PECO
An Exelon Company

Legal Department
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Philadelphia, PA 19101-8699

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January 13, 2016

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, Second Floor
Harrisburg, PA 17120

RE: Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct the Linwood - - Chichester 230 kV Transmission Line of Less Than Two Miles in Length, Docket No. A-2016-2523055

Dear Ms. Chiavetta:

PECO's Responses to Staff's Data Requests are attached. Please accept them for filing in the above-noted docket.

Scalable (native format) electronic copies of the graphic attachments have been provided to Commission Staff. Electronic copies will be made available upon request to other parties to this proceeding; please contact me by email (ward.smith@exeloncorp.com) if copies are desired.

Very truly yours,

Ward C Smith

Ward Smith
Counsel for PECO Energy Company

WS/ab
Enclosure

cc: Certificate of Service

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

PECO Energy's Answers to Template Staff Data Requests

In PECO's last two Letter of Notification dockets, Commission Staff asked the following data requests. In order to facilitate review of its Letter, PECO is answering these data requests contemporaneously with the filing of its Letter of Notification.

1. Please provide an engineering assessment of the project including information to address the following:

The proposed 220-43 (230 kV) project is a new 1.88 mile line that runs through both Lower Chichester Township and Trainer Borough from Linwood Substation to Chichester substation. The line will consist of twenty-six (26) new transmission poles. Ten (10) poles will be dual-circuit monopoles supporting the proposed 230 kV line and an existing 69 kV line. The remaining sixteen (16) poles will be single circuit monopole structures. Approximately 1.18 miles of the line will be constructed in the existing easements or on PECO property. The remaining 0.70 mile will be constructed within newly acquired easements. Additional easement width has been obtained adjacent to the existing easement west of Green Street. Structures on the existing easement will be demolished and replaced with new structures

a) Provide an analysis of minimum conductor clearances and conductor thermal ratings.

Conductor clearances for the project meet or exceed the requirement of PECO's Engineering Practice EPP-2090 OHT Design Clearances. The clearance requirement in EPP-2090 exceeds the requirements of NESC-2012. Examples of PECO clearance requirements are provided in section B.

The proposed new conductor will be; 1590 kcmil 54/19 ACSR "Falcon" conductor. Two (2) conductors will be used per phase. The PECO rating methodology AM-PE-4022_R0001 and associated PJM Bare Overhead Conductor Rating-2010 are based on the methodology of the "IEEE-738 Standard for Calculating the Current Temperature Relationship of Bare Overhead Conductors" with the following input parameters:

	Normal Rating	Emergency Rating
Wind speed (fps)	0	2.53
Wind angle	90	90
Latitude	40	40
Amb Temp (Sum/Wint)	35/10	35/10
Elev above sea level (ft)	200	20
Atmosphere	Industrial	Industrial
Sun Time (date@time)	6/10@14:00	6/10@14:00
Emissivity	0.7	0.7
Absorptivity	0.9	0.9
ACSR (Allow. conductor temp)	140 C	140 C

The rating of the conductor segment is:

- Summer Normal = 3670 amps
- Summer Emergency = 4444 amps

b) Provide engineering design criteria and parameters such as vertical clearance to ground. NESC Section 232 required the following vertical clearances for 230 kV facilities:

Ground, Farmland	22.4'
Roadways, Driveways, Parking lots	22.4'
Railroads, above top or rail	30.4'
Area not accessible by vehicles	18.4'

For new construction (including this project), PECO designs their facilities to meet the NESC rules plus a minimum of an additional 3 feet of additional vertical clearance. Similarly for the NESC horizontal clearance, PECO adds a minimum of an additional 2 feet of horizontal clearance.

c) Provide a demonstration detailing how the project will be in compliance with the current NESC including information such as how the ROW will be adequate with NESC requirements.

The ROW width for the proposed project is governed by the conductor displacement due to wind with the assumption that buildings can be erected on the property line regardless of local municipality building setback requirements. The ROW width varies along the line segments and is shown in the enclosed drawings. The ROW provided exceeds the requirements of the NESC and PECO's Engineering Practice EPP-2090 "OHT Design Clearances" and will provide access for line maintenance, repair and vegetation management.

d) Please provide information describing how PECO's design specifications and safety rules meet or surpass the requirements specified by the NESC for transmission lines.

Per PECO's Engineering Practice EPP-2090 OHT Design Clearances, Section 6.2, all new transmission line designs require an additional PECO safety clearance margin to be added to the NESC clearance requirements. The margins are:

- 3'-0" for vertical clearances
- 2'-0" for horizontal clearances

For lines 230 kV and above PECO adds the following robust design criteria requirements above NESC requirements per PECO's Engineering Practice EPP-2030 OHT Weather and Design Conditions:

- *Heavy Ice and Wind Loading Condition – Line voltage 230kV and greater. Wind pressure applied to the iced conductors shall be 8psf with 1.00 inch radial ice and temperature of 0_F. Load factor is 1.25.*
- *Extreme Wind Loading Condition – Line voltage 230kV and greater.* Wind pressure applied to the wires shall be 25psf. The ambient temperature is to be 60_F. The wind pressure applied to the structure shall be 31.25psf. Load factor is 1.00.
- *Heavy Ice Loading Condition – Line voltage 230kV and greater.* Radial ice thickness on the wires only is to be 1.50 in. No wind pressure. Temperature is 32_F. Load factor is 1.00.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

PECO Energy's Answers to Template Staff Data Requests

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2. What is the height of the existing poles near the new poles or structures that will be installed? Provide the location and footprint of the proposed structures.

The proposed line will tie Linwood substation to Chichester substation with twenty- six (26) new transmission poles. Ten (10) poles will be dual-circuit monopoles supporting both the proposed 230 kV line and the existing 69 kV line. The remaining sixteen (16) poles will be single circuit 230 kV monopole structures. All poles will be supported on caisson foundations. Below is a summary of the new pole locations, heights, and foundation diameters (footprints):

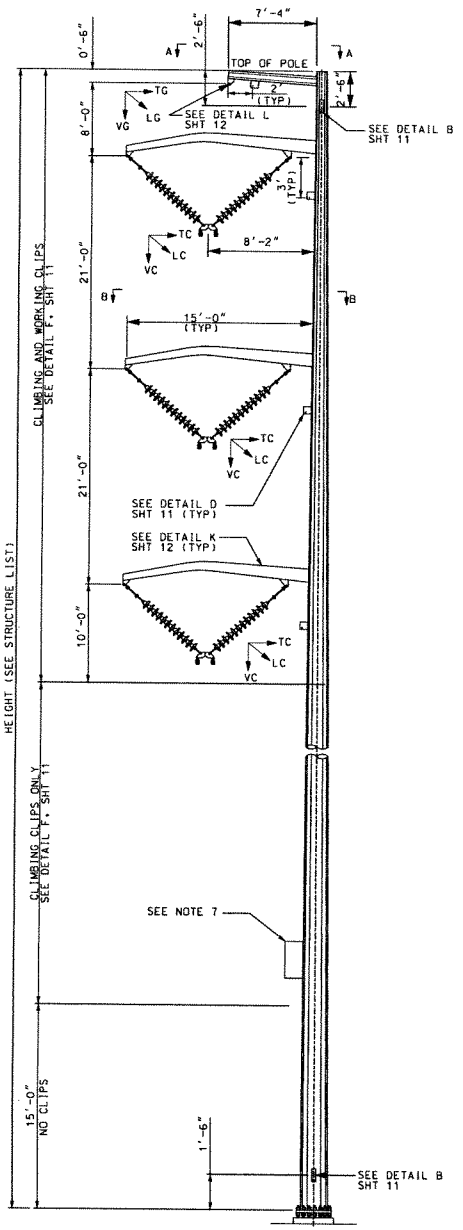
Structure Number	X Easting (ft)*	Y Northing (ft)*	Structure Height (ft)	Foundation Diameter (ft)	Comments
1-1	2619444.14	185064.84	120	7	Inside Linwood Substation
1-2	2619267.37	185363.20	120	8	
1-3	2619627.88	185590.46	125	7	
1-4	2620012.97	185811.09	130	10	Dual circuit structure
1-5	2620513.45	186110.81	130	7	Dual circuit structure
1-6	2620846.05	186322.75	120	7	Dual circuit structure
1-7	2621295.30	186580.31	125	7	Dual circuit structure
1-8	2621703.26	186814.00	120	7	Dual circuit structure
1-9	2622056.02	187025.92	130	7	Dual circuit structure
1-10	2622504.28	187318.87	135	7	Dual circuit structure
1-11	2622911.25	187612.36	135	7	Dual circuit structure
1-12	2623310.75	187845.06	120	10	Dual circuit structure
2-1	2623615.13	187280.93	140	10	Dual circuit structure
2-2	2623915.82	187151.06	120	7	
2-3	2624291.34	187376.61	110	7	

2-4	2624650.82	187625.48	110	7	
2-5	2624934.41	187804.45	110	7	
2-6	2625239.74	188001.15	110	7	
2-7	2625567.90	188281.18	110	8	
2-8	2625365.20	188624.50	120	7	
2-9	2625132.44	188980.13	140	9	
2-10	2624514.53	188751.23	135	9	
2-11	2624225.05	189196.80	120	9	
3-1	2623831.70	188959.86	125	7	Inside Chichester Substation
3-2	2623459.76	188760.52	120	9	Inside Chichester Substation
3-3	2623229.73	189076.54	125	7	Inside Chichester Substation

*X/Y coordinates are in State Plane NAD83, Zone 3702 PA South

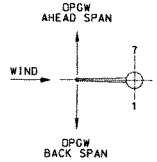
For additional detail, please refer to the enclosed structure drawings labelled "DR-2 – Linwood-Chichester Structure Drawings."

