EA), DOI-BLM-NM-L000-2025-0008-EA entitled "Black Mountain Solar Interconnection Right-of-Way Project", I have determined that the selected alternative and design features will not significantly affect the quality of the human environment. Therefore, an Environmental Impact Statement (EIS) is not required.

Issue (EA Section)	Short-Term Effects and Significance Conclusions	Long-Term Effects and Significance Conclusions
Issue 1: How would the Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property affect habitat for the night-blooming cereus (*Peniocereus greggii var. greggii*) and sand prickly-pear (*Opuntia arenaria*) individuals and potential habitat?	Short-term temporary disturbance is defined as surface disturbance that occurs during the construction phase of the proposed project and would then be reclaimed after construction The analysis area for this issue comprises the City of El Paso-Rio Grande watershed (Hydrologic Unit Code 10 [HUC10] 1303010209), which covers 178,522 acres in New Mexico and Texas, and would include the project area. The project area and surrounding area have been previously disturbed by livestock grazing, roads, and transmission lines During the 2024 biological survey, no individuals of night-blooming cereus or sand prickly-pear were observed	Long-term disturbance is defined as surface disturbance that would occur during the construction phase of the proposed project and remain in effect throughout the operations phase, or the life of the project (30 years plus the potential for renewal). The analysis area for this issue comprises the City of El Paso-Rio Grande watershed (Hydrologic Unit Code 10 [HUC10] 1303010209), which covers 178,522 acres in New Mexico and Texas, and would include the project area. The Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property would represent a

	(SWCA 2024a). The Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property may impact potential habitat for these species or individuals not observed during the biological survey. The Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property would represent a 0.60% loss of night-blooming cereus and 0.55% loss of sand prickly-pear habitat, respectively, within the 178,522-acre analysis area.	0.60% loss of night-blooming cereus and 0.55% loss of sand prickly-pear habitat, respectively, within the 178,522-acre analysis area. Neither the Proposed Action nor the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property are likely to contribute toward a federal listing or loss of viability of these species due to the low context of habitat impacts relative to the available habitat within the analysis area and design features to minimize potential impacts.
Issue 2: How would the Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property affect wildlife habitat, including that of monarch butterfly (*Danaus plexippus*) and migratory birds.	Suitable nesting habitat for migratory birds is present throughout the project area for species that ground nest and nest in Chihuahuan desert scrub vegetation. During the 2024 survey, 11 bird species were detected, and 18 nests were observed, one of which was an active Swainson's hawk (*Buteo swainsoni*) nest containing one fledgling. Although no monarch butterflies or milkweed species (*Asclepias sp*.) were observed during the 2024 surveys, adult butterflies	Direct impacts to wildlife from construction would include the removal of existing habitat, risk of direct mortality of species during construction, loss or degradation of native habitat, and displacement of wildlife species from habitat due to development. Long-term impacts to migratory bird species would be minimal and unlikely to result in population-level effects. Long-term impacts to monarch butterflies are not expected to contribute to the federal listing

	may occur here during their annual migration, due to the presence of flowering plants that may be used for foraging. Construction activities would cause temporary disturbance to birds, such as noise disturbances, that would temporarily displace migratory birds in the proposed project area and vicinity. Affected individuals would be able to shift use to adjacent lands with similar habitat. Migratory bird nest survey would be required prior to construction and maintenance activities conducted within the nesting seasons, and design features would follow Avian Power Line Interaction Committee's best management practices. Potential monarch butterfly foraging habitat, which includes herbaceous flowering plants, may be removed during the construction phase; however, the herbaceous flowering plants within the project area is similar to surrounding habitat, therefore monarch butterflies could utilize adjacent habitat for foraging. In addition, design features include reclamation activities that involve using a seed mix that include milkweed species and a variety of flowering plants.	of the species or to a loss of its viability.

RESULTS OF NEPA ANALYSIS

Potentially beneficial and adverse effects related to the Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property are disclosed and analyzed in Chapter 3 of the EA.

Table 2. Summary of Beneficial and Adverse Impacts of Issues Analyzed in Detail

Issue Analyzed in Detail (EA Section 3.0)	Impact Summary (both Beneficial and Adverse) and Significance Conclusions
Issue 1: How would the Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property affect habitat for the night-blooming cereus (*Peniocereus greggii var. greggii*) and sand prickly-pear (*Opuntia arenaria*) individuals and potential habitat?	The project area and surrounding area have been previously disturbed by livestock grazing, roads, and transmission lines. The project area is located within the Chihuahuan Desert: Chihuahuan Basins, and Playas EPA Level IV ecoregion (Griffith et al. 2006). LANDFIRE National Vegetation Classification version 200 (U.S. Geological Survey 2016) identifies two dominant vegetation communities: Chihuahuan Desert Scrub (85.7% of project area) and North American Warm Desert Ruderal Scrub and Grassland (13.0% of project area). These are very common vegetation communities within the analysis area and the ecoregion, comprising 14.77% and 52.31% of the analysis area, respectively. Night-blooming cereus is designated as a state endangered species (New Mexico Energy, Minerals, and Natural Resources Department [EMNRD] 2023) and is a BLM sensitive species (BLM 2024c). The project area contains sandy soils and sand dunes which are considered potential habitat for night-blooming cereus. There are approximately 562.1 acres of suitable habitat for this species within the project area. Sand prickly-pear is designated as a state endangered species (EMNRD 2023) and is a BLM sensitive species (BLM 2024c). The North American Warm Desert Ruderal Scrub and Grassland and Chihuahuan Desert Scrub habitat types contain marginal and suitable habitat respectively for the sand prickly-pear due to the presence of sandy soils, dune features, and suitable vegetation associations (SWCA 2024a). The Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property would disturb potential habitat for night-blooming cereus and sand prickly-pear. The potential impact represent a 0.60% loss of night-blooming cereus and 0.55% loss of sand prickly-pear habitat, respectively, within the 178,522-acre analysis area; however, in practice, not all acres are expected to be disturbed during actual construction and implementation of the Proposed Action and development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property.
Issue 2: How would the Proposed Action and the development of a proposed	Impacts to wildlife species and potential habitat from the Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property

ISSUE ANALYZED IN DETAIL (EA SECTION 3.0)	IMPACT SUMMARY (BOTH BENEFICIAL AND ADVERSE) AND SIGNIFICANCE CONCLUSIONS
100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property affect wildlife habitat, including that of monarch butterfly *(Danaus plexippus*) and migratory birds.	would occur through permanent and temporary loss of habitat, vehicle traffic, and noise. The Chihuahuan Deserts: Chihuahuan Basins and Playas Level IV ecoregion provides habitat for a variety of wildlife species (Griffith et al. 2006). Wildlife observed during the 2024 biological survey throughout the project area includes 11 bird species and five mammal species (SWCA 2024a). Suitable nesting habitat for migratory birds is present throughout the project area for species that ground nest and nest in Chihuahuan desert scrub vegetation. Various species of songbirds and raptors are common to the area and could use this habitat for nesting. During the 2024 survey, 11 bird species were detected, and 18 nests were observed, one of which was an active Swainson's hawk (Buteo swainsoni) nest containing one fledgling. Although no monarch butterflies or milkweed species (*Asclepias* sp.) were observed during the 2024 surveys, adult butterflies may occur here during their annual migration, due to the presence of flowering plants that may be used for foraging. Direct impacts to wildlife from construction would include the removal of existing habitat, risk of direct mortality of species during construction, loss or degradation of native habitat, and displacement of wildlife species from habitat due to development. Potential indirect impacts could include disruption or displacement of species from nesting/birthing and foraging areas, changes in activity patterns due to construction, increased human activity, and noise disturbance. The monarch butterfly is designated as a U.S. Fish and Wildlife Service (USFWS) candidate species (USFWS 2024) and is a BLM sensitive species (BLM 2024c). Primary threats to the species include habitat destruction and fragmentation throughout the flyway, especially in overwintering and breeding sites; habitat loss through urbanization; use of toxic agrochemicals; and a reduction of milkweed populations (Commission for Environmental Cooperation 2008). The Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property may impact up to 656.1-acres of potential foraging habitat during the construction phase. Vegetation within the project area is similar to surrounding habitat, therefore monarch butterflies could utilize adjacent habitat for foraging. The Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property are unlikely to impact breeding habitat, as no milkweed species were identified and detected during the 2024 biological survey. The Proposed Action and the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE owned private property are not expected to contribute to the federal listing of the monarch butterfly or to a loss of viability.

The following discussion focuses only on those issues for which NEPA analysis was determined to be necessary in the Black Mountain Solar Interconnection Project EA. *See* 43 C.F.R. § 46.310 ("The level of detail and depth of impact analysis should normally be limited to the minimum needed to determine whether there would be significant environmental effects.")

1. The degree to which the action may adversely affect public health and safety.

In the EA, public health and safety–related effects are described in Table 1.1 (air quality, risk of fire, and EMFs). The Proposed and Related Actions would be designed and constructed to maintain public safety in accordance with all applicable regulations. All new electrical facilities would be constructed, operated, and maintained in accordance with Occupational Safety and Health Administration regulations and established protocols for emergency preparedness and response. Project design would incorporate clearance requirements and industry safety design standards as established by the National Electrical Safety Code, as well as industry guidelines and standards published by the IEEE for electrical facilities. These mitigation measures would prohibit the spread of surface fire and assist in containment if a fire were to occur (see EA Section 2.1.8.11).

During construction, the project would likely result in a temporary increase in traffic on public roads in the vicinity of the project area. Because permanent personnel on-site postconstruction is expected to be zero, both the Proposed and Actions would likely have a negligible impact to traffic on local roads during operations.

Scientific review panels have consistently concluded that neither electric fields nor magnetic fields typically generated by transmission lines similar to the project are known or likely to cause any adverse health effect at the long-term, low-exposure levels found in the environment (see EA, Section 1.5.3, Table 1.2).

2. The degree to which the action may adversely affect unique characteristics of the geographic area such as historic or cultural resources, parks, Tribal sacred sites, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

A Class I records review of previously recorded cultural resources and a pedestrian Class III cultural resource inventory was conducted on September 13 through 21, 2024, and September 28 and 29, 2024, for the entire project area. All cultural resources identified in the surveyed area are either not eligible for the National Register of Historic Places or are no longer present. The Proposed and Related Actions would not impact any eligible or potentially eligible resources.

The analysis in the EA indicates that suitable potential habitat is present within the proposed project area for the night-blooming cereus and sand prickly-pear cactus, both New Mexico state endangered and BLM sensitive species. Results of a general biological survey were negative as neither of these species or look-a-like species were detected. Additionally, there are no U.S. Fish and Wildlife Service–designated critical habitats within the project area or its vicinity.

None of the soils within the project area are considered prime farmland or farmland of statewide importance. The project area does not intersect any wetlands or other water resources.

3. **Whether the action may violate relevant Federal, State, Tribal, or local laws or other requirements or be inconsistent with Federal, State, Tribal, or local policies designed for the protection of the environment.**

The Proposed and Related Actions do not violate any federal, state, local, or tribal law, regulation, or policy imposed for the protection of the environment. This project is consistent with applicable laws, land management plans, and policies.

4. **The degree to which the potential effects on the human environment are highly uncertain.**

The Proposed and Related Actions are relatively routine within southern New Mexico and the potential effects on the human environment are not highly uncertain or involve unique or unknown risks.

5. **The degree to which the action may adversely affect resources listed or eligible for listing in the National Register of Historic Places**.

The Proposed and Related Actions are not anticipated to create any degree of impacts to sites/objects on the National Register of Historic Places or to cause significant adverse loss or destruction of significant scientific, cultural, or historical resources because all cultural resources identified in the surveyed area are either not eligible for the National Register of Historic Places or no longer present. Any cultural resource (historic or prehistoric site or object) discovered by EPE, or any person working on their behalf, on public or federal land shall be immediately reported to the BLM Authorized Officer and EPE would follow an Unanticipated Discovery Protocol.

6. **The degree to which the action may adversely affect an endangered or threatened species or its habitat, including habitat that has been determined to be critical under the Endangered Species Act of 1973 (ESA).**

The Proposed and Related Actions are not likely to adversely affect any endangered or threatened species or its critical habitat. The Proposed and Related Actions are in conformance with the 1993 Mimbres RMP, which is based on the analysis of the Proposed RMP/EIS and associated Biological Assessment. Consultation was conducted with the United States Fish and Wildlife Service (USFWS) regarding the implementation of the RMP. This consultation resulted in concurrence from USFWS that the RMP "may affect, not likely to adversely affect" determination for all federally listed species and critical habitat under the ESA (Cons. #2-22-01-I-389). Additionally, a project-specific biological analysis was completed and concluded that no federally listed threatened or endangered species have a likelihood to occur within the proposed project area. Additionally, although two state-listed endangered species and BLM sensitive species (night-blooming cereus and sand prickly-pear) have the potential to occur in the project area, they were not observed during the biological survey and the project is unlikely to result in population-level effects.

7. The degree to which the action may adversely affect rights of Tribal Nations that have been reserved through treaties, statutes, or Executive Orders.

The Proposed and Related Actions would not adversely affect rights of Tribal Nations. The BLM LCDO recognizes that Native American tribes are governmental sovereigns with inherent powers to make and enforce laws, administer justice, and manage and control their natural resources. The BLM LCDO continues to pursue meaningful and long-lasting relationships with Tribes and Pueblos that may be affected by BLM decisions to ensure rights of Tribal Nations are respected and honored.

CONCLUSION

Based on the information contained in the EA, as well as all other information available to me at this time, it is my determination that the Proposed Action is in conformance with the 1993 Mimbres RMP, and that the degree of the effects of the Proposed Action do not rise to the level of significance requiring preparation of an EIS.

ANTHONY HOM Digitally signed by ANTHONY HOM Date: 2025.05.09 12:11:32 -06'00'

Anthony Hom
BLM Las Cruces District Office,
Deputy District Manager Multiple Resources

Date

Executive Order 14154, Unleashing American Energy (Jan. 20, 2025), and a Presidential Memorandum, Ending Illegal Discrimination and Restoring Merit-Based Opportunity (Jan. 21, 2025), require the Department to strictly adhere to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq. Further, such Order and Memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such Orders is a legal impossibility. The [bureau] verifies that it has complied with the requirements of NEPA, including the Department's regulations and procedures implementing NEPA at 43 C.F.R. Part 46 and Part 516 of the Departmental Manual, consistent with the President's January 2025 Order and Memorandum.

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Las Cruces District Office
1800 Marquess Street
Las Cruces, New Mexico 88005

DECISION RECORD
for Black Mountain Solar Interconnection Right-of-Way Project

DOI-BLM-NM-L000-2025-0008-EA
May 9, 2025

I. DECISION

It is my decision to implement the proposed action in the Environmental Assessment (EA), which is to issue a new right-of-way (ROW) grant for the construction and operation of the Black Mountain Solar Interconnection Right-of-Way Project on lands managed by the Bureau of Land Management (BLM) Las Cruces District d Office in Doña Ana County, New Mexico, as proposed by El Paso Electric Company (EPE). The project will consist of the following:

- Two transmission lines consisting of two overhead single-circuit 345-kV generation-tie (gen-tie) transmission lines constructed within a 2,539-foot-long × 300-foot-wide ROW corridor. 2,199.413 feet of the ROW corridor will occur on BLM-administered land. The remaining 339.587 feet of the ROW corridor will occur on private land.
- One 14-foot-wide permanent access road within the ROW corridor, used for inspections, operations, and maintenance of the gen-tie transmission lines.
- Ten 150 × 300–foot permanent work areas around each transmission structure to be used during inspection and maintenance activities. The structures will be spaced approximately 450 feet apart. Two of the 10 structures will be a structure replacement on the existing line authorized by NMNM 029898.
- Two temporary 150 × 400–foot pulling and tensioning (P/T) sites at the Point of Interconnection.

EPE's goal of the proposed action is to connect to and support the development of a proposed 100-megawatt (MW) photovoltaic solar facility and a proposed 50-MW battery energy storage system on EPE-owned private property directly south of the proposed action. Together, the solar facility and battery energy storage system are considered a non-Federal connected action.

II. COMPLIANCE AND CONFORMANCE

The proposed action, as described in the EA and the Finding of No Significant Impact (FONSI), conforms to the lands and realty program resource management guidance provided under the BLM Mimbres Resource Management Plan (RMP), approved in December 1993. In the EA, Section 1.4 Plan Conformance and Relationship to Statutes and Regulations, identifies the relevant and appropriate laws and regulations that the proposed project will conform to.

Executive Order 14154, Unleashing American Energy (Jan. 20, 2025), and a Presidential Memorandum, Ending Illegal Discrimination and Restoring Merit-Based Opportunity (Jan. 21, 2025), require the Department to strictly adhere to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq. Further, such Order and Memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such Orders is a legal impossibility. The [bureau] verifies that it has complied with the requirements of NEPA, including the Department's regulations and procedures implementing NEPA at 43 C.F.R. Part 46 and Part 516 of the Departmental Manual, consistent with the President's January 2025 Order and Memorandum. The [bureau]has also voluntarily considered the Council on Environmental Quality's rescinded regulations implementing NEPA, previously found at 40 C.F.R. Parts 1500–1508, as guidance to the extent appropriate and consistent with the requirements of NEPA and Executive Order 14154.

III. PUBLIC INVOLVEMENT

The EA, which serves as the basis for this decision, was prepared with adequate public involvement. The BLM solicited input from the public on the proposed project to assist in identifying key issues and defining the scope of the project and environmental analysis.

The BLM posted the Draft EA for EPE's proposed Black Mountain Solar Interconnection Right-of-Way Project (BLM Case File No. NMNM-141963) to ePlanning on Friday, March 28, 2025 to initiate a 30-day public comment period. During the comment period, the BLM LCDO received three public comments.

IV. RATIONALE FOR DECISION

By authorizing the proposed action, the BLM fulfills its responsibility under the Federal Land Policy and Management Act of 1976, which provides for land use authorizations to accommodate systems for generation, transmission, and distribution of electric energy.

The proposed action, as described above, conforms to the BLM Mimbres RMP and will not result in any undue or unnecessary environmental degradation. There will not be any significant impacts to the human environment; therefore, an environmental impact statement is not required as set forth in the FONSI document.

The BLM recognizes gen-tie lines as an appropriate use of public land through its issuance of ROWs, leases, and permits to individuals, businesses, and government entities for the use of public land. The Mimbres RMP provides management direction for the designation of ROW corridors, encouraging applicants to locate new facilities near existing sites or within existing ROW corridors. EPE's plan of development is legally incorporated into the ROW grant via stipulation.

The decision to implement the proposed action is based on the following findings and requirements for the project:

1) The proposed and connected actions will not negatively affect air quality; water resources; prime farmland; general vegetation; cultural resources; paleontological resources; visual quality of the landscape; livestock grazing; quality of life of local

residents; resources, objectives, and values of the Organ Mountains–Desert Peaks National Monument; or existing ROWs.

2) The proposed and connected actions will not contribute to public health and safety impacts with implementation of applicable design features.
3) The proposed and connected actions will have impacts to potential habitat for night-blooming cereus (*Peniocereus greggii* var. *greggii*) and sand prickly-pear (*Opuntia arenaria*), both state endangered and BLM sensitive species. Neither of these species were identified within or adjacent to the proposed and connected actions during biological resource surveys and the project is not expected to contribute toward a federal listing or loss of viability of these species. The implementation of the proposed project will lead to a loss of 0.60% night-blooming cereus potential habitat and a 0.55% loss of sand prickly-pear potential habitat within the 178,522-acre analysis area due to surface disturbance.
4) Adverse impacts from fugitive dust will be minimal through dust control measures outlined in the Air Quality project design features.
5) The proposed and connected actions will have impacts on wildlife habitat, migratory birds, and the monarch butterfly (*Danaus Plexippus*), a BLM sensitive and proposed threatened species as designated by the U.S. Fish and Wildlife Service. Direct impacts to wildlife would occur from construction and include the removal of existing habitat, risk of direct mortality to species during construction, loss or degradation of native habitat, and displacement of wildlife species from habitat due to development. There will be temporary impacts to migratory birds during construction activities, such as noise disturbances. Affected bird species would be able to utilize similar habitat on adjacent lands. Additionally, migratory bird nest surveys would be required prior to construction and maintenance activities that would occur during nesting season. Long-term impacts to migratory bird species would be minimal and unlikely to result in population-level effects. The project may impact up to 656.1 acres of potential foraging habitat for the monarch butterfly during the construction phase when vegetation is removed due to the presence of herbaceous flowering plants such as broom snakeweed (*Gutierrezia sarothrae*); however, vegetation within the project is similar to surrounding habitat, therefore, monarch butterflies could use adjacent habitat for foraging purposes. Both the proposed and connection actions are unlikely to impact breeding habitat, as no milkweed species were detected during the biological survey. Additionally, the proposed and connection actions are not expected to contribute to the federal listing of the species or to a loss of its viability. El Paso Electric (EPE) has included design features to minimize fugitive dust that could further impact foraging habitat. During the final reclamation phase of the project, the project area would be revegetated through reseeding. If successful, this effort is expected to enhance foraging and breeding habitat for the monarch butterfly.

V. RIGHT OF PROTEST AND/OR APPEAL:

Information On Taking Appeals To The Interior Board Of Land Appeals

DO NOT APPEAL UNLESS

1. This decision is adverse to you,

AND

2. You believe it is incorrect

IF YOU APPEAL, THE FOLLOWING PROCEDURES MUST BE FOLLOWED

1. NOTICE OF APPEAL	A person who wishes to appeal to the Interior Board of Land Appeals must file in the office of the officer who made the decision (not the Interior Board of Land Appeals) a notice that he/she wishes to appeal. A person served with the decision being appealed must transmit the *Notice of Appeal* in time for it to be filed in the office where it is required to be filed within 30 days after the date of service. If a decision is published in the FEDERAL REGISTER, a person not served with the decision must transmit a *Notice of Appeal* in time for it to be filed within 30 days after the date of publication (43 Code of Federal Regulations [CFR] 4.411 and 4.413).
2. WHERE TO FILE Notice of Appeal	Bureau of Land Management 1800 Marquess Street Las Cruces, New Mexico 88005
With Copy to Solicitor	Regional Solicitor Southwest Region U.S. Department of the Interior, 505 Marquette Avenue NW, Suite 1800 Albuquerque, New Mexico 87102
3. STATEMENT OF REASONS	Within 30 days after filing the *Notice of Appeal*, file a complete statement of the reasons why you are appealing. This must be filed with the United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. If you fully stated your reasons for appealing when filing a *Notice of Appeal*, no additional statement is necessary (43 CRF 4.412 and 4.413).
With Copy to Solicitor	Regional Solicitor Southwest Region U.S. Department of the Interior, 505 Marquette Avenue NW, Suite 1800 Albuquerque, New Mexico 87102

4. ADVERSE PARTIES	Within 15 days after each document is filed, each adverse party named in the decision and the Regional Solicitor having jurisdiction over the State in which the appeal arose must be served with a copy of: (a) the *Notice of Appeal,* (b) the Statement of Reasons, and (c) any other documents filed (43 CFR 4.413).
5. PROOF OF SERVICE	Within 15 days after any document is served on an adverse party, file proof of that service with the United States Department of Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. This may consist of a certified or registered mail "Return Receipt Card" signed by the adverse party (43 CFR 4.401(c)).
6. REQUEST FOR STAY	Except where program-specific regulations place this decision in full force and effect or provide for an automatic stay, the decision becomes effective upon the expiration of the time allowed for filing an appeal unless a petition for a stay is timely filed together with a *Notice of Appeal* (43 CFR 4.21). If you wish to file a petition for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Interior Board of Land Appeals, the petition for a stay must accompany your Notice of Appeal (43 CFR 4.21 or 43 CFR 2801.10 or 43 CFR 2881.10). A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the *Notice of Appeal* and Petition for a Stay **must** also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted. **Standards for Obtaining a Stay**. Except as otherwise provided by law or other pertinent regulations, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards: (1) the relative harm to the parties if the stay is granted or denied, (2) the likelihood of the appellant's success on the merits, (3) the likelihood of immediate and irreparable harm if the stay is not granted, and (4) whether the public interest favors granting the stay.

Unless these procedures are followed, your appeal will be subject to dismissal (43 CFR 4.402). Be certain that **all** communications are identified by serial number of the case being appealed.

NOTE: A document is not filed until it is actually received in the proper office (43 CFR 4.401(a)). See 43 CFR Part 4, Subpart B for general rules relating to procedures and practice involving appeals.

This action may be appealed to the Interior Board of Land Appeals as described above.

VI. APPROVAL

ANTHONY HOM Digitally signed by ANTHONY HOM
Date: 2025.05.09 12:43:54 -06'00'

Anthony Hom
BLM Las Cruces District Office
Deputy District Manager, Multiple Resources

Date

ATTACHMENT: A) Design Features

ATTACHMENT: A) DESIGN FEATURES:

To reduce impacts on resources, the following general and resource-specific design features have been developed and incorporated into the proposed action:

General

- All construction-vehicle movement outside the ROW will be restricted to designated access, P/T sites, contractor-acquired access, or public roads.
- The spatial limits of construction activities will be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents indicating survey or construction limits will be applied to rocks, vegetation, structures, fences, etc.
- Prior to construction, environmental awareness training will be conducted to instruct all personnel on the protection of cultural, ecological, and other natural resources, including 1) federal and state laws regarding antiquities and plants and wildlife, including collection and removal; 2) the importance of these resources; and 3) the purpose and necessity of protecting them.
- The contractor will limit movement of crews, vehicles, and equipment on the ROW, P/T sites, and approved access roads to minimize damage to property and disruption of normal land use activity.
- Construction vehicles and equipment will be maintained in proper operating condition and will be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, engine enclosures).

Air Quality

- EPE shall meet all federal, State of New Mexico, and local standards for necessary dust control measures as approved by the BLM Authorized Officer. This includes a fugitive dust plan as described in New Mexico Administrative Code Title 20, Chapter 2, Part 23.
- EPE shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.
- Construction of all project components will take approximately 24 months and occur in phases. The transmission gen-tie on BLM land is expected to last 4 to 6 months. Staggering site preparation, ROW clearing, and other mechanical activities will reduce surface disturbance and the number of sources of fugitive dust emissions, which reduces the overall potential for uncontrolled fugitive dust from the project (EPA 1992).
- Wet suppression methods (application of water via water truck) will be implemented prior to, during, and after ground-disturbing activities. Water will be applied to travel surfaces and working construction areas. Water application will occur at sufficient frequency and quantity (e.g., more frequently and in greater amounts during drier, warmer days where fugitive dust is more likely) to control fugitive dust emissions (EPA 1992).
- EPE and its contractor will consider weather conditions (e.g., wind speed, humidity) on a daily basis when planning construction activities. Water will be applied prior to periods of higher winds and construction will be halted during high wind events.

- EPE and its contractor will ensure that all equipment and vehicles are cleaned prior to entering and exiting the Proposed Action to prevent mud and dirt tracking as a result of wet suppression applications during construction (Midwest Research Institute 1990).
- Water will be applied to the spoil/soil stockpiles, and ground areas around the piles (particularly as soil is added and removed from the pile).
- No spoil or soil stockpiles will be left on-site after construction (EPA 1992).
- If project activities require hauling of soil/debris by truck during construction, wet suppression will be implemented by watering the load and covering it during transportation (EPA 1992).
- All disturbed areas not needed for operations or ongoing maintenance of the project will be reclaimed and revegetated after construction to minimize fugitive dust emissions resulting from wind erosion (EPA 1992).

