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May 18, 2018

HAND – DELIVERED

Melanie Sandoval
Record Bureau Chief
New Mexico Public Regulations Commission
1120 Paseo de Peralta
Santa Fe, NM 87501

The Corona Wind Companies Case No. 18-00065-UT.
Supplemental Testimony of Greg Parent.

Dear Ms. Sandoval:

Enclosed for filing, please find an original and five copies (plus a sixth copy for conforming for our records) of the ***Supplemental Testimony of Greg Parent*** pursuant to the Hearing Examiners' Order Granting Joint Applicants' Expedited Motion to Submit Supplemental Testimony of Greg Parent dated May 18, 2018.

Please contact me at your earliest convenience with any questions or comments.

Sincerely,

Carla R Najjar

Daniel A. Najjar
Carla R. Najjar
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Attorneys for the Corona Wind Companies

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE CORONA WIND COMPANIES' JOINT APPLICATION FOR THE LOCATION OF THE CORONA WIND PROJECTS AND THE CORONA GEN-TIE SYSTEM IN LINCOLN, TORRANCE AND GUADALUPE COUNTIES PURSUANT TO THE PUBLIC UTILITY ACT, NMSA 1978, §62-9-3	)	**Case No. 18-00065-UT**
ANCHO WIND LLC, COWBOY MESA LLC, DURAN MESA LLC, RED CLOUD WIND LLC, TECOLOTE WIND LLC, VIENTO LOCO LLC,	)	
JOINT APPLICANTS.	)	

DIRECT TESTIMONY OF

GREG PARENT

ON BEHALF OF THE CORONA WIND COMPANIES

Q PLEASE STATE YOUR NAME.

A. Greg Parent, P.E., S.E. The P.E. stands for licensed Professional Engineer and the S.E. stands for licensed Structural Engineer.

Q. BY WHOM AND IN WHAT CAPACITY ARE YOUR EMPLOYED?

A. I am employed by Ulteig Engineers, Inc. as a Senior Engineer in the Transmission and Distribution Department. My business address is 5575 DTC Parkway, Suite 200, Greenwood Village, CO 80111.

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

A. I am providing supplemental testimony on behalf of the Corona Wind Companies, who are the Joint Applicants in this proceeding. I understand from my clients that after the initial testimony was filed by Mr. Derek Price, Senior Pre-Construction Manager for the Pattern Energy Group, LP, ("Pattern") the Commission staff expressed some concerns that Pattern had not utilized a licensed professional engineer ("P.E.") to support the calculation of the requested right-of-way width ("ROW") for the proposed Corona Gen-Tie System. As the lead P.E. for Ulteig Engineers, Inc. assigned to this project, I was asked to provide this supplemental testimony to address some of the issues identified by the Commission Staff in the initial filing.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND WORK EXPERIENCE.

A. I have a Master of Science in Structural Engineering from Lehigh University. I am a licensed P.E. in 17 states and am also a licensed Structural Engineer in Illinois, Hawaii, Nevada and Utah. My application for licensure in New Mexico is currently being processed in this state and I expect it to be approved shortly. I have 9 years of

transmission line design experience and have designed approximately 650 miles of transmission line.

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN ANY OTHER PROCEEDING?

A. No. However, before I designed transmission lines I designed building structures. My specialty was in foundation design. I was hired a few years back to analyze an existing retaining wall to determine if it had adequate structural capacity. The intent was to use the report and the corresponding calculations as expert testimony in a legal case, but I understand the case was settled before it went to trial.

Q. ARE YOU FAMILIAR WITH THE PROPOSED TRANSMISSION LINE FACILITES WHICH ARE THE SUBJECT OF THIS JOINT APPLICATION?

A. Yes. I have worked closely with Pattern personnel, including Derek Price, in the design of this project. More specifically, the ROW width requirement calculation for the Corona Wind 345 kV transmission line ("Corona Gen-Tie Transmission System") was performed by Ulteig Engineers, Inc. I have also reviewed the testimony filed by Derek Price on behalf of the Joint Applicants and understand his conclusion that a ROW width for the proposed transmission line needs to be 180 feet.

Q. DO YOU AGREE WITH MR. PRICE'S TESTIMONY AND CONCLUSIONS?

A. Yes. As indicated above, I have worked closely with Mr. Price and Pattern on this proposed project and am able to provide some more detail to his testimony to address some of the concerns raised by the Commission Staff.

Q. PLEASE ELABORATE.

A. Mr. Price states on page 6, lines 11-13 of his testimony an explanation for how ROW width is determined. He states that generally the ROW width required for an electric high voltage transmission line is determined by required access for the construction, operation, and maintenance of the line and for National Electric Safety Code ("NESC") compliance. I agree with this testimony but would also add compliance with the requirements of the Environmental Protection Agency ("EPA") as an additional factor in determining the width of a transmission facility. Additionally, on page 7, Mr. Price explains the need for the 180-foot ROW for the proposed Corona Gen-Tie Transmission System. I agree with his statements completely but add as an additional factor in warranting the 180-foot ROW width the need for compliance with the recommended audible noise restrictions. EPA requirements for audible noise levels at the edge of the ROW are in the interest of the landowners and intended to reduce the audible noise impact off the approved transmission ROW.

Q. CAN YOU ELABORATE ON THE BASIC DESIGN CONDITIONS YOU EVALUATED IN DETERMINING THAT A 180-FOOT ROW WAS REQUIRED FOR THESE PROJECTS?

A. Yes. Preliminary design considerations include geotechnical soil studies, topographical surveys and wind and weather conditions to determine a range of preliminary specifications for equipment and infrastructure for the proposed location for the proposed transmission and interconnection facilities. The loading conditions for the transmission lines follow the requirements stated in the National Electric Safety Code (NESC-2017). We analyzed the required ROW width for the following load cases:

1. NESC 234.C.1.a (At Rest)
    a. 0 psf wind pressure acting perpendicular to the conductor

b. 60 deg Fahrenheit ambient temperature.

2. NESC 234.C.1.b (6 psf Wind)

a. 6 psf wind pressure acting perpendicular to the conductor

b. 60 deg Fahrenheit ambient temperature

3. NESC 250B – Heavy Loading District Loading without load factors

a. 4 psf wind pressure acting perpendicular to the conductor

b. ½" of radial ice

c. 0 deg Fahrenheit ambient temperature

4. NESC 250C – Extreme Wind. The wind load map in NESC 250C matches the basic wind speed map in the American Society of Civil Engineers – Minimum Design Loads for Building and Other Structures - ASCE 7-05. The Corona Wind Project extends over a large region. The extreme wind speed varies over this region. Part of the Corona Wind project is in the 90-mph wind speed region but also extends into a "Special Wind Region". These special wind regions experience higher wind speeds than 90mph. Pattern has determined that the extreme wind speed for these special wind regions should be set at 100mph. For consistency the extreme wind speed for the entire project has been set to 100mph whether it is inside or outside the special wind regions.

a. 100 mph wind speed (25.6psf) acting perpendicular to the conductor

b. 60 deg Fahrenheit ambient temperature

Under these conditions, and the aforementioned considerations, we evaluate the clearances, conductor movement, and structure deflection to calculate span lengths and structure types and configurations.

Q. DO YOU BELIEVE THAT THE CRITERIA YOU RELIED UPON IN DETERMINING THE NECESSITY FOR A 180-FOOT ROW REASONABLE?

A. Yes. These criteria are appropriate and consistent with the accepted practice within the industry. I have designed approximately a dozen 345kV transmission lines and the right of way widths for those projects ranged between 150ft – 200ft. The variations in right of way width for these projects depended on design spans, structure types and audible noise requirements that were used on each line.

Q. DO YOU HAVE EXHIBITS SUPPORTING YOUR CALCULATIONS THAT WARRANT THE 180-FOOT ROW WIDTH THAT THE JOINT APPLICANTS' REQUEST IN THIS PROCEEDING?

A. Yes. Please see the attached exhibit titled GP-1.

Q. PLEASE EXPLAIN THE INFORMATION CONTAINED IN EXHIBIT GP-1.

A. Page 1 of this exhibit provides the calculations for the NESC required horizontal clearances from the transmission line conductor to building structures for NESC Rules 234B1a, 234B1b. Also provided is the recommended horizontal clearance when the transmission line is subject to 100mph wind speed. The above clearances have been adjusted for an altitude of 7100ft. The following pages of this Exhibit GP-1 illustrate the results of the blowout analysis for three different structure types. The three structure types are as follows:

- Double Circuit Steel Monopole,
- Single Circuit Steel Monopole
- Single Circuit Wood H-Frame.

The actual structure types that will be used on this project have not yet been determined and will depend on material lead times, material costs and construction cost of the

different structure types. It is critical that the ROW be wide enough to accommodate any of the above structure types.

To determine conductor blowouts and pole deflections each structure type was modeled using a bundled (2) 954kcmil ASCR "Cardinal" conductor per phase. A 1300 ft design span between structures was assumed. Actual design spans could vary depending on the topography. A design span of 1300ft would likely be a maximum design span. Pole heights were determined to provide adequate vertical clearance under the conductor during maximum operating temperature at mid-span assuming flat terrain.

Each structure type was analyzed under the following four different load cases:

1. NESC Rule 234B1a – [At Rest Condition, 0 psf wind, 60 degF]
2. NESC Rule 234B1b – [6psf Condition, 6 psf wind, 60 degF]
3. NESC Rule 250B – Heavy Region [4psf wind, ½" Radial Ice, 0 degF]
4. NESC Rule 250C – Extreme Wind [100 mph (25.6 psf), 60 degF]

To determine the conductor blowouts and pole deflections, each structure type and each load case was modeled in the transmission line design software PLS-CADD. The results of the required right of way width are illustrated in Exhibit GP-1. The controlling structure type and load case were the single circuit wood H-Frame under NESC Rule 250C – Extreme Wind [100 mph (25.6 psf), 60 degF]. This structure type and load case would require a minimum right of way width approximately 177'-5" wide, which is just shy of the requested 180'-0" Right of Way width. A detailed analysis of the H-Frame structure under the 250C – Extreme Wind case is provided in the last (4) pages of Exhibit GP-1. This structure and load case control the Right of Way width.