The existing poles near the proposed line are PECO distribution poles located along Ridge Road. The typical pole height ranges from 34' to 40' above ground.

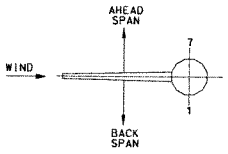


SC-TAN STRUCTURE

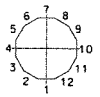
SINGLE STEEL POLE, TANGENT, SINGLE CIRCUIT



VIEW A-A
OPGW PLAN



VIEW B-B
230KV CONDUCTOR PLAN



ORIENTATION DETAIL

LOADING TABLE

WIRES	LOAD	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	
		INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	OPGW NOT INTACT*	CONDUCTOR NOT INTACT*
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.40	2.30	0.50	3.50	1.50	0.40	0.80	0.80	1.00	1.00
	TG	1.20	1.80	1.10	0.60	0.30	0.20	0.40	0.50	0.50	0.70
	LG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	5.70	0.00
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	7.70	9.70	3.70	12.40	7.40	3.40	6.70	6.70	5.70	5.70
	TC	4.60	5.30	5.10	2.20	1.40	0.70	2.40	3.00	2.50	2.20
	LC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.50	0.00	13.90
WIND ON STRUCTURE (DOES NOT INCLUDE OVERLOAD FACTORS)	W	4.00	8.00	31.25	0.00	0.00	0.00	2.00	2.00	4.00	
OVERLOAD FACTOR	TW	2.50	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10	
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10	
	V	1.50	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10	

* ONE SUB-CONDUCTOR OF ANY ONE PHASE BUNDLE IS ASSUMED BROKEN. WITH THE OTHER SUB-CONDUCTORS ASSUMED TO REMAIN INTACT.

MECHANICAL LOADING CRITERIA

CASE 1 NESC HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 PECO HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL ICE 0°F

CASE 3 PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 7 CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 8 CONSTRUCTION LOAD (WIRE BOUND IN BLOCK)
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 9 ONE BROKEN SUB-CONDUCTOR
ONE SUB-CONDUCTOR BROKEN, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.3 LB/FT NESC CONSTANT

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED = 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. ALL LOAD CASES INCLUDE:
   - 40 LBS FOR OPGW HARDWARE
   - 500 LBS FOR SUSPENSION INSULATORS

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. ALL STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871, EXCEPT STRUCTURES 3-1 & 3-3, WHICH SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH ASTM A123.
7. OPGW SPLICE LOCATION AT STRUCTURE 3-1, SEE SHEET 13.

WIRE DATA

STATIC WIRE: OPGW 36 FIBER AC-92/614 DNO-8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

SPAN AND ANGLE DATA	
STR TYPE	SC-TAN
DESIGN WIND SPAN (FT)	550
DESIGN WEIGHT SPAN (FT)	700
DESIGN LINE ANGLE (DEG)	0-3

REFERENCE:

1) PLAN AND PROFILES - C-268987

STRUCTURE LIST

STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	MAX BOLT CIRCLE DIA (IN)
SC-TAN	2-3, 2-4, 2-5	110	3	48
	2-8	120	1	48
	1-3, 3-1*, 3-3*	125	3	48

*SEE NOTE 6

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A102	20	WO-07662161 EC-177238	A I M	B R B	B R B
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW			
A207	08	WO-07662161 EC-177238	D E L	C E O	B R B
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL			
A309	04	WO-07662161 EC-177238	D E L	C E O	B R B
	15	POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL			

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
SC-TAN MONOPOLE (230 kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			07-15-14

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

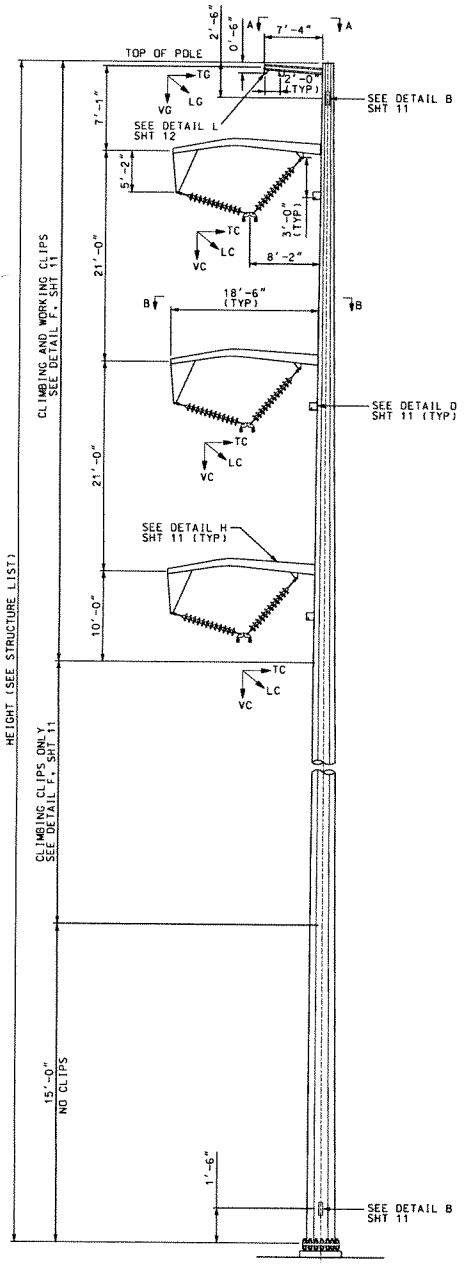
SHEET 1 OF 13 | C-269016-A3

EC# 177238

1 PLOT SCALE
FILE SCALE

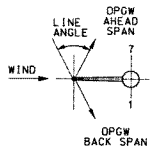
POWER DELIVERY
ENGINEERING SERVICES

ROUTE ATLINEDC

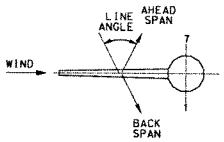


SC-RA(15) STRUCTURE

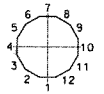
SINGLE STEEL POLE, RUNNING ANGLE, SINGLE CIRCUIT



VIEW A-A
OPGW PLAN



VIEW B-B
230KV CONDUCTOR PLAN



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ALL WIRES INTACT, INITIAL TENSIONS
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ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

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ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

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ONE SUB-CONDUCTOR BROKEN, INITIAL TENSIONS
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GENERAL NOTES:

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5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871.

SPAN AND ANGLE DATA	
STR TYPE	SC-RA(15)
DESIGN WIND SPAN (FT)	500
DESIGN WEIGHT SPAN (FT)	550
DESIGN LINE ANGLE (DEG)	15

STRUCTURE LIST					
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE DIA (IN)
SC-RA(15)	2-6	110	1	-10.54	48

REFERENCE:

1) PLAN AND PROFILES - C-268987

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	DRWN	CHKD	APP'D
A1	02 20 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	DVW	BRB	BRB
A2	07 08 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL	DME	CEO	BRB
A3	09 04 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL	DME	CEO	BRB

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
SC-RA(15) MONOPOLE (230KV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			05-23-14

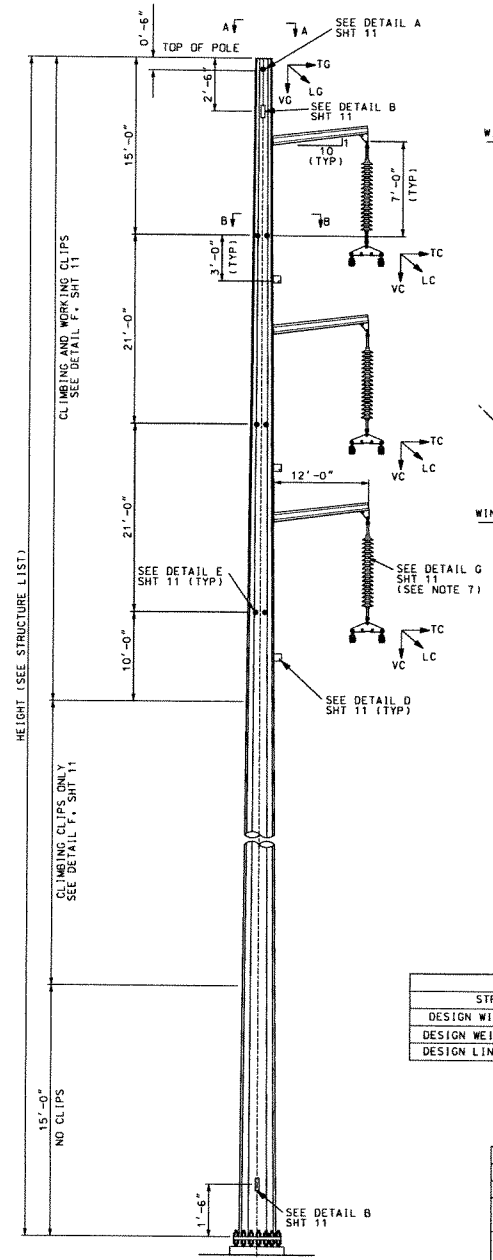
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 2 OF 13 | C-269016-A3

EC# 177238

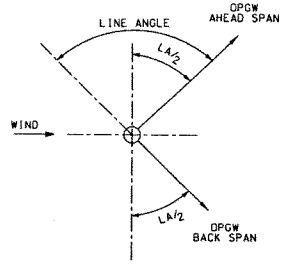
PLOT SCALE
FILE SCALE

POWER DELIVERY
ENGINEERING SERVICES

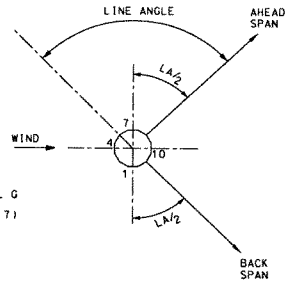


SC-DE(60) SC-DE(95) & SC-DE(95)-LS STRUCTURE

SINGLE STEEL POLE, DEADEND, SINGLE CIRCUIT



VIEW A-A
STATIC AND OPGW PLAN



VIEW B-B
230KV CONDUCTOR PLAN

ORIENTATION DETAIL

MECHANICAL LOADING CRITERIA

CASE 1 NESC HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 PECO HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL ICE 0°F

CASE 3 PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 4% POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.30 LB/FT NESC CONSTANT

CASE 7 EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 8 CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F.