Soils and Vegetation

- EPE shall remove only the minimum amount of vegetation necessary for the construction of structures. Topsoil shall be conserved during excavation and reused as cover on disturbed areas to facilitate regrowth of vegetation.
- EPE shall, as determined and directed by the BLM Authorized Officer, seed all disturbed areas, using an agreed-upon method suitable for the location. Seeding shall be repeated if a satisfactory stand is not obtained as determined by the Authorized Officer upon evaluation.
    - Seed-bed preparation shall be performed to provide a hospitable environment for germinating seed by breaking up impermeable soil layers that have formed and increasing void spaces for air and water. Ground shall be roughed-up prior to seeding, by raking, harrowing, or other methods, especially those areas that are compacted during project construction.
    - Seeding shall be accomplished in June or July to coincide with the "rainy" season to achieve optimum results. Seed will be planted 0.25 to 2 inches deep using a disc type or similar rangeland drill sufficient to accommodate variations in seed sizes, or if broadcast, the rates should be doubled. If broadcast, a "cyclone" hand seeder or similar broadcast seeder shall be used to facilitate an even spread. After seed is broadcast, ground shall be raked or dragged, to help bury it and improve soil contact and provide texture.
    - Mulching is required on all seeding projects to prevent loss of moisture and seed to wind. Mulch shall be free of weeds and weed seed. Rotten or molded hay is not acceptable as mulch. Mulching shall be accomplished using one of the following methods:
        - Weed free straw (2 tons/acre)
        - Wood residues (sawdust, wood chips, bark) (2 tons/acre)
        - Hydro-mulching (1,500 pounds/acre)
        - Composted manure (5 tons/acre)
        - Excelsior blanket
        - Straw jute
    - Mulch shall be applied on the surface within 1 day following seeding. A soil stabilizer shall be applied as an overspray after seed and mulch are in place. This tack should be at a sufficient rate so as to prevent mulch from moving due to wind. The following site identifies certified weed-free mulch providers: http://aces.nmsu.edu/ces/seedcert/certified-weed-free-fora.html. Site-specific seed mix will be reviewed and approved by the Authorized Officer.

    - Any seed used on public land shall not contain noxious weed seed and must meet certified seed quality. The seed procured for use on public land will meet the Federal Seed Act criteria. All seed to be applied on public land must have a valid seed test, within 1 year of the acceptance date, from a seed analysis lab by a registered seed analyst (Association of Official Seed Analysts). The seed lab results shall show no more than 0.5% by weight of other weed seeds. The seed lot shall contain no noxious, prohibited, or restricted weed seeds according to state seed laws in the respective state(s). Copies of the seed lab test results, including purity and germination (viability) rate, must be forwarded to the appropriate BLM office prior to seed application. If the seed does not meet BLM and state/federal standards for noxious weed seed content or other crop seed allowances, it shall not be applied to public land.
    - Stabilization will occur after a minimum of two full summer growing seasons after planting.

- Erosion issues shall be repaired as discovered, as directed by the BLM Authorized Officer.
- During reclamation, compacted areas (typically any area that received repeated traffic or three or more passes by heavy equipment) will be decompacted, to the depth of compaction, by subsoiling or ripping to the depth of compaction. This will help prepare the seed bed, encourage infiltration, and help to prevent accelerated runoff and erosion. Where topsoil has been salvaged and segregated, decompaction will occur prior to respreading topsoil. Scarification will be used only on shallow soils.
- Salvaged topsoil will be protected from wind and water erosion at all times. To ensure proper erosion control of topsoil piles, all sediment and erosion control measures will be inspected after large rain events and repairs will be performed as needed.
- Soil erosion will be minimized by implementing procedures described in the Stormwater Pollution Prevention Plan (SWPPP).
- If construction is planned during a storm event, vehicle traffic and equipment will be restricted to prevent excessive rutting.
- No activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 3 inches deep, the soil shall be deemed too wet to support construction equipment.
- EPE shall span areas of known erosion to the greatest extent possible as they are responsible for the prevention and control of soil erosion, stormwater runoff, stabilization, and revegetation on BLM-administered land covered by this authorization, and land adjacent thereto, where such erosion has resulted from construction or maintenance of this project.
- If diversion of water from the authorized area will result in accelerated erosion in undisturbed areas, water bars shall not be constructed. Furthermore, if the authorized area has a side slope approximately one-third or more of the slope along the length of the authorized area, water bars may not be constructed. Exceptions to spacing intervals will be upon approval of the Authorized Officer.
- EPE shall re-contour disturbed areas or designated sections of the authorized area by grading to restore the sites to approximately the original contour of the ground, as determined by the Authorized Officer.
- EPE shall, as directed by the BLM Authorized Officer, rectify backfill settling in the authorized area.
- When sufficiently abundant, overburden and topsoil will be stockpiled (within the authorized area) during construction for use during reclamation. Prior to seeding, the topsoil will be re-deposited (shaped and contoured) to resemble surrounding topography. Ripping or plowing

compacted soils may be necessary in some areas and will be addressed on a case-by-case basis, as directed by the BLM Authorized Officer.

- EPE shall uniformly spread topsoil over all unoccupied disturbed areas (outside the ditch line, fence line, or work area). Spreading shall not be done while the ground or topsoil is frozen or wet.
- EPE shall restore drainages, to the greatest extent possible, to the original bank concentration, stream-bottom width, and channel gradient.
- EPE shall construct, maintain, repair, or replace, erosion control measures (water bars, etc.), barriers, and sedimentation control devices as necessary to ensure optimum function, as directed by the BLM Authorized Officer.
- All soils compacted by movement of construction vehicles and equipment will be 1) loosened and leveled through harrowing or disking to approximate preconstruction contours and 2) reseeded with certified weed-free native grasses and mulched (except in cultivated fields). The specific seed mix(es) and rate(s) of application will be determined by the BLM.
- Excavated material not used in the backfilling of poles will be spread around each pole or hauled off-site or transported as fill to other locations where needed.
- In newly disturbed temporary work areas, soil will be salvaged, distributed, and contoured evenly over the surface of the disturbed area after construction completion. The soil surface will be left rough to help reduce potential wind erosion.
- Upon completion of work, all work areas, except any permanent access roads/routes necessary for operation and future maintenance, will be regraded as required so that all surfaces will drain naturally and blend with the natural terrain, and be left in a condition to facilitate natural revegetation, provide for proper drainage, and prevent erosion.
- EPE shall be responsible for weed control on disturbed areas within the limits of the site. EPE is responsible for consultation with the BLM Authorized Officer and/or local authorities for acceptable weed control methods, which include following NEPA and BLM requirements and policy.
- Power clean, or high-pressure clean all equipment of all mud, dirt, and plants immediately prior to moving into the Proposed Action. Any gravel or fill to be used must come from weed-free sources. Inspect gravel pits and fill sources to identify weed-free sources. No soil spoil that could potentially contain noxious weed seeds shall be transported out of the area where it is created.
- EPE shall be responsible for conducting a survey for and control of noxious weeds along the route proposed for construction. If during construction, noxious weeds are identified that were not originally encountered during the survey, the project applicant shall avoid driving vehicles and equipment through or over the infested area. If avoidance measures cannot be implemented within the area originally cleared, construction shall cease and the BLM Authorized Officer shall be contacted.
- Any use of herbicides/pesticides shall comply with the applicable federal and state laws. Herbicides/pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, EPE shall obtain from the Authorized Officer written approval of a plan showing the type and quantity of materials to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the Authorized Officer. Emergency use of pesticides shall be approved in writing by the Authorized Officer prior to use.

Water Resources

- A SWPPP will be implemented to minimize stormwater transport of sediment from disturbed areas to area streams. All project-related SWPPP implementations will be in compliance with a National Pollutant Discharge Elimination System permit.
- Any chemical treatments of the ROW will comply with the applicable laws and procedures of the land management agencies, the EPA, and the New Mexico Environment Department.
- Construction activities will be performed by methods that prevent entrance or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing streams or dry watercourses, lakes, and underground water sources. Such pollutants and wastes include but are not restricted to refuse, garbage, cement, concrete, sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing.

Wildlife and Special-Status Species, including Special-Status Plants

- Special-status species or other species of particular concern will be considered in accordance with management policies set forth by appropriate land management agencies. In cases where such species are identified, adverse impacts on the species and its habitat will be avoided to the maximum extent practical and in consultation with the agencies.
- Electrical facility design will be in accordance with *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee 2006) and EPE's approved internal standards.
- If EPE's construction and maintenance activities, including mechanical or herbicide treatments of woody vegetation, occur during the primary nesting season for migratory birds (March 1–September 15), migratory bird and nest surveys will be performed no more than 2 weeks prior to commencing with those activities by a qualified biologist, and an avoidance buffer around each active nest will be implemented until the young have fledged, the size and timing of which may vary by species but will be no less than 100 feet. Established stick nests will always be identified and avoided; stick nest locations shall be provided to the BLM Authorized Officer.
- If during construction, wildlife species (such as reptiles, amphibians, or small mammals) are encountered, they will be avoided or allowed to move out of the way.
- A 200-meter avoidance buffer will be implemented around any active western burrowing owl nest burrow or active raptor nest until the young have fledged.
- The BLM may require a biological monitor near occupied nests and burrowing owl burrows identified during preconstruction surveys.
- Removal of any unoccupied raptor nests may require replacement by nest platforms if directed by the BLM Authorized Officer.
- Construction holes left open overnight shall be covered. Covers shall be secured in place and shall be strong enough to prevent livestock or wildlife from falling through and into a hole.

Cultural Resources

- Impacts to archaeological sites will be avoided. In consultation with appropriate land management agencies and the State Historic Preservation Office, specific mitigation measures for cultural resources will be developed and implemented, which may include project modifications (e.g., reroutes or narrowing of ROWs), monitoring of construction activities, and/or data recovery studies.

- Any cultural resource (historic or prehistoric site or object) discovered by EPE, or any person working on public or federal land shall be immediately reported to the BLM Authorized Officer. EPE shall suspend all operations within 30 meters (approximately 100 feet) of such discovery until written authorization to proceed is issued by the Authorized Officer. In addition, the area of discovery will be covered, stabilized, or otherwise protected from damage. An evaluation of the discovery will be made by the BLM Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. EPE will be responsible for the cost of the evaluation, and any decision as to proper mitigation measures will be made by the BLM Authorized Officer after consulting with EPE.

Paleontological Resources

- Impacts to paleontological resources will be avoided.
- EPE shall immediately notify the BLM Authorized Officer of any paleontological resources discovered (unanticipated discovery) as a result of operation under this authorization. EPE shall suspend all activities in the vicinity of such discovery until notified to proceed by the BLM Authorized Officer and shall protect the discovery from damage or looting. EPE may not be required to suspend all operations if activities can be adjusted to avoid further impacts to a discovered locality or can be continued elsewhere. The BLM Authorized Officer will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than 10 working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the BLM Authorized Officer after consulting with EPE. Within 10 days, EPE will be allowed to continue construction through the site or will be given the choice of either (1) following the BLM Authorized Officer's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (2) following the BLM Authorized Officer's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

Visual Resources

- No signs or advertising devices shall be placed on the premises or on adjacent public land except those posted by or at the direction of the BLM Authorized Officer.
- EPE plans to construct the project with weathered steel structures to reduce visual impacts.
- Non-specular conductors (conductors made of non-reflective materials) will be used where specified by the BLM Authorized Officer.
- Vegetation, soil, and rocks left as a result of construction will be randomly scattered over the Proposed Action and will not be left in rows, piles, or berms unless requested by the BLM.

Noise

- Construction and maintenance activities will only occur during daytime hours. Any emergency work needed to restore services during nighttime hours will be exempt from general noise limits established under the County Noise Ordinance (BLM 2017).
- Construction vehicles and equipment will be maintained in proper operating condition and will be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, engine enclosures).

Livestock

- All fences and gates will be maintained during the construction period.

- Range improvements, such as fences, gates, and walls, will be replaced, repaired, or reclaimed to their original condition as required by the landowner or the land-management agency if they are removed, damaged, or destroyed by construction activities. Fences will be braced before cutting.
- Gates or enclosures will be installed only with the permission of the landowner or the land-management agency and will be removed/reclaimed following construction should it be necessary.
- Cattle guards could be installed on a case-by-case basis in negotiation with the landowner or land-management agency.

Public Safety

- All new electric facilities will be constructed, operated, and maintained in accordance with Occupational Safety and Health Administration regulations and established protocols for emergency preparedness and response.
- Project design will include appropriate clearance requirements and safety design standards found in the National Electrical Safety Code.
- EPE's gen-tie transmission line design and construction will follow industry guidelines and standards.

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE APPLICATION OF EL PASO ELECTRIC COMPANY FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE	)	**Case No. 26-00___**
EL PASO ELECTRIC COMPANY, Applicant	)	

DECLARATION OF EDMUNDO SALAZAR IN SUPPORT OF THE FOREGOING DIRECT TESTIMONY OF EL PASO ELECTRIC COMPANY'S APPLICATION FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE

I ***Edmundo Salazar***, pursuant to Rule 1-011 NMRA, state as follows:

1. I affirm in writing under penalty of perjury under the laws of the State of New Mexico that the following statements are true and correct.

2. I am over 18 years of age and have personal knowledge of the facts stated herein. I am employed by El Paso Electric Company ("EPE" or "the Company") as *Director of Project Development for the Energy Solutions and Business Development Department.*

3. The foregoing Direct Testimony of Edmundo Salazar, together with all exhibits sponsored therein and attached thereto, is true and accurate based on my knowledge and belief.

4. I submit this Declaration, based upon my personal knowledge and upon information and belief, in support of EPE's ***Application for Determination of Right-of-Way Width for the Lava In and Out Transmission Line.***

FURTHER, DECLARANT SAYETH NAUGHT.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 17, 2026.

/s/ *Edmundo Salazar*

EDMUNDO SALAZAR

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE APPLICATION OF EL PASO ELECTRIC COMPANY FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE	))))	**Case No. 26-00___**
	))	
EL PASO ELECTRIC COMPANY, Applicant	)))	

DIRECT TESTIMONY OF

MICHELLE A. VELOZ

ON BEHALF OF

EL PASO ELECTRIC COMPANY

April 17, 2026

EL PASO ELECTRIC COMPANY
DIRECT TESTIMONY OF
MICHELLE A. VELOZ

TABLE OF CONTENTS

SUBJECT **PAGE**

EXHIBITS

EL PASO ELECTRIC COMPANY
DIRECT TESTIMONY OF
MICHELLE A. VELOZ

I. INTRODUCTION AND QUALIFICATIONS

Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Michelle A. Veloz. My business address is 100 North Stanton Street, El Paso, Texas 79901.

Q2. WHO IS YOUR CURRENT EMPLOYER AND WHAT POSITION DO YOU HOLD?

A. I am employed by El Paso Electric Company ("EPE" or the "Company") as Supervisor of Transmission Substation Relay for Transmission Line Design.

Q3. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I am the EPE Transmission Engineering Supervisor responsible for the design, development and execution of the Lava In and Out transmission line. I have been employed by EPE since November 2021 and in my current role since 2022. Before working as a Supervisor in the Transmission Engineering group, I worked as a Senior Engineer in the Transmission Engineering group from 2021 to 2022. Prior to joining EPE in November 2021, I worked as a Senior Transmission Line Design Engineer at POWER Engineers starting in June 2017. I received my Bachelor of Science degree in Civil Engineering from The University of Texas at El Paso in May 2017.

Q4. WHAT ARE YOUR RESPONSIBILITIES WITH EPE?

A. My responsibilities are to oversee a team responsible for planning, designing, and maintaining the company's transmission infrastructure. I also coordinate and oversee the development of new transmission lines, rebuild of existing transmission lines and upgrades to support system reliability and renewable integration. I am responsible for ensuring all projects are delivered on schedule, within budget and comply with North American Electric Reliability Corporation (NERC), Federal Energy Regulatory Commission (FERC), state regulatory bodies and internal policies.

Q5. HAVE YOU PREVIOUSLY PRESENTED TESTIMONY IN REGULATORY PROCEEDINGS?

A. No.

II. PURPOSE OF DIRECT TESTIMONY

Q6. WHAT IS EPE SEEKING IN THIS CASE?

A. EPE is seeking to obtain approval from the New Mexico Public Regulation Commission for a transmission right-of-way width greater than 100 feet related to EPE's planned Lava In and Out transmission line.

Q7. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to introduce, support, describe and sponsor the overview of the engineering design for the Lava In and Out transmission line. EPE's goal is to connect to and support the development of a planned 100-megawatt (MW) photovoltaic solar facility and a planned 50-MW battery energy storage system (the "Black Mountain Project"), which will be located on EPE-owned private property, with a portion of the requested right-of-way crossing federally owned property that is managed by the Bureau of Land Management and the remaining crossing EPE-owned land. The Direct Testimony of EPE witness Edmundo Salazar provides additional background information on this project. The Direct Testimony of New Mexico licensed engineer Alejandro Galvis discusses the safety analyses done for the transmission line, including the project-specific conductor blowout, safe operating corridor, clearance, and vegetation-management considered to confirm that the proposed Project design and right-of-way ("ROW") are sufficient for safe construction, operation, inspection, and maintenance.

Q8. ARE YOU SPONSORING ANY EXHIBITS IN SUPPORT OF YOUR TESTIMONY?

A. Yes, I am sponsoring the exhibits listed in the Table of Contents. Specifically, those include the following exhibits:

- Exhibit MAV-1: Lava In and Out Vicinity Map
- Exhibit MAV-2: EPE Transmission Construction Standards

III. BACKGROUND INFORMATION ON THE LAVA IN AND OUT TRANSMISSION LINE

Q9. PLEASE DESCRIBE THE LAVA IN AND OUT TRANSMISSION LINE.

A. The planned Lava In and Out transmission line consists of two new 345kV single circuit transmission lines, approximately one half mile in length, which will connect EPE's existing Afton – Newman 345 kV transmission line to the planned Point of Interconnection ("POI"), which is located at the planned new Lava Substation. The new Lava Substation will be connected to the Black Mountain generation and energy storage facility via a gen-tie line. The Black Mountain generation and energy storage facility and Lava Substation are entirely located on EPE's private property. The Lava In and Out transmission line (or the "transmission line tap") will be built on new self-supporting steel structures. This transmission line tap will be located approximately 5.31 miles southeast of EPE's existing Afton Substation that is located approximately 8 miles west of La Mesa, New Mexico.

The specific length of the planned transmission line tap from the existing Afton – Newman 345kV line to the POI is approximately 0.5 miles, which may vary slightly depending on the final transmission alignment. The planned transmission line, including all structures and conductors, will be designed to fit within the proposed 300 foot ROW. The project vicinity map is shown in Exhibit MAV-1.

Q10. WHAT CONDUCTOR AND STRUCTURES DID EPE SELECT FOR CONSTRUCTION OF THE PLANNED LAVA IN AND OUT TRANSMISSION LINE?

A. EPE will construct the transmission lines utilizing single-circuit steel 3-Pole Deadends and H-Frame Tangent structures framed and insulated for 345 kV. Typical structure heights will range from 100 to 120 feet. After evaluating several factors including span length between structures, structure footprints, construction and maintenance feasibility and a 300 foot ROW, EPE affirmed the use of these structure types for the planned Lava In and Out 345 kV transmission line. Typical 345kV 3-Pole Deadend and H-Frame structures are shown in Figures TCS-401 and TCS-501 in the *Transmission Construction Standards,* which is included as Exhibit MAV-2.

The 345 kV circuits will be installed using double-bundle 954 kilo circular mils (kcmil) aluminum conductor steel supported wire ("ACSS"). The normal peak operating current rating for this conductor is approximately 1,249 amperes.

Q11. CAN YOU EXPLAIN WHY THESE STRUCTURES WERE SELECTED?

A. EPE selected the single-circuit 345 kV self-supporting steel structures for numerous reasons including costs, technical specifications, structure footprint, 300 foot ROW width, and other engineering-related reasons. These structure types have typically been EPE's standard for single-circuit 345 kV construction and were chosen as the best option for this transmission tap line. Due to the large number of high-voltage projects projected for construction in the region and constraints on material availability, EPE evaluates which structure type will be used on a project-by-project basis.

IV. RIGHT OF WAY WIDTH EVALUATION

Q12. PLEASE EXPLAIN THE PURPOSE OF EPE'S ROW WIDTH EVALUATION.

A. As addressed in the Direct Testimony of EPE witness Galvis, the proposed ROW is the minimum width necessary to safely construct, operate and maintain the 345 kV transmission lines, ensuring the reliability of EPE's grid.

Q13. PLEASE EXPLAIN THE BASIC DESIGN CONDITIONS EVALUATED BY EPE.

A. The planned Lava In and Out transmission line will be designed and constructed to meet or exceed the specifications and criteria set forth in the latest edition of the National Electrical Safety Code (NESC) and EPE's standard design practices.

Q14. DID EPE TAKE OTHER CONSIDERATIONS INTO ACCOUNT?

A. Yes. The selected route balances construction feasibility and environmental impacts while securing sufficient ROW to operate and maintain the line safely. Please see EPE witness Galvis testimony for additional information on the blowout analysis.

Q15. HOW DO CONSTRUCTION, OPERATIONS AND MAINTENANCE AFFECT THE NECESSARY ROW WIDTH?

A. The width of the ROW for the transmission line is determined by the space necessary to safely and effectively construct, operate and maintain the transmission facilities. During construction, the 300 foot ROW accommodates the use of heavy machinery, cranes, concrete trucks, and other equipment used to install foundations, erect structures and string conductor. During operation, the ROW must provide sufficient clearance between the energized conductors and surrounding vegetation and terrain. This includes sufficient space to account for the line being moved by the wind (known as conductor blowout), lowest point in the transmission line (known as conductor sag) and compliance with EPE and NESC's minimum safety clearances.

Q16. WHAT DID YOU CONCULDE WAS THE REQUIRED ROW WIDTH?

A. The specified 150 feet of ROW width per each of the two side by side 345 kV transmission lines comprising the Lava In and Out transmission line represents the minimum area necessary to safely construct, operate and maintain the transmission lines while minimizing impacts to the surrounding area and complying with all standards and regulations.

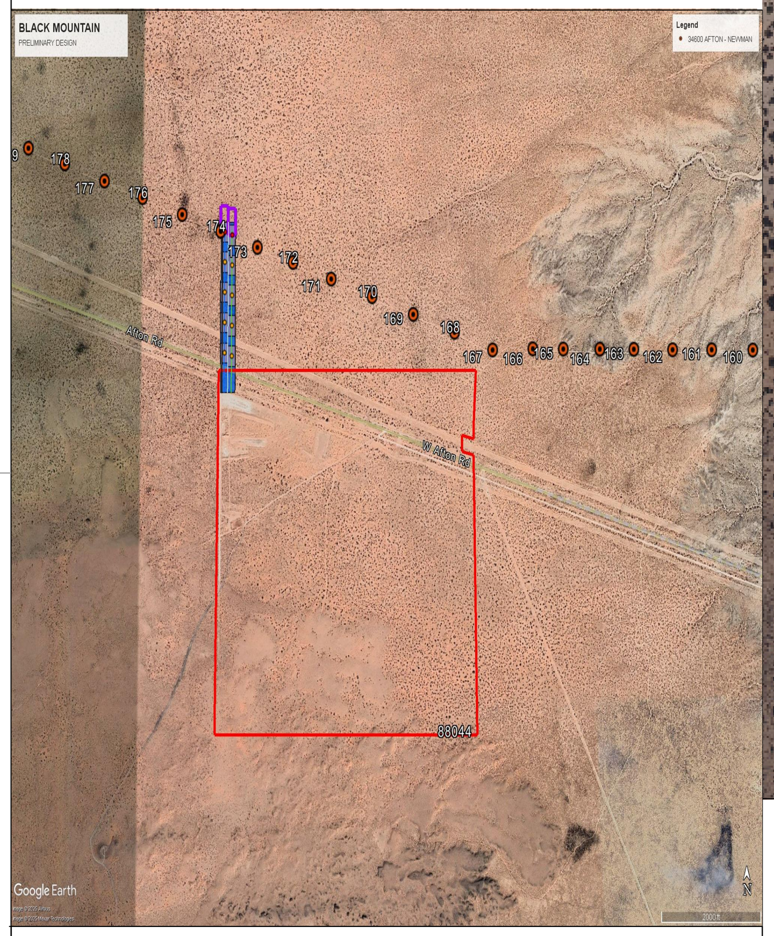
Q17. BASED ON EPE'S ANALYSIS, WHAT IS THE NECESSARY ROW WIDTH?

A. The necessary ROW width per 345 kV transmission line is 150 feet. Both new segments of 345 kV transmission line, which are side by side, will require a total width of 300 feet.