Another calculation that was performed was the audible noise volume that would be heard at the edge of the right of way. In 1974, the Environmental Protection Agency (EPA) published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* in which the EPA set 55dBA as the outdoor noise threshold that would prevent activity interference or annoyance. Many utilities I have worked with have a 50dBA noise threshold limit at the edge of the right of way. Page 14 of Exhibit GP-1 shows the calculations of the audible noise for the Single Circuit Wood H-Frame structure. In this analysis the audible noise produced by the transmission line would be 49.61 dBA 90ft from the transmission line center line (90ft x 2 = 180ft ROW). With the transmission line centered in a right of way width of 180ft the audible noise produced is just under the recommended 50dBA limit. From the analysis performed to determine required ROW widths, it is my opinion that a right of way of 180ft is appropriate for this line.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Ulteig Engineering
Project Name: Corona Wind Farm Project
Required NESC Horizontal Clearances - Rule 234B1a & 234B1b
Engineer: Greg Parent
Date: 04-19-18

Ulteig
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(VN) = Nominal Opperating Voltage Phase-Phase (kV) $V_N := 345\ kV$

(VM) = Max Transient Overvoltage Phase-Phase (kV) $V_M := 1.05 \cdot V_N = 362.25\ kV$

(Elev) = Design Elevation (ft) $Elev := 7100\ ft$

(CHAR) = Required Horizontal Clearance At Rest (ft) NESC RULE 234B1a

(CH@6psf) = Required Horizontal Clearance under 6psf (ft) NESC RULE 234B1b

(CH@100mph) = Recomended Horizontal Clearance under 100mph

$$CH_{AR} := 7.5\ ft + ((50\ kV - 22\ kV)) \cdot \left(\frac{0.4\ \frac{in}{kV}}{12\ \frac{in}{ft}} \right) + \left(\left(\frac{V_M}{\sqrt{3}} - 50\ kV \right) \cdot \left(\frac{0.4\ \frac{in}{kV}}{12\ \frac{in}{ft}} \right) \cdot 1.03^{\frac{Elev - 3300\ ft}{1000\ ft}} \right)$$

$$CH_{AR} = 14.369\ ft$$

$$CH_{@6psf} := 4.5\ ft + ((50\ kV - 22\ kV)) \cdot \left(\frac{0.4\ \frac{in}{kV}}{12\ \frac{in}{ft}} \right) + \left(\left(\frac{V_M}{\sqrt{3}} - 50\ kV \right) \cdot \left(\frac{0.4\ \frac{in}{kV}}{12\ \frac{in}{ft}} \right) \cdot 1.03^{\frac{Elev - 3300\ ft}{1000\ ft}} \right)$$

$$CH_{@6psf} = 11.369\ ft$$

$$CH_{@100mph} := 345\ kV \cdot \frac{0.1\ \frac{in}{kV}}{12\ \frac{in}{ft}} \cdot 1.03^{\frac{Elev - 3300\ ft}{1000\ ft}}$$

Assuming 10kV per inch dielectric constant for air

$$CH_{@100mph} = 3.217\ ft$$

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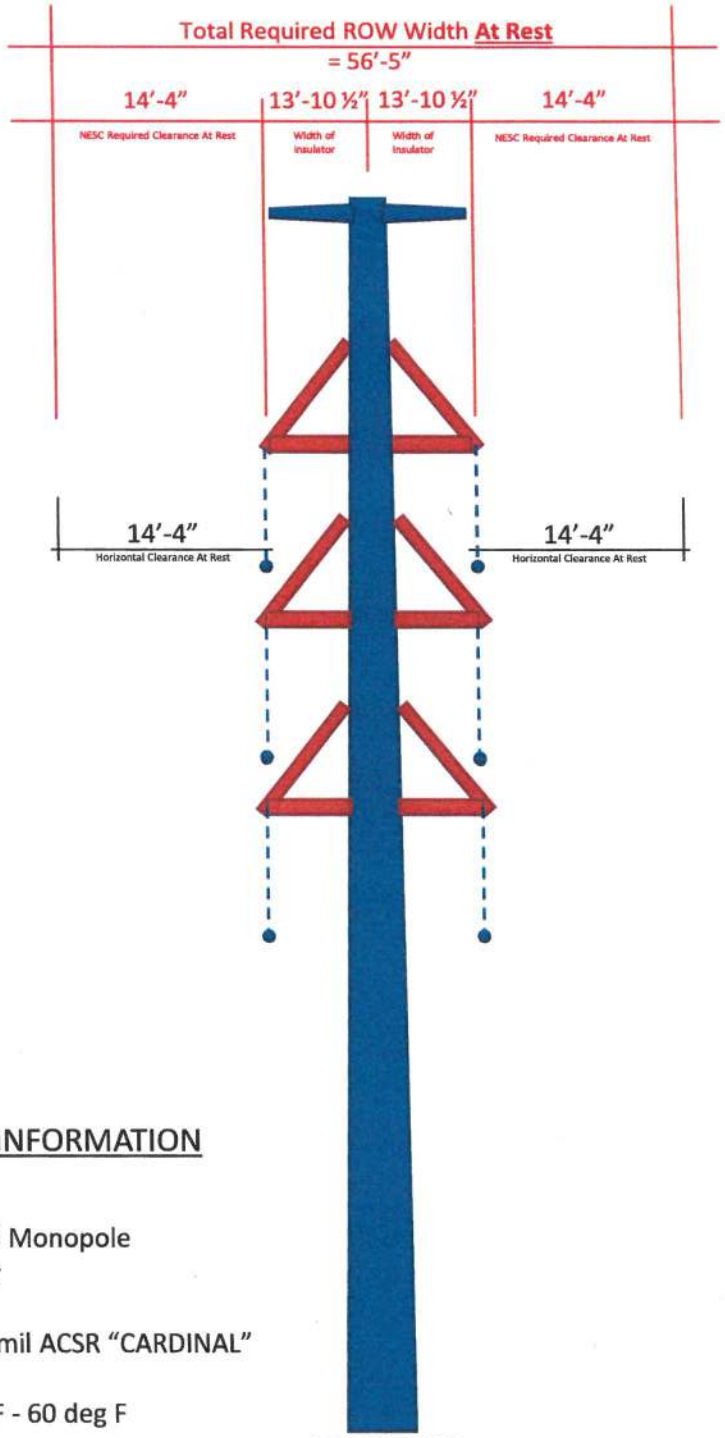
5-17-2018



SCALE: NTS

STRUCTURE AND CONDUCTOR INFORMATION

Operational Voltage: 345kV
Structure Type = Double Circuit Steel Monopole
Insulator Type = Brace-Post Insulator
Typical Design Span = 1300ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 234B1a
Weather Condition Displayed = 0 PSF - 60 deg F

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CORONA WIND PROJECT

LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

Rev.	Date	Description	By
A	04-19-2018	ROW EXHIBITS	UEI

PATTERN ENERGY GROUP
4225 EXECUTIVE SQUARE
LA JOLLA, CA 92037

Pattern

Exhibit GP-1
Page 2 of 18

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ROW WIDTH EXHIBITS
DC STEEL MONOPOLE

REVISION:
A

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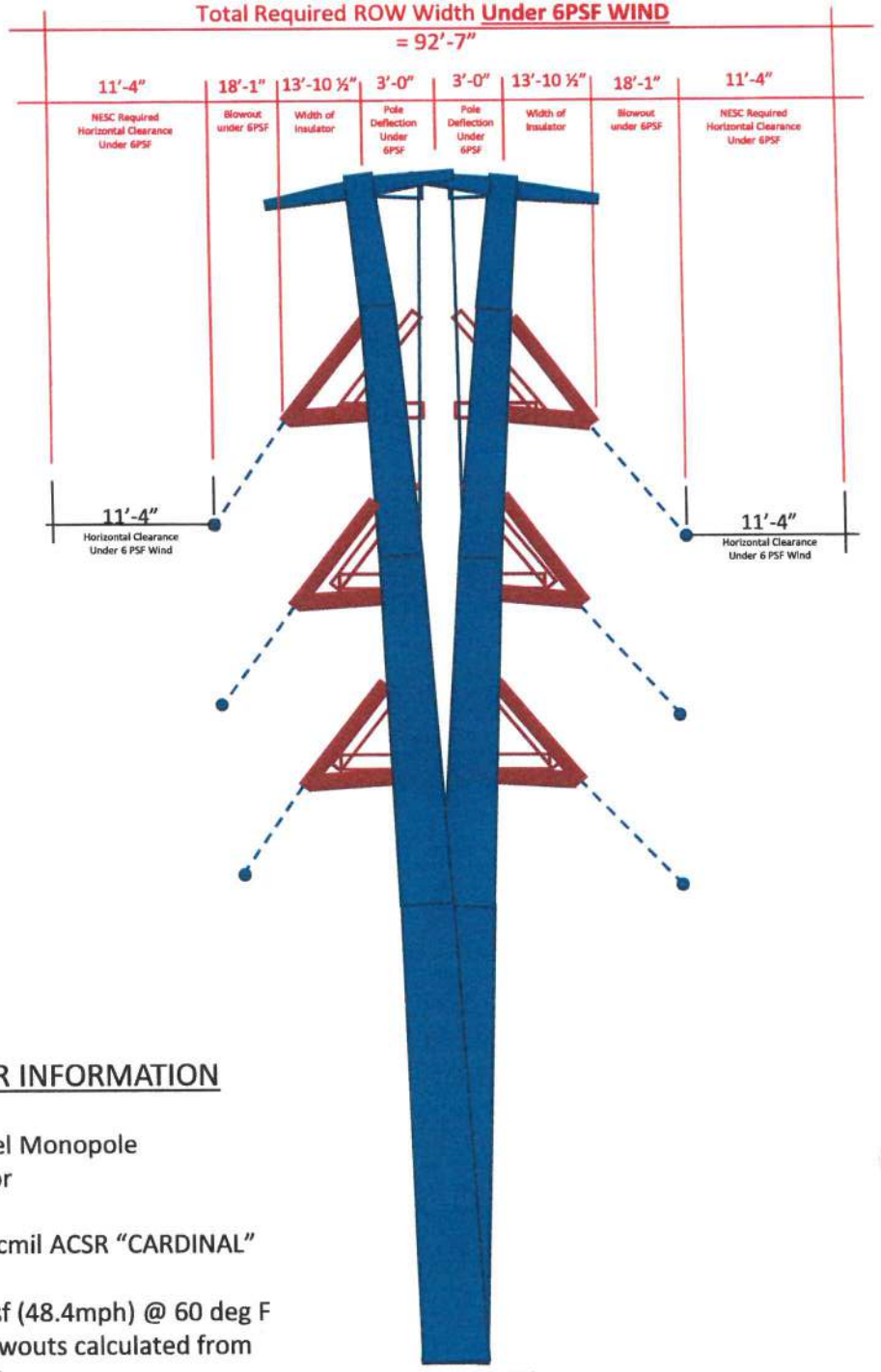

SCALE: NTS

STRUCTURE AND CONDUCTOR INFORMATION

Operational Voltage: 345kV
Structure Type = Double Circuit Steel Monopole
Insulator Type = Brace-Post Insulator
Typical Design Span = 1300ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 234B1b
Weather Condition Displayed = 6 psf (48.4mph) @ 60 deg F
Pole Deflections and Conductor Blowouts calculated from analysis of pole models in PLS-CADD.