WIRE DATA

STATIC WIRE: OPGW 36 FIBER AC-92/614 DNO-8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

LOADING TABLE FOR SC-DE(60)

WIRES	LOAD	CASE 1		CASE 2		CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
		INTACT	DE	INTACT	DE	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.10	0.60	1.80	1.00	0.40	2.80	1.40	0.70	0.40	1.30
	TG	9.10	4.60	11.00	5.50	5.40	11.40	4.00	5.40	2.00	5.20
	LG	0.00	7.30	0.00	8.60	0.00	0.00	0.00	0.00	0.00	0.00
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	6.40	3.70	7.90	4.40	3.20	10.00	6.40	4.30	2.90	11.40
	TC	43.80	21.90	40.50	20.30	25.20	41.60	26.00	26.10	13.00	33.80
	LC	0.00	36.10	0.00	32.50	0.00	0.00	0.00	0.00	0.00	0.00
WIND ON STRUCTURE (DOES NOT INCLUDE OVERLOAD FACTORS)	W	4.00	4.00	8.00	8.00	31.25	0.00	0.00	4.00	0.00	2.00
OVERLOAD FACTOR	TW	2.50	2.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.65	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
	V	1.50	1.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00

LOADING TABLE FOR SC-DE(95)

WIRES	LOAD	CASE 1		CASE 2		CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
		INTACT	DE	INTACT	DE	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.10	0.60	1.80	1.00	0.40	2.80	1.40	0.70	0.40	1.30
	TG	13.10	6.60	15.70	7.90	7.60	16.80	5.90	7.80	3.00	7.50
	LG	0.00	5.70	0.00	6.70	0.00	0.00	0.00	0.00	0.00	0.00
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	6.30	3.60	7.90	4.30	3.10	10.00	6.30	4.20	2.80	11.20
	TC	63.50	31.80	58.30	29.20	35.40	61.40	38.40	38.10	19.20	49.50
	LC	0.00	28.10	0.00	25.40	0.00	0.00	0.00	0.00	0.00	0.00

LOADING TABLE FOR SC-DE(95)-LS

WIRES	LOAD	CASE 1		CASE 2		CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
		INTACT	DE	INTACT	DE	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.50	0.80	2.50	1.30	0.50	3.80	1.60	1.00	0.50	1.70
	TG	13.30	6.70	16.00	8.00	7.80	16.80	5.90	7.90	3.00	7.60
	LG	0.00	5.70	0.00	6.70	0.00	0.00	0.00	0.00	0.00	0.00
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	8.30	4.60	10.50	5.60	4.00	13.40	8.00	5.60	3.70	14.50
	TC	64.10	32.10	59.20	29.60	36.40	61.40	38.40	38.30	19.20	49.70
	LC	0.00	28.10	0.00	25.40	0.00	0.00	0.00	0.00	0.00	0.00

SPAN AND ANGLE DATA

STR TYPE	SC-DE(60)	SC-DE(95)	SC-DE(95)-LS
DESIGN WIND SPAN (FT)	500	500	650
DESIGN WEIGHT SPAN (FT)	550	550	750
DESIGN LINE ANGLE (DEG)	60	95	95

STRUCTURE LIST

STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE DIA (IN)
SC-DE(60)	2-2	120	1	-55.59	48
SC-DE(95)	2-7	110	1	-79.46	60
	1-2, 3-2*	120	2	88.42, 84.74	60
SC-DE(95)-LS	2-11	120	1	-86.90	72
	2-10	135	1	77.32	72
	2-9	140	1	-78.40	72

*SEE NOTE 6

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED = 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR OPGW HARDWARE
   - 590 LBS FOR DEADEND INSULATORS
7. JUMPER ARMS ONLY REQUIRED ON SC-DE(60) STRUCTURES.

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. ALL STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871, EXCEPT STRUCRURE 3-2 SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH ASTM A123.

REFERENCE:

1) PLAN AND PROFILES - C-268987

TABLE OF ADDITIONS & CHANGES USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A1	02	WO-07662161	A	B	B
	04	EC-177238	I	R	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	M	B	B
A2	07	WO-07662161	D	C	B
	08	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL		R	B
A3	09	WO-07662161	D	C	B
	04	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL		R	B

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
SC-DE(60), (95), (95)-LS MONOPOLE (230kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			05-28-14

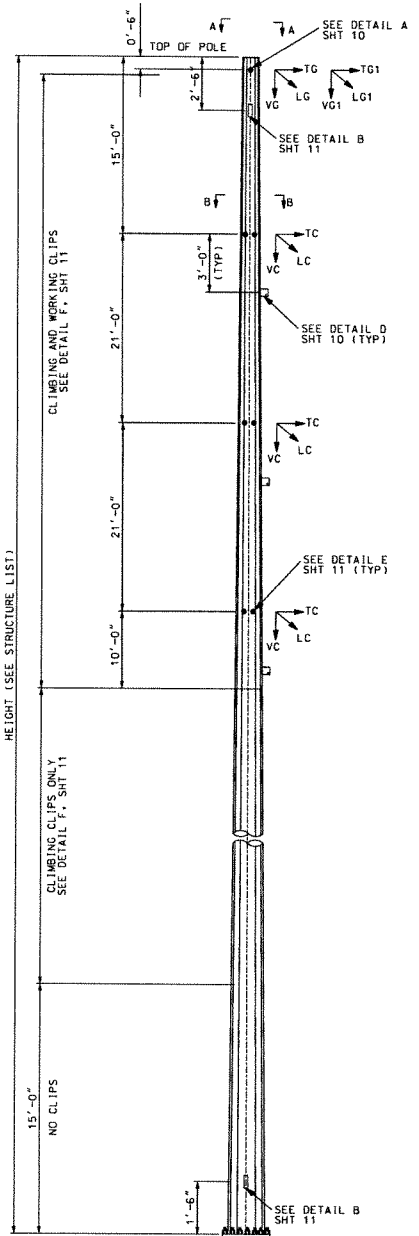
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 3 OF 13 | C-269016-A3

ECI# 177236

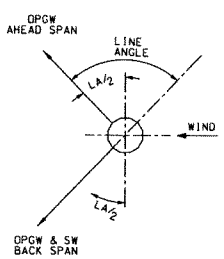
PLOT SCALE
FILE SCALE

POWER DELIVERY ENGINEERING SERVICES

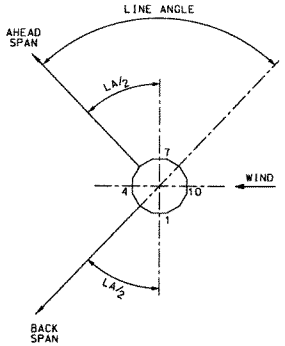


SC-DE(90)_1-1 STRUCTURE

SINGLE STEEL POLE, DEADEND, SINGLE CIRCUIT



VIEW A-A
STATIC AND OPGW
PLAN



VIEW B-B
230KV CONDUCTOR PLAN

ORIENTATION DETAIL

MECHANICAL LOADING CRITERIA

CASE 1 NESC HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 PECO HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL 0°F

CASE 3 PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 4% POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.30 LB/FT NESC CONSTANT

CASE 7 EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 8 CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F,

LOADING TABLE

WIRES	LOAD	CASE 1		CASE 2		CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
		INTACT	DE	INTACT	DE	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT
OPGW 36 FIBER AC-92/614 DNO-8338 (NORTH SIDE)	VG	0.80	0.50	1.40	0.70	0.30	2.10	1.20	0.60	0.30	1.00
	TG	7.10	6.30	8.40	7.50	4.10	9.10	3.20	4.20	1.60	3.90
	LG	-5.30	-6.00	-6.30	-7.00	-3.00	-7.10	-2.60	-3.20	-1.30	-3.30
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	4.80	2.80	5.90	3.30	2.40	7.40	5.10	3.20	2.20	8.80
	TC	32.50	30.30	30.10	27.70	18.50	31.60	19.60	19.40	9.80	25.00
	LC	-27.70	-29.50	-24.80	-26.60	-14.20	-27.30	-17.30	-16.80	-8.70	-22.40
7 NO. 5 ALUMOWELD SHIELD WIRE (SOUTH SIDE)	VG1	0.50	0.10	0.70	0.10	0.20	1.00	1.00	0.30	0.20	0.60
	TG1	0.90	0.00	1.00	0.00	0.50	1.10	0.40	0.50	0.20	0.40
	LG1	0.80	0.00	0.80	0.00	0.40	1.10	0.40	0.50	0.20	0.40
WIND ON STRUCTURE (DOES NOT INCLUDE OVERLOAD FACTORS)	W	4.00	4.00	8.00	8.00	31.25	0.00	0.00	4.00	0.00	2.00
OVERLOAD FACTOR	TW	2.50	2.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.65	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
	V	1.50	1.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED - 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR OPGW AND 7 NO.5 ALUMOWELD HARDWARE
   - 590 LBS FOR DEADEND INSULATORS

WIRE DATA

STATIC WIRE: OPGW 36 FIBER AC-92/614 DNO-8338
800 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F. INITIAL TENSIONS

STATIC WIRE (BACK SPAN ONLY): 7 NO. 5 ALUMOWELD
850 LBS. (BACK SPAN ONLY)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F. INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
1,000 LBS. PER SUB CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F. INITIAL TENSIONS

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURE 1-1 SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH ASTM A123.