Q18. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

PROJECT VICINITY MAP



VICINITY MAP

300.0 FT. HORIZ. SCALE

N

NO.	DESCRIPTION	DATE	BY
0	PRELIMINARY DESIGN PENDING APPROVAL	7/22/25	AA

PROJECT VICINITY MAP
Project Name: Lava In and Out 345kV Line

DRAWN A.ACEVES	WORK ORDER NO. PENDING
DESIGNED A.ACEVES	SCALE NTS
APPROVED M.VELOZ	DATE 7/22/25 LAST REVISED 7/22/25

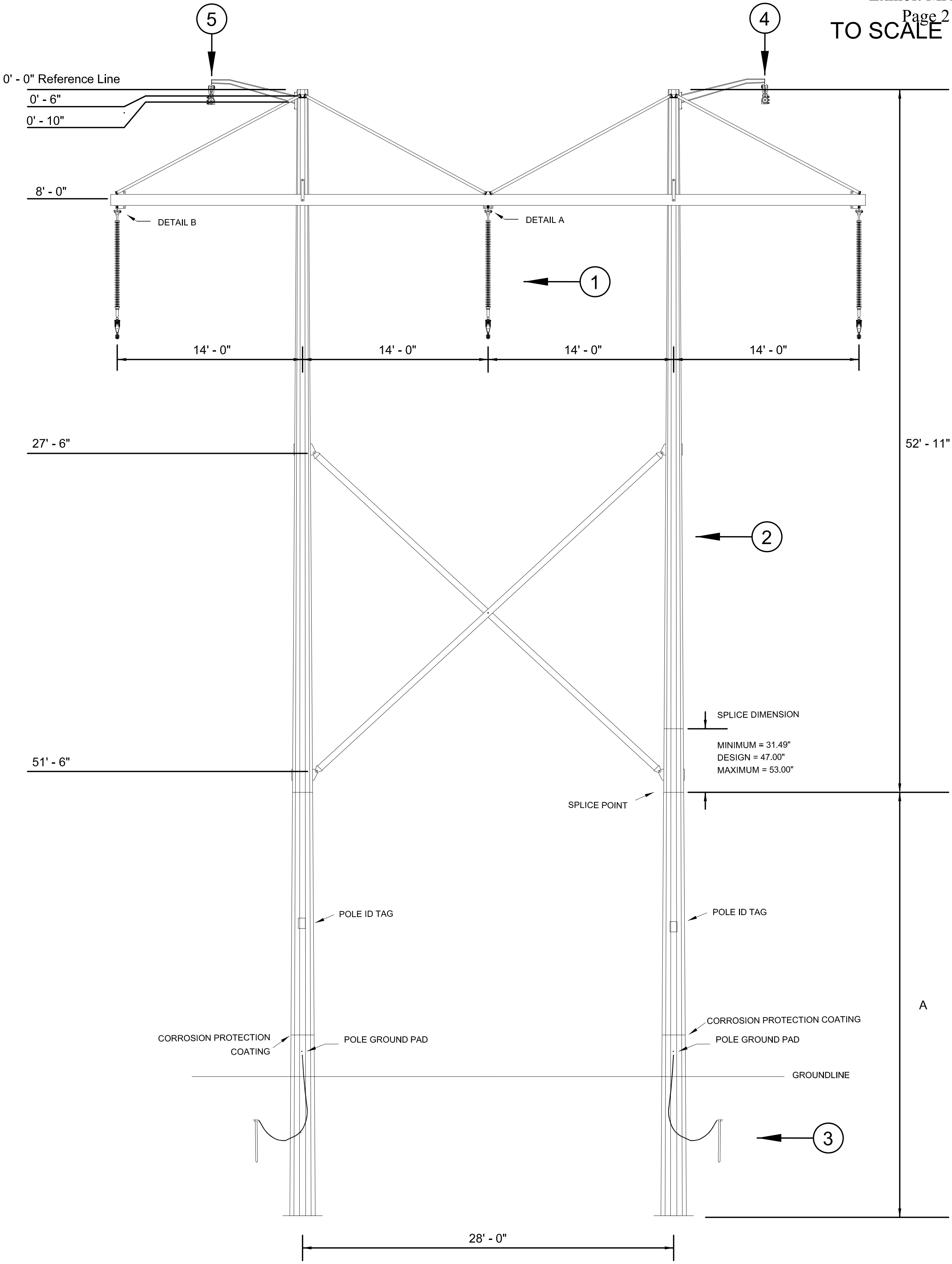
TRANSMISSION ENGINEERING
The Electric Company

Standards Engineering

Transmission Construction Standards

January 2020

TO SCALE



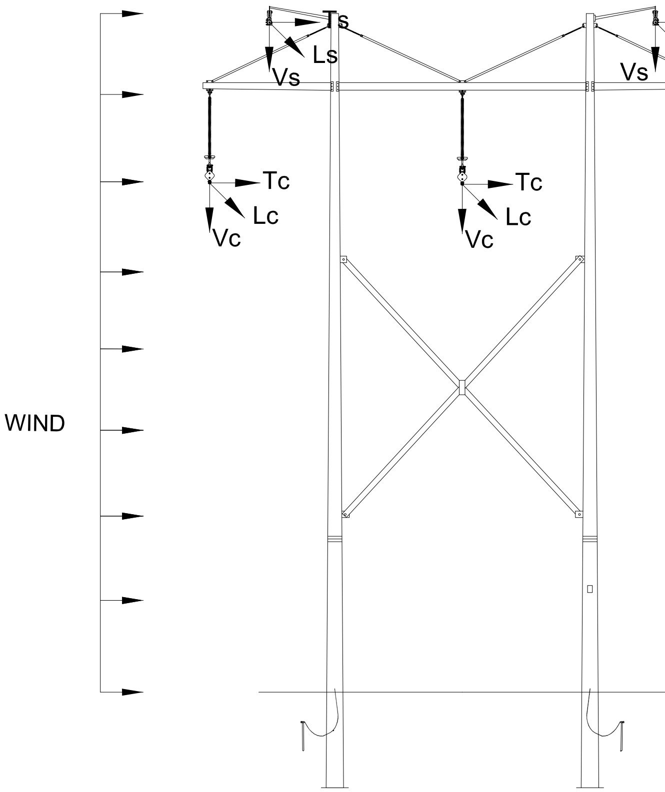
345 kV H FRAME NEW CONSTRUCTION STRUCTURE

EL PASO ELECTRIC CO. TRANSMISSION CONSTRUCTION STANDARD

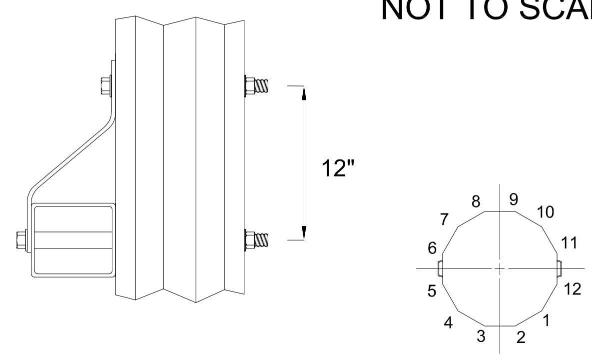
ORIG. DATE: 04/01/2019
REV. DATE: ________

TCS 405
PAGE 1 OF 4

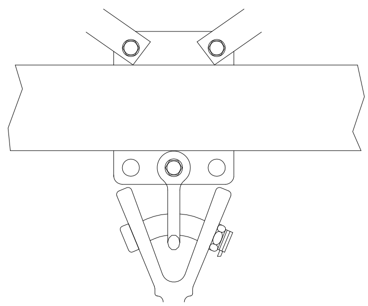
NOT TO SCALE



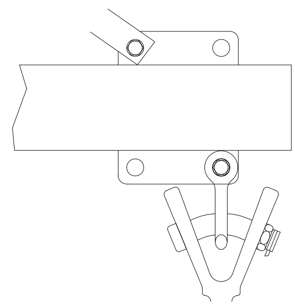
Loading Tree



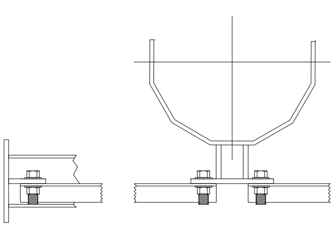
CROSS ARM CONNECTION



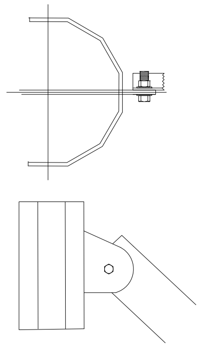
Detail A



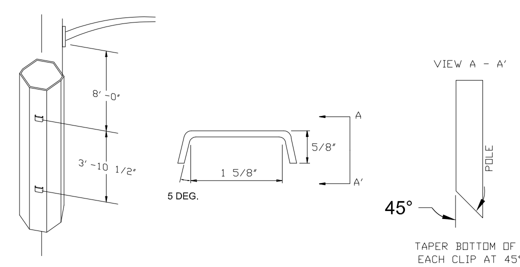
Detail B



ANGLE BRACING

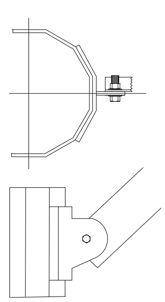


X-BRACING TOP

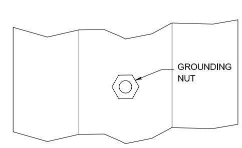


PROVIDE LADDER CLIPS SPACED 3'-10 1/2" CENTER TO CENTER AS SHOWN FROM 12' ABOVE GROUND LINE TO 6' BELOW TOP OF POLE ON FLATS 3-2 AND 8-9.

LADDER CLIP DETAIL



X-BRACING BOTTOM



GROUNDING NUT AT 6" ABOVE GROUND LINE DRILL POLE AND WELD A 1/2" - 13 STAINLESS STEEL NUT OVER HOLE IN TUBULAR STEEL SHAFT ON FACE 3-2.

GROUND NUT DETAIL

345 kV H FRAME NEW CONSTRUCTION STRUCTURE

EL PASO ELECTRIC CO. TRANSMISSION CONSTRUCTION STANDARD

ORIG. DATE: 04/01/2019
REV. DATE: ________

TCS 405

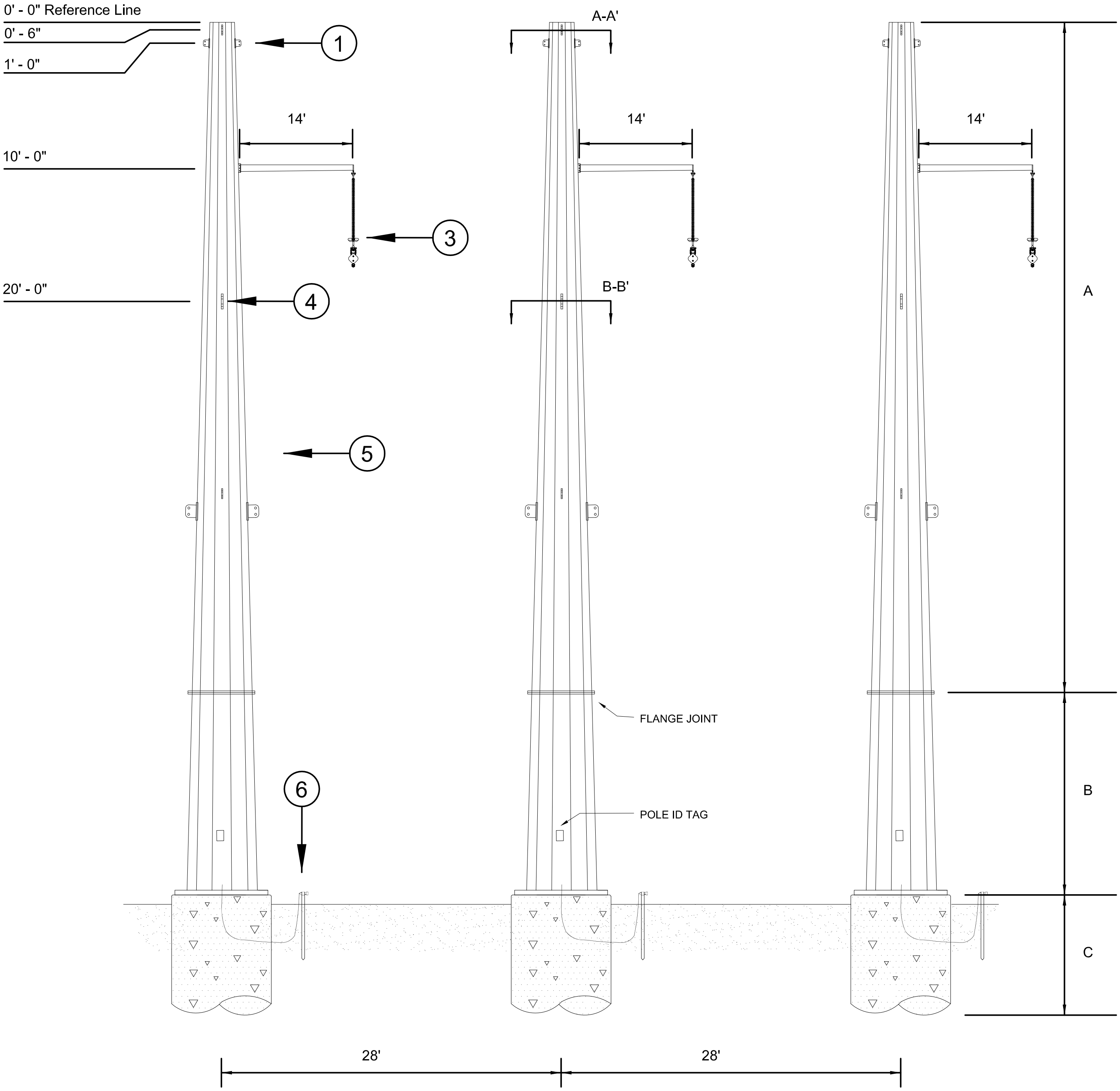
Item	345 kV H Frame New Construction	TMS/TCS No.	Qty.
1	345 kV Vertical Bundle Suspension Insulator Assembly or 345 kV Horizontal Bundle Suspension Insulator Assembly	TCS 701 or TCS 705	3 or 3
2	345 kV H Frame New Constcrution Structure Assembly	TCS 729	1
3	Direct Embed Steel Pole Groudning Assembly	TCS 1101	2
4	OPGW Tangent Assembly	TCS 805	1*
5	OHGW Tangent Assembly	TCS 809	1

* If OPGW is not required in the design, use two of the OHGW assemblies.

TCS Application

For New Construction Only.

NOT TO SCALE

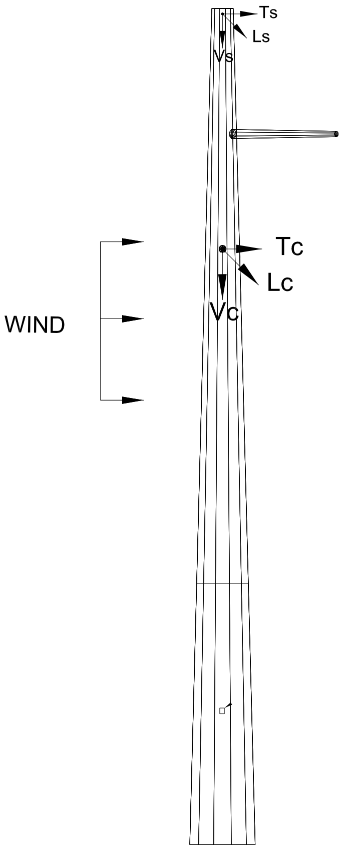


345 kV SELF-SUPPORTED THREE-POLE DEADEND STRUCTURE

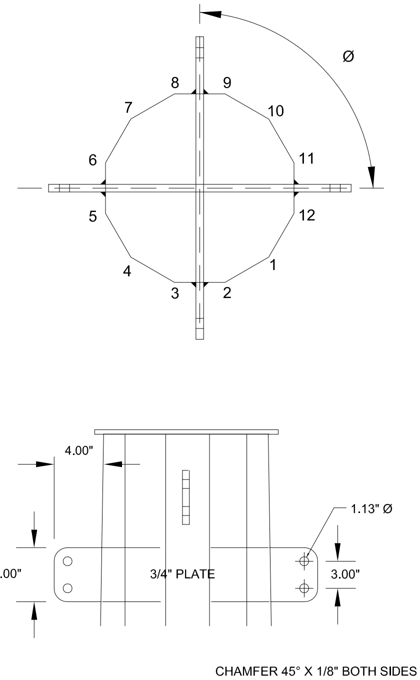
ORIG. DATE: 04/01/2019
REV. DATE: ________

EL PASO ELECTRIC CO. TRANSMISSION CONSTRUCTION STANDARD

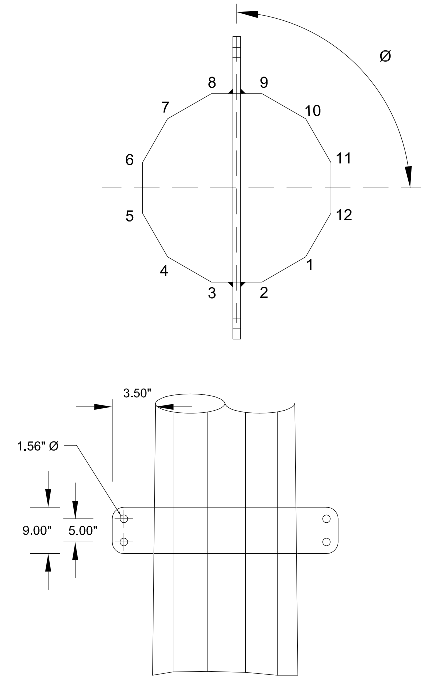
NOT TO SCALE



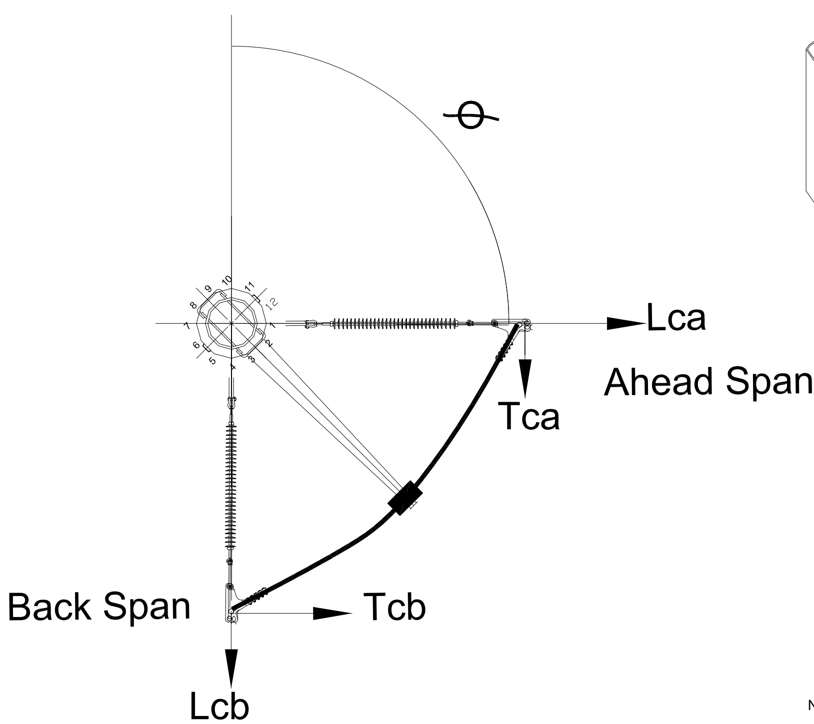
LOADING TREE



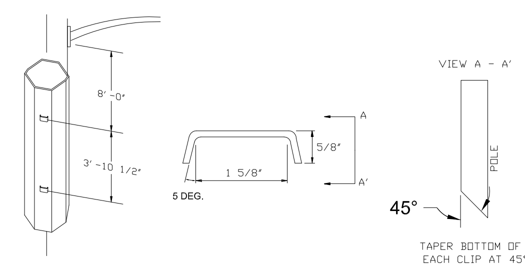
DETAIL A-A'



DETAIL B-B'

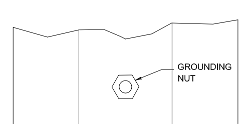


Transmission Line Detail



PROVIDE LADDER CLIPS SPACED 3'-10 1/2" CENTER TO CENTER AS SHOWN FROM 12' ABOVE GROUND LINE TO 6' BELOW TOP OF POLE ON FLATS 3-2 AND 8-9.

LADDER CLIP DETAIL



GROUNDING NUT AT 6" ABOVE GROUND LINE DRILL POLE AND WELD A 1/2" - 13 STAINLESS STEEL NUT OVER HOLE IN TUBULAR STEEL SHAFT ON FACE 3-2.

GROUND NUT DETAIL

345 kV SELF-SUPPORTED THREE-POLE DEADEND STRUCTURE

ORIG. DATE: 04/01/2019
REV. DATE: ________

EL PASO ELECTRIC CO. TRANSMISSION CONSTRUCTION STANDARD

TCS 505
PAGE 2 OF 4

Item	345 kV Three-Pole Angle Deadend	TMS/TCS No.	Qty.
1	OPGW - OHGW Deadend Assembly	TCS 813	6
2	Single Davit Arm Assembly	TCS 905	3
3	345 kV Vertical Bundle Jumper Insulator Assembly	TCS 709	3
4	345 kV Bolted Strain Deadend Insulator Assembly	TCS 721	6
5	Engineered Steel Pole	By Design	3
6	Direct Embed Steel Pole Grouding Assembly	TCS 1101	3

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE APPLICATION OF EL PASO ELECTRIC COMPANY FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE	)	**Case No. 26-00___**
EL PASO ELECTRIC COMPANY, **Applicant**	)	

DECLARATION OF MICHELLE A. VELOZ IN SUPPORT OF THE FOREGOING DIRECT TESTIMONY OF EL PASO ELECTRIC COMPANY'S APPLICATION FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE

I ***Michelle A. Veloz***, pursuant to Rule 1-011 NMRA, state as follows:

1. I affirm in writing under penalty of perjury under the laws of the State of New Mexico that the following statements are true and correct.

2. I am over 18 years of age and have personal knowledge of the facts stated herein. I am employed by El Paso Electric Company ("EPE" or "the Company") as *Supervisor of Transmission Substation Relay for Transmission Line Design.*

3. The foregoing Direct Testimony of Michelle A. Veloz, together with all exhibits sponsored therein and attached thereto, is true and accurate based on my knowledge and belief.

4. I submit this Declaration, based upon my personal knowledge and upon information and belief, in support of EPE's ***Application for Determination of Right-of-Way Width for the Lava In and Out Transmission Line.***

FURTHER, DECLARANT SAYETH NAUGHT.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 17, 2026.

/s/ *Michelle A. Veloz*

MICHELLE A. VELOZ

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE APPLICATION OF EL PASO ELECTRIC COMPANY FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE	))))))	**Case No. 26-00___**
EL PASO ELECTRIC COMPANY, Applicant	)))	

DIRECT TESTIMONY

OF

ALEJANDRO GALVIS

ON BEHALF OF

EL PASO ELECTRIC COMPANY

APRIL 17, 2026

EL PASO ELECTRIC COMPANY
DIRECT TESTIMONY OF
ALEJANDRO GALVIS

TABLE OF CONTENTS

EXHIBITS

EL PASO ELECTRIC COMPANY
DIRECT TESTIMONY OF
ALEJANDRO GALVIS

I. INTRODUCTION AND QUALIFICATIONS

Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Alejandro Galvis. My business address is 8005 Brockman Street, Austin, Texas 78757.

Q2. WHAT IS YOUR CURRENT POSITION?

A. I am a Transmission Line Engineer with Coalesce Management Consulting and have been engaged by El Paso Electric Company ("EPE or Company").

Q3. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I hold a Bachelor of Science in Electrical Engineering from the University of Memphis, awarded in 2010, and a Master of Science in Electrical and Computer Engineering from Indiana University–Purdue University Indianapolis, awarded in 2012. I am a licensed Professional Engineer, including in the State of New Mexico (PE No. 31694). I have specialized in transmission line design since 2013. My resume is attached as Exhibit AG-3.

Q4. PLEASE DESCRIBE YOUR CURRENT JOB DUTIES.

A. My professional responsibilities include transmission line engineering, electrical evaluation, and design support for transmission projects, including my work with EPE. This work includes developing and reviewing transmission line designs, performing conductor sag, tension, and clearance evaluations, and supporting structure spotting and layout using industry-standard engineering tools. It also includes reviewing conductor and structure configurations, evaluating conductor behavior under applicable loading conditions, reviewing line clearances, and supporting the development and modification of transmission line designs for new facilities and interconnections. In connection with the Project, I apply EPE's transmission design standards and the National Electrical Safety Code ("NESC") to help ensure the Project is designed for safe construction, operation, and maintenance.

Q5. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.

A. I have worked on transmission line engineering assignments for Pacific Gas and Electric, Westar Energy, Georgia Transmission Company, the Lower Colorado River Authority, and, most recently, El Paso Electric. My experience includes both utility and consulting work on systems ranging from 12.5 kV to 500 kV, with primary emphasis on 69 kV to 345 kV facilities. My work has included transmission line engineering, electrical evaluation, and design support for new transmission facilities and interconnections, including conductor sag, tension, and clearance evaluations, conductor and structure configuration review, and structure spotting and layout using industry-standard engineering tools. In addition to my role with EPE, I provide professional engineering consulting services through

Coalesce Management Consulting, with a focus on renewable energy, generator interconnection, and greenfield transmission line projects.

II. PURPOSE AND SCOPE OF TESTIMONY

Q6. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. EPE is seeking approval from the Commission for a right-of-way ("ROW") width greater than 100 feet for the planned Lava In and Out transmission line associated with the Black Mountain Project. The purpose of my testimony is to present the transmission line engineering analysis supporting EPE's proposed ROW width, including the project-specific conductor blowout evaluation, and to explain how those results inform ROW width, safe operating corridor, clearance, and vegetation-management considerations for the Project. My testimony also confirms that the Project's design and proposed ROW corridor provide sufficient space for safe construction, operation, inspection, and maintenance, consistent with applicable standards and EPE criteria.

Q7. ARE YOU SPONSORING EXHIBITS TO YOUR TESTIMONY?

A. Yes. I am sponsoring the exhibits listed in the Table of Contents.

Q8. PLEASE DESCRIBE THE PROPOSED PROJECT.

A. The proposed project consists of the Black Mountain Project and the related transmission interconnection facilities needed to connect that project to EPE's transmission system. The Black Mountain Project is a planned 100 MW photovoltaic solar facility with a 50 MW 4-hour battery energy storage system located on EPE-owned land in Afton, New Mexico. The Project will interconnect to EPE's system at a single point of interconnection at the planned new Lava Substation, and the collector substation and Lava Substation will also be located on EPE-owned property.

The related transmission facilities include the planned Lava in-and-out 345kV Line, which consists of two new 345 kV single-circuit transmission lines, approximately one-half mile in length, connecting EPE's existing Afton-Newman 345 kV transmission line to the planned point of interconnection at the new Lava Substation. Those facilities are planned within a 2,539-foot-long by 300-foot-wide right-of-way corridor and include a permanent access road, permanent work areas around the transmission structures, and temporary pulling and tensioning sites needed for construction and maintenance.

III. TRANSMISSION LINE DESIGN, INCLUDING CONDUCTOR AND STRUCTURE SELECTION

Q9. WHAT CONDUCTOR AND STRUCTURES DID EPE SELECT FOR CONSTRUCTION OF THE PROJECT?

A. EPE selected single-circuit 345 kV steel H-frame tangent structures and three-pole dead-end structures for construction of the Project. Because the Project is designed as a transmission tap into EPE's existing Afton-Newman 345 kV transmission line, the new H-frame structures are consistent with the existing line configuration into which the Project will interconnect. The selected structures are framed and insulated for 345 kV service, and typical structure heights are expected to range from approximately 100 to 120 feet. In selecting these structure types, EPE considered span lengths, structure footprint, construction and maintenance feasibility, and the proposed 300-foot right-of-way. EPE also selected double-bundle 954 kilo circular mils ("kcmil") Rail aluminum conductor steel supported ("ACSS") phase conductor for the 345 kV circuits.

Q10. DOES THE TRANSMISSION LINE DESIGN COMPLY WITH APPLICABLE SAFETY AND DESIGN STANDARDS?

A. Yes. The Project will be designed and constructed to meet or exceed applicable requirements of the National Electrical Safety Code ("NESC"), applicable NERC Reliability Standards, and EPE's 345 kV transmission line design criteria and standard practices. More specifically, the Project has been evaluated in accordance with EPE's 345 kV Standard Design Criteria, attached as Exhibit AG-5, which establishes the design basis for EPE 345 kV transmission lines, including applicable weather loading, conductor and shield wire criteria, structure criteria, right-of-way blowout evaluation, and clearance requirements. The design process includes conductor sag and tension modeling, structure loading checks, and clearance evaluations under the applicable weather cases to ensure safe clearances for construction, operation, and maintenance.

More specifically, the Project has been evaluated in accordance with EPE's 345 kV Standard Design Criteria, attached as Exhibit AG-5, which establishes the design basis for EPE 345 kV transmission lines, including applicable weather loading, conductor and shield wire criteria, structure criteria, right-of-way blowout evaluation, and clearance requirements.

IV. CONDUCTOR BLOWOUT ANALYSIS AND CORRIDOR CONSIDERATIONS

Q11. PLEASE EXPLAIN WHAT IS MEANT BY CONDUCTOR BLOWOUT AND WHY IT IS IMPORTANT.

A. "Blowout" is the lateral displacement of a suspended conductor due to wind. Suspended conductors are flexible and are supported by insulator assemblies; under transverse wind loading, the energized conductors can displace laterally from their still-air position. Blowout is evaluated so the transmission line can be designed with an adequate clearance envelope for all expected operating and weather conditions, including maintaining safe separation from the ground, structures, and any vegetation that may be present now or in the future.

Q12. WHAT DATA DID YOU REVIEW TO EVALUATE CONDUCTOR BLOWOUT FOR THE PROJECT?

A. I reviewed the conductor blowout results contained in Exhibit AG-1 (Blowout Report) and summarized in Exhibit AG-2 (Blowout Report Summary). These exhibits report the maximum horizontal offset of the phase conductors from the transmission line centerline under three weather cases: (1) 0 psf wind (no ice, 60°F final), (2) the NESC blowout case at 6 psf wind (no ice, 60°F final), and (3) the EPE extreme wind case at 100 mph (25.58 psf, no ice, 60°F final). For the wind cases, results are provided with wind applied from both left and right directions.

Q13. WHAT IS THE MAXIMUM CONDUCTOR BLOWOUT IDENTIFIED IN THE BLOWOUT REPORT, AND WHAT DOES IT REPRESENT?

A. Exhibit AG-1 depicts the conductor blowout in both wind directions for the three blowout load cases. For purposes of the Project right-of-way ("ROW") corridor evaluation, the controlling maximum conductor blowout is 48.89 feet from centerline under the EPE extreme wind case, and the controlling NESC blowout value is 32.89 feet from centerline. Those values represent the possible horizontal offset of an energized phase conductor from the transmission line centerline under the specified wind-loading condition, including the conductor's at-rest position and the additional lateral movement caused by wind-induced swing. In that way, the blowout values define the conductor movement envelope used to evaluate clearance, safe operating corridor, and ROW-width considerations for the route portion of the Project.