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LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

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ROW WIDTH EXHIBITS
DC STEEL MONOPOLE

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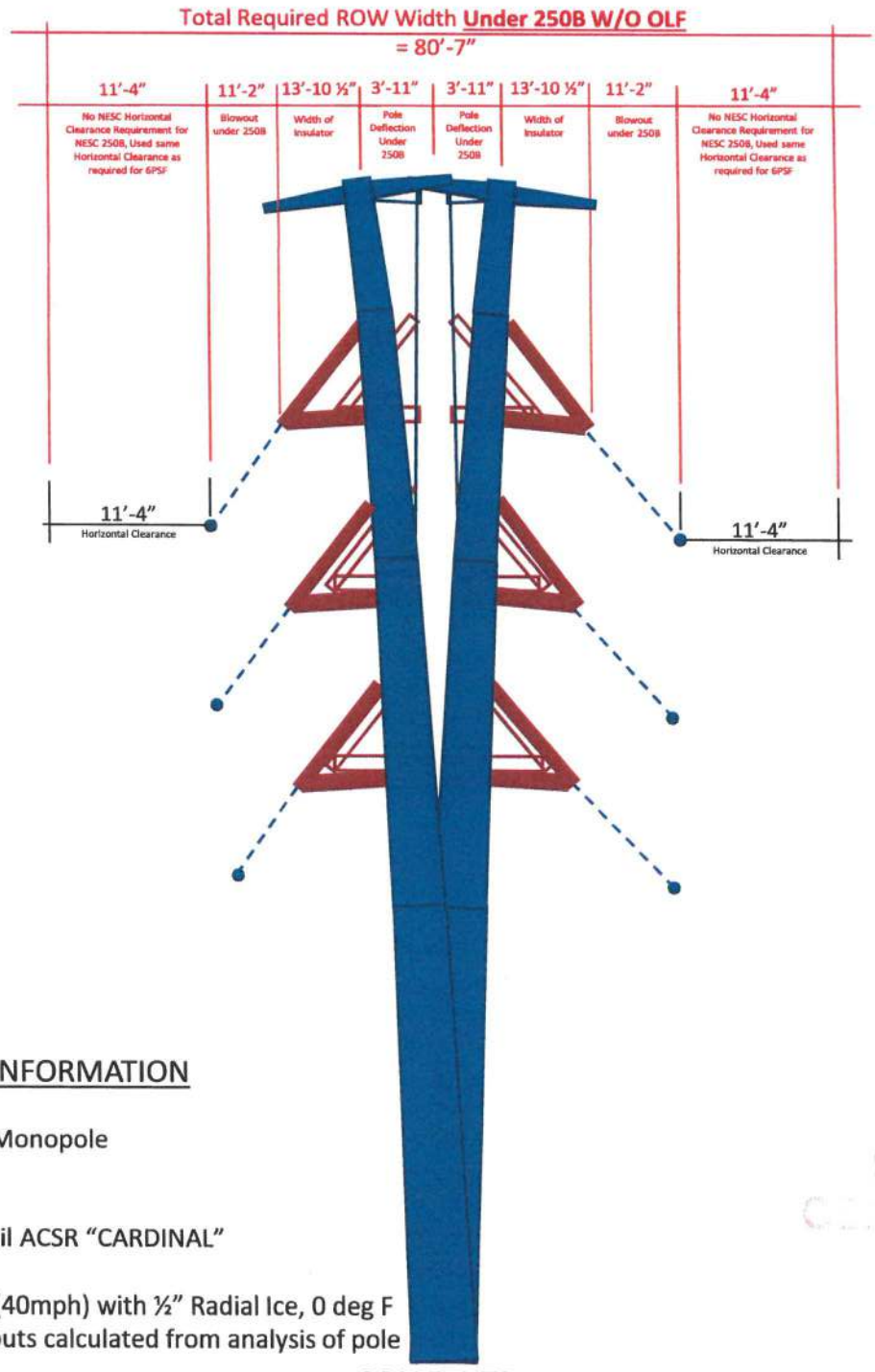

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STRUCTURE AND CONDUCTOR INFORMATION

Operational Voltage: 345kV
Structure Type = Double Circuit Steel Monopole
Insulator Type = Brace-Post Insulator
Typical Design Span = 1300ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 250B W/O OLF
Weather Condition Displayed = 4 PSF (40mph) with ½" Radial Ice, 0 deg F
Pole Deflections and Conductor Blowouts calculated from analysis of pole models in PLS-CADD.

SCALE: NTS

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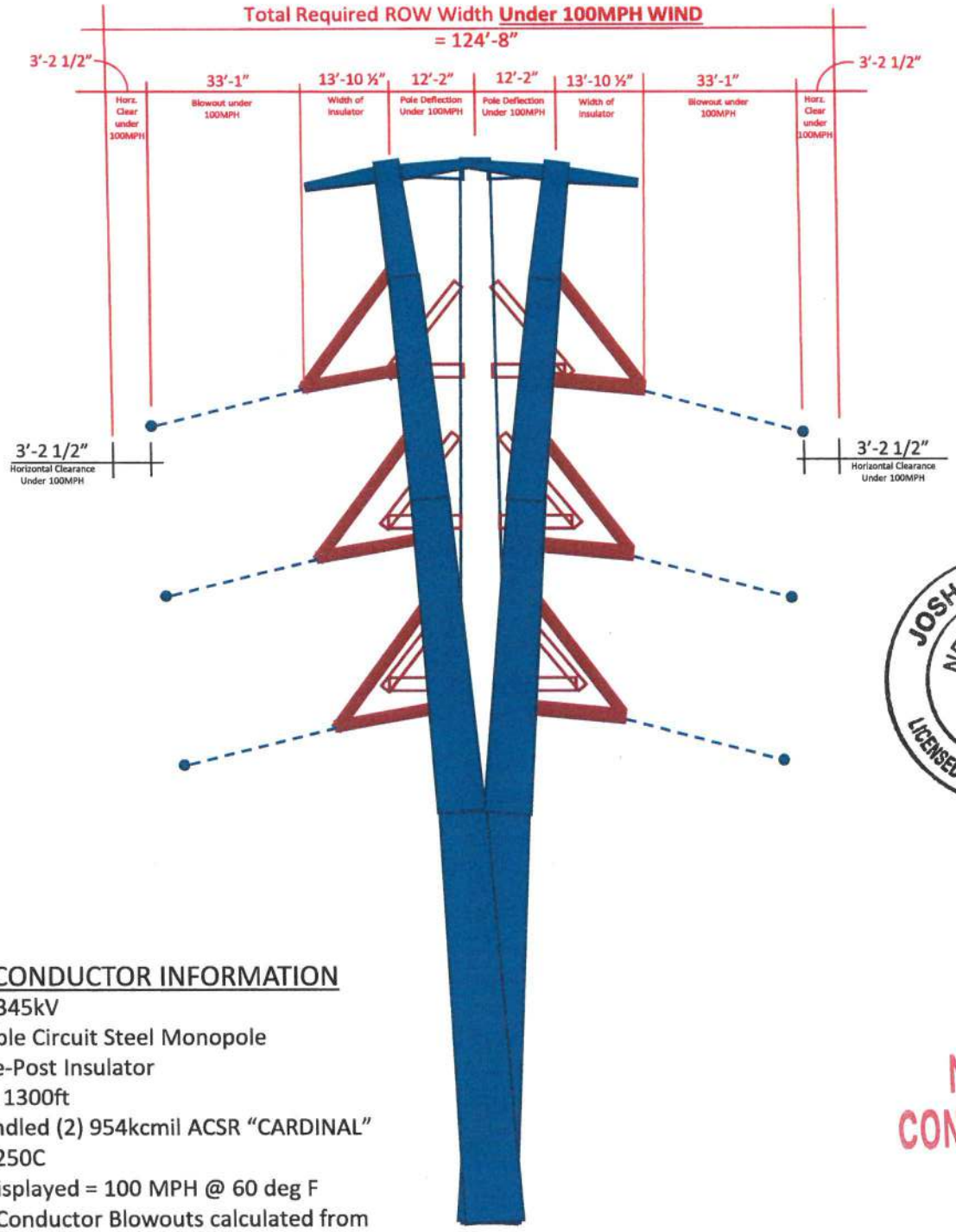

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STRUCTURE AND CONDUCTOR INFORMATION

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NESC Rule Analyzed: 250C
Weather Condition Displayed = 100 MPH @ 60 deg F
Pole Deflections and Conductor Blowouts calculated from analysis of pole models in PLS-CADD.

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LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

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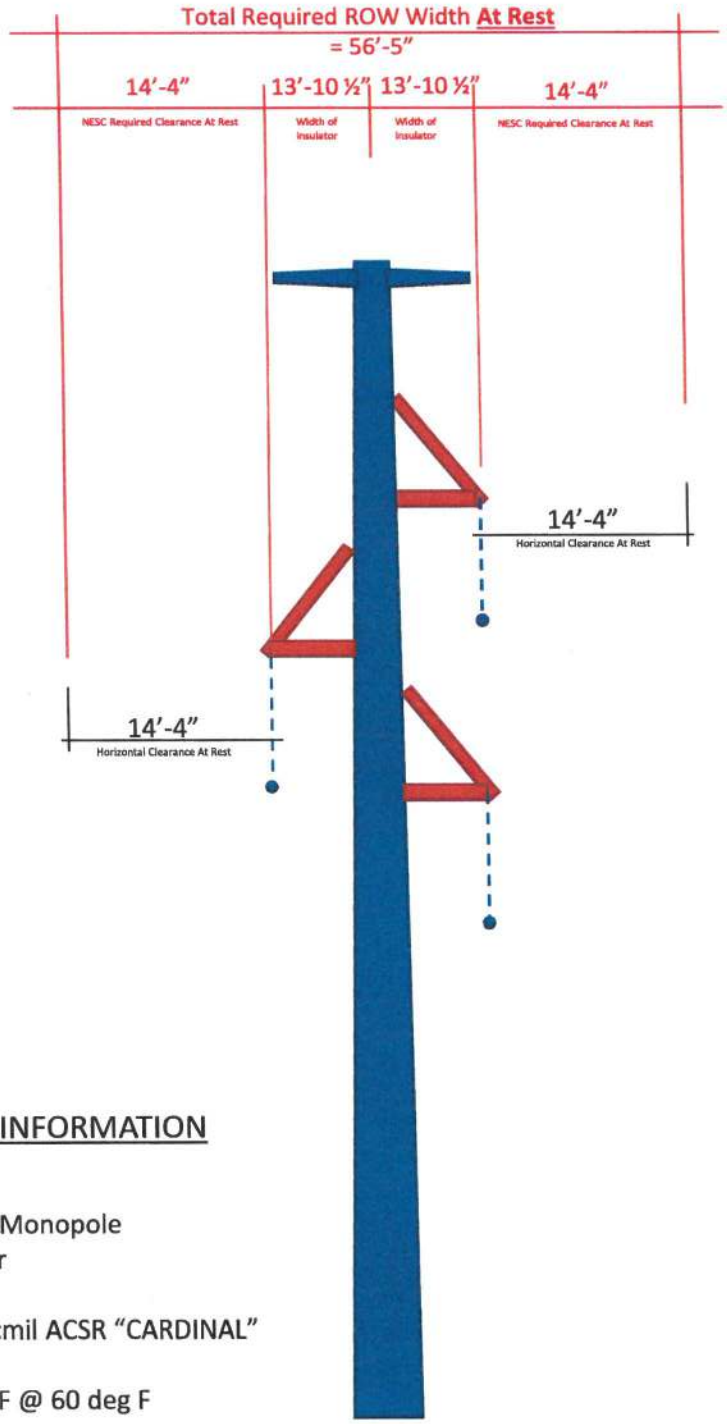

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Structure Type = Single Circuit Steel Monopole
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NESC Rule Analyzed: 234B1a
Weather Condition Displayed = 0 PSF @ 60 deg F