REFERENCE:

1) PLAN AND PROFILES - C-268987

SPAN AND ANGLE DATA	
STR TYPE	SC-DE(90)_1-1
DESIGN WIND SPAN (FT)	300
DESIGN WEIGHT SPAN (FT)	400
DESIGN LINE ANGLE (DEG)	90

STRUCTURE LIST					
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE DIA (IN)
SC-DE(90)_1-1	1-1	120	1	-90.00	48

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	DRN	CHK	APP
A1	02	WO-07662161	A	B	B
	20	EC-177238	I	R	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	M	B	B
A2	07	WO-07662161	D	C	B
	08	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL		O	B
A3	09	WO-07662161	D	C	B
	04	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL		O	B

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
SC-DE(90)_1-1 MONOPOLE (230kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			05-28-14

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 4 OF 13 | C-269016-A3

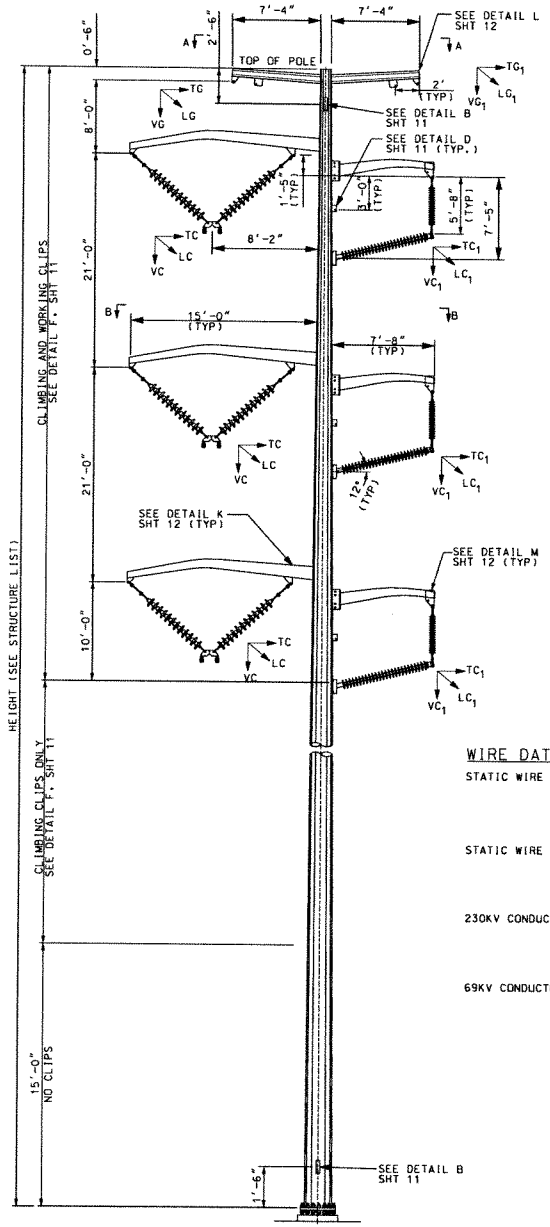
EC# 177238

PLOT SCALE
FILE SCALE

POWER DELIVERY
ENGINEERING SERVICES

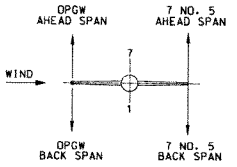
C-269016

ROUTE ATLINEDC



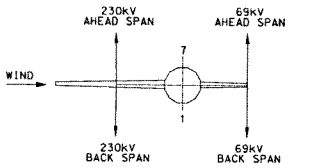
DC-TAN STRUCTURE

SINGLE STEEL POLE, TANGENT, DOUBLE CIRCUIT



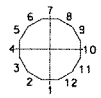
VIEW A-A

STATIC & OPGW PLAN



VIEW B-B

69KV & 230KV CONDUCTOR PLAN



ORIENTATION DETAIL

LOADING TABLE

WIRES	LOAD	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9			
		INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	OPGW NOT INTACT*	FALCON NOT INTACT*	7 NO. 5 NOT INTACT*	DRAKE NOT INTACT*
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.40	2.30	0.50	3.50	1.50	0.40	1.60	0.80	1.00	1.00	1.00	1.00
	TG	1.20	1.80	1.10	0.60	0.30	0.20	0.40	0.50	0.50	0.70	0.70	0.70
	LG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	-5.70	0.00	0.00	0.00
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	7.70	9.70	3.70	12.40	7.40	3.40	13.30	6.70	5.70	5.70	5.70	5.70
	TC	4.60	5.30	5.10	2.20	1.40	0.70	2.40	3.00	2.50	2.20	2.50	2.50
	LC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.50	0.00	-13.90	0.00	0.00
7 NO. 5 ALUMOWELD SHIELD WIRE	VG_1	1.30	2.20	0.50	3.40	1.60	0.50	1.70	0.90	1.00	1.00	1.00	1.00
	TG_1	1.20	1.70	1.00	0.60	0.30	0.20	0.40	0.50	0.70	0.70	0.50	0.70
	LG_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	0.00	0.00	-5.70	0.00
69KV CONDUCTOR 795 ACSR "DRAKE"	VC_1	2.60	3.60	1.20	4.90	2.80	1.10	4.10	2.10	1.90	1.90	1.90	1.90
	TC_1	1.80	2.30	1.90	0.90	0.60	0.30	0.90	1.10	1.00	1.00	1.00	0.70
	LC_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.20	0.00	0.00	0.00	-10.50
WIND ON STRUCTURE (DOES NOT INCLUDE OVERLOAD FACTORS)	W	4.00	8.00	31.25	0.00	0.00	0.00	2.00	2.00	4.00			
OVERLOAD FACTOR	TW	2.50	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10			
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10			
	V	1.50	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10			

* ONE SUB-CONDUCTOR OF ANY ONE PHASE BUNDLE IS ASSUMED BROKEN, WITH THE OTHER SUB-CONDUCTORS ASSUMED TO REMAIN INTACT.

WIRE DATA

STATIC WIRE (OVER 230kV): OPGW 36 FIBER AC-92/614 DNO-8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

STATIC WIRE (OVER 69kV): 7 NO. 5 ALUMOWELD
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

69KV CONDUCTOR: 795 KCMIL, 26/7 ACSR "DRAKE"
9,800 LBS. (BACK SPAN)
9,800 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

MECHANICAL LOADING CRITERIA

CASE 1 NESC HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 PECO HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL ICE 0°F

CASE 3 PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 7 CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 8 CONSTRUCTION LOAD (WIRE BOUND IN BLOCK)
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 9 ONE BROKEN SUB-CONDUCTOR
ONE SUB-CONDUCTOR BROKEN, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.3 LB/FT NESC CONSTANT

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED = 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR OPGW AND 7 NO. 5 ALUMOWELD HARDWARE
   - 500 LBS FOR SUSPENSION INSULATORS (230kV SIDE)
   - 300 LBS FOR SUSPENSION INSULATORS (69kV SIDE)

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871.

REFERENCE:

1) PLAN AND PROFILES - C-268987

SPAN AND ANGLE DATA	
STR TYPE	DC-TAN
DESIGN WIND SPAN (FT)	550
DESIGN WEIGHT SPAN (FT)	700
DESIGN LINE ANGLE (DEG)	0-3

STRUCTURE LIST				
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	MAX BOLT CIRCLE DIA (IN)
DC-TAN	1-6	120	1	48
	1-7, 1-8	125	2	48
	1-5, 1-9	130	2	48

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A	10 2 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	A M	B R B	B R B
A	20 08 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL	D M	C E O	B R B
A	30 04 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL	D M	C E O	B R B

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
DC-TAN MONOPOLE (69kV & 230 kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			05-27-16