The blowout results also identify a larger value in the phase-conductor termination span adjacent to the Lava Substation, meaning the final span where the energized phase conductors transition from the transmission line into the substation termination area. In that separate substation-approach span, the EPE extreme wind blowout maximum reaches 113.30 feet from centerline, with a corresponding NESC blowout maximum of 113.04 feet from centerline. Because those values are associated with the substation termination span, and that span is located within EPE substation property boundaries, they are not part of the transmission line right-of-way corridor analysis and may be excluded from the ROW width evaluation.

Q14. HOW DO CONDUCTOR BLOWOUT RESULTS RELATE TO THE RIGHT-OF-WAY CORRIDOR?

A. Conductor blowout results inform the lateral movement envelope that the energized conductors may occupy under wind loading and therefore are an important engineering input in establishing the appropriate right-of-way ("ROW") corridor. In evaluating a ROW corridor for a high-voltage transmission line, utilities consider the conductor movement envelope together with required electrical clearances and safe work access for construction, inspection, operation, and maintenance. The corridor must also support vegetation clearance requirements, recognizing that vegetation may grow into the corridor over time and that conductor movement under wind and other rated operating conditions must be accounted for in maintaining safe separation distances.

The blowout values do not, by themselves, establish the full ROW width, but they are an important part of that evaluation. Here, the project-specific blowout results support the need to preserve a corridor wide enough to safely contain conductor movement from the transmission line centerline while also accommodating the other design considerations identified by EPE witness Michelle Veloz. Considered together with structure configuration, sag, clearances, vegetation-management needs, and access requirements, those results are consistent with EPE's requested 300-foot ROW corridor for the two parallel 345-kV single-circuit transmission lines, or 150 feet per line on a centerline basis.

V. EVALUATION OF FEASIBLE ALTERNATIVES

Q15. WHY IS IT NOT PRACTICAL TO SIMPLY ADD MORE STRUCTURES TO REDUCE BLOWOUT?

A. While reducing span length can reduce conductor swing in some cases, it is not practical to simply add many more structures along the entire route. Increasing the number of structures increases the number of foundation and work areas, expands the extent of temporary construction disturbance, and can increase interactions with environmental resources and landowner uses. More structures also increase the number of locations where construction access must be established and maintained, and can introduce additional geometric constraints at crossings and other constrained areas.

In addition, the spans that tend to control blowout are often special crossing spans or constrained segments where structure placement is limited by existing infrastructure, permitting constraints, terrain, or required crossing geometry. For those locations, the practical design approach is to use appropriate structure types, structure placement, and conductor configuration to maintain the necessary clearance envelope, rather than attempting to eliminate blowout through structure density alone.

VI. RIGHT OF WAY WIDTH APPROVAL

Q16. WHAT IS YOUR UNDERSTANDING OF THE REQUIREMENTS OF THE RIGHT OF WAY WIDTH STATUTE AT NMSA 1978, SECTION 62-9-3.2?

A. I understand that the ROW Width Statute states as follows:

> Unless otherwise agreed to by the parties, no person shall begin the construction of any transmission line requiring a width for right of way of greater than one hundred feet without first obtaining from the commission a determination of the necessary right-of-way width to construct and maintain the transmission line. For the purposes of this subsection, "construction" does not include acquisition of rights of way, preparation of surveys or ordering of equipment.

Q17. PLEASE EXPLAIN THE PURPOSE OF YOUR ROW WIDTH EVALUATION.

A. I reviewed the conductor blowout results summarized in Exhibit AG-2. These exhibits report the maximum horizontal offset of the energized phase conductors from the transmission line centerline under applicable weather cases, with wind applied from both left and right directions. For corridor planning purposes, the reported centerline-based offsets represent the conductor's lateral movement under transverse wind pressure and are used to evaluate whether the conductor movement envelope can be maintained within the available corridor with appropriate operating, maintenance, and vegetation-management margins.

Q18. HAS EPE DETERMINED THE WIDTH OF THE RIGHT OF WAY NEEDED FOR THE PROJECT?

A. Yes. EPE has determined that the right-of-way ("ROW") needed for the Project is 300 feet in total, consisting of 150 feet for each of the two parallel overhead single-circuit 345 kV transmission lines connecting the new Lava Substation to the existing Afton-Newman 345 kV transmission line. EPE determined that this width represents the minimum area necessary to safely construct, operate, inspect, and maintain the Project transmission facilities.

The 300-foot ROW accommodates the conductor movement envelope, including blowout and sag, required electrical clearances, vegetation-management needs, and access necessary for construction and ongoing operation and maintenance. It also accommodates the permanent 14-foot-wide access road within the corridor, the permanent work areas around each transmission structure, and the temporary pulling and tensioning areas associated with the point of interconnection. The BLM-approved project description likewise identifies the Project as two overhead single-circuit 345 kV gen-tie transmission lines constructed within a 2,539-foot-long by 300-foot-wide ROW corridor.

Exhibits AG-2 and Exhibit AG-4 support this evaluation by depicting and summarizing the conductor blowout envelope and its relationship to the ROW boundary for purposes of assessing clearance, corridor adequacy, and safe operation and maintenance. Those exhibits do not by themselves establish the ROW width, but they illustrate an important part of the engineering basis for EPE's conclusion that a 300-foot corridor is necessary for the Project.

Q19. PLEASE EXPLAIN WHY THE PROPOSED RIGHT OF WAY WIDTH IS SUFFICIENT FOR THIS PROJECT?

A. The proposed ROW widths provide adequate corridor space to maintain the required conductor movement and clearance envelope and to support safe construction, inspection, and maintenance activities. Exhibit AG-2 summarizes the maximum horizontal offsets of the energized conductors from the transmission line centerline under the applicable weather cases, including the NESC blowout wind condition used for corridor evaluation.

For the centerline within the line ROW corridor, Exhibit AG-2 shows that the typical span maximum offsets under the NESC blowout case are approximately 20 to 25 feet from centerline, with an overall maximum of 32.83 feet from centerline when the substation termination span is excluded. For the 100-foot ROW segments, where the line is centered within the corridor, a 32.83-foot maximum offset leaves approximately 17 feet of lateral space to the ROW edge. This provides a reasonable safety margin in excess of one foot beyond the conductor movement envelope to support safe operations and maintenance activities and long-term vegetation clearance management within the corridor. This remaining lateral space is consistent with ROW edge clearance checks used in EPE's 345 kV criteria for representative wind conditions and supports maintaining a safe operating and maintenance corridor outside the conductor movement envelope. Exhibit AG-2 provides the controlling blowout values used in these evaluations, and Exhibit AG-4 illustrates how the conductor movement envelope and vegetation management margin relate to the ROW boundary.

In the segment where the Project is adjacent to an existing transmission line (Structure 1 through Structure 39), the Project ROW is independent and runs side-by-side with the existing line's ROW, and the approximately 200-foot overall corridor across both facilities provides the additional width necessary for appropriate separation and safe operating and maintenance envelopes. This additional width supports appropriate separation between the two lines, accommodates conductor movement under wind loading, and provides the access space needed for inspection, maintenance, and vegetation management practices intended to maintain safe and reliable operation over the service life of both facilities.

Adequate corridor width also supports vegetation management and related wildfire risk reduction practices over the life of the line by helping prevent vegetation encroachment into the conductor movement envelope and preserving a defensible operating and maintenance corridor. This is consistent with the vegetation-management principles reflected in applicable reliability standards, which recognize the need to account for conductor movement and long-term vegetation growth in maintaining safe clearances.

Adequate corridor width also supports vegetation management and related wildfire risk reduction practices over the life of the line by helping prevent vegetation encroachment into the conductor movement envelope and preserving a defensible operating and maintenance corridor.

VII. SUMMARY AND CONCLUSION

Q20. PLEASE SUMMARIZE YOUR TESTIMONY.

A. The project-specific blowout analysis shows that, within the route portion of the Lava in-and-out 345kV Line corridor, the controlling NESC blowout value is 40.34 feet from centerline and the controlling EPE extreme-wind blowout value is 53.64 feet from centerline. Those values, together with the broader transmission line design considerations addressed by EPE witness Veloz, support EPE's requested right-of-way width for the Black Mountain Project. In my opinion, the blowout results summarized in Exhibit AG-2 support EPE's requested corridor width when considered together with the other transmission design and operating considerations addressed in this proceeding.

Q21. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

PRELIMINARY EXHIBIT AG-1 PLAN AND PROFILE 1/2

PROJECT NOTES

CONDUCTOR:
954 RAIL ACSS
DOUBLE BUNDLE (18 INCH SPACING)

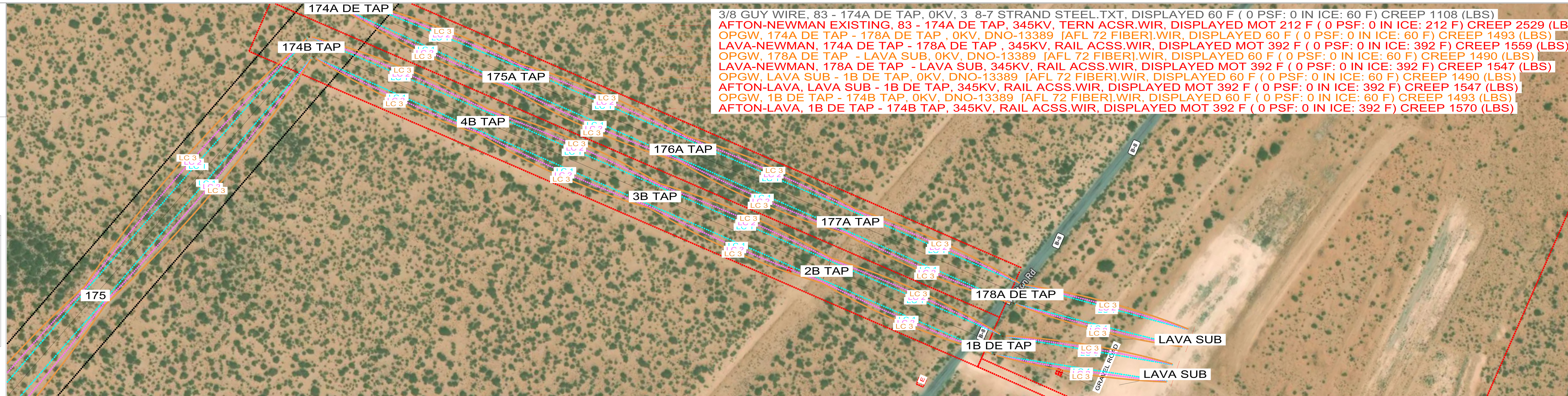
FIBER:
72 FIBER COUNT OPGW

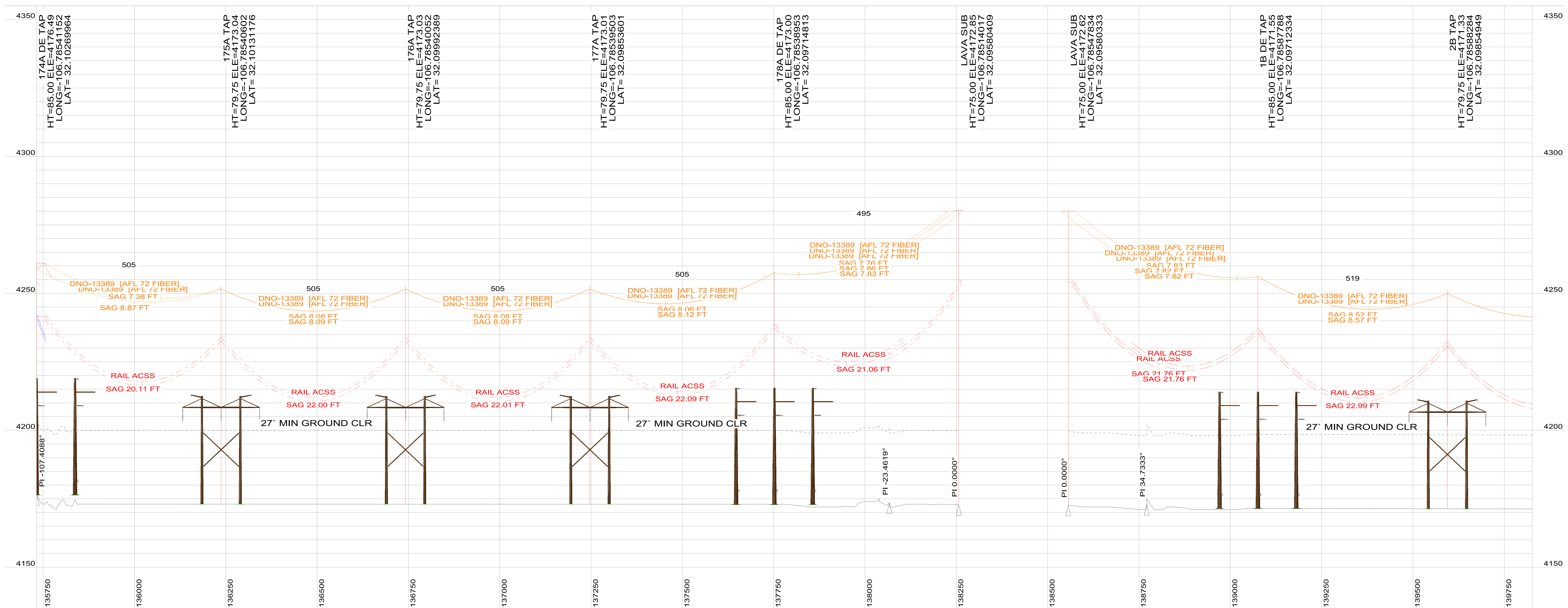
BLOWOUT LOAD CASE LEGEND:

LC 1: 0 PSF WIND, 0 IN ICE, 60°F FINAL

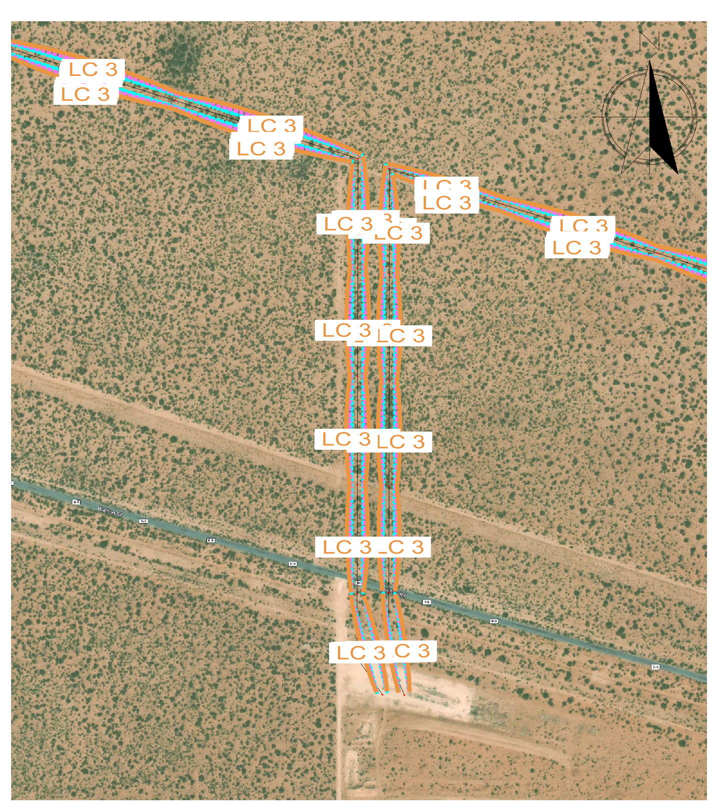
LC 2: 6 PSF WIND, 0 IN ICE, 60°F FINAL

LC 3: 25.58 PSF WIND, 0 IN ICE, 60°F FINAL





PROFESSIONAL CERTIFICATION



N.T.S.

VICINITY MAP

150.0 FT. HORIZ. SCALE
20.0 FT. VERT. SCALE

NO	DESCRIPTION	DATE	BY
0	EXHIBIT AG-1 PLAN AND PROFILE DRAWINGS	4/14/2026	AG

PLAN AND PROFILE
PROJECT NAME: LAVA IN-AND-OUT 345KV LINE

DRAWN	A.GALVIS	WORK ORDER NO.	
DESIGNED	A.GALVIS	SCALE	N.T.S.
APPROVED	M. VELOZ	DATE	4/14/2026 LAST REVISED 4/14/2026

TRANSMISSION ENGINEERING
El Paso Electric Company

PRELIMINARY EXHIBIT AG-1 PLAN AND PROFILE 2/2

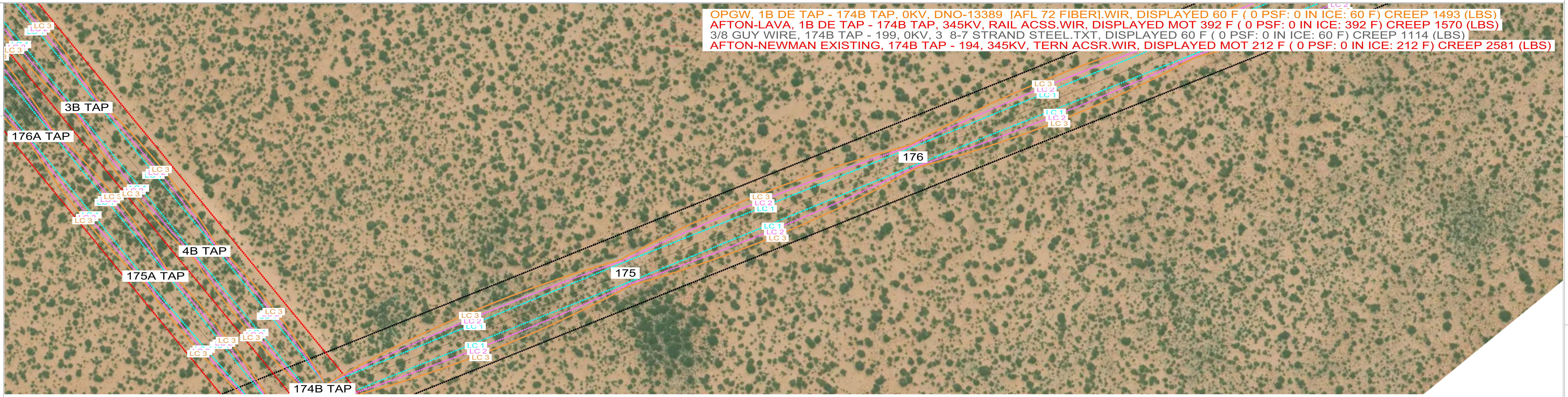
PROJECT NOTES

CONDUCTOR:
954 RAIL ACSS
DOUBLE BUNDLE (18 INCH SPACING)

FIBER:
72 FIBER COUNT OPGW

BLOWOUT LOAD CASE LEGEND:

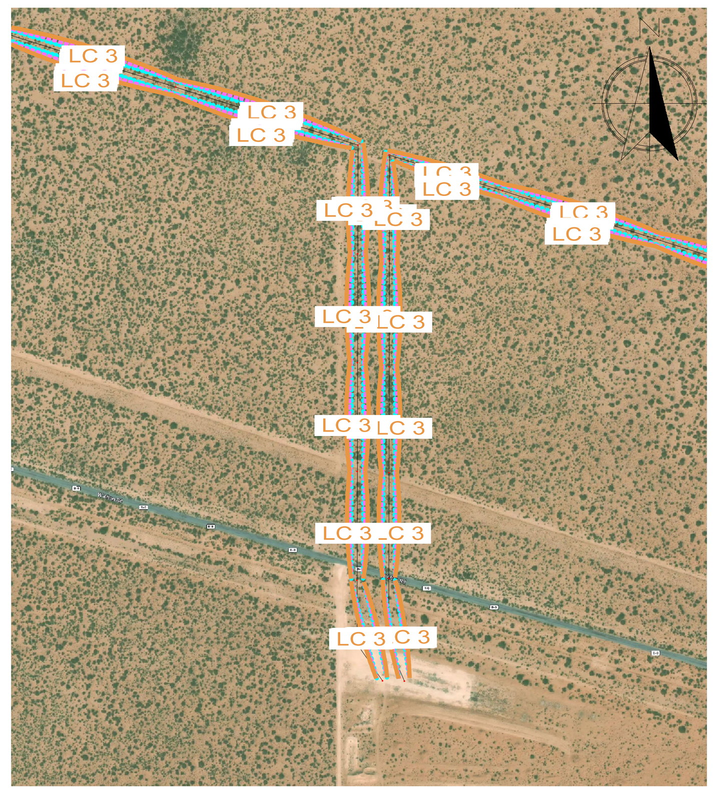
- LC 1: 0 PSF WIND, 0 IN ICE, 60°F FINAL
- LC 2: 6 PSF WIND, 0 IN ICE, 60°F FINAL
- LC 3: 25.58 PSF WIND, 0 IN ICE, 60°F FINAL



Alex Galvis 04/16/2026

ALEJANDRO GALVIS
NEW MEXICO
31694
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION



N.T.S.

VICINITY MAP

150.0 FT. HORIZ. SCALE
20.0 FT. VERT. SCALE

NO.	DESCRIPTION	DATE	BY
0	EXHIBIT AG-1 PLAN AND PROFILE DRAWINGS	4/14/2026	AG

PLAN AND PROFILE
PROJECT NAME: LAVA IN-AND-OUT 345KV LINE

DRAWN A.GALVIS	WORK ORDER NO.
DESIGNED A.GALVIS	SCALE N.T.S.
APPROVED M. VELOZ	DATE 4/14/2026 LAST REVISED 4/14/2026

TRANSMISSION ENGINEERING
The Electric Company

BLOWOUT REPORT SUMMARY

(CONDUCTOR BLOWOUT ENVELOPE FOR ROW EVALUATION)

This exhibit is sponsored by Alejandro Galvis, P.E., a professional engineer licensed in New Mexico (PE No. 31694), and is submitted in support of his direct testimony

This exhibit presents the project-specific conductor blowout results for the planned Lava in-and-out 345kV Line and summarizes the conductor movement envelope used for right-of-way ("ROW") evaluation. The blowout values represent the maximum horizontal offset of the energized phas e conductors from the transmission line centerline under the specified weather cases. The Project uses double-bundle 954 kilo circular mils ("kcmil") Rail Aluminum Conductor Steel Supported ("ACSS") phase conductors, and the blowout results reflected in this exhibit are based on that conductor configuration.

For wind cases, the reported blowout offset reflects the conductor's at-rest horizontal position plus the additional lateral movement associated with conductor swing under wind loading. For purposes of identifying the controlling blowout values in this exhibit, the maximum blowout offset is evaluated using the absolute value of the centerline-based offset, so offsets to either side of the centerline are treated by magnitude.

The results show that, for the route portion of the Project, the controlling NESC blowout value is 40.34 feet from centerline in the span from 2B TAP to 3B TAP. The controlling EPE extreme wind blowout value is 53.64 feet from centerline in the span from 3B TAP to 4B TAP.

A. WEATHER CASES EVALUATED.

Load Case	Description	Wind Direction
1	NESC blowout case: 6 psf wind, 0 in ice, 60°F final condition	Wind from Left and Right

Load Case	Description	Wind Direction
2	EPE extreme wind case: 25.58 psf wind, 0 in ice, 60°F final condition	Wind from Left and Right

B. CONTROLLING BLOWOUT VALUES WITHIN THE PROJECT ROW CORRIDOR

For the route portion of the Project, the controlling span-based maximum offsets are as follows:

Weather Case	Controlling Span	Cable Condition	Wind From	Max Offset (ft)
NESC Blowout (6 psf, 0 in ice, 60°F final)	2B TAP to 3B TAP	Initial RS	Left	40.34
EPE Extreme Wind (25.58 psf, 0 in ice, 60°F final)	3B TAP to 4B TAP	Initial RS	Right	53.64

Within the route-corridor phase-conductor rows, the highest NESC absolute offset occurs in the span from 2B TAP to 3B TAP under Initial RS with wind from the Left at 40.34 feet. The highest EPE extreme-wind absolute offset occurs in the span from 3B TAP to 4B TAP under Initial RS with wind from the Right at 53.64 feet. These values represent the maximum horizontal conductor movement envelope within the Project ROW corridor for the applicable wind cases.

C. CONTROLLING MAXIMUM OFFSET WITHIN THE PROJECT ROW CORRIDOR

The controlling maximum energized-conductor offset within the Project ROW corridor occurs under the EPE Extreme Wind case in the span from 3B TAP to 4B TAP with wind from the Right. Using the absolute value of the centerline-based offset, the controlling maximum offset within the Project ROW corridor is 53.64 feet.

For the NESC blowout case, the controlling maximum offset within the Project ROW corridor occurs in the span from 2B TAP to 3B TAP under Initial RS with wind from the Left. Using the absolute value of the centerline-based offset, the controlling NESC blowout maximum within the Project ROW corridor is 40.34 feet.

D. STATISTICAL SUMMARY OF ABSOLUTE ROUTE-CORRIDOR BLOWOUT OFFSETS

Across the route-corridor phase-conductor rows, the absolute blowout offsets range from 9.15 feet to 53.64 feet from centerline, with a mean of 27.01 feet, a median of 23.54 feet, a sample standard deviation of 12.58 feet, a 90th percentile of 44.87 feet, and a 95th percentile of 52.21 feet. Within the NESC Blowout (6 PSF: 0 IN ICE: 60 F), the absolute blowout offsets range from 9.15 feet to 40.34 feet. Within the EPE Extreme Wind (25.58 PSF: 0 IN ICE: 60 F), the absolute blowout offsets range from 18.67 feet to 53.64 feet.

NOTE REGARDING SUBSTATION TERMINATION SPANS

The blowout results also include the two phase-conductor termination spans adjacent to the Lava Substation. Those spans are separate from the route-span ROW corridor evaluation because they are located within private property associated with the substation approach.

For those termination spans, the controlling NESC blowout maximum is 102.27 feet from centerline, and the controlling EPE extreme wind maximum is 109.90 feet from centerline. Because those values are associated with the substation approach, rather than the route ROW corridor, they should be addressed separately from the route ROW corridor summary.

Alex Galvis
04/16/2026

ALEJANDRO GALVIS
NEW MEXICO
31694
PROFESSIONAL ENGINEER

RESUME OF ALEJANDRO GALVIS, P.E.

Alejandro Galvis, P.E.
8005 Brockman Street – Austin, Texas 78757

PROFESSIONAL SUMMARY

Transmission line engineer specializing in overhead transmission line design and **engineering analysis**, including PLS-CADD line modeling, sag-tension, structure spotting, clearance verification, and evaluation of wind-driven lateral conductor movement ("blowout"). Experience supporting utility design standards and maintaining safe clearance envelopes for operation, maintenance, and vegetation management planning. Professional experience in transmission line design beginning in 2013, including work for multiple utilities across the United States.

TECHNICAL EXPERTISE

- Overhead transmission line design and engineering analysis (12.5 kV to 500 kV; primary emphasis 69 kV to 345 kV)
- PLS-CADD engineering analysis: weather cases, sag-tension, structure spotting, and clearance verification
- Conductor lateral movement / blowout envelope evaluation under transverse wind
- ROW corridor and clearance envelope considerations supporting safe operation and maintenance
- Plan and profile development support, structure schedules, and technical documentation
- Structure analysis using the PLS suite (including PLS-POLE for demand/utilization checks where applicable)
- Multidisciplinary coordination (survey, civil, geotechnical, and substation interfaces) and design comment resolution

PROFESSIONAL EXPERIENCE

El Paso Electric Company – Transmission Line Engineer

Austin, Texas | February 2026 – Present

- Performs transmission line engineering analysis and design support, including PLS-CADD modeling, structure spotting, and clearance evaluations under applicable weather cases.
- Supports evaluation of conductor movement envelopes (including blowout under transverse wind) and documentation used for ROW/corridor clearance determinations.
- Supports plan and profile preparation, design reviews, and technical responses to internal and external comments.

Coalesce Management Consulting Limited – Transmission Line Engineer
Austin, Texas | August 2024 – Present

- Performed transmission line **engineering analysis** using PLS-CADD, including sag-tension modeling, weather case evaluation, and clearance verification for overhead line segments.
- Developed and checked **conductor blowout envelopes** (centerline-based lateral offsets with wind applied from both directions) and evaluated impacts to corridor/ROW clearance margins.
- Conducted structure demand/utilization checks using the PLS suite (including **PLS-POLE** where applicable) to support structural adequacy under governing load cases.
- Supported plan and profile deliverables, structure schedules, and design documentation packages; coordinated with survey/civil/substation stakeholders to resolve design constraints.