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5-17-2018

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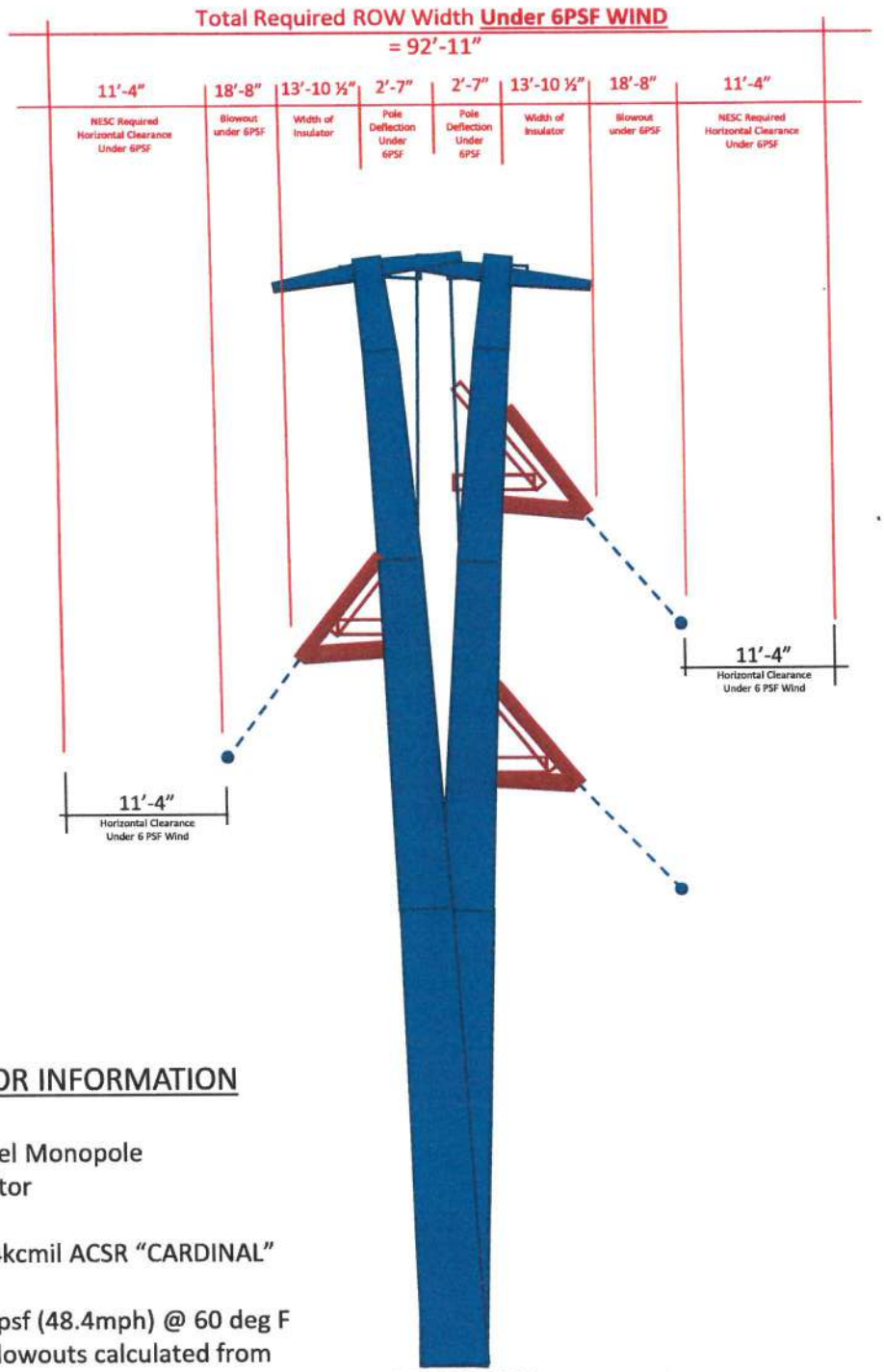

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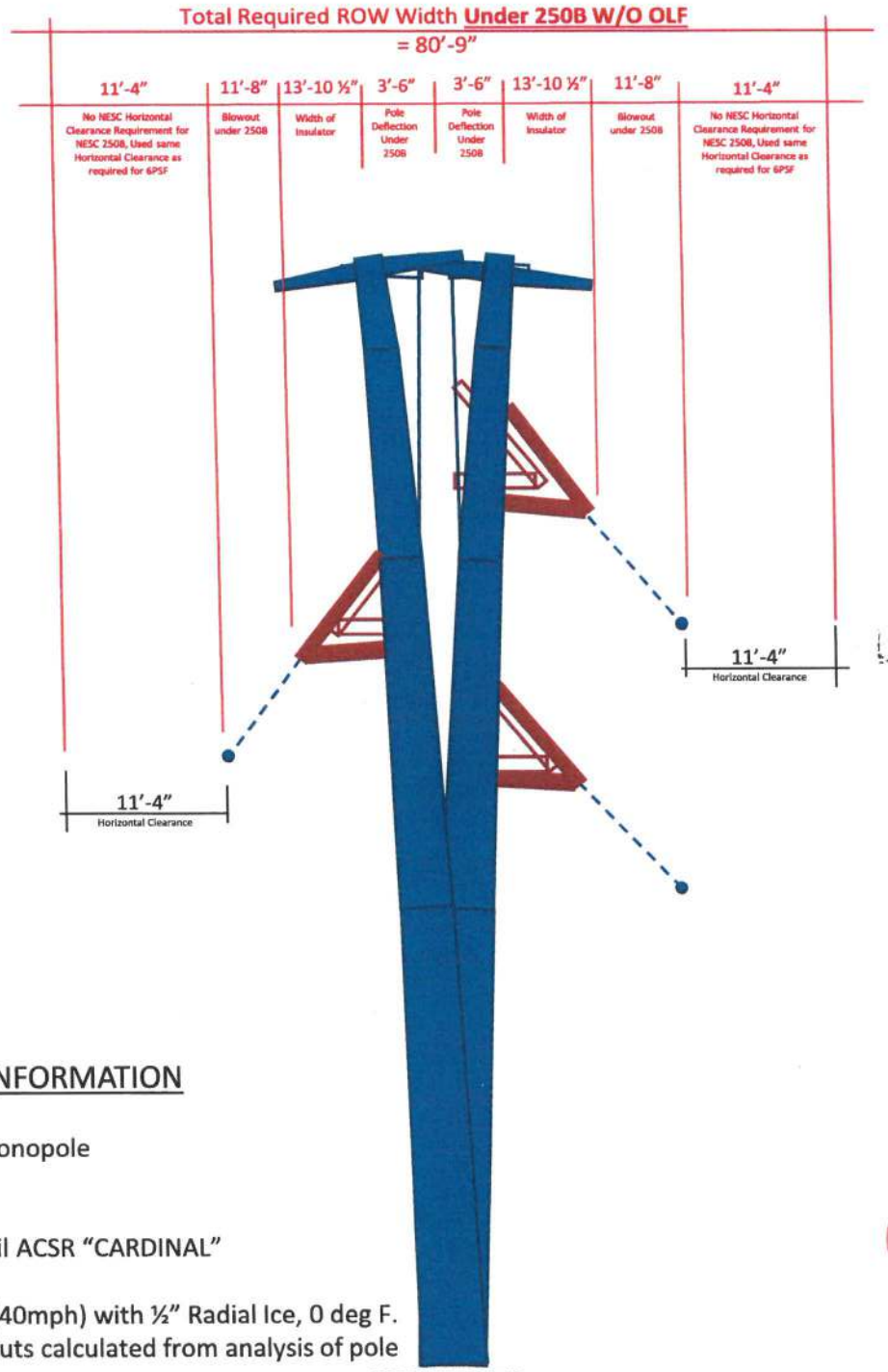

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5-17-2018

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Weather Condition Displayed = 4 PSF (40mph) with ½" Radial Ice, 0 deg F.
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LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

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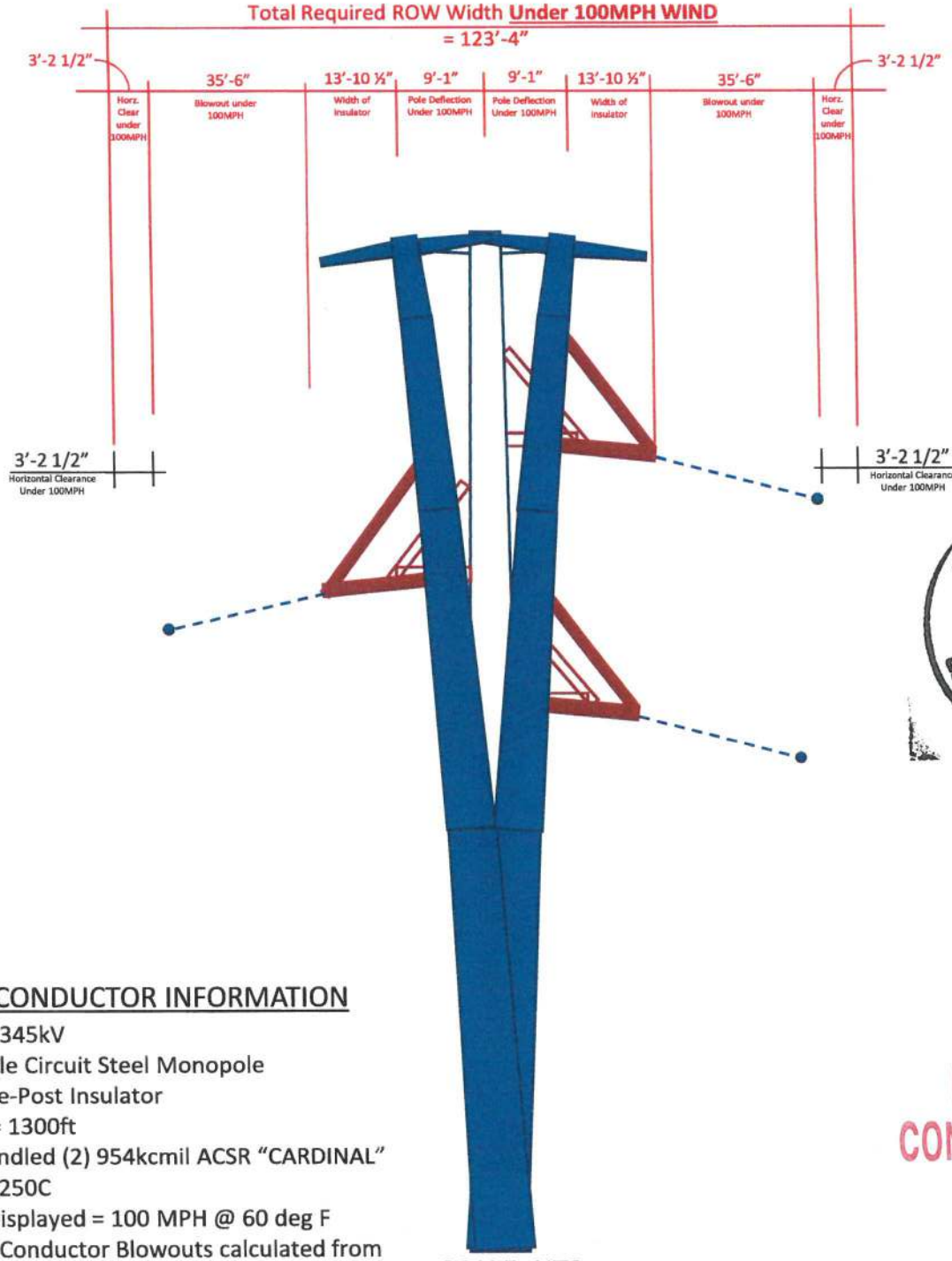

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5-17-2018

STRUCTURE AND CONDUCTOR INFORMATION

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Insulator Type = Brace-Post Insulator
Typical Design Span = 1300ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 250C
Weather Condition Displayed = 100 MPH @ 60 deg F
Pole Deflections and Conductor Blowouts calculated from analysis of pole models in PLS-CADD.