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

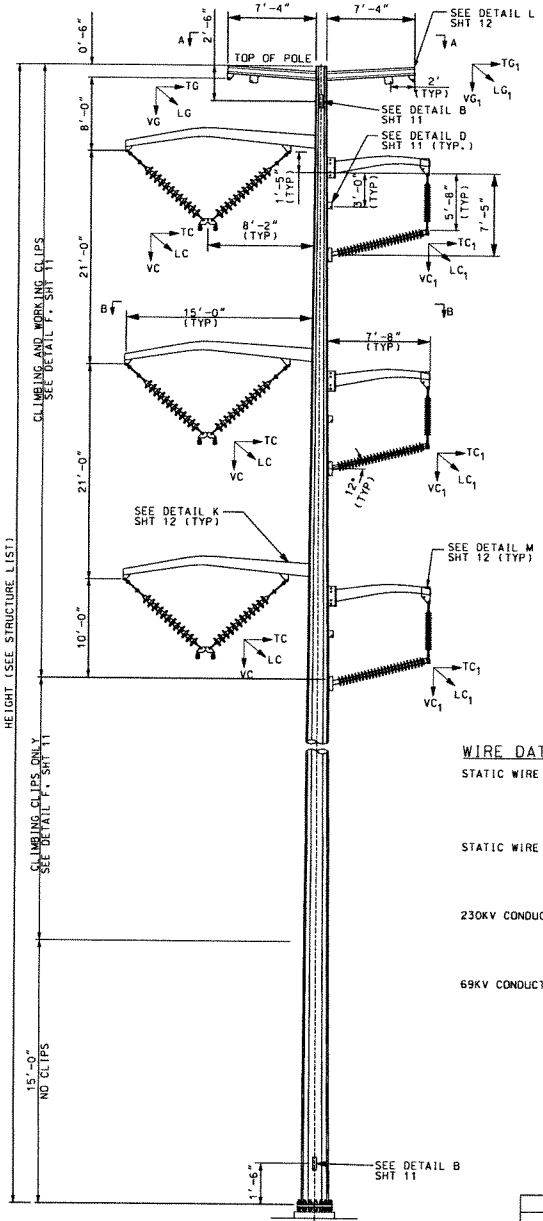
SHEET 5 OF 13 | C-269016-A3

EC# 177238

PLOT SCALE
FILE SCALE

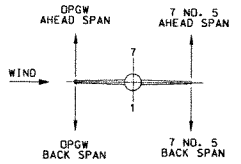
POWER DELIVERY ENGINEERING SERVICES

ROUTE ATLINEDC

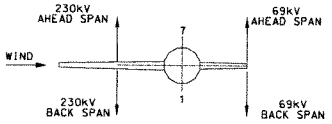


DC-LRA(6) STRUCTURE

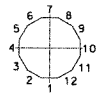
SINGLE STEEL POLE, LIGHT RUNNING ANGLE, DOUBLE CIRCUIT



VIEW A-A
STATIC & OPGW PLAN



VIEW B-B
69KV & 230KV CONDUCTOR PLAN



ORIENTATION DETAIL

LOADING TABLE

WIRES	LOAD	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9			
		INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	OPGW NOT INTACT*	FALCON NOT INTACT*	7 NO. 5 NOT INTACT*	DRAKE NOT INTACT*
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.50	2.50	0.50	3.80	1.60	0.50	1.70	0.90	1.10	1.10	1.10	1.10
	TG	1.70	2.30	1.30	1.20	0.50	0.30	0.70	0.90	0.70	1.00	1.00	1.00
	LG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	-5.70	0.00	0.00	0.00
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	8.20	10.40	3.90	13.30	7.80	3.60	14.10	7.10	6.00	6.00	6.00	6.00
	TC	6.70	7.20	6.20	4.40	2.80	1.40	4.10	5.30	4.00	3.30	4.00	4.00
	LC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.50	0.00	-13.90	0.00	0.00
7 NO. 5 ALUMOWELD SHIELD WIRE	VG_1	1.40	2.40	0.50	3.70	1.60	0.50	1.80	0.90	1.10	1.10	1.10	1.10
	TG_1	1.60	2.30	1.20	1.20	0.50	0.30	0.70	0.90	0.90	0.90	0.70	0.90
	LG_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	0.00	0.00	-5.70	0.00
69KV CONDUCTOR 795 ACSR "DRAKE"	VC_1	2.80	3.90	1.20	5.20	2.90	1.10	4.40	2.20	2.10	2.10	2.10	2.10
	TC_1	2.70	3.10	2.40	1.80	1.10	0.60	1.50	1.90	1.60	1.60	1.60	1.00
	LC_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.20	0.00	0.00	0.00	-10.50
WIND ON STRUCTURE (DOES NOT INCLUDE OVERLOAD FACTORS)	W	4.00	8.00	31.25	0.00	0.00	0.00	2.00	2.00	4.00			
OVERLOAD FACTOR	TW	2.50	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10			
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10			
	V	1.50	1.25	1.10	1.10	2.00	1.00	2.00	2.00	1.10			

* ONE SUB-CONDUCTOR OF ANY ONE PHASE BUNDLE IS ASSUMED BROKEN, WITH THE OTHER SUB-CONDUCTORS ASSUMED TO REMAIN INTACT.

WIRE DATA

STATIC WIRE (OVER 230kV): OPGW 36 FIBER AC-92/614 DNO-8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

STATIC WIRE (OVER 69kV): 7 NO. 5 ALUMOWELD
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

69KV CONDUCTOR: 795 KCMIL, 26/7 ACSR "DRAKE"
9,800 LBS. (BACK SPAN)
9,800 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

MECHANICAL LOADING CRITERIA

CASE 1 NESC HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 PECO HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL ICE 0°F

CASE 3 PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 7 CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 8 CONSTRUCTION LOAD (WIRE BOUND IN BLOCK)
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 9 ONE BROKEN SUB-CONDUCTOR
ONE SUB-CONDUCTOR BROKEN, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.3 LB/FT NESC CONSTANT

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED = 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR OPGW AND 7 NO. 5 ALUMOWELD HARDWARE
   - 500 LBS FOR SUSPENSION INSULATORS (230kV SIDE)
   - 300 LBS FOR SUSPENSION INSULATORS (69kV SIDE)

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871.

REFERENCE:

1) PLAN AND PROFILES - C-268987

SPAN AND ANGLE DATA	
STR TYPE	DC-LRA(6)
DESIGN WIND SPAN (FT)	550
DESIGN WEIGHT SPAN (FT)	750
DESIGN LINE ANGLE (DEG)	≤6

STRUCTURE LIST					
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE DIA (IN)
DC-LRA(6)	1-11	135	1	5.81	48

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A102		WO-07662161	A	B	B
	20	EC-177238	I	R	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	M	B	B
A207		WO-07662161	D	C	B
	08	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL		O	B
A309		WO-07662161	D	C	B
	04	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL		O	B

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
DC-LRA(6) MONOPOLE (69kV & 230 kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			05-27-16

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 6 OF 13 | C-269016-A3

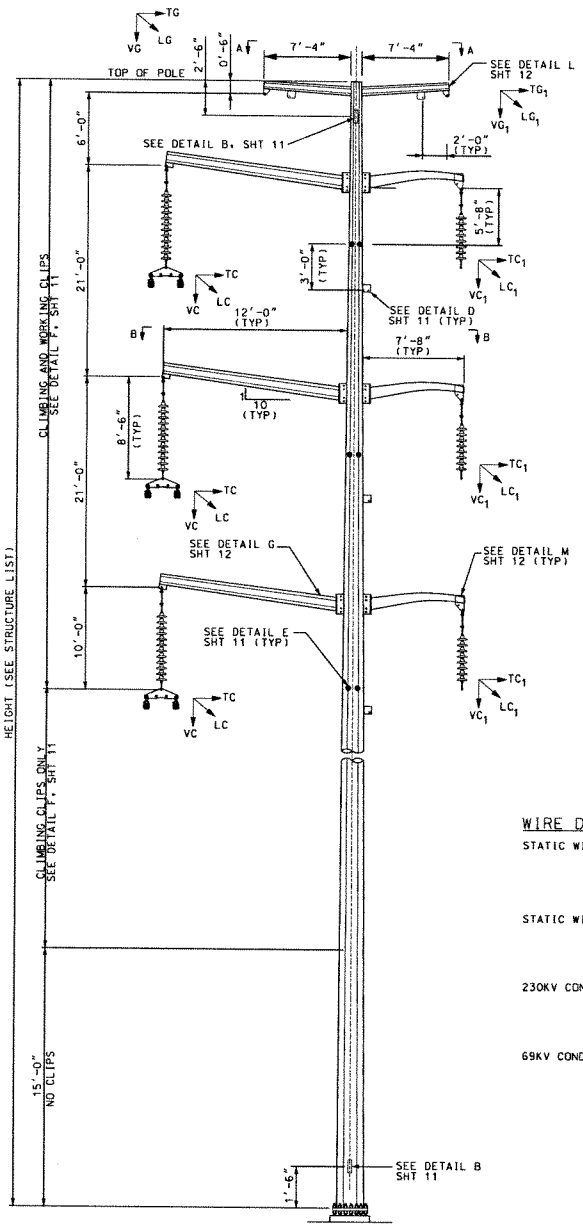
EC# 177238

PLOT SCALE
FILE SCALE

POWER DELIVERY
ENGINEERING SERVICES

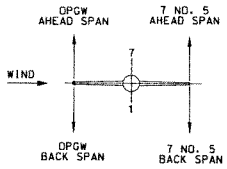
C-269016

ROUTE ATLINEDC

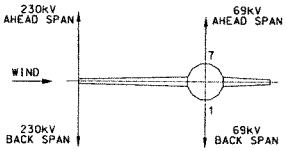


DC-LRA(3)-1

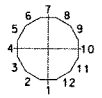
SINGLE STEEL POLE, LIGHT RUNNING ANGLE, DOUBLE CIRCUIT



VIEW A-A
STATIC & OPGW PLAN



VIEW B-B
69KV & 230KV CONDUCTOR PLAN



ORIENTATION DETAIL

LOADING TABLE

WIRES	LOAD	CASE 1		CASE 2		CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9		
		INTACT	DRAKE DE	INTACT	DRAKE DE	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT	OPGW NOT INTACT*	FALCON NOT INTACT*	7 NO. 5 NOT INTACT*
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.50	1.50	2.60	2.60	0.50	4.00	1.60	0.50	1.80	0.90	1.10	1.10	1.10
	TG	1.30	1.30	1.90	1.90	1.10	0.60	0.30	0.20	0.40	0.50	0.60	0.70	0.70
	LG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	-5.70	0.00	0.00
230KV CONDUCTOR 1590 ACSR "FALCON"	VC	8.30	8.30	10.70	10.70	3.90	13.90	7.70	3.50	14.00	7.00	6.10	6.10	6.10
	TC	4.80	4.80	5.60	5.60	5.40	2.20	1.40	0.70	2.40	3.00	2.60	2.30	2.60
	LC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.50	0.00	-13.90	0.00
7 NO. 5 ALUMOWELD SHIELD WIRE	VG_1	1.50	1.50	2.50	2.50	0.60	3.90	1.70	0.50	1.90	1.00	1.10	1.10	1.10
	TG_1	1.30	1.30	1.80	1.80	1.00	0.60	0.30	0.20	0.40	0.50	0.70	0.70	0.50
	LG_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	0.00	0.00	-5.70
69KV CONDUCTOR 795 ACSR "DRAKE"	VC_1	2.90	1.70	4.10	2.20	1.30	5.60	3.00	1.20	4.60	2.30	2.20	2.20	2.20
	TC_1	1.90	1.00	2.40	1.20	2.00	0.90	0.60	0.30	0.90	0.90	1.10	1.10	1.10
	LC_1	0.00	15.70	0.00	15.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WIND ON STRUCTURE (DOES NOT INCLUDE OVERLOAD FACTORS)	W	4.00		8.00		31.25	0.00	0.00	0.00	2.00	2.00	4.00		
OVERLOAD FACTOR	TW	2.50		1.25		1.10	1.10	2.00	1.00	2.00	2.00	1.10		
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65		1.25		1.10	1.10	2.00	1.00	2.00	2.00	1.10		
	V	1.50		1.25		1.10	1.10	2.00	1.00	2.00	2.00	1.10		

* ONE SUB-CONDUCTOR OF ANY ONE PHASE BUNDLE IS ASSUMED BROKEN, WITH THE OTHER SUB-CONDUCTORS ASSUMED TO REMAIN INTACT.