Lower Colorado River Authority (LCRA) – Transmission Line Engineer
Austin, Texas | 2022 – 2024

- Supported overhead transmission line design and rebuild efforts, including structure spotting support, clearance checks, and design documentation.
- Coordinated with internal stakeholders to resolve design comments and support constructible deliverables.
- Supports PLS-CADD engineering analysis, deliverable development, and technical review services as needed.

Pacific Gas and Electric Company (PG&E) – Transmission Line Engineer
California | 2017 – 2022

- Supported overhead transmission line engineering, including PLS-CADD modeling, clearance evaluations, and design documentation for line upgrades and reliability-driven projects.
- Coordinated multidisciplinary inputs and supported design review resolution.

Westar Energy / Evergy – Transmission Line Engineer
Kansas | 2013 – 2017

- Supported overhead transmission line design and engineering analysis, including structure loading/clearance considerations and design documentation.

EDUCATION

- **M.S., Electrical and Computer Engineering** – Indiana University–Purdue University Indianapolis (2012)
- **B.S., Electrical Engineering** – University of Memphis (2010)

LICENSURE AND CERTIFICATIONS

Professional Engineer (PE) Licensure

State	Board Name	License No.	Issue Date	Expiration Date
CA	California Board for Professional Engineers, Land Surveyors, and Geologists	24031	01/27/2022	06/30/2026
VT	Vermont Board of Professional Engineering	18.0136751	03/16/2026	07/31/2026
TX	Texas Board of Professional Engineers and Land Surveyors	146363	10/06/2022	09/30/2026
GA	Georgia Professional Engineers and Land Surveyors Board	55821	02/23/2026	12/31/2026
NM	New Mexico State Board of Licensure for Professional Engineers and Professional Surveyors	31694	03/13/2026	12/31/2026
NV	Nevada State Board of Professional Engineers and Land Surveyors	35426	03/13/2026	06/30/2027
ME	Maine Board of Licensure for Professional Engineers	19928	03/09/2026	12/31/2027
KS	Kansas State Board of Technical Professions	25379	12/11/2016	04/30/2028
ID	Idaho Board of Licensure of Professional Engineers and Professional Land Surveyors	1081909	03/09/2026	10/31/2028

Selected Technical Training / Certifications

Computerized Transmission Line Design: PLS-CADD (University of Wisconsin); Structural Analysis and Design of Transmission Structures: PLS-POLE; Analysis and Design of Transmission Towers using TOWER

ROW WIDTH DETERMINATION USING CONDUCTOR BLOWOUT

This exhibit is sponsored by Alejandro Galvis, P.E., a professional engineer licensed in New Mexico (PE No. 31694), and is submitted in support of his direct testimony.

ROW width is determined by (1) the full lateral conductor movement under wind (“blowout”), including insulator swing and structure deflection, and (2) additional width on each side for vegetation management, so that safe clearances can be maintained over the life of the line.

Variables (units: feet)

- w_s: effective structure width (outboard conductor spacing).
- $w_{CD,L}$, $w_{CD,R}$: conductor displacement from centerline under the controlling transverse wind case applied from left/right (includes swing/deflection).
- W_{CME} conductor movement envelope width (range of conductor positions under wind from both directions).
- W_{VM} : vegetation management width added outside the CME on each side; W_{ROW} : minimum ROW width for purchase.

All lateral offsets are measured horizontally from the transmission line centerline; left/right results are evaluated using absolute values.

Calculation steps

1. From the project line model (e.g., PLS-CADD), obtain $|w_{CD,L}|$ and $|w_{CD,R}|$ under the governing wind case(s), with wind applied from both directions.
2. Compute CME width (vertical single-post):

$$W_{\text{CME}} = w_s + |w_{CD,L}| + |w_{CD,R}|$$

3. Compute ROW width and apply rounding to whole 5-ft increments (see Figure 1):

$$W_{\text{ROW}} = W_{\text{CME}} + 2W_{\text{VM}}$$

$$W_{\text{ROW,rounded}} = 5 \cdot \left\lceil \frac{W_{\text{ROW}}}{5} \right\rceil$$

For 345 kV: $W_{\text{VM}} = 15$ ft (each side).

ROW edge clearance checks (EPE 345 kV criteria)

Verify the blown-out conductor remains within the ROW boundary and maintains the minimum separation to the ROW edge, as applicable to the check cases below:

- Load Case 1 (0 psf wind, 60°F, final): $X_{\text{ROW}} = 16$ ft
- Load Case 2 (6 psf wind, 60°F, final): $X_{\text{ROW}} = 13$ ft
- Load Case 3 (EPE extreme wind, 100 mph): keep conductor on the ROW with $X_{\text{ROW}} =$ 1 ft margin

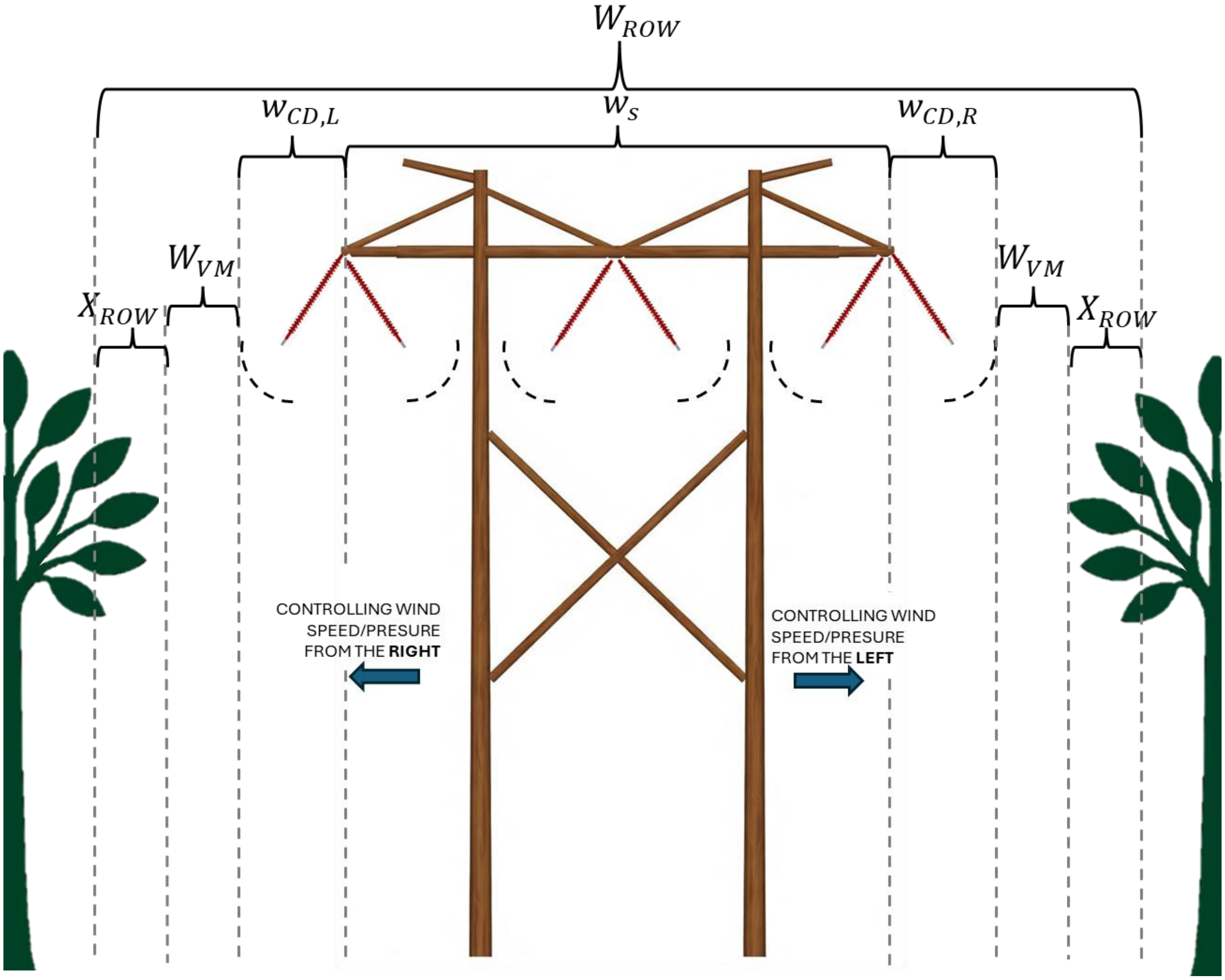


Figure 1. *Conceptual right-of-way (ROW) width determination showing the transmission line centerline, the maximum lateral conductor movement under wind ("blowout") to either side, and the applicable clearance/safety margin offsets used to define the required ROW boundary and resulting ROW width.*

EL PASO ELECTRIC COMPANY

345kV STANDARD DESIGN CRITERIA

Revision History	
Rev Number	**Date**
0	12/4/2018

TABLE OF CONTENTS

ABBREVIATIONS

AAMT:	Average Annual Minimum Temperature
AAT:	Annual Average Temperature
ACI:	American Concrete Institute
ACSR:	Aluminum Conductor, Steel Reinforced
ACSS:	Aluminum Conductor, Steel Supported
ADSS:	All Dielectric Self-Supporting Fiber Optic Cable
AGS:	Armor Grip Support
ANSI:	American National Standards Institute
ASCE:	American Society of Civil Engineers
ASTM:	American Society for Testing and Materials
ATCM:	Average Mean Temperature in the Coldest Month
CIGRE:	International Council on Large Electric Systems
DCD:	Design Code Document
EPE:	El Paso Electric Company
EPRI:	Electric Power Research Institute
FC:	Sag Tension Limit, Final After Creep Condition
FL:	Sag Tension Limit, Final After Load Condition
ft:	Feet
GFD:	Ground Flash Density
Hz:	Hertz
I:	Sag Tension Limit, Initial Condition
in:	Inches
IEEE:	Institute of Electrical and Electronics Engineers
kcmil:	1000 Circular Mills
kips:	1000 pounds
kV:	kilovolts
MAD:	Minimum Approach Distance
MAID:	Minimum Air Insulation Distance
Manual No. 74:	ASCE Manual and Report on Engineering Practice No. 74 "Guidelines for Electrical Transmission Line Structural Loading
MOT:	Maximum continuous operating temperature
MOTemerg:	Conductor operating temperature under 30-minute emergency rating conditions
MVCD:	Minimum Vegetation Clearance Distances
N/A:	Not Applicable
NESC:	National Electrical Safety Code, 2017
OHSW:	Overhead Shield Wire
OPGW:	Fiber Optic Ground Wire
OSHA:	Occupational Safety & Health Administration
PCI:	Prestressed Concrete Institute
ROW:	Right-of-Way
RUS:	Rural Utilities Service
SEI:	Structural Engineering Institute
TBD:	To Be Determined
TW:	Round Conductor, Trapezoidal-Shaped Stranding

1. GENERAL INFORMATION

1.1 Purpose

The scope and content of this Design Criteria Document (DCD) will serve as the basis for the detailed design and engineering of El Paso Electric Company (EPE) 345kV AC transmission lines located in EPE service territory. This document will provide consistency across the EPE system with new 345kV transmission lines. The application of this criteria will meet or exceed the requirements of the most recent version of the National Electric Safety Code (NESC). The 2017 edition of the NESC was used to develop the criteria set forth in this DCD. The engineer responsible for the design of the project is to verify the codes referenced in this document are current.

1.2 Scope

This document applies to the design of all new transmission lines owned by EPE. The engineer responsible for the design of the project is to verify that all national and safety codes are adhered to. The requirements of this document should be met unless approved by the appropriate EPE transmission engineering representative.

2. ENVIRONMENTAL

2.1 Location

The location of the project should be evaluated to determine the elevation, terrain, applicable permits, loading requirements, AAT, AAMT, and ATCM temperatures.

2.2 Right-of-Way

Wires are to be centered on the ROW. The right of way width is to be evaluated for any new projects and for any projects being rebuilt on an existing Right-of-Way.

2.3 Weather

The Project design is guided by numerous sources of weather information. The NESC is the governing code for the Project. The weather loading conditions described within the NESC must be considered in the design for compliance with the governing code.

The approach taken when applying these sources of weather information includes the following considerations:

- Compliance with minimum NESC conditions to confirm compliance with the code.
- Application of the EPE specific weather conditions.

2.3.1 Ambient Temperature Range

The historical ambient temperatures are to be analyzed for each project location. Refer to Table 2:1 for the temperature definitions.

Table 2.1 - Ambient Temperatures		
Design Designation	**Temp (ºF)**	**Description**
AAT	Refer to Map in Appendix B	Annual, mean average temperature
AAMT	Refer to Map in Appendix B	Annual, mean extreme minimum temperature
ATCM	Refer to Map in Appendix B	Average mean temperature in the coldest month

Note:
1. AAT, AAMT, and ATCM temperatures may vary depending on project location and elevation

2.3.2 Extreme Wind

In the United States, the climatic loads for transmission line design are defined in ASCE Manual No. 74 and the NESC. Per ASCE Manual No. 74, the basic 3-second gust wind speed at 33 ft above ground for Exposure C category corresponds to a 50-year MRI (mean recurrence interval, or return period).

NESC Rule 250C, Extreme Wind Loading requires all structures 60 ft above ground or water to withstand the Basic Wind Speed (i.e. 50-year return period wind) as specified by Figure 2.1. Projects in EPE territory are predominately in the NESC 90 mph region. Projects within EPE territory could fall within a special wind region as depicted by the shaded areas in Figure 2.1. If applicable, the engineer should design for the special wind considerations as noted in the NESC.

A 1.15 relative reliability or importance factor for the transmission line design is to be utilized, resulting in a maximum 100 mph equivalent design wind speed.

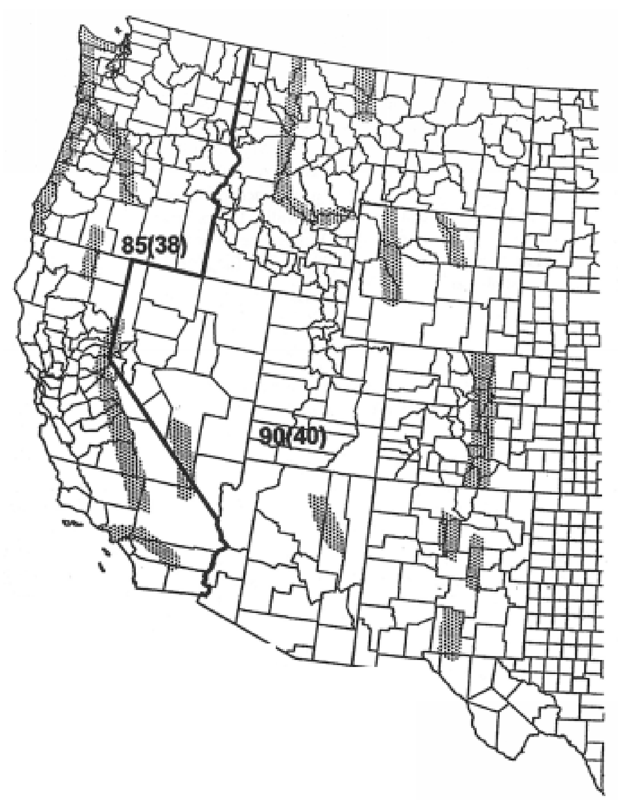


Figure 2.1: NESC Figure 250-2(a) – Basic Wind Speeds

2.3.3 Concurrent Wind and Ice

NESC Rule 250D, Extreme Ice with Concurrent Wind Loading requires all structures 60 ft above ground or water to withstand the uniform ice thickness with concurrent wind as specified by Figure 2.2. This rule implements an extreme ice and wind speed loading approach by incorporating the 50-year return period ice plus wind map from ASCE Manual No. 74, into the NESC.

Using "Figure 250-3(a) – Uniform ice thickness with concurrent wind from the current edition of the NESC, projects in EPE territory range from 0" ice to .25" ice with wind at 30 mph. An ice thickness of 0.25" will be applied to all projects in EPE territory.

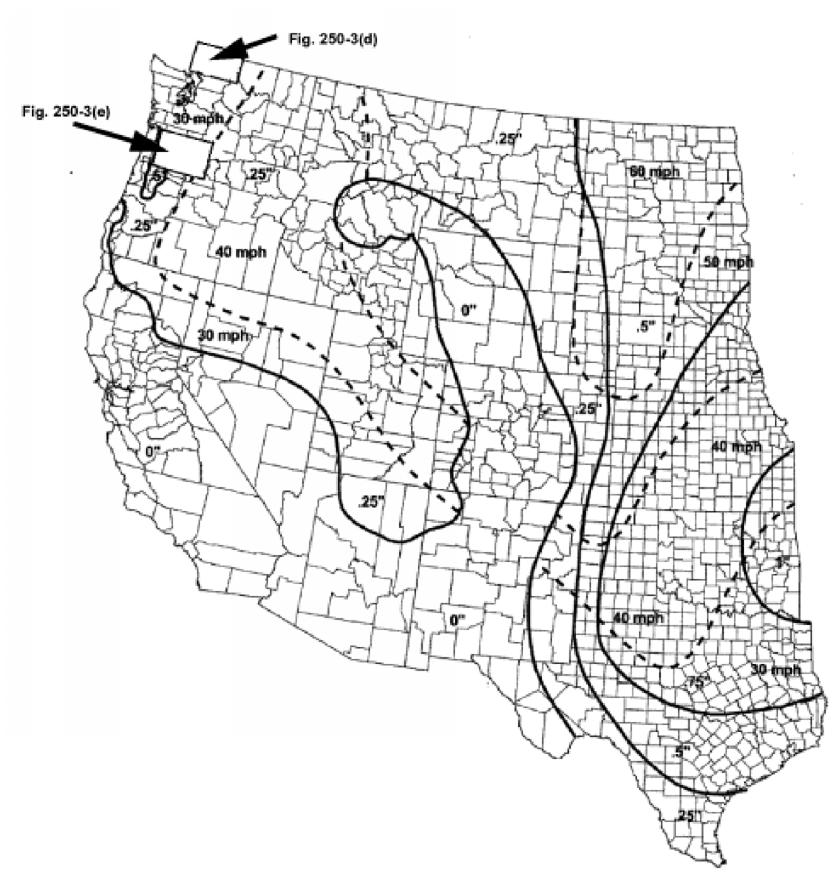


Figure 2.2: NESC Figure 250-3(a) – Uniform ice thickness with concurrent wind

2.3.4 Contamination

An analysis to determine the insulation contamination level is to be considered for each project location. IEEE 1313 identifies two types of contamination; industrial and sea. Industrial contamination is caused by particles displaced by wind that are deposited on the surface of the insulator. The contamination may be dust from roads, cement, fly ash, etc. These materials contain salt and form a conducting layer when wetted.

Using current publicly available aerial imagery, locations of possible major industrial/chemical facilities in close proximity to the transmission line should be evaluated. There are currently no established guidelines for determining insulator contamination without the removal and testing of existing insulators. Engineering judgement should be used to evaluate the potential for contamination at the project location.

2.3.5 Weather Summary

The following weather cases shown in Table 2.2 will be considered in the design, considering the criteria described within this DCD.

Table 2.2 - Weather Case Summary

Case Designation	Weather Case	Wind	Wire Ice Thickness (in)	Wire Temp (Deg F)	Comments
WC 1a	NESC 250B Heavy	4 psf	0.50	0	NESC Rule 250B Assumed wire ice density 57 lbs/ft^3
WC 1b	NESC 250B Medium	4 psf	0.25	15	NESC Rule 250B Assumed wire ice density 57 lbs/ft^3
WC 1c	NESC 250B Light	9 psf	-	30	NESC Rule 250B
WC 2	NESC 250C Extreme Wind	90 mph	-	60	NESC Rule 250C
WC 3	NESC 250D	2.31 psf	0.25	15	NESC Rule 250D Assumed wire ice density 57 lbs/ft^3
WC 4	EPE Extreme Wind	100 mph	-	60	Wind speed per NESC 250C and ASCE 74. Basic wind pressure to be adjusted for wind on wires and structures using a 1.15 wind factor/importance factor while also considering the wire and structure height, terrain type, and gust response factor per ASCE 74 and NESC 2017.
WC 5	EPE Extreme Ice	-	1.00	30	Assumed wire ice density 57 lbs/ft^3
WC 6	NESC Blowout	6 psf	-	60	NESC 233.A.1, 234.A.2, 235.B.2, and 235.E.2
WC 7	120 Deg	-	-	120	NESC 232.A.1, 233.A.1, and 234.A.1
WC 8[1,2]	Max Operating Temp.	-	-	212	Determined from line Ampacity Rating and Conductor Size
WC 9	60 Deg	-	-	60	NESC 233.A.1 and 235.B.1.b
WC 10	32 Deg, NESC District Ice	-	0.50 or 0.25	32	NESC 233.A.1.a(3)(c), and 234.A.1(c). Ice Thickness depends on location of project.
WC 11	30 Deg	-	-	30	Conductor Tension Case
WC 12	Uplift	-	-	0	Wire temperature assumed to be 0°F
WC 13	Construction & Maintenance	2 psf	-	60	ASCE 74, Section 3.1.2.3.1 Wire temperature assumed to be 60°F
WC 14	Galloping (swing)	2 psf	0.5	32	Galloping Case: RUS 1724E-200
WC 15	Galloping (sag)	-	0.5	32	Galloping Case: Per RUS 1724E-200
WC 16[3]	AAT	-	-	TBD	Average annual temperature near project location Per NOAA Weather Data
WC 17[3]	AAMT	-	-	TBD	Average annual extreme minimum temperature near project location Per UDSA Plant Hardiness Zone Map
WC 18[3]	ATCM	-	-	TBD	Average temperature of the coldest month near project location Per NOAA Weather Data

Notes:
1. Ambient temperature at AAT. If ACSS is utilized, Maximum Operating Temperature is to be re-evaluated
2. Ambient temperature for all other weather cases assumed to be the same as the wire temperature
3. Refer to map in Appendix B

2.4 FAA

The FAA notice criteria tool should be evaluated for all new structures. If required by the FAA, a permit is to be filed. The following information is required to fill out the FAA notice Criteria Tool.

1. Structure locations in latitude and longitude coordinates
2. Structure elevation
3. Structure above ground height

2.5 Access Restrictions

Access restrictions should be identified during the design process and accounted for in the design of the transmission line. Land Management should be contacted to identify if there are any restrictions.

3. ELECTRICAL DESIGN CRITERIA

3.1 Line Information

Table 3.1 below summarizes the basic design of the project:

Table 3.1 - 345kV Transmission Line	
Voltage	345kV
Maximum Operating Temperature (Emergency)	212°F
Maximum Operating Temperature (Normal)	167°F
Maximum Design Temperature	212°F
Bundle Configuration[1]	Vertical
Bundle Spacing	18 inches
Shielding Angle[2]	<15°
Underbuild	Project Specific

Notes:
1. Vertical bundle configuration is preferred but horizontal may be needed in special situations.
2. Allowable Shielding Angle can be increased if negative reverse shielding is utilized in the structure configuration, an existing EPE structure type is utilized, or a lightning study is performed.

3.2 Applicable Codes and Standards

Structural and electrical design criteria for the transmission lines shall be determined in accordance with existing design standards and the 2017 National Electric Safety Code and ASCE Manual No. 74.

Table 3.2 - Controlling Code(s)	
NESC District (250B)[1]	Project Specific
Extreme Wind (250C)	60°F, 0”, 90mph
Concurrent Wind & Ice (250D)	15°F, 0.25”, 30mph (2.31 psf)

Notes:
1. NESC District (250B) should be evaluated per project location. The project is to be designed up to the next level of NESC loading zones.

3.3 Wire Information

3.3.1 Conductor Selection

A conductor study should be performed to determine the optimum conductor type to be utilized for the project.

The conductor size should be selected by analyzing ampacity ratings based on the maximum operating temperature.

The conductor steel core should be selected while considering any potentially corrosive areas near the project. For areas located near any highly contaminated areas, the steel core wires should consist of aluminum-clad steel designated as ACSR/AW or ACSS/AW.

3.3.2 Conductor

The conductor selected for structure loads development has the following characteristics:

Table 3.3 - Typical Conductor Characteristics		
Ruling Span Application	<1,000 ft	>1,000 ft
Size (kcmil/AWG)	954	954
Composition (ACSR, ACSS, etc.)	ACSR	ACSR
Code Word	Rail	Cardinal
Diameter	1.165”	1.196”
Weight	1.074 lb/ft	1.227 lb/ft
Rated Breaking Strength (Standard)	25,900 lbs	33,800 lbs
Design Voltage	345kV	
Typical Operating Voltage	345kV	
Maximum Operating Voltage	362.25kV (assume 5% overvoltage)	

Notes:
1. Rail conductor is typically utilized for standard span lengths. Cardinal conductor is to be considered for spans longer than 1,000 ft.

3.3.3 Shieldwire Selection

A short circuit rating should be considered when specifying the shieldwire(s) for a project. If the ground fault current exceeds the values for the shieldwire(s), then additional grounding requirements may be needed.

3.3.4 OPGW

The OPGW selected for structure loads development has the following characteristics:

Table 3.4 - OPGW Characteristics	
Size (Type / Fiber Count)	36 Fibers
Composition (EHS, OPGW, etc.)	OPGW
Diameter	0.528”
Weight	0.35 lb/ft
Rated Breaking Strength	18,432 lbs

3.3.5 Shield Wire

The shield wire selected for structure loads development has the following characteristics:

Table 3.5 - Shieldwire Characteristics	
Size (kcmil/AWG)	3/8
Composition (EHS, AW, etc.)	EHS
Diameter	0.360”
Weight	0.273 lb/ft
Rated Breaking Strength	15,400 lbs

3.4 Fault Current Rating

A short circuit thermal analysis based on short circuit levels and estimated protection clearing times should be performed to determine the minimum short circuit rating (I^2t) necessary to reduce risk of damaging fiber optic cables during short circuit events. Single line-to-ground (SLG) faults close to the substation result in the highest fault currents for the shield wires. Most of the current returns to the substation through the shield wires, causing resistive heating. This heat can damage the fiber optic cables. The short circuit rating is an important parameter when selecting an OPGW as it directly impacts the amount of aluminum in the cable.

3.5 Ampacity Requirements

The conductor ampacity calculations should be considered per IEEE Standard 738, “Standard for Calculating the Current Temperature of Bare Overhead Conductors” and SWRate. This calculation is based on steady-state relationships between the conductor temperature and the electrical current at ambient conditions.

The parameters shown below in Table 3.6 and IEEE Standard 738 is to be considered when calculating conductor ampacity.

Table 3.6 – Conductor Ampacity Calculation Parameters	
Ambient temperature	40ºC (104ºF)
Emissivity	0.5 (Average Oxidized Conductor)
Absorptivity	0.5 (Average Oxidized Conductor)
Wind Speed	3.7 feet/second (2.5 miles/hour)
Wind Direction	60º
Elevation	Highest Elevation on Project
Line Azimuth	Project Specific
Latitude	31.8º
Atmospheric Condition	Clear (Sunny Day)
Time of Day	4 p.m.
Date	June 10
Conductor Normal Temp	75ºC
Conductor Emergency Temp	100ºC

3.6 Corona and Field Effects

3.6.1 Corona

3.6.1.1 Audible Noise

Noise is defined as unwanted sound. It may be continuous (constant noise and decibel level), steady (constant noise with a fluctuating decibel level), impulsive (having a peak of short duration), stationary (occurring from a fixed source), intermittent (occurring at the same rate), or transient (occurring at a different rate). Noise levels are quantified using units of decibels. The A-weighted scale, reported in A-weighted decibels (dBA), most effectively approximates the human ear's response to sounds.