SCALE: NTS

NOT FOR CONSTRUCTION

CORONA WIND PROJECT

LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

Rev.	Date	Description	By
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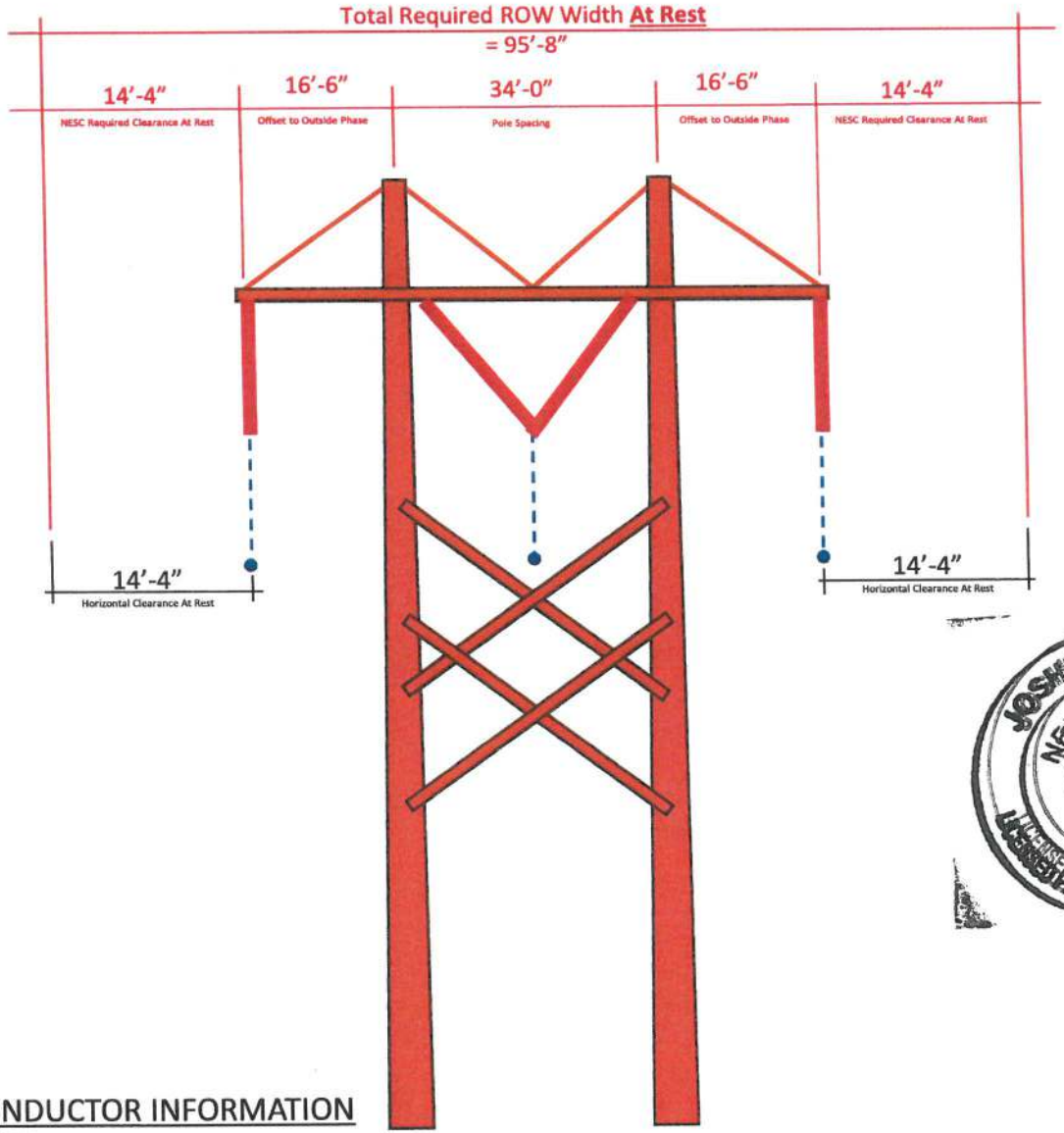
ROW WIDTH EXHIBITS
SC STEEL MONOPOLE

REVISION:
A

COR-TLO-E-ROW-008



SCALE: NTS

STRUCTURE AND CONDUCTOR INFORMATION

Operational Voltage: 345kV
Structure Type = Single Circuit Wood H-Frame
Insulator Type = Suspension Insulators, I & V Type
Typical Design Span = 1300ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 234B1a
Weather Condition Displayed = 0 PSF @ 60 deg F

JOSHUA E. ... NEW MEXICO 23051 LICENSED PROFESSIONAL ENGINEER

5-17-2018

NOT FOR CONSTRUCTION

CORONA WIND PROJECT

LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

Rev.	Date	Description	By
A	04-19-2018	ROW EXHIBITS	UEI

PATTERN ENERGY GROUP
4225 EXECUTIVE SQUARE
LA JOLLA, CA 92037

Pattern

Exhibit GP-1
Page 10 of 18

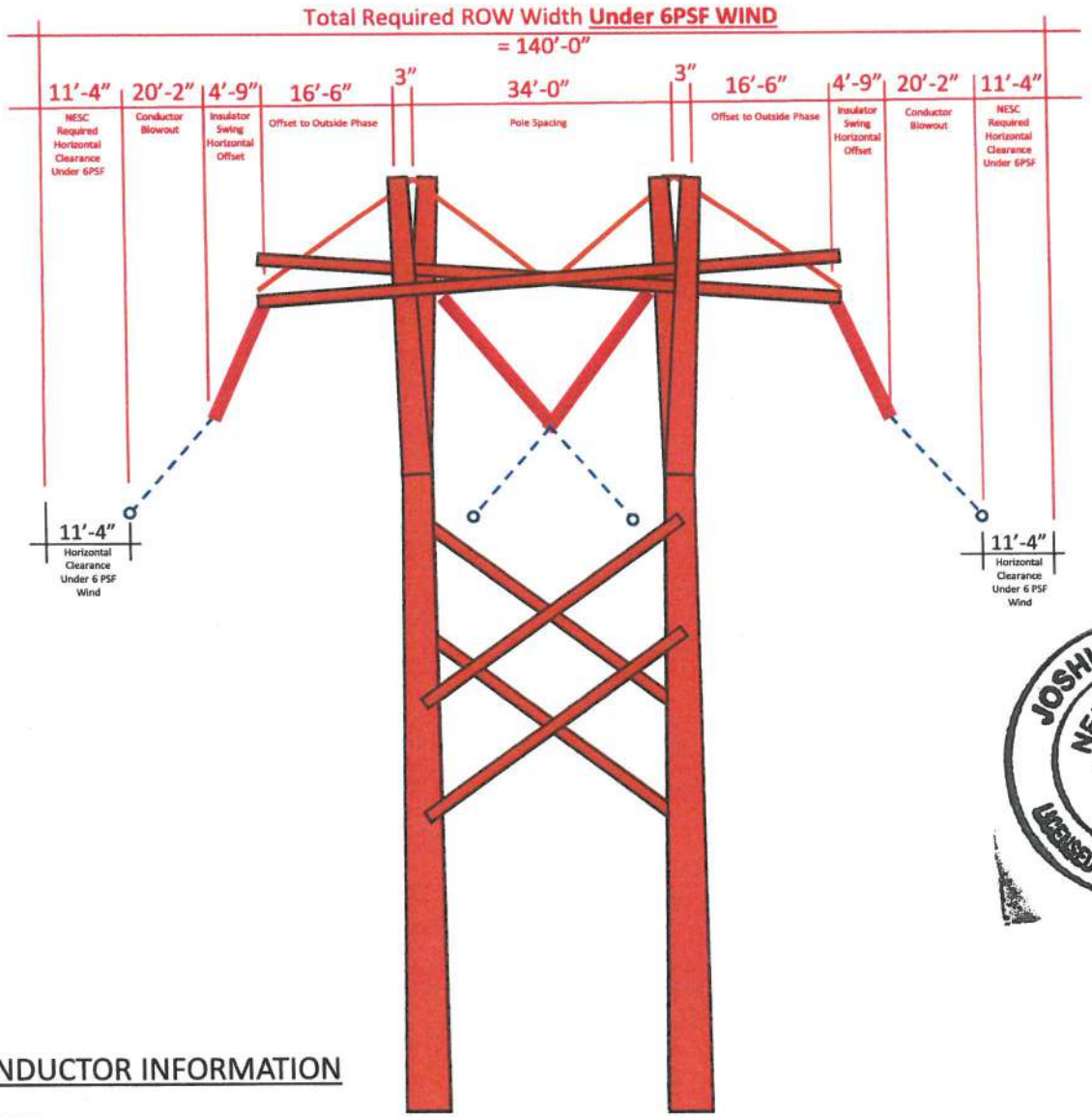
Ulteig
3350 38th Avenue South
Fargo, North Dakota 58104
Phone: 701.280.8500
Fax: 701.237.3191
www.ulteig.com
Bismarck · Denver · Detroit Lakes · Fargo · Sioux Falls · St. Paul

Design By:
Drawn By:
Approved By:
Project Number:

ROW WIDTH EXHIBITS
SC WOOD H-FRAME

REVISION:
A

COR-TLO-E-ROW-00



SCALE: NTS

JOSHUA E. POTTS
NEW MEXICO
23051
LICENSED PROFESSIONAL ENGINEER

5-17-2018

STRUCTURE AND CONDUCTOR INFORMATION

Operational Voltage: 345kV
Structure Type = Single Circuit Wood H-Frame
Insulator Type = Suspension Insulators, I & V Type
Typical Design Span = 1300ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 234B1b
Weather Condition Displayed = 6 psf (48.4mph) @ 60 deg F
Pole Deflections, Insulator Swings and Conductor Blowouts calculated from analysis of pole models in PLS-CADD.

NOT FOR CONSTRUCTION

CORONA WIND PROJECT

LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

Rev.	Date	Description	By
A	04-19-2018	ROW EXHIBITS	UEI

PATTERN ENERGY GROUP
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Page 11 of 18

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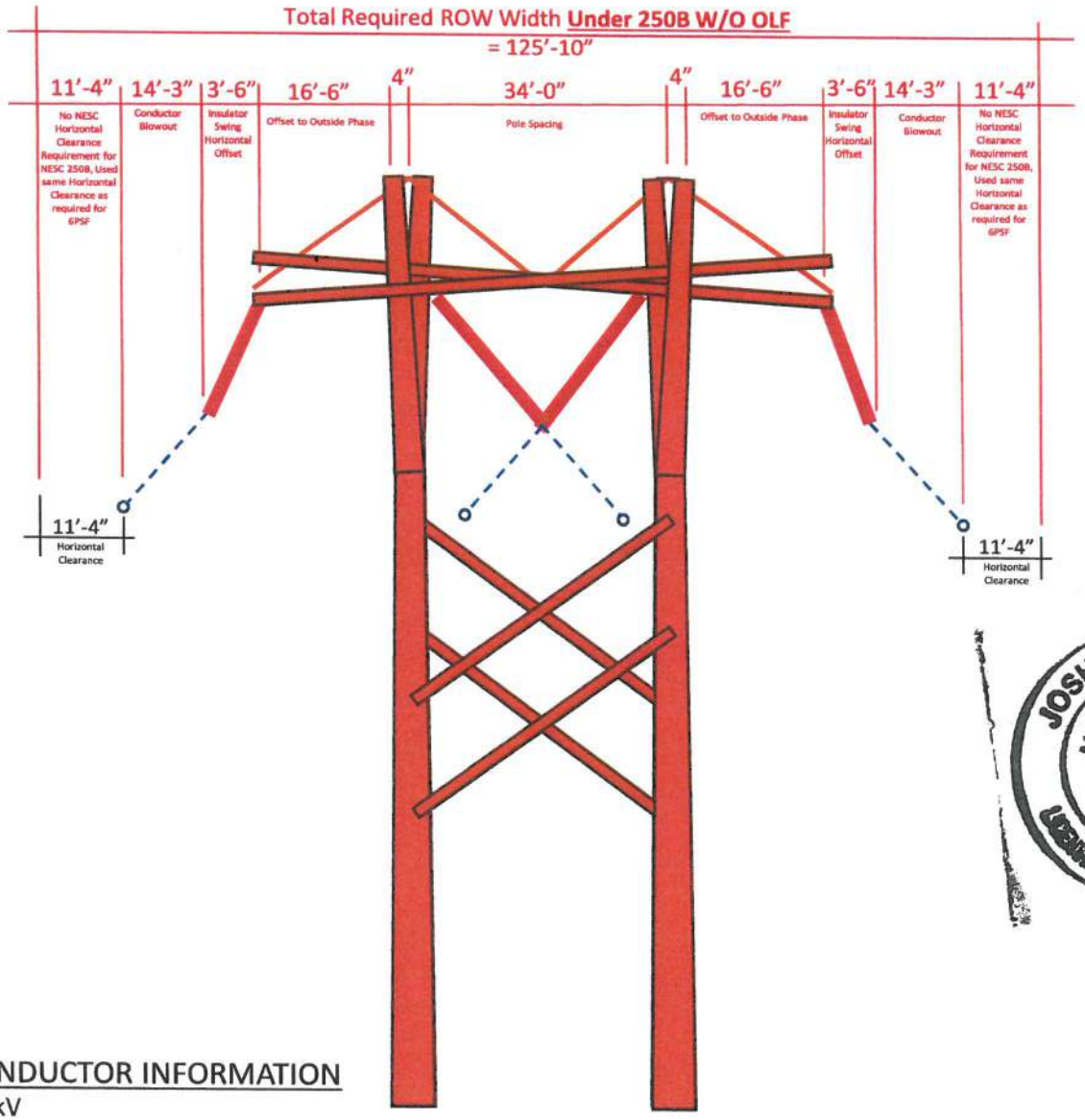
Design By:
Drawn By:
Approved By:
Project Number:

ROW WIDTH EXHIBITS
SC WOOD H-FRAME

REVISION:
A

COR-TLO-E-ROW-01(



SCALE: NTS

JOSHUA E. POTTS
NEW MEXICO
23051
LICENSED PROFESSIONAL ENGINEER
5-17-2018

STRUCTURE AND CONDUCTOR INFORMATION

Operational Voltage: 345kV
Structure Type = Single Circuit Wood H-Frame
Insulator Type = Suspension Insulators, I & V Type
Typical Design Span = 1000ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 250B W/O OLF
Weather Condition Displayed = 4 PSF (40mph) with ½" Radial Ice, 0 deg F
Pole Deflections, Insulator Swings and Conductor Blowouts calculated from analysis of pole models in PLS-CADD.

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CORONA WIND PROJECT

LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

Rev.	Date	Description	By
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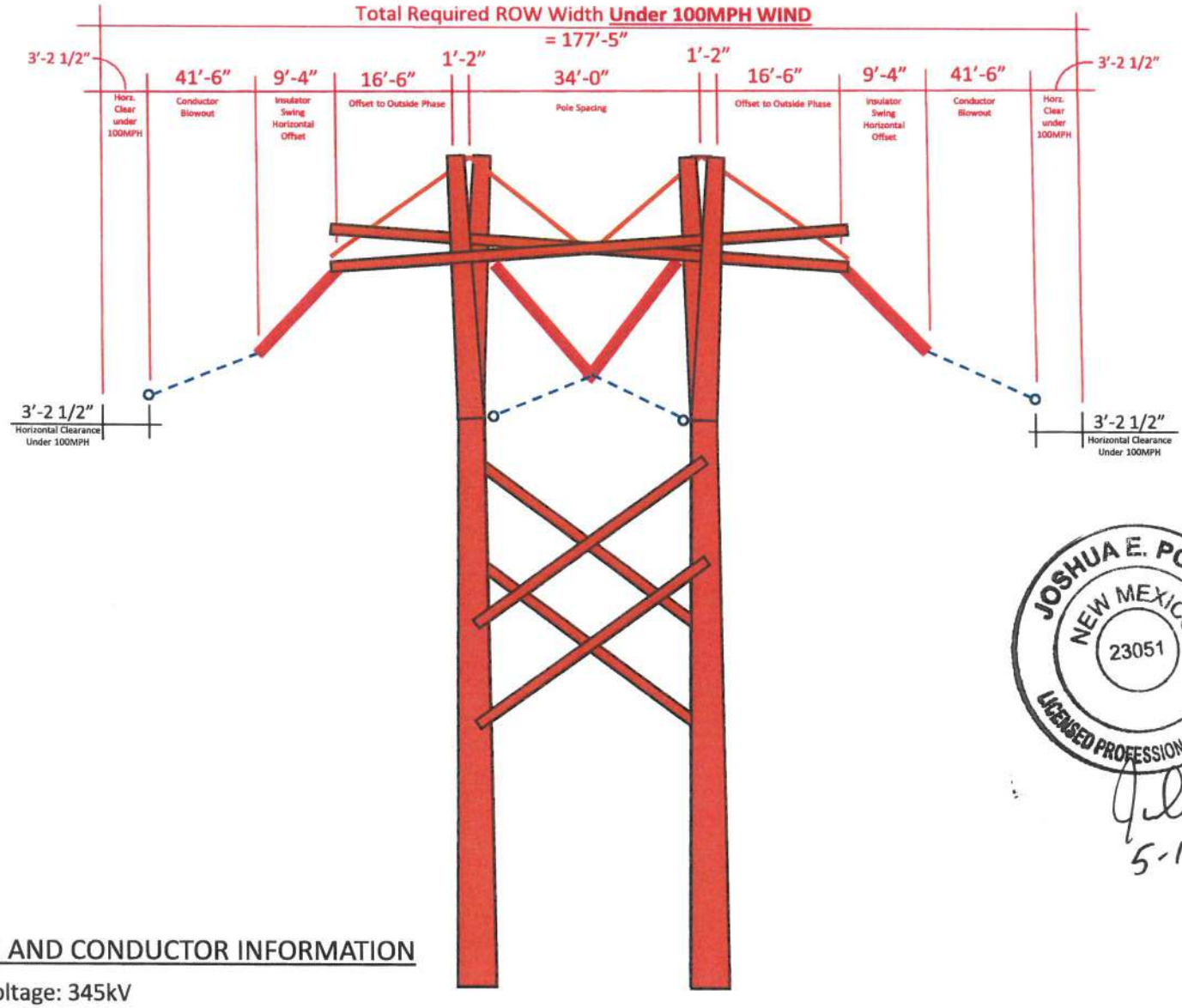
ROW WIDTH EXHIBITS
SC WOOD H-FRAME

REVISION:
A

COR-TLO-E-ROW-01



JOSHUA E. POTTS
NEW MEXICO
23051
LICENSED PROFESSIONAL ENGINEER

5-17-2018

STRUCTURE AND CONDUCTOR INFORMATION

Operational Voltage: 345kV
Structure Type = Single Circuit Wood H-Frame
Insulator Type = Suspension Insulators, I & V Type
Typical Design Span = 1300ft
Conductor Type = Bundled (2) 954kcmil ACSR "CARDINAL"
NESC Rule Analyzed: 250C
Weather Condition Displayed = 100 MPH @ 60 deg F
Pole Deflections, Insulator Swings and Conductor Blowouts calculated from analysis of pole models in PLS-CADD.

SCALE: NTS

NOT FOR CONSTRUCTION

CORONA WIND PROJECT

LINCOLN AND TORRANCE COUNTIES, NEW MEXICO

Rev.	Date	Description	By
A	04-19-2018	ROW EXHIBITS	UEI

PATTERN ENERGY GROUP
4225 EXECUTIVE SQUARE
LA JOLLA, CA 92037

Pattern

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Page 13 of 18

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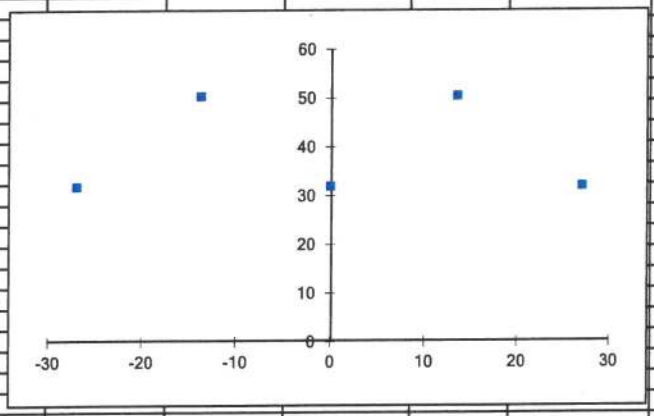
Design By:
Drawn By:
Approved By:
Project Number:

ROW WIDTH EXHIBITS
SC WOOD H-FRAME

REVISION:
A

COR-TLO-E-ROW-01

Audiable Noise Calculation									
Project Name: Corona Wind Project									
Engineer: Greg Parent									
Bundle	x-feet	y-feet	n cond	cond dia	spacing	l-n voltage	phase	Kv/cm	
1	27	32	2	1.196	18	205	0	15.1994	
2	0	32	2	1.196	18	205	120	16.3518	
3	-27	32	2	1.196	18	205	240	15.2031	
4	13.5	50.5	1	0.6		0	0	4.1242	
5	-13.7	50.5	1	0.6		0	0	4.1462	
6								0.0000	
7								0.0000	
8								0.0000	
NPH=	5.00	Calculated	Altitude ft=	7100					
(Inverse	8343.59	Dummy Output)	Note: Use "Paste Special" and "values" to copy data						
Dist		L50 rain							
Away from Center Line (ft)	Vert	Decibles at distance away from centerline [db]							
-300	5	43.66	O.K.						
-280	5	44.00	O.K.						
-260	5	44.37	O.K.	Goal: output in C column < 50 DB					
-240	5	44.76	O.K.						
-220	5	45.19	O.K.						
-200	5	45.66	O.K.						
-180	5	46.18	O.K.						
-160	5	46.77	O.K.						
-140	5	47.43	O.K.						
-120	5	48.18	O.K.						
-100	5	49.08	O.K.						
-90	6	49.61	O.K.						
-80	5	50.16	N.G.						
-60	5	51.49	N.G.						
-40	5	53.04	N.G.						
-20	5	54.31	N.G.						
0	5	54.88	N.G.						
20	5	54.31	N.G.						
40	5	53.04	N.G.						
60	5	51.48	N.G.						
80	5	50.15	N.G.						
90	6	49.61	O.K.						
100	5	49.08	O.K.						
120	5	48.18	O.K.						
140	5	47.42	O.K.						
160	5	46.77	O.K.						
180	5	46.18	O.K.						
200	5	45.66	O.K.						
220	5	45.19	O.K.						
240	5	44.76	O.K.						
260	5	44.37	O.K.						
280	5	44.00	O.K.						
300	5	43.66	O.K.						
Max Decibles =		54.88							