WIRE DATA

STATIC WIRE (OVER 230kV): OPGW 36 FIBER AC-92/614 DNO-8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

STATIC WIRE (OVER 69kV): 7 NO. 5 ALUMOWELD
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

69KV CONDUCTOR: 795 KCMIL, 26/7 ACSR "DRAKE"
9,800 LBS. (BACK SPAN)
9,800 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

MECHANICAL LOADING CRITERIA

CASE 1: NESC HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2: PECO HEAVY
INTACT = ALL WIRES INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL ICE 0°F

CASE 3: PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4: HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5: PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6: EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 7: CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 8: CONSTRUCTION LOAD (WIRE BOUND IN BLOCK)
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F

CASE 9: ONE BROKEN SUB-CONDUCTOR
ONE SUB-CONDUCTOR BROKEN, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.3 LB/FT NESC CONSTANT

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED = 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR OPGW AND 7 NO. 5 ALUMOWELD HARDWARE
   - 500 LBS FOR SUSPENSION INSULATORS (230kV SIDE)
   - 300 LBS FOR SUSPENSION INSULATORS (69kV SIDE)

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871.

REFERENCE:

1) PLAN AND PROFILES - C-268987

SPAN AND ANGLE DATA	
STR TYPE	DC-LRA(3)-1
DESIGN WIND SPAN (FT)	600
DESIGN WEIGHT SPAN (FT)	800
DESIGN LINE ANGLE (DEG)	≤3

STRUCTURE LIST					
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE
DC-LRA(3)-1	1-10	135	1	-2.63	48

TABLE OF ADDITIONS & CHANGES USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A1	02	WO-07662161	D	C	B
	12	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	E	O	B
A2	07	WO-07662161	D	C	B
	08	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL	E	O	B
A3	09	WO-07662161	D	C	B
	04	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL	E	O	B

STRUCTURAL | INDEX C-269249

STRUCTURE ASSEMBLY
DC-LRA(3)-1 MONOPOLE (69kV & 230 kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			02-11-15

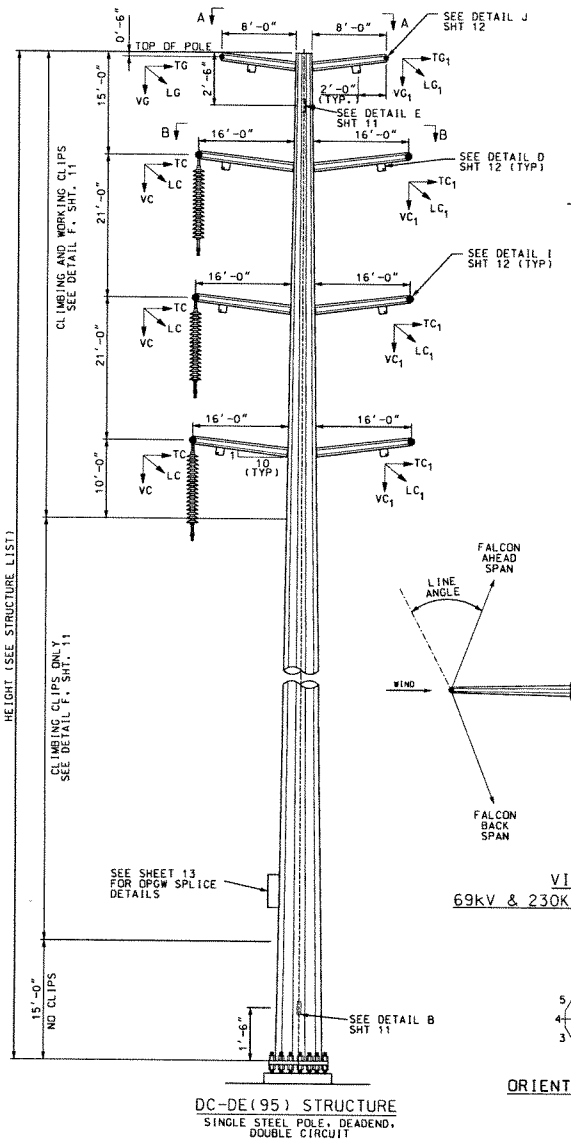
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 7 OF 13 | C-269016-A3

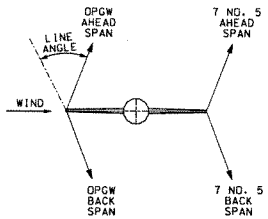
EC# 177238

PLOT SCALE
FILE SCALE

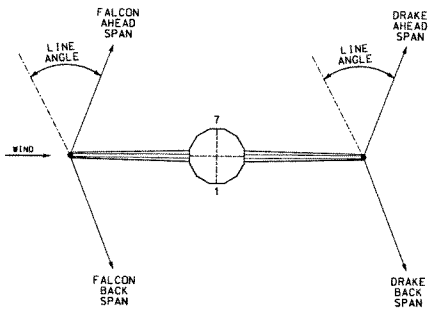
POWER DELIVERY ENGINEERING SERVICES



DC-DE(95) STRUCTURE
SINGLE STEEL POLE, DEADEND, DOUBLE CIRCUIT



VIEW A-A
STATIC AND OPGW PLAN



VIEW B-B
69kV & 230kV CONDUCTOR PLAN

ORIENTATION DETAIL

MECHANICAL LOADING CRITERIA

CASE 1 NESC HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 PECO HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL ICE, 0°F

CASE 3 PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 4% POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.30 LB/FT NESC CONSTANT

CASE 7 EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 8 CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F.

LOADING TABLE

WIRES	LOADS	CASE 1		CASE 2		CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
		INTACT	DE	INTACT	DE	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT
OPGW 36 FIBER AC-92/614 DNO-8338	VG	1.50	0.50	2.60	0.70	0.50	4.00	1.60	1.00	0.50	1.80
	TG	13.40	6.70	16.10	8.00	7.80	16.80	5.90	7.90	3.00	7.60
	LG	0.00	5.70	0.00	6.70	0.00	0.00	0.00	0.00	0.00	0.00
230kV CONDUCTOR 1590 ACSR "FALCON"	VC	8.80	2.80	11.10	3.30	4.20	14.20	8.40	5.90	3.90	15.30
	TC	64.20	32.00	59.30	29.50	36.60	61.40	38.40	38.40	19.20	49.70
	LC	0.00	28.10	0.00	25.40	0.00	0.00	0.00	0.00	0.00	0.00
7 NO. 5 ALUMOWELD SHIELD WIRE	VC_1	1.50	0.50	2.50	0.70	0.60	3.90	1.70	1.00	0.50	1.90
	TC_1	13.30	6.60	16.00	8.00	7.70	16.80	5.90	7.90	3.00	7.50
	LC_1	0.00	5.70	0.00	6.70	0.00	0.00	0.00	0.00	0.00	0.00
69kV CONDUCTOR 795 ACSR "DRAKE"	VC_1	1.40	1.10	1.80	1.30	0.70	2.30	2.60	0.90	0.60	2.40
	TC_1	16.70	13.60	17.30	13.70	9.90	17.70	9.80	10.00	4.90	11.40
	LC_1	6.70	8.60	6.30	8.50	3.90	6.50	4.60	4.10	2.30	5.40
WIND ON STRUCTURES (DOES NOT INCLUDE OVERLOAD FACTOR)	W	4.00	4.00	8.00	8.00	31.25	0.00	0.00	4.00	0.00	2.00
OVERLOAD FACTOR	TW	2.50	2.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.65	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
	V	1.50	1.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00

WIRE DATA

STATIC WIRE (OVER 230kV): OPGW 36 FIBER AC-92/614 DNO-8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F. INITIAL TENSIONS

STATIC WIRE (OVER 69kV): 7 NO. 5 ALUMOWELD
7,900 LBS. (BACK SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F. INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F. INITIAL TENSIONS

69KV CONDUCTOR: 795 KCMIL, 26/7 ACSR "DRAKE"
9,800 LBS. (BACK SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F. INITIAL TENSIONS

SPAN AND ANGLE DATA	
STR TYPE	DC-DE(95)
DESIGN WIND SPAN (FT)	675
DESIGN WEIGHT SPAN (FT)	800
DESIGN LINE ANGLE (DEG) - FALCON	≤95
DESIGN LINE ANGLE (DEG) - DRAKE	≤114

STRUCTURE LIST					
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE DIA (IN)
DC-DE(95)	1-12	120	1	91.87	96

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED = 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR OPGW AND 7 NO. 5 ALUMOWELD HARDWARE
   - 590 LBS FOR DEADEND INSULATOR (FALCON)
   - 250 LBS FOR DEADEND INSULATOR (DRAKE AND DAHLIA)

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871.