Audible noise from transmission lines is primarily due to point source corona (crackling and hissing with small amounts of light). It routinely occurs when air is ionized around a gap, burr, irregularity, or some non-insulated component on an energized transmission line. Periods of rain, fog, or heavy humidity amplify these corona effects due to the bridging capabilities of electricity and water. Audible noise calculations, measurements and limits are commonly referred to as either fair weather or foul weather audible noise. IEEE 539 defines fair weather as the weather condition when the precipitation intensity is zero and the transmission line conductors are dry. Foul weather is defined as the weather condition when there is precipitation or that can cause the transmission line conductors to be wet.

Concern about noise is related to negative impacts on humans and animals. Human response to noise is most commonly expressed as an annoyance and the level of annoyance may be affected by the intensity of the noise, its frequency (pitch), its duration of exposure and/or its recurrence. Ambient noise is the total noise in an environment and usually comprises sounds from many sources.

The following parameters should be considered as part of the audible noise study:

1. The controlling weather condition shall be wet conductor, fog, or light rain.
2. Nominal operating voltage shall be used for noise calculations.
3. Conductor elevation shall be determined based on final sag at MOT.
4. Average conductor height should be used to calculate audible noise.

5. Audible noise is calculated at 5 ft above ground corresponding to the typical height of the human ear and in accordance with standard audible noise measurements recommended by IEEE 656.

Audible noise, radio, and TV interference due to corona effects shall be considered in the selection of conductors. The conductor size should be selected so the audible noise and radio interference thresholds are not exceeded. Calculations shall be made using the BPA Corona and Field Effects program or equivalent. Elevation effects should be considered.

3.6.1.2 Radio Interference

Corona and gap discharges are two potential sources of radio interference. Corona discharges induce trains of short-duration current pulses that propagate along the line conductors, away from the point of generation. Gap discharges result from electrical discharges between broken or poorly fitting hardware, such as insulators, clamps and brackets. Gap discharges are typically relevant to distribution lines and not transmission lines. Radio interference is measured in decibels and is referenced to a signal input of 1 microvolt tuned to a certain measurement frequency (the unit is decibel microvolt per meter or dBμV/m). The radio interference level and measurement frequency of the line varies based on many factors. The primary factors are weather conditions, time, and altitude.

There are no established standards for allowable radio interference signal strength in the United States. It is recommended to use a criteria of 45 dBμV/m based in fair weather and measured at 100 horizontal feet from the centerline of the transmission circuit measured at six feet above the ground as a reasonable guideline based on data presented in IEEE Standard 430.

3.6.1.3 Electromagnetic Field (EMF)

Electric and magnetic fields are present wherever electricity flows: around appliances and power lines, in offices, schools, and homes. These fields are low energy, extremely low frequency fields, and should not be confused with high energy or ionizing radiation such as X-rays and gamma rays. The current (a flow of electric charge, measured in amperes), creates a magnetic field. The magnetic field is expressed in units of milliGauss (mG). The voltage (the force or pressure that causes the current to flow), measured in units of thousands of volts (kV), creates an electric field expressed in units of kV per meter (kV/m).

Current and voltage are required to transmit electrical energy over a transmission line. A 60-Hertz (Hz; cycles per second) magnetic field is created in the space around transmission line conductors by the electric current flowing in the conductors. This is the frequency of ordinary household current, usually referred to as 60 cycles. The strength of the magnetic field produced by an electric transmission line depends on the amount of current flowing through the conductor (the higher the electrical load, the higher the current), the configuration of the conductors (spacing and orientation), the height of the conductors, the distance from the line, and the proximity of other electrical lines. As the electric load (and the resulting current) on the transmission line varies continually on a daily and seasonal basis, the magnetic fields likewise vary throughout the day and year. Magnetic fields are highest closer to the line and diminish with distance. Physical structures, such as buildings, are transparent to magnetic fields in that they do not provide any shielding. Electric field considerations in the immediate vicinity of electric power lines include the potential for electric shock. The clearance of the power lines above ground, measures to prevent unauthorized climbing of the structures, and the proximity of the transmission lines to other utilities such as oil wells and pipelines will be considered.

Electric and magnetic field levels produced by the transmission line should be calculated at the edge of Right-of-Way (ROW). EMF levels should be calculated at a height of one meter above ground with phase conductors located at minimum conductor heights. The maximum operating voltage with a peak line loading should be used for the analysis of the transmission line and its different structures.

There are currently no established state regulations or standards for EMF. A reasonable guideline is presented in IEEE Std C95.6-2002 . The IEE STd C95.6-2002 recommends maximum permissible exposure of 10kV/m for the general public in the right-of-way and a limit of 5kV/m outside the right-of-way.

In addition to this limit, NESC Rule 232C.1.c requires clearances be increased to limit the steady-state current due to electrostatic effects to 5 mA rms if the largest anticipated truck, vehicle, or equipment under the line were short-circuited to ground at 120°F, final.

3.6.1.4 Lightning Protection

The shield angle should be evaluated by an analysis of lightning performance if a standard structure type is not utilized.

Lightning outage rate should comply with IEEE 1243, 1313.2. Lightning performance shall be analyzed, and a reasonable structure design should be established that limits shielding failures and back flashovers. This should be based on data from the National Lightning Detection Network to establish the ground flash density (GFD) and flash current distribution. GFD shall be based on a minimum of 5 years data in the Project area.

3.6.1.5 Grounding

The target ground rod reading is 15-25 ohms or less. During construction, a review of actual ground rod readings should be conducted to see how many structures have ground rod readings that are above the target. If a significant number of readings are above 25 ohms, a determination will be made of the impact on lightning performance to decide if mitigation is required. The following grounding procedures may be considered:

1. Place a single ground rod on the outside of the foundation.
2. After seven days from installation, measure the impedance
3. If the impedance is the target ground rod reading or less, no further action is required.
4. If any combination of five consecutive structure average is the target ground reading or less, no further action is required.
5. If the impedance is greater than the target ground rod reading, additional ground rods and counter point grounding are to be considered.

All pole line hardware and shield wires shall be effectively bonded.

Bond wire should be sized accordingly to address fault current capacity. Wire size and type shall be based on the maximum symmetrical phase to ground fault current for duration of 8 cycles without fusing. The duration used for OPGW sizing and bond wire sizing is independent of the substation design criteria related to fault duration. The duration of 8 cycles is based on high speed relaying and breaker operation, and assumes that the breaker closes back in on a fault after the initial outage, before the cable has completely cooled. It is also close to the clearing time for most backup relays to clear the fault. The initial temperature assumed for the calculation shall be equal to the ambient temperature assumed for conductor summer ratings.

To prevent bending forces on bonding tabs, all bond wires connecting the structure to articulating shield wire suspension hardware shall use the “S-strap” configuration. The S-shape should be perpendicular to the shield wire, and the bonding lug shall be oriented in a manner to avoid any substantial bending forces on the tab.

Fence and gate grounding should be considered in a manner consistent with NESC 092E and good engineering practice.

1. Fences perpendicular to the proposed transmission line shall be effectively grounded and bonded.
2. Fences parallel to the proposed transmission line shall be effectively grounded and bonded.

All grounding and bonding connectors utilized above and below ground should comply with Section 11.4 of IEEE Std. 80-2000. This requirement relates to a specific qualification for connectors that are expected to withstand fault current.

If required to analyze AC interference in pipelines or other parallel utilities, the maximum touch potential should be determined for above ground objects accessible to the public, as well as buried facilities accessible only by utility crews. Voltage and current density limits must comply with IEEE Std 80, NACE RP0177-2000, OSHA Std 2207, Part 1926 and the requirements of the facility owner.

If asymmetrical structure configuration is used, transposition structures may be required.

3.6.1.6 Electrical Reliability

IEEE 1313-2 recommends a back flash rate of 0.5 flashovers per 100 km per year (0.80 flashovers per 100 miles per year). Shield wire placement, structure grounding, and insulation should be considered to achieve this level of expected reliability.

Maximum transient overvoltage results are used in statistical distribution analysis to calculate the expected number of switching surge flashovers. Typical practice for EHV circuits is to select the insulation in order to limit this number to one or less flashover events per 100 operations.

3.6.1.7 Insulation

Insulation rating requirements, including the dry arc and leakage distance, contamination levels, 60 Hz Flashover, Impulse Flashover, and M&E strength, should be evaluated. The use of corona rings will be required to protect the insulators.

A contamination analysis should be performed for the project specific area. Contamination levels as defined in IEEE 1313.2 are to be used to determine the insulation requirements for this project and can be found in Table 3.7 below.

Table 3.7 – Contamination Site Severity

Site Severity	ESDD, mg/cm2
	IEEE
Very Light	0-0.03
Light	0.03-0.06
Average/Moderate	0.06-0.10
Heavy	>0.10

The equations used to calculate the leakage distance for the four contamination levels are shown below.

$$D_{lkg} = V_{lnMax} * D_{l-kV} * CF_{Alt}$$

$$CF_{Alt} = e^{\frac{El_{km}}{14}}$$

where:
V_{lnMax} = Maximum Line-to-Neutral Voltage, in kV
$D_{l\text{-}kV}$ = Leakage Distance per kV_{ln}
CF_{Alt} = Altitude Correction Factor
El_{km} = Elevation, in Kilometers

EPE typically utilizes Medium Contamination but should be determined on a case by case basis.

4. WIRE CRITERIA

4.1 Conductor Sag-Tension Limits

Table 4.1 below summarizes conductor sag-tension limits considered. The most stringent limit will be utilized to control the sag-tension in each span. The tension limits shown in the table below are minimum design limits per client standards. The Engineer is to verify compliance of all NESC tension limits. The ultimate controlling tension limit should be evaluated and implemented based on the project location and the final conductor selection.

Table 4.1 – Conductor Sag-Tension Limits

Case Designation	Weather Case	Temp (°F)	Ice (in)	Wind (psf)	Wire Condition	Ultimate Tension % of RBS
WC 1c	NESC 250B (Light)	30	0.00	9	I	25
WC 1b	NESC 250B (Medium)	15	0.25	4	I	25
WC 5[1]	EPE Extreme Ice	30	1.00	0	I	40
WC 9	60 Degrees	60	0.00	0	I	20
WC 9	60 Degrees	60	0.00	0	F	17

Notes:
1. Tension limit is to be applied at the discretion of the Engineer.

4.2 OPGW Sag-Tension Limits

Table 4.2 below summarizes all OPGW sag-tension limits considered. The Engineer is to verify compliance of all NESC tension limits. The most stringent limit will be utilized to control the sag-tension in each span.

Table 4.2 – OPGW Sag-Tension Limits

Case Designation	Weather Case	Temp (°F)	Ice (in)	Wind (psf)	Wire Condition	Ultimate Tension % of RBS
WC 1c	NESC 250B (Light)	30	0.00	9	I	25
WC 1b	NESC 250B (Medium)	15	0.25	4	I	25
WC 5[2]	EPE Extreme Ice	30	1.00	0	I	40
WC 9	60 Degrees	60	0.00	0	I	20
WC 9	60 Degrees	60	0.00	0	F	17

Notes:
1. OPGW to be sagged at 60°F Final at 80% of the 345kV conductor sagged at 60°F Final
2. Tension limit is to be applied at the discretion of the Engineer.

4.3 Shield Wire Sag-Tension Limits

Table 4.3 below summarizes all shield wire sag-tension limits considered. The Engineer is to verify compliance of all NESC tension limits. The most stringent limit will be utilized to control the sag-tension in each span.

Table 4.3 – Shield Wire Sag-Tension Limits

Case Designation	Weather Case	Temp (°F)	Ice (in)	Wind (psf)	Wire Condition	Ultimate Tension % of RBS
WC 1c	NESC 250B (Light)	30	0.00	9	I	25
WC 1b	NESC 250B (Medium)	15	0.25	4	I	25
WC 5[2]	EPE Extreme Ice	30	1.00	0	I	40
WC 9	60 Degrees	60	0.00	0	I	20
WC 9	60 Degrees	60	0.00	0	F	17

Notes:
1. Shield Wire to be sagged at 60°F Final at 80% of the 345kV conductor sagged at 60°F Final
2. Tension limit is to be applied at the discretion of the Engineer.

4.4 Final after Load and Creep

Final after load is defined as NESC 250B and final after creep is defined as Everyday Condition (60°F, 0”, 0#).

4.5 Bimetallic Conductor Option

It is assumed that aluminum strands of ACSR conductor will support compression at high temperatures. The maximum virtual compressive stress these strands can support is assumed to be 1.5 ksi.

4.6 Aeolian Vibration Analysis

A vibration analysis should be performed by the damper supplier or using the damper suppliers software. Location and weight of vibration dampers shall be in accordance with the recommendation of the manufacturers of the conductor and the vibration damper. Spiral dampers may be utilized for conductors and shieldwires less than 0.75” in diameter.

4.7 Spacer Requirements

When required, spacers will be utilized and will be installed such that:

- The maximum distance from the conductor clamp to the first spacer and between spacers will be coordinated with the spacer vendor or using the spacer damper suppliers software.
- Two or more spacers will be installed in jumper strings. They will be equally spaced between the deadends.
- Spacers are not anticipated in vertical bundle spans, but may be used on vertical bundle jumpers.

5. STRUCTURE CRITERIA

5.1 Codes and Standards

The structural design for the transmission line will be in accordance with the latest accepted revision of the following list of codes and standards. The line will be designed to Grade B Standards, as defined by the National Electrical Safety Code. A summary of the codes, industry standards, and guides to be used are as follows:

- National Electrical Safety Code (NESC), ANSI C2
- ANSI/ASCE-10, Design of Latticed Steel Transmission Structures
- ASCE-72, Design of Steel Transmission Pole Structures
- PCI, Design Handbook-Precast and Pre-stressed Concrete
- ACI-318, Building Code Requirements for Structural Concrete

Specific standards for structural design are referenced below:

- IEEE Std. 524-2003, IEEE Guide to the Installation of Overhead Transmission Line Conductors
- IEEE Std. 524a-1993, IEEE Guide to Grounding During the Installation of Overhead Transmission Line Conductor: Supplement to IEEE Std. 524-1992
- IEEE Std. 691-2001, IEEE Guide for Transmission Structure Foundation and Testing
- IEEE Std. 951-1996, IEEE Guide to the Assembly and Erection of Metal Transmission Structures
- IEEE Std. 977-1991, IEEE Guide to Installation of Foundations for Transmission Line Structures

Other recognized standards shall be used where required to serve as guidelines for the design, when not in conflict with the above listed standards.

5.2 Structure Types

The structures listed in Table 5.1 below will be utilized

Table 5.1 – Structure Types				
Structure Type	**Structure Designation**	**Line Angle**	**Wind Span**	**Weight Span**
Tangent	Refer to Appendix C	0°-2°	Project Specific	Project Specific
Small Running Angle	Refer to Appendix C	2°-6°	Project Specific	Project Specific
Medium Running Angle	Refer to Appendix C	6°-15°	Project Specific	Project Specific
Large Running Angle	Refer to Appendix C	15°-25°	Project Specific	Project Specific
Small Deadend	Refer to Appendix C	0°-60°	Project Specific	Project Specific
Large Deadend	Refer to Appendix C	60°-100°	Project Specific	Project Specific

5.3 Structural Loading Conditions

All transmission structures will be designed for the load cases outlined in Table 5.2 with the load factors in Table 5.3 applied. Shape factors for structural components are shown in Table 5.4.

Table 5.2 – Loading Conditions

Load Case	Weather Case	Case Description	Wind on Wire	Wind on Structure	Radial Ice Thickness	Temp.	Condition of Wires
			($lb./ft^2$)	($lb./ft^2$)	(in.)	(°F)	
LC 1	See Note 11	NESC 250B	See Note 11	See Note 11	See Note 11	See Note 11	Intact
LC 2	WC 2	Extreme Wind[2]	See Section 5.3.1	See Section 5.3.2	0	60	Intact
LC 3	WC 4	EPE Extreme Wind	100 mph	100 mph	0	60	Intact
LC 4	WC 3	Concurrent Wind and Ice[3]	2.31	2.31	0.25	15	Intact
LC 5	WC 5	EPE Extreme Ice[13]	0	0	1.00	30	Intact
LC 6	WC 9	Everyday[4]	0	0	0	60	Intact
LC 7	WC 13	Construction Snub[5]	2.00	2.00	0	60	Intact
LC 8	WC 13	Maintenance[6]	2.00	2.00	0	60	Intact
LC 9	WC 9	Broken Shield Wire[10]	0	0	0	60	1/2 of wires broken
LC 10	WC 9	Broken Conductor[10]	0	0	0	60	1/2 of wires broken
LC 11	WC 10	Unbalanced Ice[12, 13]	0	0	See Note 12	32	Intact
LC 12	See Note 11	NESC 250B (Deadend)[7]	See Note 11	See Note 11	See Note 11	See Note 11	Wires installed one side
LC 13	WC 2	Extreme Wind (Deadend)[2,7]	See Section 5.3.1	See Section 5.3.2	0	60	Wires installed one side
LC 14	WC 4	EPE Extreme Wind (Deadend)[7]	100 mph	100 mph	0	60	Wires installed one side
LC 15	WC 3	Concurrent Wind and Ice (Deadend)[3,7]	2.31	2.31	0.25	15	Wires installed one side
LC 16	WC 5	EPE Extreme Ice (Deadend)[7,13]	0	0	1.00	30	Wires installed one side
LC 17	WC 4	Oblique Wind[9]	100 mph	100 mph	0	60	No Wires

Notes:
1. All loading cases include the weight of a person and hardware of 500 lbs.
2. In compliance with NESC Rule 250C and ASCE 74
3. In compliance with NESC Rule 250D and ASCE 74
4. Pole tip deflection for structures is not to exceed 1.5% of the above ground height
5. Load case includes a 3:1 vertical load
6. Point load applied to structure arms or bridge
7. Applies to deadend Structures only
8. With the exception of cases noted in Note 4, the maximum pole tip deflection is not to exceed 10% of the above ground height
9. Wind in most impactful direction, no conductor, no shield wires attached. Applies to Lattice Towers Only
10. Applies to tangent structures only. Wire loads applied individually, not simultaneously
11. NESC 250B loading depends on the location of the project (WC_1a, WC_1b, or WC_1c)
12. Apply ice to ahead and back span wires with the opposite side bare. Ice thickness per NESC District Ice
13. EPE Extreme Ice and Unbalanced Ice is to only apply to structures located above 6,000 ft in elevation

5.3.1 Extreme Wind on Wire Loads Calculations

The equations below show the calculations used for the Extreme Wind adjustments on the conductor and shieldwires using the wind pressure parameters and coefficients per the NESC and ASCE Manual No. 74. The calculation producing the greatest wind pressure for conductors attached at the design maximum height should be utilized for design. The EPE Extreme wind weather case (WC 4) satisfies the NESC wind on wire and structure calculation for typical structure/height configurations. The engineer is to verify all extreme wind code requirements.

5.3.1.1 Extreme Wind on Wire – NESC Calculation

Calculation of the extreme wind force per the NESC can be found in the equations below.

$$\frac{F}{A} = 0.00256(V_{RP})^2 k_z G_{RF} I C_f$$

where:
F = Wind Force
A = Surface Area
V_{RP} = Basic Wind Speed, 3-sec Gust Design Wind Speed for 50-year Return Period
k_z = Velocity Pressure Exposure Coefficient (NESC Rule 250C1, Table 250-2)
G_{RF} = Gust Response Factor (Wire) (NESC 250C2)
I = Importance Factor (1.0 for Utility Structures and their Supported Facilities per NESC 2017: Utilize 1.15 for design)
C_f = Force Coefficient (Shape Factor) (NESC 251A2 and 252B)

5.3.1.2 Extreme Wind on Wire – ASCE 74 Calculation

Calculation of the extreme wind force per ASCE Manual No. 74 can be found in the equations below.

$$\frac{F}{A} = QK_zK_{zt}(V_{RP})^2 \gamma_w G C_f$$

$$G = \frac{1 + 2.7E\sqrt{B_w}}{{K_v}^2}$$

$$E = 4.9\sqrt{\kappa} * (\frac{33}{z_h})^{\frac{1}{\alpha_{PM}}}$$

$$B_w = \frac{1}{1 + \frac{0.8S}{L_s}}$$

where:
F = Wind Force
A = Surface Area
Q = 0.00256 (ASCE 74, Section 2.1.2)
K_z = Velocity Pressure Coefficient (Values from ASCE 74, Table 2-2, Exposure C)
K_{zt} = Topographic Factor (Values from ASCE 74, Section 2.1.7.3)
V_{RP} = 3-sec Gust Design Wind Speed for 50-year Return Period
γ_w = Wind Load Factor for 100-year Return Period (ASCE 74 Table 1-1)
G = Gust Response Factor (Wire) (ASCE 74, Section 2.1.5.1, Equation 2-4)
K_v = 1.43, (ASCE 74, Section 2.1.5.1)
κ = Surface Drag Coefficient (ASCE Table 2-3)
z_h = Effective Height of Wire, in ft (ASCE 74, Section 2.1.5.1)
α_{PM} = Power Law Exponent, Sustained Wind (ASCE 74, Table 2-3)
S = Design Wind Span, in feet, of the wires (ASCE 74, Section 2.1.5.1)
L_s=Turbulence Scale (ASCE 74, Table 2-3)
C_f = Force Coefficient (ASCE 74, Section 2.1.6.2.1, Conductors and Ground Wires)

5.3.2 Extreme Wind on Structure Load Calculations

The vendor selected to design structures for this project will be required to apply extreme wind forces to the structures in compliance with the NESC and ASCE Manual No. 74.

5.3.3 Structure Load, Strength, and Shape Factors

Table 5.3 – Load Factors

Load Case	Weather Case	Case Description	Wind on Wire	Wind on Structure	Radial Ice Thickness	Temp.	Load Factor			
			(lb./ft^2)	(lb./ft^2)	(in.)	(°F)	Vert.	Trans.	Long.	Wind on Structure
LC 1	See Note 3	NESC 250B	See Note 4	See Note 4	See Note 4	See Note 4	1.50[1]	2.50[1]	1.65[1]	2.50[1]
LC 2	WC 2	Extreme Wind	See Section 5.3.1	See Section 5.3.2	0	60	1.00[1]	1.00[1]	1.00[1]	See Note 2
LC 3	WC 4	EPE Extreme Wind	100 mph	100 mph	0	60	1.00	1.00	1.00	1.00
LC 4	WC 3	Concurrent Wind and Ice	2.31	2.31	0.25	15	1.00[1]	1.00[1]	1.00[1]	1.00[1]
LC 5	WC 5	EPE Extreme Ice	0	0	1.00	30	1.00	1.00	1.00	1.00
LC 6	WC_9	Everyday	0	0	0	60	1.00	1.00	1.00	1.00
LC 7	WC 13	Construction Snub	2.00	2.00	0	60	1.50	1.50	1.50	1.50
LC 8	WC_13	Maintenance	2.00	2.00	0	60	1.50	1.50	1.50	1.50
LC 9	WC 9	Broken Shield Wire	0	0	0	60	1.00	1.00	1.00	1.00
LC 10	WC 9	Broken Conductor	0	0	0	60	1.00	1.00	1.00	1.00
LC 11	WC 10	Unbalanced Ice	0	0	See Note 5	32	1.00	1.00	1.00	1.00
LC 12	See Note 3	NESC 250B(Deadend)	See Note 4	See Note 4	See Note 4	See Note 4	1.50[1]	2.50[1]	1.65[1]	2.50[1]
LC 13	WC 2	Extreme Wind (Deadend)	See Section 5.3.1	See Section 5.3.2	0	60	1.00[1]	1.00[1]	1.00[1]	See Note 2
LC 14	WC 4	EPE Extreme Wind (Deadend)	100 mph	100 mph	0	60	1.00	1.00	1.00	1.00
LC 15	WC 3	Concurrent Wind and Ice (Deadend)	2.31	2.31	0.25	15	1.00[1]	1.00[1]	1.00[1]	1.00[1]
LC 16	WC 5	EPE Extreme Ice (Deadend)	0	0	1.00	30	1.00	1.00	1.00	1.00
LC 17	WC 4	Oblique Wind	100 mph	100 mph	0	60	1.00	1.00	1.00	See Note 2

Notes:
1. Per NESC Table 253-1
2. Wind load on pole to be in compliance with NESC Rule 250C and ASCE 74
3. NESC 250B loading depends on the location of the project (WC_1, WC_2, or WC_3)
4. NESC 250B loading depends on the location of the project (WC_1a, WC_1b, or WC_1c)
5. Apply ice to ahead and back span wires with the opposite side bare. Ice thickness per NESC District Ice

Table 5.4 - Shape Factors for Wires, Cylindrical, and Flat Surfaces	
Surface Types	**Shape Factor**
Wires[1]	1.0
Cylindrical Surfaces (wood and 12-sided steel poles)[2]	1.0
Flat Surfaces[2]	1.6
Latticed Structures (considers both sides of a tower)	See Note 3

Notes:
1. Per NESC 251A2 and ASCE 74, Section 2.1.6.2.1
2. Per NESC 251B2 and ASCE 74, Section 2.1.6.2.4, Table 2-6
3. Shape Factor for Latticed Structures to be in compliance with NESC Rule 250C and ASCE 74

5.3.4 Broken Wire Loads

Angle suspension and deadend structures will be designed to resist the residual static load (RSL) resulting from the release of the tension of one ground wire or conductor phase, non-coincidentally. The RSL is calculated for average spans and at average ambient conditions, final tensions.

5.3.5 Unbalanced Ice Loads

Unequal ice accumulations or shedding adjacent spans will induce critical out-of-balance longitudinal loads on structures. Loads will be developed assuming ice accumulation in the ahead or back span with no ice on the opposite side.

5.3.6 Construction and Maintenance Loads

Construction and maintenance loads, unlike weather-related loads, are controllable to a large extent and are directly related to work methods. These load cases consider relatively common ambient conditions combined with typical construction and maintenance activities. The construction load case is to include a 3:1 vertical load.

5.4 Additional Structure Information

5.4.1 Failure Containment

The application of failure containment measures is to minimize cascade failures that might otherwise extend well beyond the failed section of the line. The project approach to failure containment is to place a deadend structure approximately every 10 miles and designing all structures for longitudinal loads.

5.4.2 Other Information

Table 5.5 below contains additional project specific structure information.

Table 5.5 – Additional Structure Information	
Raptor Protection	As Required
Pole Height Restrictions[1]	200 ft AGH (Max)
Anodes Required	As Required

Notes:
1. Maximum pole height is to be lower than 200ft, if possible, to avoid needing FAA lights to be installed on the structure. The height limit of EPE bucket trucks should also be considered when structure heights exceed 105 ft AGH. Additional climbing devices are to be considered for structures taller than 105 ft AGH

6. HARDWARE

6.1 Assembly Types

The assemblies outlined in Table 6.1 shall be utilized. Corona free hardware will be used for the 345kV line to minimize the effects of corona.

Table 6.1 – Assembly Types						
Wire Description	Suspension			Deadend		
	Suspension Clamp	Armor Rods	AGS	Bolted	Compression	Hardware Considerations
Conductor	Project Specific	Project Specific	Project Specific	Project Specific	Project Specific	☒ Normal[1] ☐ High Temp ☒ Corona Free
OPGW	Project Specific	Project Specific	Project Specific	Project Specific	Project Specific	☒ Normal ☐ High Temp ☐ Corona Free
OHSW	Yes	N/A	N/A	Yes	N/A	☒ Normal ☐ High Temp ☐ Corona Free

Notes:
1. High temperature hardware is to be utilized for ACSS conductors
2. Material fittings should be evaluated on a case by case basis

6.2 Grading Requirements

Grading rings are required for non-ceramic insulators and should be installed per the insulator manufacturer's requirements. Grading ring are recommended but not required for porcelain or glass insulators and should be considered on a case by case basis.

6.3 OPGW

Splice enclosures shall be installed on the pole such that the bottom of the cable coil and enclosure is at a minimum height of 15 ft above grade.