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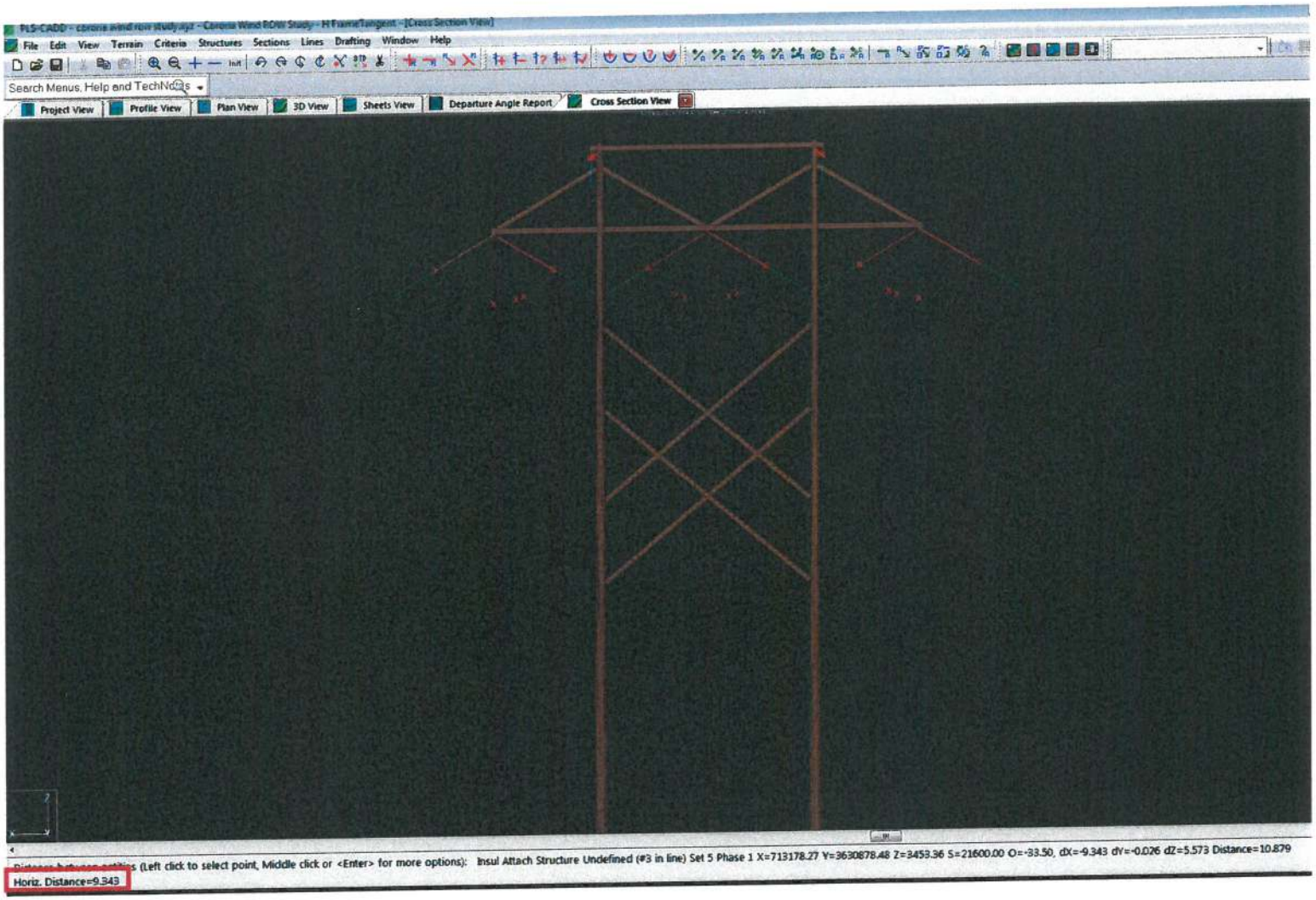
The table below is a screen shot of a report from PLS CADD which shows the structure deflections for each load case. The controlling case is highlighted below:

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label		Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
NESC 250C EXTREME WIND, NA+,I	NA+	L:t	0.25	14.07	-0.12	14.07	0.01	0.21	0.00
NESC 250C EXTREME WIND, NA+,I	NA+	R:t	0.24	14.05	-0.24	14.05	0.01	0.33	0.00
NESC 250C EXTREME WIND, NA-,I	NA-	L:t	0.24	-14.05	-0.24	14.05	0.01	-0.33	-0.00
NESC 250C EXTREME WIND, NA-,I	NA-	R:t	0.25	-14.07	-0.12	14.07	0.01	-0.21	-0.00
NESC 250D ICE W/ WIND, NA+,I	NA+	L:t	0.25	3.58	-0.03	3.59	0.01	-0.01	0.00
NESC 250D ICE W/ WIND, NA+,I	NA+	R:t	0.24	3.56	-0.06	3.57	0.01	0.14	0.00
NESC 250D ICE W/ WIND, NA-,I	NA-	L:t	0.24	-3.56	-0.06	3.57	0.01	-0.14	-0.00
NESC 250D ICE W/ WIND, NA-,I	NA-	R:t	0.25	-3.58	-0.03	3.59	0.01	0.01	-0.00
HEAVY ICE,I	NA+	L:t	0.48	0.03	-0.06	0.49	0.03	-0.18	0.00
HEAVY ICE,I	NA+	R:t	0.48	-0.01	-0.06	0.49	0.03	0.18	-0.00
UPLIFT,I	NA+	L:t	0.34	0.02	-0.03	0.34	0.02	-0.05	0.00
UPLIFT,I	NA+	R:t	0.34	0.01	-0.03	0.34	0.02	0.05	-0.00
NESC RULE 261A (wind towards 181),I	Max	L:t	-56.00	0.08	-1.39	56.02	-2.33	-0.02	-0.01
NESC RULE 261A (wind towards 181),I	Max	R:t	-56.00	0.06	-1.39	56.02	-2.33	0.03	0.01
DEFLECTION, NA+,I	NA+	L:t	0.23	3.51	-0.02	3.52	0.01	0.02	0.00
DEFLECTION, NA+,I	NA+	R:t	0.23	3.50	-0.05	3.51	0.01	0.12	0.00
DEFLECTION, NA-,I	NA-	L:t	0.23	-3.50	-0.05	3.51	0.01	-0.12	-0.00
DEFLECTION, NA-,I	NA-	R:t	0.23	-3.51	-0.02	3.52	0.01	-0.02	-0.00
NO WIND, DEFLECTION,I	NA+	L:t	0.34	0.02	-0.03	0.34	0.02	-0.05	0.00
NO WIND, DEFLECTION,I	NA+	R:t	0.34	0.01	-0.03	0.34	0.02	0.05	-0.00
HEAVY ICE (NO OLF),I	NA+	L:t	0.45	0.03	-0.06	0.46	0.03	-0.16	0.00
HEAVY ICE (NO OLF),I	NA+	R:t	0.45	-0.01	-0.06	0.46	0.03	0.16	-0.00
NESC 250B HEAVY W/K, NA+,I	NA+	L:t	0.31	10.55	-0.10	10.56	0.02	0.06	0.00
NESC 250B HEAVY W/K, NA+,I	NA+	R:t	0.30	10.51	-0.19	10.52	0.02	0.34	0.00
NESC 250B HEAVY W/K, NA-,I	NA-	L:t	0.30	-10.51	-0.19	10.52	0.02	-0.34	-0.00
NESC 250B HEAVY W/K, NA-,I	NA-	R:t	0.31	-10.55	-0.10	10.56	0.02	-0.06	-0.00
NESC RULE 277 INSULATORS, NA+,I	NA+	L:t	0.24	3.25	-0.02	3.26	0.01	-0.01	0.00
NESC RULE 277 INSULATORS, NA+,I	NA+	R:t	0.24	3.23	-0.05	3.24	0.01	0.13	0.00
NESC RULE 277 INSULATORS, NA-,I	NA-	L:t	0.24	-3.23	-0.05	3.24	0.01	-0.13	-0.00
NESC RULE 277 INSULATORS, NA-,I	NA-	R:t	0.24	-3.25	-0.02	3.26	0.01	0.01	-0.00
NESC RULE 277 INSULATORS, NA+,I	NA+ 1	L:t	0.24	12.69	-0.10	12.69	0.01	0.19	0.00
NESC RULE 277 INSULATORS, NA+,I	NA+ 1	R:t	0.23	12.67	-0.20	12.68	0.01	0.30	0.00
NESC RULE 277 INSULATORS, NA-,I	NA- 1	L:t	0.23	-12.67	-0.20	12.68	0.01	-0.30	-0.00
NESC RULE 277 INSULATORS, NA-,I	NA- 1	R:t	0.24	-12.69	-0.10	12.69	0.01	-0.19	-0.00
NESC RULE 277 INSULATORS, NA+,I	NA+ 2	L:t	0.24	3.25	-0.02	3.26	0.01	-0.01	0.00
NESC RULE 277 INSULATORS, NA+,I	NA+ 2	R:t	0.24	3.23	-0.05	3.24	0.01	0.13	0.00
NESC RULE 277 INSULATORS, NA-,I	NA- 2	L:t	0.24	-3.23	-0.05	3.24	0.01	-0.13	-0.00
NESC RULE 277 INSULATORS, NA-,I	NA- 2	R:t	0.24	-3.25	-0.02	3.26	0.01	0.01	-0.00
NESC 250B HEAVY NO OLF W/K, NA+,I	NA+	L:t	0.26	4.16	-0.03	4.17	0.01	-0.01	0.00
NESC 250B HEAVY NO OLF W/K, NA+,I	NA+	R:t	0.25	4.14	-0.07	4.15	0.01	0.17	0.00
NESC 250B HEAVY NO OLF W/K, NA-,I	NA-	L:t	0.25	-4.14	-0.07	4.15	0.01	-0.17	-0.00
NESC 250B HEAVY NO OLF W/K, NA-,I	NA-	R:t	0.26	-4.16	-0.03	4.17	0.01	0.01	-0.00

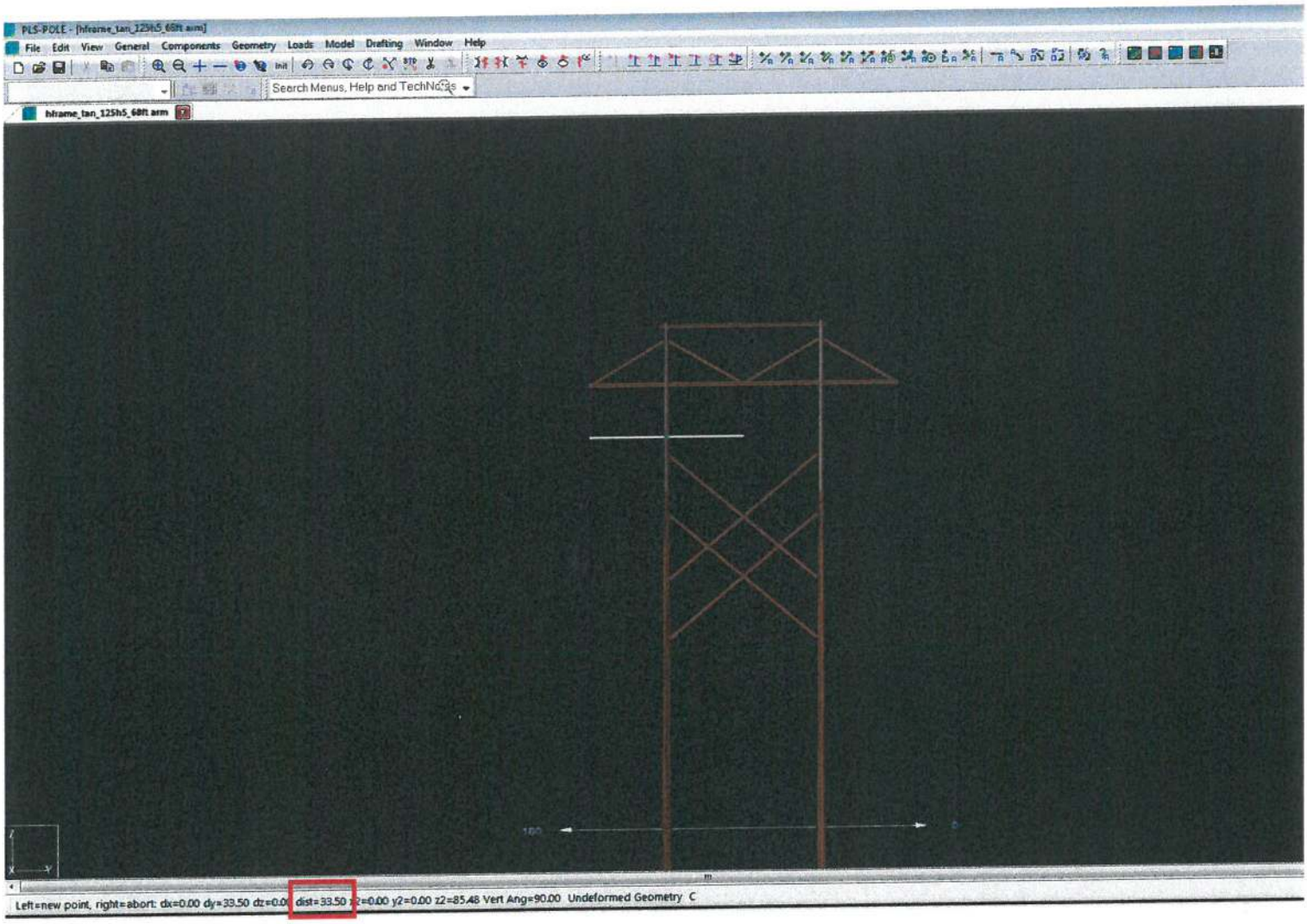
The image below is a screen shot of the cross sectional view of the structure. The insulator swing shown is at the 100 MPH Wind load case. The horizontal distance of the insulator swing (9.43 ft) is shown in the red box in the image:



JOSHUA E. POTTS
NEW MEXICO
23051
LICENSED PROFESSIONAL ENGINEER

5-17-2018

The image below shows the measurement of the outer phase attachment point to the center of the structure (33.5 ft):



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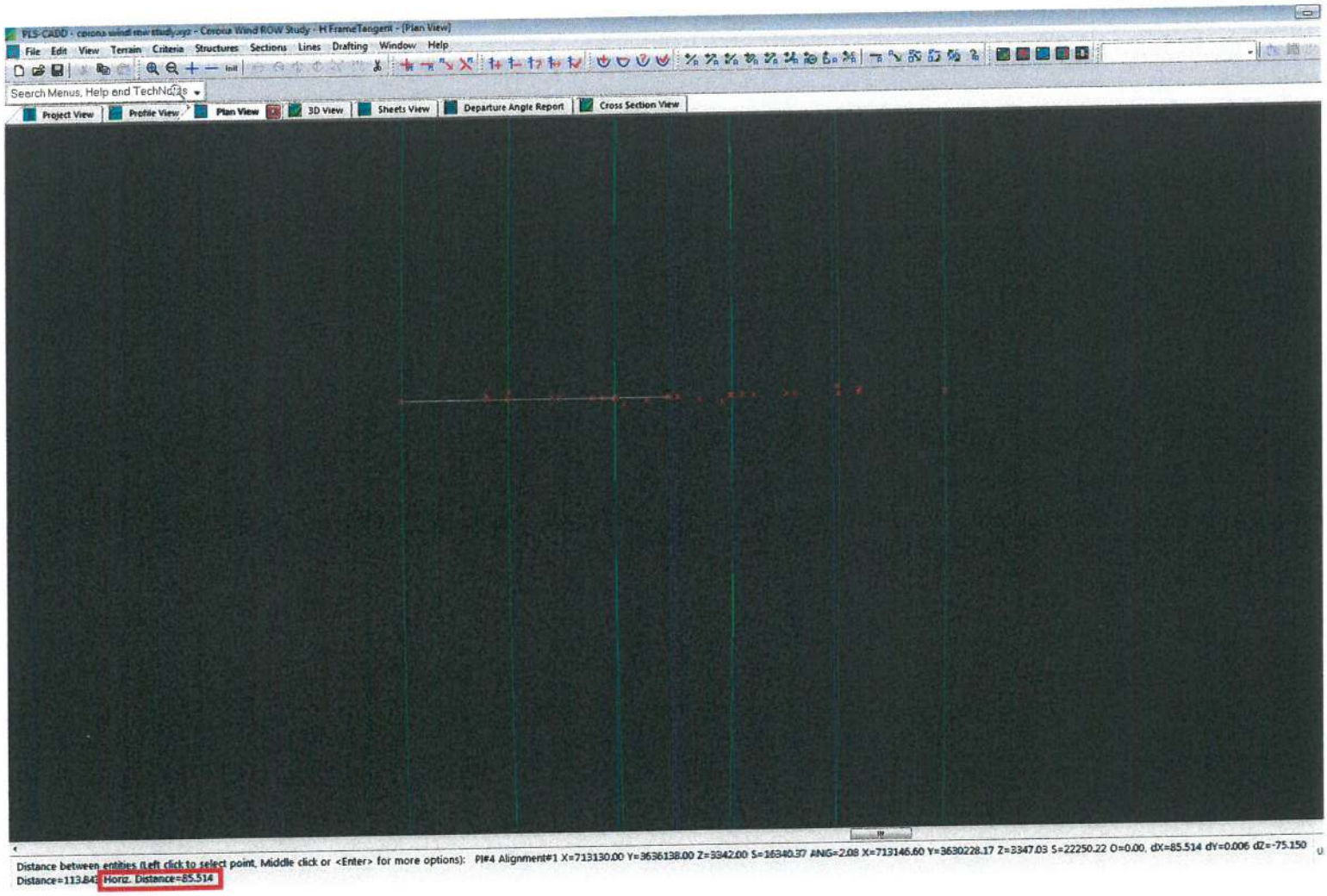
5-17-2018

The image below shows the measurement of the total conductor blowout from the center line of the alignment. The distance shown below includes insulator swing, structure deflection and the offset of the outer phase from the center.



The conductor blowout can be calculated by subtracting the structure deflection, horizontal insulator swing length, and attachment point offset from the total blowout value shown above.

(B_C) = Conductor Blowout (ft)
(D_S) = Structure Deflection (ft)
(D_I) = Insulator Swing Horizontal Distance (ft)
(D_O) = Outer Phase Attachment Offset From Structure Center (ft)
(B_T) = Total Blowout

$B_C = B_T - D_S - D_I - D_O$
$= 85.5 \text{ ft} - 1.17 \text{ ft} - 9.34 \text{ ft} - 33.5 \text{ ft}$
$= 41.49 \text{ ft}$

JOSHUA E. POTTS
NEW MEXICO
23051
LICENSED PROFESSIONAL ENGINEER

5-17-2018

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE CORONA WIND COMPANIES' JOINT APPLICATION FOR THE LOCATION OF THE CORONA WIND PROJECTS AND THE CORONA GEN-TIE SYSTEM IN LINCOLN, TORRANCE AND GUADALUPE COUNTIES PURSUANT TO THE PUBLIC UTILITY ACT, NMSA 1978, §62-9-3	)	**Case No. 18-00065-UT**
ANCHO WIND LLC, COWBOY MESA LLC, DURAN MESA LLC, RED CLOUD WIND LLC, TECOLOTE WIND LLC, VIENTO LOCO LLC,	)	
JOINT APPLICANTS.	)	

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the ***Supplemental Testimony of Greg Parent*** was sent on this 18th day of May 2018 by electronic mail and/or by first class postage pre-paid mail and hand delivery to the companies and individuals listed below:

Via Email:

Cydney Beadles	Cydney.beadles@state.nm.us;
Milo Chavez	milo.chavez@state.nm.us;
Jack Sidler	Jack.sidler@state.nm.us;
John Reynolds	john.reynolds@state.nm.us;
John Bogatko	John.bogatko@state.nm.us;
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Nita Taylor (Lincoln County Manager	Ntaylor@lincolncountynm.gov
Yolanda M. Garcia (City of Santa Rosa)	Ygarcia@srnm.org

Angela Creamer (Head Librarian Estancia)	estanciapblib@townofestancia.com
Terri Racher (Clerk Village of Corona	villageofcorona@plateautel.net
Irma Devine (Ruidoso Municipal Clerk)	IrmaDevine@ruidosodowns.us
Carol Virden (Clerk Ruidoso Downs	cvirden@ruidosodowns.us
Loretta Chavez (Clerk Village of Encino)	oakvillage@plateautel.net
Sheila Larranga-Murphy (Clerk Moriarty)	clerk@moriartynm.gov
Dennis Fulfer (Clerk Town of Mountainair)	townclerk@mountainairnm.gov

Via Hand Delivery:

John Bogatko
NMPRC
1120 Paseo de Peralta
Santa Fe, New Mexico 87504

Via US Mail

Town of Carrizozo
c/o Leann Weibrecht - Clerk-Treasurer
400 9th St.
P.O. Box 247
Carrizozo, NM 88301-0247

City of Santa Rosa
c/o Yolanda M. Garcia - City Clerk
244 S 4th St.
PO Box 429
Santa Rosa, NM 88435-0429

Town of Estancia, Public Library
c/o Angela Creamer - Head Librarian
601 South Tenth Street
PO Box 166 Estancia, NM 87016

Lincoln County
c/o Nita Taylor, County Manager
300 Central Avenue
Carrizozo, NM 88301

Guadalupe County
c/o George Dodge, Jr., County Manager
130 S. 4th Street
Santa Rosa, NM 88435

Village of Corona
c/o Terri Racher - Village Clerk-Treasurer
461 Corona Main St.
P.O. Box 37
Corona, NM 88318-0037

Town of Estancia
c/o Michelle Jones – Clerk
513 Williams Ave
P.O. Box 166
Estancia, NM 87016-0166

Town of Carrizozo, Public Library
c/o Head Librarian
406 Central Avenue (Hwy 54)
Carrizozo, NM 88301

Moise Memorial Library
c/o Mary Martinez - Library Director
208 S. 5th St.
Santa Rosa, NM 88435

Torrance County
c/o Belinda Garland, County Manager
205 9th Street
Estancia, NM 87016

Village of Capitan
c/o Laura NcInnes - Clerk-Treasurer
114 Lincoln Ave.
P.O. Box 1380,
Capitan, NM 88316

Village of Ruidoso
c/o Irma Devine - Village Clerk
313 Cree Meadows Dr.
Ruidoso, NM 88345

City of Ruidoso Downs
c/o Carol Virden -Clerk-Treasurer
123 Downs Drive
P.O. Box 348
Ruidoso Downs, NM 88346

City of Moriarty
c/o Sheila Larranaga-Murphy - Clerk
201 Broadway Street
P.O. Box 130
Moriarty, NM 87035

Village of Willard
c/o Angela Halbert – Clerk/Treasurer
720 N Dunlavy St
PO Box 204
Willard, NM 87063

Village of Encino
c/o Loretta Chavez - Clerk-Treasurer
427A N Main
P.O. Box 163
Encino, NM 88321-0163

Town of Mountainair
c/o Dennis Fulfer - Town Clerk
105 E Broadway
PO Box 115
Mountainair, New Mexico 87036

Town of Vaughn
c/o Fronia Jaramillo – Clerk
322 8th St
P.O. Box 278
Vaughn, NM 88353-0278

DATED this 18th day of May 2018.

Sincerely,

VIRTUE & NAJJAR, PC

Carla R Najjar

Daniel A. Najjar
Carla R. Najjar
2200 Brothers Road
P.O. Box 22249
Santa Fe, NM 87502-2249
(505) 983-6101
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csnajjar@virtuelaw.com

Attorneys for the Corona Wind Companies