REFERENCE:

1) PLAN AND PROFILES - C-268987

TABLE OF ADDITIONS & CHANGES USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A102	08-15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	DVW	BRB	BRB
A207	08-15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL	DM	CEO	BRB
A309	04-15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL	DM	CEO	BRB

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
DC-DE(95) MONOPOLE, (69kV & 230kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			02-11-15

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 8 OF 13 | C-269016-A3

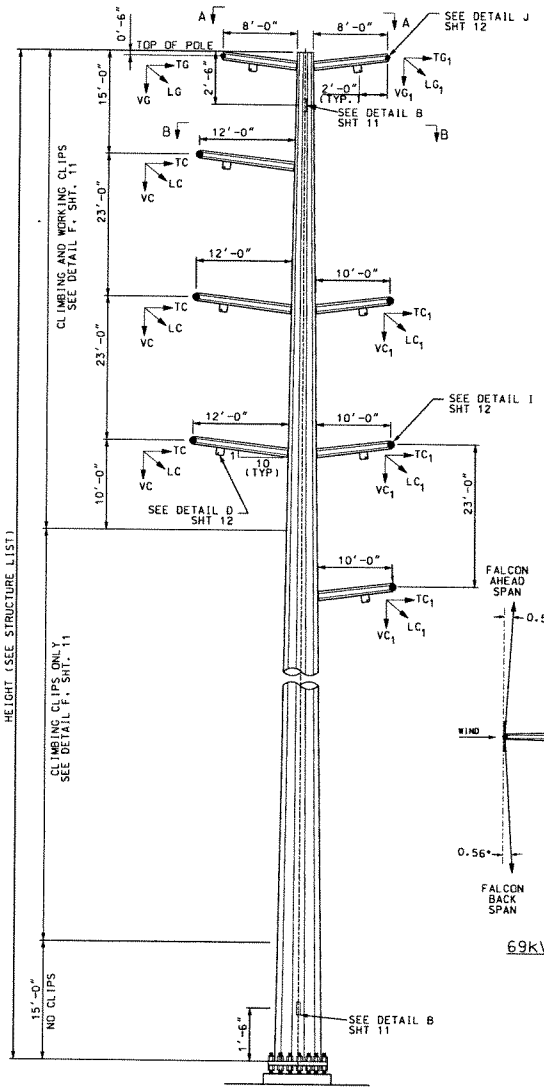
EC# 177238

PLOT SCALE
FILE SCALE

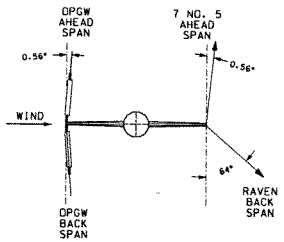
POWER DELIVERY ENGINEERING SERVICES

C-269016

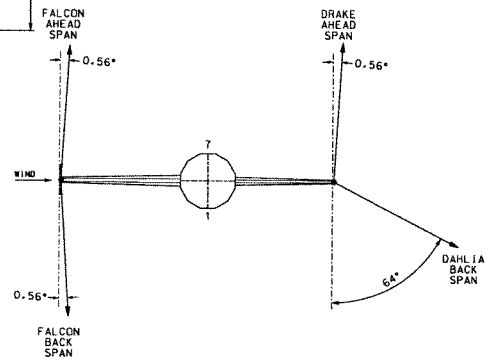
ROUTE ATLINEDC



DC-DE(2)-1-4 STRUCTURE
SINGLE STEEL POLE, DEADEND, DOUBLE CIRCUIT



VIEW A-A
STATIC AND OPGW PLAN



VIEW B-B
69KV & 230KV CONDUCTOR PLAN

ORIENTATION DETAIL

MECHANICAL LOADING CRITERIA

CASE 1 — NESC HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 — PECO HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
8 PSF WIND, 1.0" RADIAL 0°F

CASE 3 — PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 — HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 — PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 — 4% POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.30 LB/FT NESC CONSTANT

CASE 7 — EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 8 — CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F,

WIRE DATA

STATIC WIRE (OVER 230kV): OPGW 36 FIBER AC-92/614 DNO-8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

STATIC WIRE (OVER 69kV, AHEAD SPAN): 7 NO. 5 ALUMOWELD
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

69KV CONDUCTOR: (AHEAD SPAN) 795 KCMIL, 26/7 ACSR "DRAKE"
9,800 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

69KV CONDUCTOR: (BACK SPAN) 556.5 KCMIL, 19/0 "DAHLIA" AAC
600 LBS. (BACK SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

STATIC WIRE (OVER 69kV, BACK SPAN): 1/0 AWG 6/1 ACSR "RAVEN"
500 LBS. (BACK SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

SPAN AND ANGLE DATA	
STR TYPE	DC-DE(2)-SP
DESIGN WIND SPAN (FT)	600
DESIGN WEIGHT SPAN (FT)	650
DESIGN LINE ANGLE (DEG)	2° (230kV); 70° (69kV)

STRUCTURE LIST					
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE DIA (IN)
DC-DE(2)-SP	1-4	130	1	-1.11	84

LOADING TABLE

WIRES	LOADS	CASE 1 INTACT	CASE 1 DE	CASE 2 INTACT	CASE 2 DE	CASE 3 INTACT	CASE 4 INTACT	CASE 5 INTACT	CASE 6 INTACT	CASE 7 INTACT	CASE 8 INTACT
OPGW 36 FIBER AC-92/614 DNO-8054	VG	1.30	0.70	2.10	1.10	0.50	3.30	1.50	0.90	0.40	1.50
	TG	1.20	0.60	1.70	0.90	1.10	0.40	0.20	0.60	0.10	0.30
	LG	0.00	-8.50	0.00	-9.90	0.00	0.00	0.00	0.00	0.00	0.00
230kV CONDUCTOR 1590 ACSR "FALCON"	VC	7.30	4.10	9.20	5.00	3.60	11.70	7.10	4.90	3.20	12.80
	TC	4.00	2.00	4.90	2.50	5.10	1.50	1.00	1.90	0.50	1.80
	LC	0.00	-41.60	0.00	-37.50	0.00	0.00	0.00	0.00	0.00	0.00
7 NO. 5 ALUMOWELD SHIELD WIRE	VG_1	0.80	0.70	1.20	1.10	0.30	1.90	1.20	0.50	0.30	1.00
	TG_1	1.10	0.60	1.50	0.90	0.80	1.10	0.20	0.60	0.10	0.30
	LG_1	-8.30	-8.50	-9.70	-9.90	-4.60	-11.10	-4.00	-5.00	-2.00	-5.00
69kV CONDUCTOR 556 "DAHILA" AAC/795 ACSR "DRAKE"	VC_1	1.60	1.50	2.00	1.90	0.80	2.70	2.00	1.10	0.70	2.60
	TC_1	1.50	0.90	1.90	1.10	1.50	1.20	0.60	0.80	0.30	0.70
	LC_1	-15.50	-15.70	-15.30	-15.50	-8.80	-16.10	-9.90	-9.40	-5.00	-11.50
WIND ON STRUCTURES (DOES NOT INCLUDE OVERLOAD FACTOR)	W	4.00	4.00	8.00	8.00	31.25	0.00	0.00	4.00	0.00	2.00
OVERLOAD FACTOR	TW	2.50	2.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.65	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
	V	1.50	1.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED = 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR OPGW AND 7 NO. 5 ALUMOWELD HARDWARE
   - 590 LBS FOR DEADEND INSULATOR (FALCON)
   - 250 LBS FOR DEADEND INSULATOR (DRAKE AND DAHILA)

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871.

REFERENCE:

1) PLAN AND PROFILES - C-268987

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A1	02	WO-07662161 20 EC-177238 15 POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	A I M	B R B	B R B
A2	07	WO-07662161 08 EC-177238 15 POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL	D M	C E O	B R B
A3	07	WO-07662161 08 EC-177238 15 POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL	D M	C E O	B R B

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
DC-DE(2)-SP MONOPOLE, (69kV & 230kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			05-02-14