The Supplier shall account for the OPGW cable length during the design so that there is sufficient cable at each splice location to allow future splice repairs, and specify this in the construction specifications, for the pre-splice and post splice conditions. At a minimum, the OPGW length is to include 100 ft pre-splice, coiled at the ground, and 60 ft of cable coiled in post splice condition. OPGW cable ends shall be sealed with an end cap adequate to prevent moisture intrusion, immediately after stringing. The OPGW pull length should be evaluated per the manufacturer's recommendation in regard to the cumulative and maximum line angles of a section.

6.4 Strength Requirements

Table 6.2 outlines the strength factors that apply to the insulators and hardware

Table 6.2 – Insulators and Hardware Strength Factors					
Material	**Load Case Description**	**Load Factor**	**Strength Factor**		
			NESC	**Client**	**Design**
Non-Ceramic Insulator	NESC 250B	No	0.50[1]	0.50	0.50
	NESC 250C & NESC 250D	No	0.65[1]	0.50	0.50
	All Non-NESC Cases	No	-	0.50	0.50
Ceramic Insulator	NESC 250B	No	0.50[1]	0.50	0.50
	NESC 250C & NESC 250D	No	0.50[1]	0.50	0.50
	All Non-NESC Cases	No	-	0.50	0.50
Support and Attachment Hardware	NESC 250B	Yes	1.00[2]	1.00	1.00
	NESC 250C & NESC 250D	Yes	0.80[2]	0.50	0.50
	All Non-NESC Cases	Yes	-	0.50	0.50
Deadend Fittings & Hardware	NESC 250B	Yes	1.00[3]	1.00	1.00
	NESC 250C & NESC 250D	No	0.80[3]	0.50	0.50
	All Non-NESC Cases	No	-	0.50	0.50
Guys and Guy Grips	NESC 250B	Yes	0.90[2]	0.90	0.90
	NESC 250C & NESC 250D	Yes	0.90[2]	0.65	0.65
	All Non-NESC Cases	Yes	-	0.65	0.65

Notes:
1. NESC Table 277-1
2. NESC Rule 261.M and Table 261-1
3. NESC Rule 261.H.2.c

6.5 Insulator Swing Angle

Refer to Table 8.4 for the required clearances to be maintained to the structure.

If V-String suspension insulators are being utilized, a detailed analysis is to be performed to determine the weather conditions that potentially cause the insulators to experience compression loading.

6.6 Uplift

Suspension assemblies should be designed to not experience uplift at the AAMT weather case. If applicable, conductor will be counterbalanced by placing weight on the conductor or adjacent structures will be increased in height to mitigate uplift concerns.

If uplift occurs on the shield wire at the AAMT weather case, the shield wire will be dead-ended only if reasonable solutions cannot be found by adding structure height or counter weights. If uplift occurs on an engineered dead-end structure, steel pole vendor to verify the pole's slip joint connection can withstand the vertical loads and mitigate as necessary.

7. FOUNDATION DESIGN

7.1 Foundation Criteria

Transmission line structure foundation types may include, but are not limited to, direct embed, drilled pier with reinforced concrete, helical anchor, and vibratory caisson foundations. Foundation types should be evaluated utilizing the Geotechnical Report for the project.

For foundations in compression, eccentric loaded foundations with a high L/r are more susceptible to buckling. For a foundation with a slenderness ratio greater than ten, the substructure shall be designed as a flexible member instead of a rigid member. The slenderness ratio is noted below that allows the deflection criteria to be utilized and to design the foundation as a rigid member.

Drilled pier and direct embedded foundations should be designed in accordance with the requirements as shown below in Table 7.1. The parameters shown in the table are to be used with EPRI's Foundation Analysis and Design (FAD) program. Alternative foundation types should be designed on an as-needed basis.

Table 7.1 – Foundation Design Criteria

Description	Acceptance Criteria
Design Concrete Strength	3,000 psi
Actual Concrete Strength	4,000 psi
Reinforcing Steel	ASTM A615 Grade 60, 60ksi
FAD Springs	-Base Shear and Base Moment Springs will not be utilized - Side Shear Springs will be utilized unless engineer expects permanent casing will be used during installation.
Drilled Pier Reveal	1'-0" Minimum
Design Loads	Factored Loads will be utilized
Direct Embed Backfill Material	Concrete
Total Ground Line Deflection[2]	3.0 in.
Total Foundation Rotation[2]	2.0 deg.
Non-Recoverable Deflection[2]	2.0 in.
Non-Recoverable Rotation[2]	1.0 deg.
Factor of Safety	1.2
Foundation Slenderness Ratio	3/1 < Depth/Diameter < 10/1
Anchor Bolt Length[1]	Full Length

Notes:
1. Standard Length Anchor Bolts can be utilized if considered advantageous for the project
2. Parameters are not applicable for compression/uplift foundation designs

8. CLEARANCES

The basis for calculating proper transmission line clearances is the NESC and EPE design practices. For new line designs, clearance buffers have been identified for vertical clearances, which are summarized in the following sections. For special cases not listed in this document the NESC document will govern and a reasonable buffer shall be utilized.

8.1 Clearance Due to Voltage

Clearances shall be determined from maximum phase-to-ground voltages. Phase-to-ground voltages shall include a 5% over-voltage for the 345kV line. Typical voltages are shown in Table 8.0

Table 8.0 - Clearance Voltage Criteria		
Nominal Phase-to-Phase Voltage (kV)	**Maximum Phase-to-Ground Voltage (kV)**	**Comments**
345	209	Includes 5% over-voltage

8.2 Right-of-Way Blowout

Minimum clearances to be maintained from the blown-out conductor to the edge of right-of way shall be as follows.

- Load cases 1 and 2 are based on maintaining NESC clearance to buildings. See NESC 234 C.1.
- Clearances for Load Case 3 are not governed by NESC. This case is a EPE criteria designed to keep the conductors on the right-of-way under an extreme wind.
- If the project is located in an urban environment, the wire blowout will need to be evaluated on a case by case basis.

Blowout of the conductors and ground wires outside the right-of-way will be checked using the clearance criteria outlined in Table 8.1.

Table 8.1 – Right-of-Way Blowout					
Load Case	**Weather Case**	**Description**	**345kV Line**		
			Required Clearance (ft)	**Adder (ft)**	**Design Clearance (ft)**
Load Case 1	WC 9	0 PSF, No Ice, 60°F, Final	14	2	16
Load Case 2	WC 6	6 PSF, No Ice, 60°F, Final	11	2	13
Load Case 3	WC 4	EPE Extreme Wind (100 mph Wind)	-	1	1

Notes:
1. Right-of-Way Required Clearances are based off of an Elevation of 4,300 ft. The clearance adder encompasses all elevations up to 8,300 ft

8.3 Vertical Clearance Requirements

Vertical clearance shall be provided for the maximum operating temperature considering aluminum compression and no wind at final sag.

Vertical clearance requirements shall be determined in accordance with the NESC requirements. Specific NESC rules are referenced below. The vertical clearances include a 5% over-voltage for the 345kV line.

8.3.1 Design Buffers

In addition to the standard minimum clearance requirements, a design clearance buffer will be included and added to the required minimum clearance. The intent of the buffer is to account for expected survey, design and construction imprecision as well as construction tolerances. The magnitude of the buffer is dependent on the type of survey, design task, construction variables and construction method, each of them with an intrinsic inaccuracy. The calculated clearance buffer is the sum of the inaccuracies that can happen simultaneously. A clearance buffer of 3.5 ft will be applied to clearance to features below or adjacent to the line. This clearance buffer includes assumed inaccuracies in the LiDAR survey, ground survey, structure setting and construction, and wire sagging.

8.3.2 Clearance Adjustments due to Altitude

EPE's territory consists of varying terrain with elevations higher than 3300 ft above sea level. Appropriate atmospheric correction factors are to be applied for clearances to account for the decrease in atmospheric pressure per the NESC. The Clearance Tables located in Appendix A of this document has the clearance values divided into three categories: Project elevation less than 4,300 ft, between 4,300 ft - 6,300 ft, and between 6,300 ft - 8,300 ft. The Engineer is to evaluate the elevation that the project traverses and apply the appropriate clearance values.

8.3.3 Adjustments to Clearance for Oversize Vehicles and Farm Equipment

If it is expected that vehicles taller than 14 ft will be crossing underneath the line, the vertical clearances to ground/road in Appendix A are to be increased by an incremental distance determined by subtracting the oversize vehicle height from 14 ft.

8.3.4 Clearance to Ground, Roadways, Rail or Water Surfaces

The vertical clearance values are located in Appendix A, Section A.

8.3.5 At Line Crossings, Conductors of Different Circuits on Different Supporting Structures

Mid-span crossing of wires should be avoided where practical. The vertical clearance at points along the span shall be measured using the weather conditions detailed in Table 8.2 below.

Table 8.2 – Line Crossing Weather Conditions (NESC Rule 233A)	
Upper Conductor Condition	Lower Conductor Position
32°F, 0#, 0" – Final	32°F, 0#, 0" – Initial
MOT – Final	Everyday (60°F, 0#, 0") – Initial

In addition, in determining clearances, conductors shall be observed when subject to the same ambient air temperature and wind loading conditions, as well as its full range of icing conditions and applicable design electrical loading.

The design and structure spotting will provide additional clearance over adjacent distribution lines assuming lines may be upgraded to higher voltages in the future. For road crossings that do not currently have adjacent distribution lines, additional clearance will be provided assuming that a future distribution line may be constructed. The distribution pole height is to be assumed to be a 40 ft pole.

Appendix A, Section B lists the Code clearance, buffer and the design vertical clearance for wire crossings.

8.3.6 Conductors of Different Circuits on the Same Supporting Structure

Appendix A, Section C and Section D lists the vertical clearance requirements at the support for wires of different circuits carried on the same structure and in the span. Note, clearance between conductors of the same circuit is not considered in this section.

8.3.7 Clearance over Buildings, Bridges or Other Structures

Appendix A, Section E lists the vertical clearance requirements over building, bridges, or other structure.

8.3.8 Clearance to Self-Supporting Structures (NESC Rule 235E)

Table 8.3 identifies the required clearance from the conductor (as displaced by wind) to the supporting structure. Note that an adder is not included for the clearances in Table 8.3.

Table 8.4 identifies the load cases and associated clearances to be utilized when calculating allowable insulator swing angles.

Table 8.3 – Clearance to Self-Supporting Structure (NESC Rule 235)

Conductor rigidly supported or transversely displaced due to 6-psf wind, at 60°F, final		345kV 4,300 ft Elevation	345kV 6,300 ft Elevation	345kV 8,300 ft Elevation
Span or Guy Wires, or messengers attached to the same structure, at or near the support	Parallel to Line	13.1’	13.8’	14.4’
	Anchor Guys	8.0’	8.4’	8.8’
	All Other	12.6’	13.3’	13.9’
Surface of support arms, at the support		6.3’	6.6’	6.9’
Surface of structure, at the support	On Jointly used structures	6.4’	6.8’	7.1’
	All Other	6.3’	6.6’	6.9’

Table 8.4 - Insulator Swing Criteria (NESC Rule 235)

Case Number	Weather Case	Cable Condition	345kV Required Clearance (ft)
Case 1[1]	60°F, no wind, no ice	Initial	8.2
Case 2[2]	60°F, 6psf wind, no ice	Initial	6.9
Case 3[2]	60°F, 6psf wind, no ice	Final	6.9
Case 4	EPE Extreme Wind (100 mph Wind)	Initial	3.5

Notes:
1. Load Case 1 includes a buffer for dry arc distance of the insulator
2. Load Case 2 and 3 Clearance based on NESC Table 235-6
3. Load Case 4 includes a buffer for an extreme wind weather event

8.4 Horizontal Clearances Requirements

In determining clearances, conductors shall be observed when subject to the same ambient air temperature and wind loading conditions, as well as its full range of icing conditions and applicable design electrical loading.

8.4.1 Adjacent Conductors of a Different Circuit on a Different Supporting Structure

Horizontal clearances between conductors of different circuits on different supporting structures are outlined in Appendix A, Section F.

8.4.2 Clearance to Buildings, Bridges or Other Structures (NESC Rule 234)

Horizontal clearance from conductors to buildings, bridges or other structures is specified with the conductor at rest and under wind displacement as outlined in Appendix A, Section G.

8.4.3 Rolling Clearances

Clearances between phase conductors or between ground wires and phases of the same circuit when "rolling" from a vertical to a horizontal configuration should not be less than the following:

Table 8.5 – Rolling Clearances

Nominal Phase to Phase Voltage (kV)	Phase-to-Phase Clearance (ft)	Phase-to-OHGW (ft)
345kV	14	13

Where practical, rolling clearances should be increased to lessen the probability of contact between phase conductors during galloping in flat areas and de-icing everywhere.

It is not anticipated that the 345 kV line will be required to "roll" from horizontal to vertical; however, there may be instances to "roll" from a horizontal configuration on substation or H-Frame structures to a delta configuration on single pole or lattice tower structures.

8.5 Galloping

Galloping ellipse spacing requirements will be considered. The A.E. Davison method shall be used for modeling single loop galloping for spans less than 600 ft. The L.W. Toye method shall be used for modeling double loop galloping for spans greater than 600 ft. The Cigre method is to be evaluaed in a case by case basis. Overlap between galloping ellipsis are not allowed unless approved by the appropriate EPE transmission engineering representative. The weather conditions shown in Table 8.6 will be used to evaluate galloping.

Table 8.6 – Galloping Weather Cases

Weather Case	Temp (°F)	Ice (in)	Wind (psf)
WC 14	32	0.5	2
WC 15	32	0.5	0

8.6 Additional Clearance to Consider

8.6.1 Minimum Approach Distances

Minimum Approach Distances should be considered when determining structure geometries. Refer to GE Energy Consulting Group's "Minimum Approach Distance Study for El Paso Electric 345kV Transmission Lines" and the Occupational Safety and Health Administration document 39 CFR, 1910.269 (OSHA 269) for more information.

9. Appendix A – Clearance Values

9.1 Clearance Values – 4300 ft Elevation

Vertical Clearances to Ground (Section 9.1A) (NESC Rule 232)			
Nature of Surface underneath wires, conductors or cables	**Voltage – 345kV**		
	Total NESC Clearance (ft) – 4300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Track rails of railroads	32.9	3.5	36.4
Roads, streets, and other areas subject to truck traffic	24.9	3.5	28.4
Driveways, parking lots, and alleys	24.9	3.5	28.4
Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc.	24.9	3.5	28.4
Spaces and ways subject to pedestrians or restricted traffic only.	20.9	3.5	24.4
Water areas not suitable for sail boating or where sail boating is prohibited	23.4	3.5	26.9
Water areas suitable for sail boating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with un unobstructed surface area of:			
Less than 20 acres	26.9	3.5	30.4
Over 20 to 200 acres	34.9	3.5	38.4
Over 200 to 2000 acres	40.9	3.5	44.4
Over 2000 acres	46.9	3.5	50.4
Established boat ramps and associated rigging areas: areas posted with sign (s) for rigging or launching sail boats			
Less than 20 acres	31.9	3.5	35.4
Over 20 to 200 acres	39.9	3.5	43.4
Over 200 to 2000 acres	45.9	3.5	49.4
Over 2000 acres	51.9	3.5	55.4

Vertical Clearances at Wire Crossings (Section 9.1B) (NESC Rule 233)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 4300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded guys, span wires and messengers	8.4	3.5	11.9
Effectively grounded communication guys, span wires and messengers	11.4	3.5	14.9
Open supply conductors, 22 kV	8.4	3.5	11.9
Open supply conductors, 34.5 kV	8.4	3.5	11.9
Open Supply conductors, 69kV	9.1	3.5	12.6
Open supply conductors, 115kV	10.1	3.5	13.6
Open supply conductors, 161kV	11.0	3.5	14.5
Open supply conductors, 230kV	12.5	3.5	16.0
Open supply conductors, 345kV	14.9	3.5	18.4

Vertical Clearances *at the Support (Section 9.1C)* Conductors of Different Circuits on the Same Supporting Structure (NESC Rule 235)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 4300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded guys, span wires and messengers	10.2	3.5	13.7
Open supply conductors, 22 kV	10.6	3.5	14.1
Open supply conductors, 34.5 kV	10.9	3.5	14.4
Open Supply conductors, 69kV	11.6	3.5	15.1
Open supply conductors, 115kV	12.6	3.5	16.1
Open supply conductors, 161kV	13.5	3.5	17.0
Open supply conductors, 230kV	15.0	3.5	18.5
Open supply conductors, 345kV	17.4	3.5	20.9

<table>
<tr><th colspan="4">Vertical Clearances in the Span (Section 9.1D)
Conductors of Different Circuits on the Same Supporting Structure
(NESC Rule 235)</th></tr>
<tr><th rowspan="2">Lower Level</th><th colspan="3">Upper Level Voltage – 345 kV</th></tr>
<tr><th>Total NESC Clearance (ft) – 4300 ft Elevation</th><th>Buffer (ft)</th><th>Design Clearance (ft)</th></tr>
<tr><td>Effectively grounded communication guys, span wires and messengers</td><td>9.0</td><td>3.5</td><td>12.5</td></tr>
<tr><td>Open supply conductors, 22 kV</td><td>9.5</td><td>3.5</td><td>13.0</td></tr>
<tr><td>Open supply conductors, 34.5 kV</td><td>9.7</td><td>3.5</td><td>13.2</td></tr>
<tr><td>Open Supply conductors, 69kV</td><td>10.4</td><td>3.5</td><td>13.9</td></tr>
<tr><td>Open supply conductors, 115kV</td><td>11.4</td><td>3.5</td><td>14.9</td></tr>
<tr><td>Open supply conductors, 161kV</td><td>12.3</td><td>3.5</td><td>15.8</td></tr>
<tr><td>Open supply conductors, 230kV</td><td>13.8</td><td>3.5</td><td>17.3</td></tr>
<tr><td>Open supply conductors, 345kV</td><td>16.2</td><td>3.5</td><td>19.7</td></tr>
</table>

<table>
<tr><th colspan="5">Vertical Clearances over Buildings, Bridges or Other Structures (Section 9.1E)
(NESC Rule 234)</th></tr>
<tr><th colspan="2" rowspan="2">Clearance Of</th><th colspan="3">Upper Level Voltage – 345 kV</th></tr>
<tr><th>Total NESC Clearance (ft) – 4300 ft Elevation</th><th>Buffer (ft)</th><th>Design Clearance (ft)</th></tr>
<tr><td colspan="2">Structures of a Different Circuit</td><td>11.0</td><td>3.5</td><td>14.5</td></tr>
<tr><td rowspan="2">Over Bridges</td><td>Attached</td><td>12.0</td><td>3.5</td><td>15.5</td></tr>
<tr><td>Not Attached</td><td>19.0</td><td>3.5</td><td>22.5</td></tr>
<tr><td rowspan="4">Buildings</td><td>Over/under roofs or projections <u>not</u> accessible to pedestrians</td><td>19.0</td><td>3.5</td><td>22.5</td></tr>
<tr><td>Over/under roofs, balconies, decks or projections accessible to pedestrians</td><td>20.0</td><td>3.5</td><td>23.5</td></tr>
<tr><td>Over roofs, ramps, decks and loading docks accessible to vehicles but <u>not</u> subject to truck traffic</td><td>20.0</td><td>3.5</td><td>23.5</td></tr>
<tr><td>Over roofs, ramps, decks, and loading docks accessible to truck traffic</td><td>25.0</td><td>3.5</td><td>28.5</td></tr>
<tr><td rowspan="2">Other Structures not Classified as Buildings or Bridges</td><td>Over or under catwalks and other surfaces upon which personnel walk</td><td>20.0</td><td>3.5</td><td>23.5</td></tr>
<tr><td>Over or under other portions of such installations</td><td>14.5</td><td>3.5</td><td>18.0</td></tr>
</table>

Horizontal Clearances to Adjacent Circuits (Section 9.1F) Conductors of Different Circuits on Different Supporting Structure (NESC Rule 233)			
Adjacent Line	Main Line Voltage – 345 kV		
	Total NESC Clearance (ft) – 4300 ft Elevation	Buffer (ft)	Design Clearance (ft)
Effectively grounded guys, span wires and messengers	11.2	3.5	14.7
Effectively grounded communication guys, span wires and messengers	11.2	3.5	14.7
Open supply conductors, 22 kV	11.2	3.5	14.7
Open supply conductors, 34.5 kV	11.2	3.5	14.7
Open Supply conductors, 69kV	11.9	3.5	15.4
Open supply conductors, 115kV	12.8	3.5	16.3
Open supply conductors, 161kV	13.8	3.5	17.3
Open supply conductors, 230kV	15.2	3.5	18.7
Open supply conductors, 345kV	17.5	3.5	21.0

Horizontal Clearance to Buildings, Bridges or Other Structures (Section 9.1G) (NESC Rule 234)				
Clearance Of		Upper Level Voltage – 345 kV		
		Total NESC Clearance (ft) – 4300 ft Elevation	Buffer (ft)	Design Clearance (ft)
Structures of a Different Circuit	No Displacement	11.5	3.5	15.0
	Displaced by Wind	11.0	3.5	14.5
Beside, Under, or Within a Bridge Structure	Attached – Readily accessible portions of any bridge, including wings, walls and abutments	12.0	3.5	15.5
	Not Attached – Readily accessible portions of any bridge, including wings, walls and abutments	14.0	3.5	17.5
	Attached – Ordinarily inaccessible portions of any bridge, including wings, walls and abutments	12.0	3.5	15.5
	Not Attached – Ordinarily inaccessible portions of any bridge, including wings, walls and abutments	13.0	3.5	16.5
Buildings	To walls, projections, and guarded windows	14.0	3.5	17.5
	To unguarded windows	14.0	3.5	17.5
	To balconies and areas readily accessible to pedestrians	14.0	3.5	17.5
Other Structures not Classified as Buildings or Bridges	To portions that are readily accessible to pedestrians	14.0	3.5	17.5
	To portions that are not readily accessible to pedestrians	14.0	3.5	17.5

9.2 Clearance Values – 6300 ft Elevation

Vertical Clearances to Ground (Section 9.2A) (NESC Rule 232)			
Nature of Surface underneath wires, conductors or cables	**Voltage – 345kV**		
	Total NESC Clearance (ft) – 6300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Track rails of railroads	33.3	3.5	36.8
Roads, streets, and other areas subject to truck traffic	25.3	3.5	28.8
Driveways, parking lots, and alleys	25.3	3.5	28.8
Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc.	25.3	3.5	28.8
Spaces and ways subject to pedestrians or restricted traffic only.	21.3	3.5	24.8
Water areas not suitable for sail boating or where sail boating is prohibited	23.8	3.5	27.3
Water areas suitable for sail boating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with un unobstructed surface area of:			
Less than 20 acres	27.3	3.5	30.8
Over 20 to 200 acres	35.3	3.5	38.8
Over 200 to 2000 acres	41.3	3.5	44.8
Over 2000 acres	47.3	3.5	50.8
Established boat ramps and associated rigging areas: areas posted with sign (s) for rigging or launching sail boats			
Less than 20 acres	32.3	3.5	35.8
Over 20 to 200 acres	40.3	3.5	43.8
Over 200 to 2000 acres	46.3	3.5	49.8
Over 2000 acres	52.3	3.5	55.8

Vertical Clearances at Wire Crossings (Section 9.2B) (NESC Rule 233)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 6300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded guys, span wires and messengers	8.8	3.5	12.3
Effectively grounded communication guys, span wires and messengers	11.8	3.5	15.3
Open supply conductors, 22 kV	8.8	3.5	12.3
Open supply conductors, 34.5 kV	8.8	3.5	12.3
Open Supply conductors, 69kV	9.5	3.5	13.0
Open supply conductors, 115kV	10.5	3.5	14.0
Open supply conductors, 161kV	11.5	3.5	15.0
Open supply conductors, 230kV	13.1	3.5	16.6
Open supply conductors, 345kV	15.6	3.5	19.1

Vertical Clearances *at the Support (Section 9.2C)* Conductors of Different Circuits on the Same Supporting Structure (NESC Rule 235)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 6300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded guys, span wires and messengers	10.5	3.5	14.0
Open supply conductors, 22 kV	11.0	3.5	14.5
Open supply conductors, 34.5 kV	11.3	3.5	14.8
Open Supply conductors, 69kV	12.0	3.5	15.5
Open supply conductors, 115kV	13.0	3.5	16.5
Open supply conductors, 161kV	14.0	3.5	17.5
Open supply conductors, 230kV	15.6	3.5	19.1
Open supply conductors, 345kV	18.1	3.5	21.6

Vertical Clearances *in the Span (Section 9.2D)* Conductors of Different Circuits on the Same Supporting Structure (NESC Rule 235)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 6300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded communication guys, span wires and messengers	9.3	3.5	12.8
Open supply conductors, 22 kV	9.8	3.5	13.3
Open supply conductors, 34.5 kV	10.1	3.5	13.6
Open Supply conductors, 69kV	10.8	3.5	14.3
Open supply conductors, 115kV	11.8	3.5	15.3
Open supply conductors, 161kV	12.9	3.5	16.4
Open supply conductors, 230kV	14.4	3.5	17.9
Open supply conductors, 345kV	16.9	3.5	20.4

Vertical Clearances over Buildings, Bridges or Other Structures (Section 9.2E) (NESC Rule 234)				
Clearance Of		**Upper Level Voltage – 345 kV**		
		Total NESC Clearance (ft) – 6300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Structures of a Different Circuit		11.4	3.5	14.9
Over Bridges	Attached	12.4	3.5	15.9
	Not Attached	19.4	3.5	22.9
Buildings	Over/under roofs or projections <u>not</u> accessible to pedestrians	19.4	3.5	22.9
	Over/under roofs, balconies, decks or projections accessible to pedestrians	20.4	3.5	23.9
	Over roofs, ramps, decks and loading docks accessible to vehicles but <u>not</u> subject to truck traffic	20.4	3.5	23.9
	Over roofs, ramps, decks, and loading docks accessible to truck traffic	25.4	3.5	28.9
Other Structures not Classified as Buildings or Bridges	Over or under catwalks and other surfaces upon which personnel walk	20.4	3.5	23.9
	Over or under other portions of such installations	14.9	3.5	18.4

Horizontal Clearances to Adjacent Circuits (Section 9.2F) Conductors of Different Circuits on Different Supporting Structure (NESC Rule 233)			
Adjacent Line	Main Line Voltage – 345 kV		
	Total NESC Clearance (ft) – 6300 ft Elevation	Buffer (ft)	Design Clearance (ft)
Effectively grounded guys, span wires and messengers	11.2	3.5	14.7
Effectively grounded communication guys, span wires and messengers	11.2	3.5	14.7
Open supply conductors, 22 kV	11.2	3.5	14.7
Open supply conductors, 34.5 kV	11.2	3.5	14.7
Open Supply conductors, 69kV	11.9	3.5	15.4
Open supply conductors, 115kV	12.8	3.5	16.3
Open supply conductors, 161kV	13.8	3.5	17.3
Open supply conductors, 230kV	15.2	3.5	18.7
Open supply conductors, 345kV	17.5	3.5	21.0

Horizontal Clearance to Buildings, Bridges or Other Structures (Section 9.2G) (NESC Rule 234)				
Clearance Of		Upper Level Voltage – 345 kV		
		Total NESC Clearance (ft) – 6300 ft Elevation	Buffer (ft)	Design Clearance (ft)
Structures of a Different Circuit	No Displacement	11.9	3.5	15.4
	Displaced by Wind	11.4	3.5	14.9
Beside, Under, or Within a Bridge Structure	Attached – Readily accessible portions of any bridge, including wings, walls and abutments	12.4	3.5	15.9
	Not Attached – Readily accessible portions of any bridge, including wings, walls and abutments	14.4	3.5	17.9
	Attached – Ordinarily inaccessible portions of any bridge, including wings, walls and abutments	12.4	3.5	15.9
	Not Attached – Ordinarily inaccessible portions of any bridge, including wings, walls and abutments	13.4	3.5	16.9
Buildings	To walls, projections, and guarded windows	14.4	3.5	17.9
	To unguarded windows	14.4	3.5	17.9
	To balconies and areas readily accessible to pedestrians	14.4	3.5	17.9
Other Structures not Classified as Buildings or Bridges	To portions that are readily accessible to pedestrians	14.4	3.5	17.9
	To portions that are not readily accessible to pedestrians	14.4	3.5	17.9

9.3 Clearance Values – 8300 ft Elevation

Vertical Clearances to Ground (Section 9.3A) (NESC Rule 232)			
Nature of Surface underneath wires, conductors or cables	**Voltage – 345kV**		
	Total NESC Clearance (ft) – 8300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Track rails of railroads	33.7	3.5	37.2
Roads, streets, and other areas subject to truck traffic	25.7	3.5	29.2
Driveways, parking lots, and alleys	25.7	3.5	29.2
Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc.	25.7	3.5	29.2
Spaces and ways subject to pedestrians or restricted traffic only.	21.7	3.5	25.2
Water areas not suitable for sail boating or where sail boating is prohibited	24.2	3.5	27.7
Water areas suitable for sail boating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with un unobstructed surface area of:			
Less than 20 acres	27.7	3.5	31.2
Over 20 to 200 acres	35.7	3.5	39.2
Over 200 to 2000 acres	41.7	3.5	45.2
Over 2000 acres	47.7	3.5	51.2
Established boat ramps and associated rigging areas: areas posted with sign (s) for rigging or launching sail boats			
Less than 20 acres	32.7	3.5	36.2
Over 20 to 200 acres	40.7	3.5	44.2
Over 200 to 2000 acres	46.7	3.5	50.2
Over 2000 acres	52.7	3.5	56.2

Vertical Clearances at Wire Crossings (Section 9.3B) (NESC Rule 233)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 8300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded guys, span wires and messengers	9.2	3.5	12.7
Effectively grounded communication guys, span wires and messengers	12.2	3.5	15.7
Open supply conductors, 22 kV	9.2	3.5	12.7
Open supply conductors, 34.5 kV	9.2	3.5	12.7
Open Supply conductors, 69kV	9.9	3.5	13.4
Open supply conductors, 115kV	11.0	3.5	14.5
Open supply conductors, 161kV	12.1	3.5	15.6
Open supply conductors, 230kV	13.7	3.5	17.2
Open supply conductors, 345kV	16.3	3.5	19.8

Vertical Clearances *at the Support (Section 9.3C)* Conductors of Different Circuits on the Same Supporting Structure (NESC Rule 235)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 8300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded guys, span wires and messengers	10.8	3.5	14.3
Open supply conductors, 22 kV	11.3	3.5	14.8
Open supply conductors, 34.5 kV	11.6	3.5	15.1
Open Supply conductors, 69kV	12.4	3.5	15.9
Open supply conductors, 115kV	13.5	3.5	17.0
Open supply conductors, 161kV	14.6	3.5	18.1
Open supply conductors, 230kV	16.2	3.5	19.7
Open supply conductors, 345kV	18.8	3.5	22.3

Vertical Clearances *in the Span (Section 9.3D)* Conductors of Different Circuits on the Same Supporting Structure (NESC Rule 235)			
Lower Level	**Upper Level Voltage – 345 kV**		
	Total NESC Clearance (ft) – 8300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded communication guys, span wires and messengers	9.6	3.5	13.1
Open supply conductors, 22 kV	10.1	3.5	13.6
Open supply conductors, 34.5 kV	10.4	3.5	13.9
Open Supply conductors, 69kV	11.2	3.5	14.7
Open supply conductors, 115kV	12.3	3.5	15.8
Open supply conductors, 161kV	13.4	3.5	16.9
Open supply conductors, 230kV	15.0	3.5	18.5
Open supply conductors, 345kV	17.7	3.5	21.2

Vertical Clearances over Buildings, Bridges or Other Structures (Section 9.3E) (NESC Rule 234)				
Clearance Of		**Upper Level Voltage – 345 kV**		
		Total NESC Clearance (ft) – 8300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Structures of a Different Circuit		11.7	3.5	15.2
Over Bridges	Attached	12.7	3.5	16.2
	Not Attached	19.7	3.5	23.2
Buildings	Over/under roofs or projections <u>not</u> accessible to pedestrians	19.7	3.5	23.2
	Over/under roofs, balconies, decks or projections accessible to pedestrians	20.7	3.5	24.2
	Over roofs, ramps, decks and loading docks accessible to vehicles but <u>not</u> subject to truck traffic	20.7	3.5	24.2
	Over roofs, ramps, decks, and loading docks accessible to truck traffic	25.7	3.5	29.2
Other Structures not Classified as Buildings or Bridges	Over or under catwalks and other surfaces upon which personnel walk	20.7	3.5	24.2
	Over or under other portions of such installations	15.2	3.5	18.7

Horizontal Clearances to Adjacent Circuits (Section 9.3F) Conductors of Different Circuits on Different Supporting Structure (NESC Rule 233)			
Adjacent Line	**Main Line Voltage – 345 kV**		
	Total NESC Clearance (ft) – 8300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Effectively grounded guys, span wires and messengers	11.2	3.5	14.7
Effectively grounded communication guys, span wires and messengers	11.2	3.5	14.7
Open supply conductors, 22 kV	11.2	3.5	14.7
Open supply conductors, 34.5 kV	11.2	3.5	14.7
Open Supply conductors, 69kV	11.9	3.5	15.4
Open supply conductors, 115kV	12.8	3.5	16.3
Open supply conductors, 161kV	13.8	3.5	17.3
Open supply conductors, 230kV	15.2	3.5	18.7
Open supply conductors, 345kV	17.5	3.5	21.0

Horizontal Clearance to Buildings, Bridges or Other Structures (Section 9.3G) (NESC Rule 234)				
Clearance Of		**Upper Level Voltage – 345 kV**		
		Total NESC Clearance (ft) – 8300 ft Elevation	**Buffer (ft)**	**Design Clearance (ft)**
Structures of a Different Circuit	No Displacement	12.2	3.5	15.7
	Displaced by Wind	11.7	3.5	15.2
Beside, Under, or Within a Bridge Structure	Attached – Readily accessible portions of any bridge, including wings, walls and abutments	12.7	3.5	16.2
	Not Attached – Readily accessible portions of any bridge, including wings, walls and abutments	14.7	3.5	18.2
	Attached – Ordinarily inaccessible portions of any bridge, including wings, walls and abutments	12.7	3.5	16.2
	Not Attached – Ordinarily inaccessible portions of any bridge, including wings, walls and abutments	13.7	3.5	17.2
Buildings	To walls, projections, and guarded windows	14.7	3.5	18.2
	To unguarded windows	14.7	3.5	18.2
	To balconies and areas readily accessible to pedestrians	14.7	3.5	18.2
Other Structures not Classified as Buildings or Bridges	To portions that are readily accessible to pedestrians	14.7	3.5	18.2
	To portions that are not readily accessible to pedestrians	14.7	3.5	18.2

10. Appendix B – Weather Maps

10.1 AAT

See Figure 10.1 for the Average Annual Temperature for EPE territory.

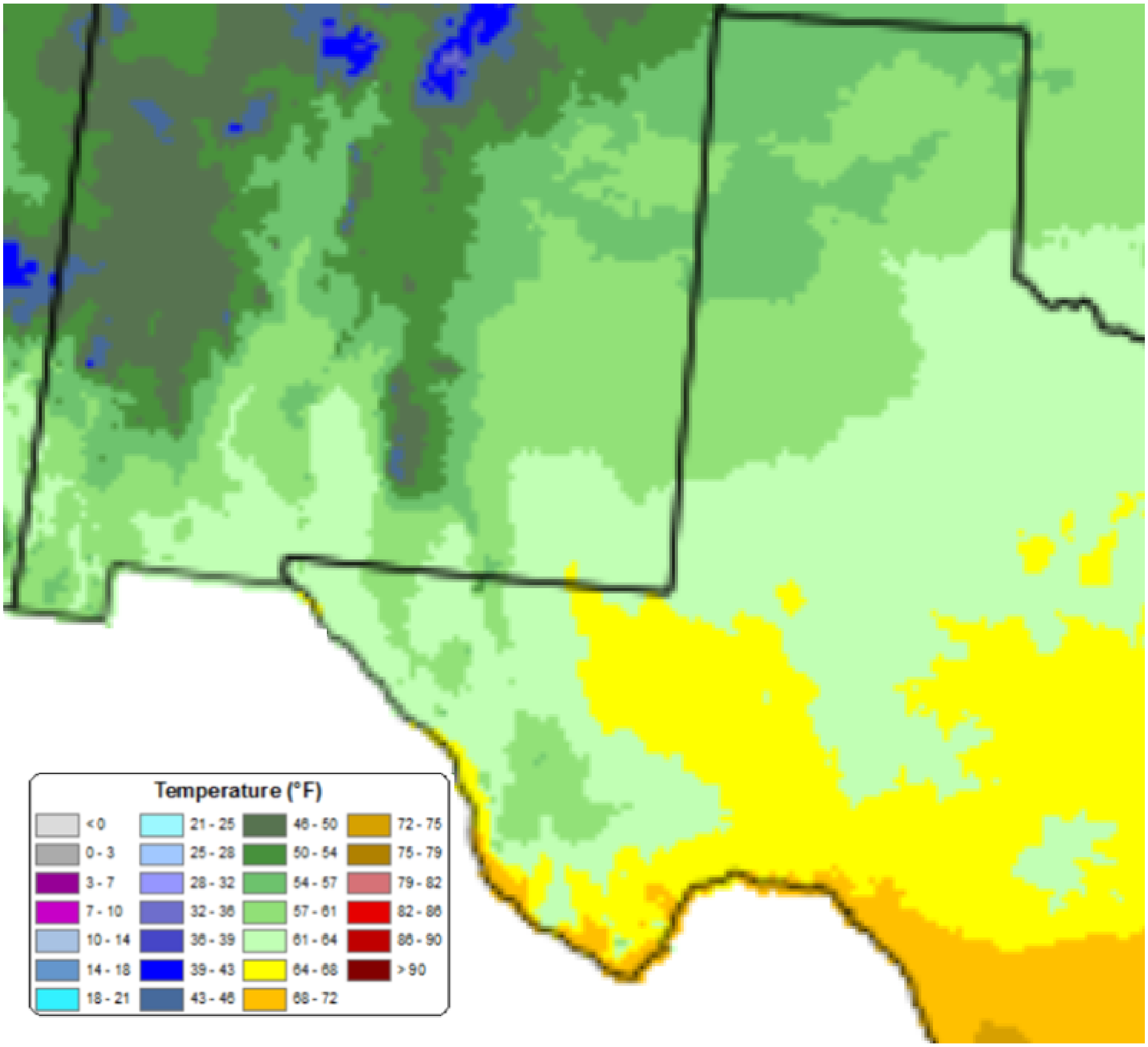


Figure 10.1 (http://prism.oregonstate.edu/normals/)

10.2 AAMT

See Figure 10.2A for the Average Annual Minimum Temperature of West Texas and Figure 10.2B for the Average Annual Minimum Temperature of New Mexico.

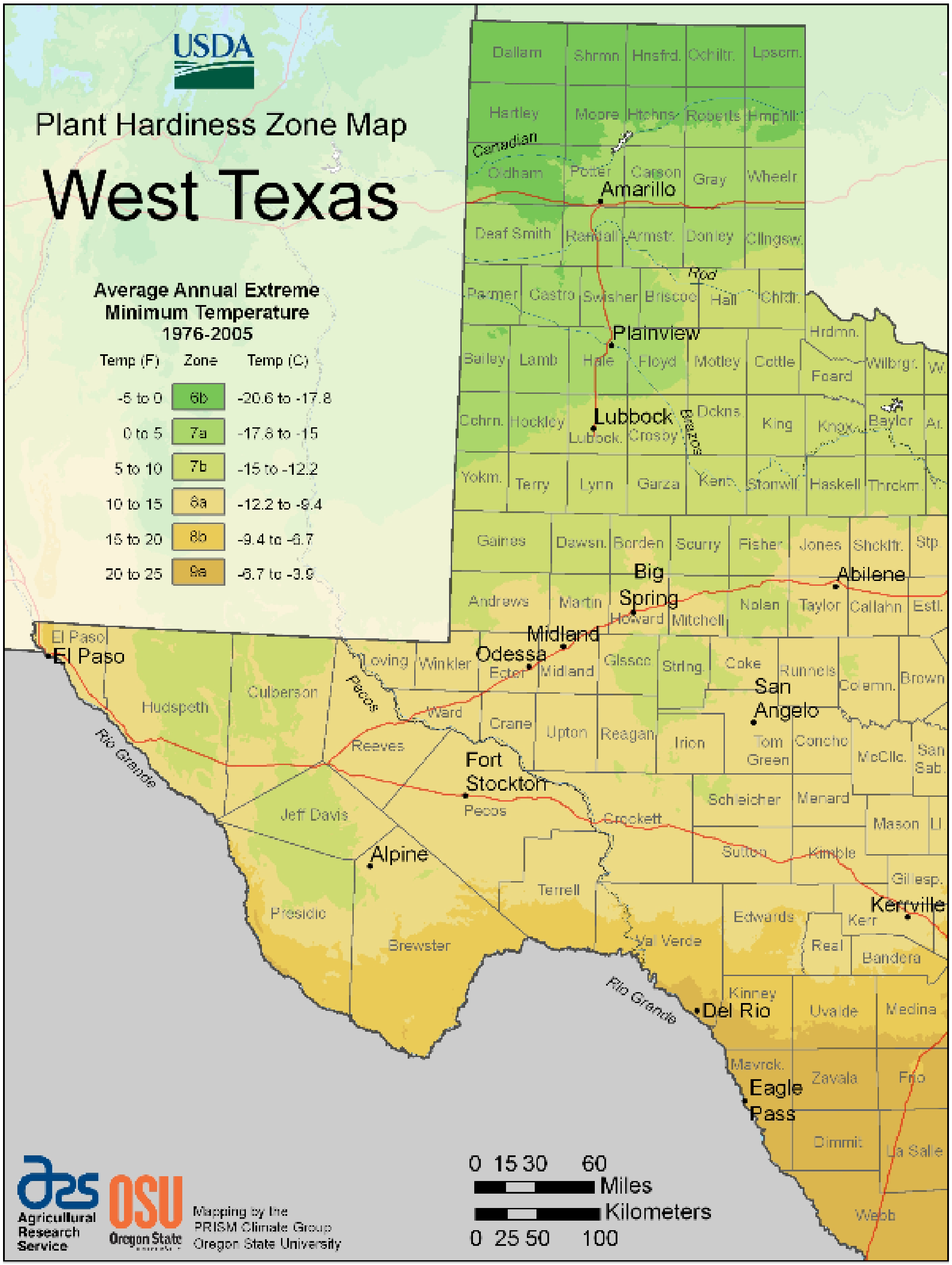


Figure 10.2A (https://planthardiness.ars.usda.gov/PHZMWeb/Maps.aspx)

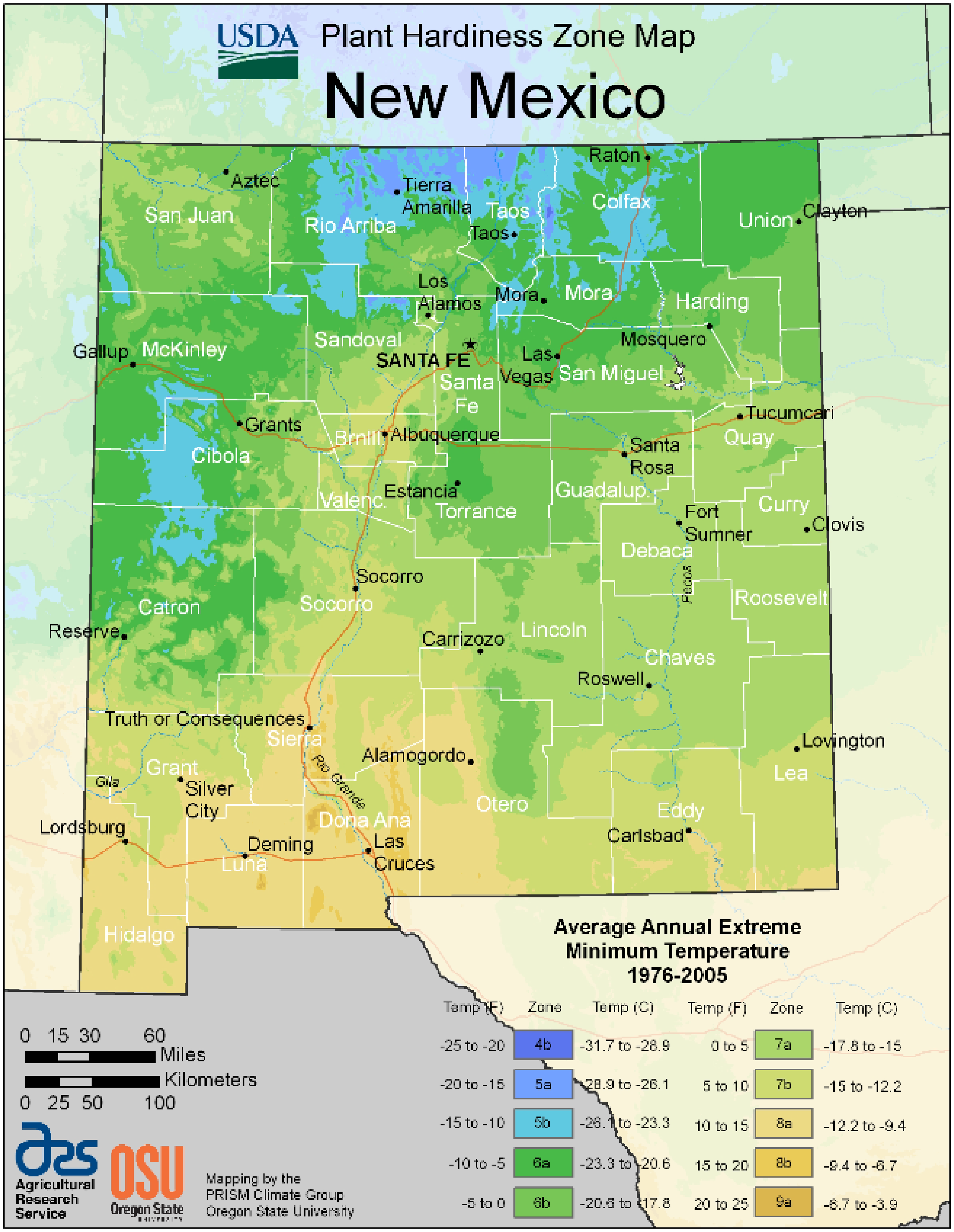


Figure 10.2B (https://planthardiness.ars.usda.gov/PHZMWeb/Maps.aspx)

10.3 ATCM

See Figures 10.3A for the Average Temperature of the Coldest Month for EPE territory.

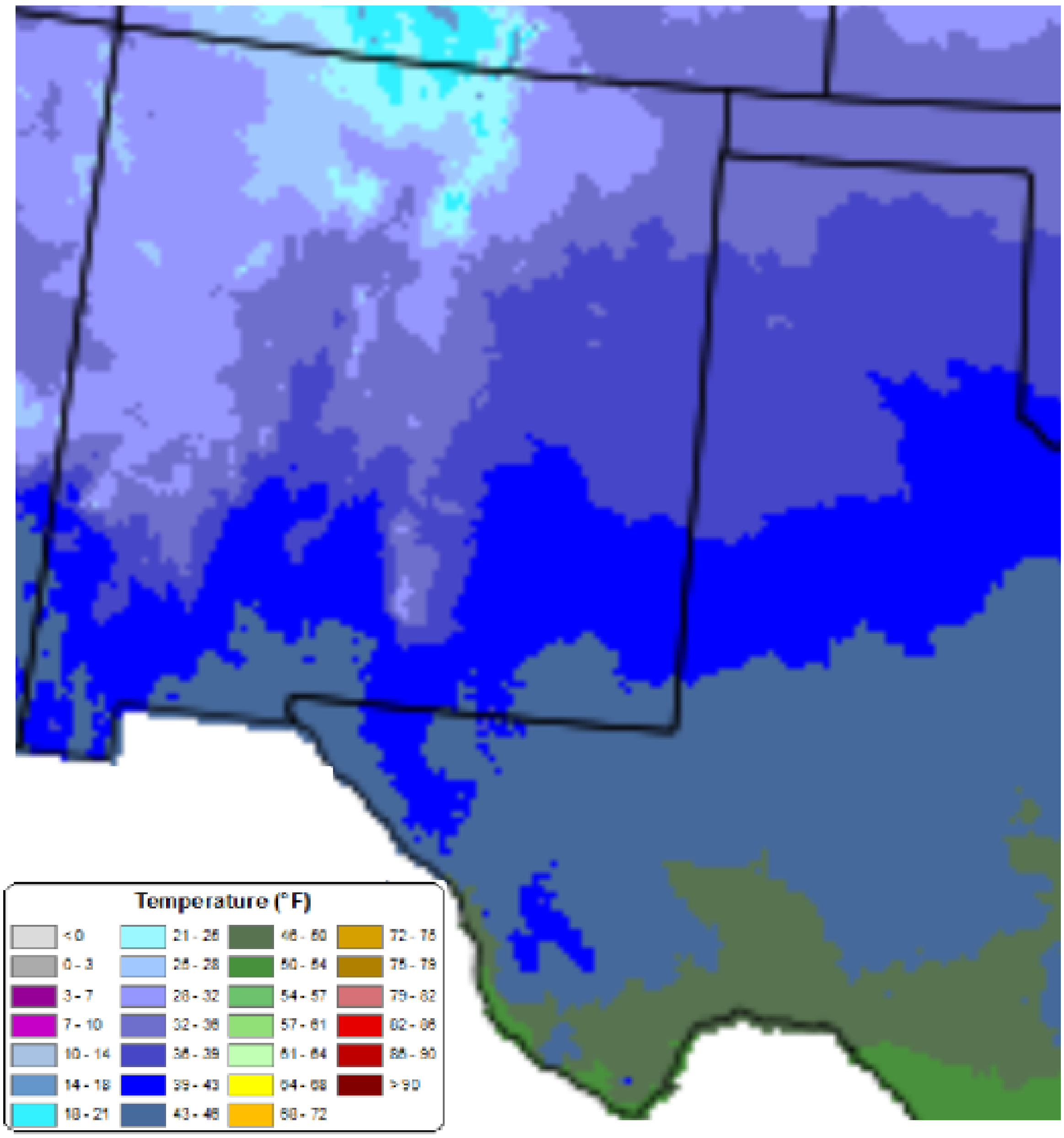
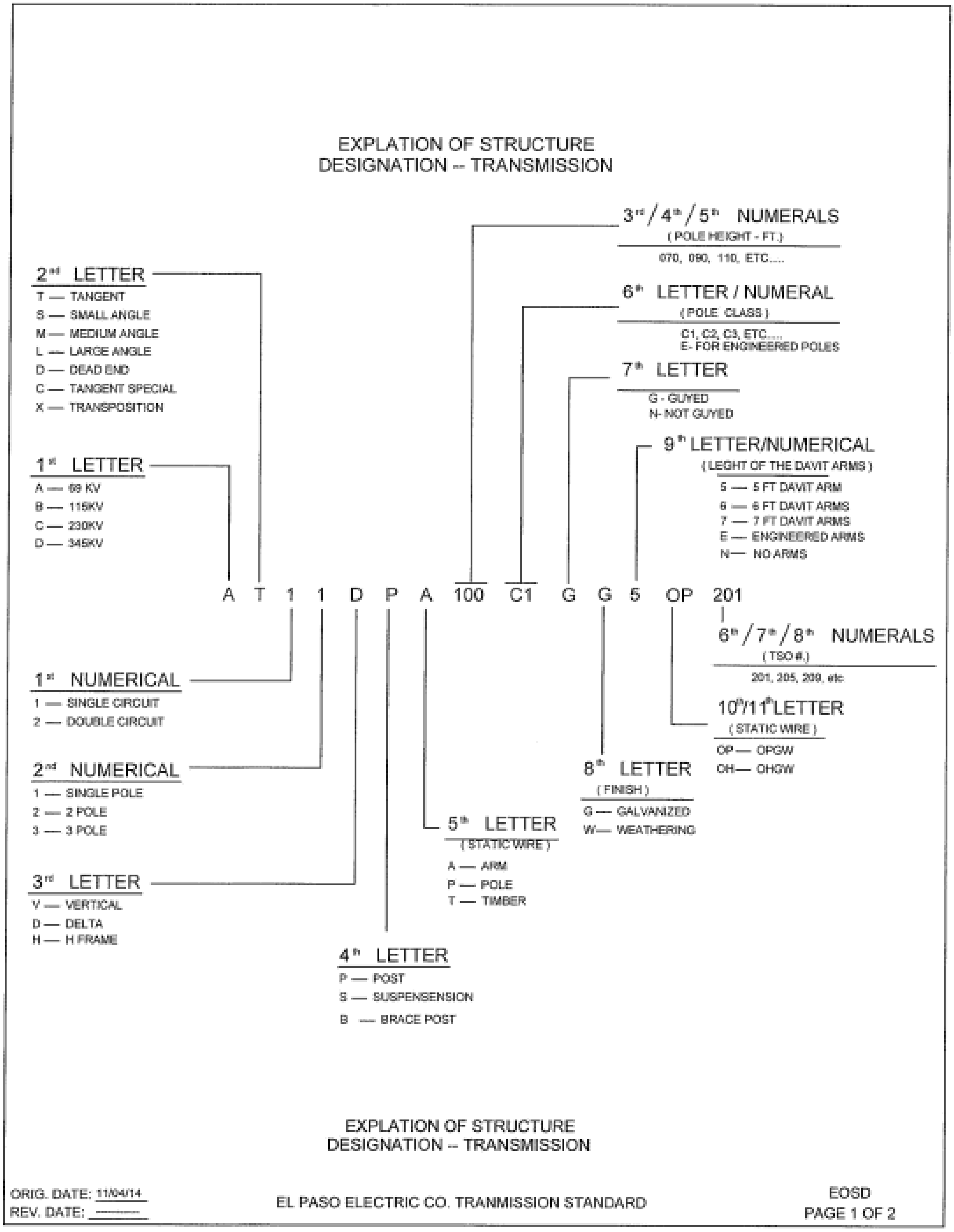


Figure 10.3A (http://prism.oregonstate.edu/normals/) – Month of January from 1981 - 2010

11. Appendix C – Structure Naming Criteria



BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE APPLICATION OF EL PASO ELECTRIC COMPANY FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE	)	**Case No. 26-00___**
EL PASO ELECTRIC COMPANY, Applicant	)	

DECLARATION OF ALEJANDRO GALVIS IN SUPPORT OF THE FOREGOING DIRECT TESTIMONY OF EL PASO ELECTRIC COMPANY'S APPLICATION FOR DETERMINATION OF RIGHT-OF-WAY WIDTH FOR THE LAVA IN AND OUT TRANSMISSION LINE

I ***Alejandro Galvis***, pursuant to Rule 1-011 NMRA, state as follows:

1. I affirm in writing under penalty of perjury under the laws of the State of New Mexico that the following statements are true and correct.

2. I am over 18 years of age and have personal knowledge of the facts stated herein. I am a consultant for El Paso Electric Company ("EPE or Company") and employed by Coalesce Management Consulting as *Transmission Line Engineer.*

3. The foregoing Direct Testimony of Alejandro Galvis, together with all exhibits sponsored therein and attached thereto, is true and accurate based on my knowledge and belief.

4. I submit this Declaration, based upon my personal knowledge and upon information and belief, in support of EPE's ***Application for Determination of Right-of-Way Width for the Lava In and Out Transmission Line.***

FURTHER, DECLARANT SAYETH NAUGHT.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 17, 2026.

/s/ *Alejandro Galvis*

ALEJANDRO GALVIS