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

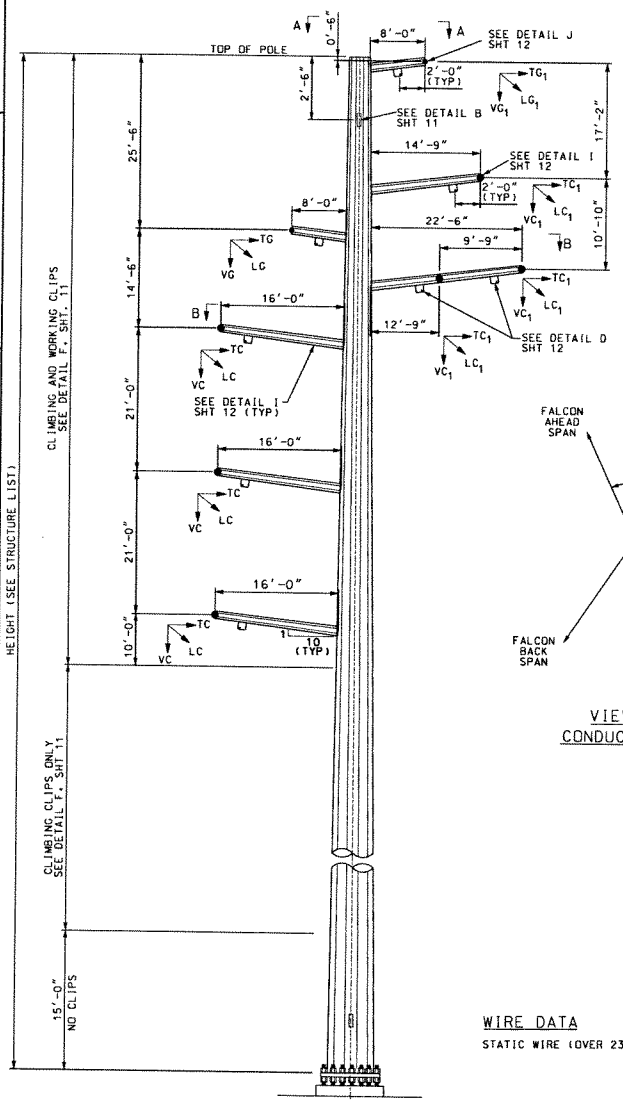
SHEET 9 OF 13 | C-269016-A3

EC# 177238

PLOT SCALE
FILE SCALE

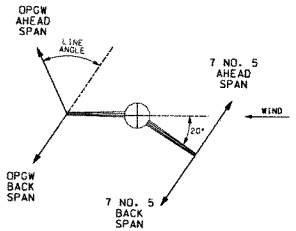
POWER DELIVERY ENGINEERING SERVICES

ROUTE ATLINEDC

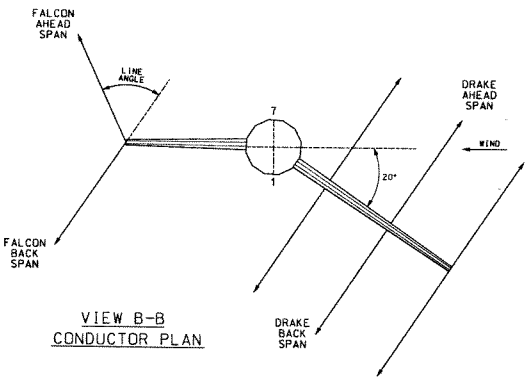


DC-DE(40)-SP

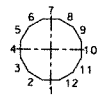
SINGLE STEEL POLE, DEADEND, DOUBLE CIRCUIT



VIEW A-A
STATIC WIRE PLAN



VIEW B-B
CONDUCTOR PLAN



ORIENTATION DETAIL

LOADING TABLE

WIRES	LOADS	CASE 1		CASE 2		CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
		INTACT	DE	INTACT	DE	INTACT	INTACT	INTACT	INTACT	INTACT	INTACT
OPGW 36 FIBER AC-92/614 DNO 8338	VG	1.20	0.70	2.00	1.20	0.40	3.00	1.40	0.80	0.40	1.40
	TG	-6.60	-3.40	-8.10	-4.20	-4.00	-7.80	-2.80	-3.80	-1.40	-3.60
	LG	0.10	8.00	0.10	9.30	0.10	0.00	0.00	0.10	0.00	0.10
230kV CONDUCTOR 1590 ACSR "FALCON"	VC	6.80	4.30	8.50	5.30	3.30	10.80	6.70	4.60	3.00	12.00
	TC	-30.90	-15.90	-29.10	-15.10	-18.90	-28.50	-17.80	-18.30	-8.90	-23.40
	LC	0.10	39.10	0.10	35.30	0.10	0.00	0.00	0.10	0.00	0.10
7#5 ALUMOWELD SHIELD WIRE	VG_1	2.20	1.30	3.80	2.20	0.80	5.80	2.10	1.50	0.70	2.70
	TG_1	-2.10	-7.00	-3.10	-8.70	-1.80	-0.80	-0.30	-1.00	-0.20	-0.60
	LG_1	-0.30	15.80	-0.30	18.50	-0.20	-0.30	-0.10	-0.20	-0.10	-0.20
69kV CONDUCTOR 795 ACSR "DRAKE"	VC_1	2.90	1.70	4.10	2.20	1.30	5.60	3.70	2.00	1.20	4.60
	TC_1	-1.70	-6.30	-2.20	-6.60	-2.00	-0.60	-0.40	-0.80	-0.20	-0.70
	LC_1	-0.20	14.70	-0.20	14.50	-0.20	-0.20	-0.20	-0.20	-0.10	-0.20
WIND ON STRUCTURES (DOES NOT INCLUDE OVERLOAD FACTOR)	W	4.00	4.00	8.00	8.00	31.25	0.00	0.00	4.00	0.00	2.00
OVERLOAD FACTOR	TW	2.50	2.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
TW-TRANSVERSE WIND LT-LINE TENSION V-VERTICAL	LT	1.65	1.65	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00
	V	1.50	1.50	1.25	1.25	1.10	1.10	2.00	1.00	1.00	2.00

MECHANICAL LOADING CRITERIA

CASE 1 NESC HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0° F
0.30 LB/FT NESC CONSTANT

CASE 2 PECO HEAVY
INTACT = ALL WIRES INTACT
DE = ONE SIDE INTACT
INITIAL TENSIONS

CASE 3 PECO EXTREME WIND
ALL WIRES INTACT, INITIAL TENSIONS
25 PSF WIND ON WIRE, NO ICE, 60°F
31.25 PSF WIND ON STRUCTURE

CASE 4 HEAVY ICE
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, 1.5" RADIAL ICE, 0°F

CASE 5 PERSONNEL SUPPORT
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F

CASE 6 4% POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
4 PSF WIND, 0.5" RADIAL ICE, 0°F
0.30 LB/FT NESC CONSTANT

CASE 7 EVERYDAY POLE DEFLECTION
ALL WIRES INTACT, INITIAL TENSIONS
NO WIND, NO ICE, 60°F
DEFLECTION LIMIT = 18"

CASE 8 CONSTRUCTION & MAINTENANCE
ALL WIRES INTACT, INITIAL TENSIONS
2 PSF WIND, NO ICE, 30°F,

NOTES:

1. ALL LOADS IN THE LOADING TABLE ARE ULTIMATE LOADS AND INCLUDE LOAD FACTORS. LOADS ARE IN KIPS. WIND PRESSURES ARE IN PSF.
2. EACH LOAD CASE SHALL BE CONSIDERED INDEPENDENTLY.
3. THE VERTICAL LOADS IN THE LOADING TABLE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL CALCULATE THE STRUCTURE DEAD LOAD. VERTICAL LOAD FACTOR APPLIED TO THE DEAD LOAD SHALL BE AS LISTED IN EACH LOAD CASE.
4. APPLY WIND FORCE WITH LOAD FACTOR TO STRUCTURE AT THE MOST CRITICAL ANGLE FOR DESIGN.
5. APPLY SHAPE FACTOR TO WIND FOR STRUCTURE LOAD.
   ROUND OR MORE THAN 12 SIDES = 1.00
   8 SIDED - 1.40
   FLAT FACE OR LESS THAN 8 SIDES = 1.60
6. FOR ALL LOAD CASES VERTICAL LOADS INCLUDE
   - 40 LBS FOR SHIELD WIRE
   - 256 LBS FOR DEADEND INSULATOR

GENERAL NOTES:

1. DESIGN PER EXELON SPEC. EP-2070-E AND FABRICATION PER TSE-01.
2. PROVIDE CLOSURES AT THE END OF ALL OPEN TUBES.
3. BASE PLATE SHALL BE DESIGNED TO RESIST THE DESIGN FACTORED LOADS WITH A MINIMUM STRENGTH REQUIREMENT OF 50% OF THE BASE SECTION CAPACITY.
4. FABRICATOR TO FURNISH ALL ANCHOR BOLTS, ERECTION BOLTS, NUTS AND LOCK WASHERS.
5. FABRICATOR TO FURNISH FACTORED FOUNDATION LOADS WITH INITIAL PROPOSAL.
6. STEEL STRUCTURES SHALL BE WEATHERING STEEL IN ACCORDANCE WITH ASTM A871.

REFERENCE:

1) PLAN AND PROFILES - C-268987

SPAN AND ANGLE DATA	
STR TYPE	DC-DE(40)-SP
DESIGN WIND SPAN (FT)	575
DESIGN WEIGHT SPAN (FT)	600
DESIGN LINE ANGLE (DEG)	40° (230kV)‡ 2° (69kV)

WIRE DATA

STATIC WIRE (OVER 230kV): OPGW 36 FIBER AC-92/614 DNO 8338
7,900 LBS. (BACK SPAN)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

STATIC WIRE (OVER 69kV): 7 NO. 5 ALUMOWELD (2 WIRES)
7,900 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

230KV CONDUCTOR: 1590 KCMIL, 54/19 ACSR "FALCON" (2-BUNDLE)
15,000 LBS. PER SUB-CONDUCTOR (BACK SPAN)
15,000 LBS. PER SUB-CONDUCTOR (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

69KV CONDUCTOR: 795 KCMIL, 26/7 ACSR "DRAKE"
9,800 LBS. (AHEAD SPAN)
AT PECO HEAVY, 8PSF WIND,
1" RADIAL ICE, 0° F, INITIAL TENSIONS

STRUCTURE LIST					
STR TYPE	STRUCTURE NO.	HEIGHT (FT)	QTY	ACTUAL LINE ANGLE	MAX BOLT CIRCLE DIA (IN)
DC-DE(40)-SP	2-1	140	1	-38.29	84

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	DES	CHK	APP'D
A1	02	WO-07662161	D	B	B
	04	EC-177238	V	R	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	W	B	B
A2	07	WO-07662161	D	C	B
	04	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL		O	B
A3	09	WO-07662161	D	C	B
	04	EC-177238	M	E	R
	15	POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL		O	B

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
DC-DE(40)-SP MONOPOLE (69kV & 230kV)
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			12-11-15

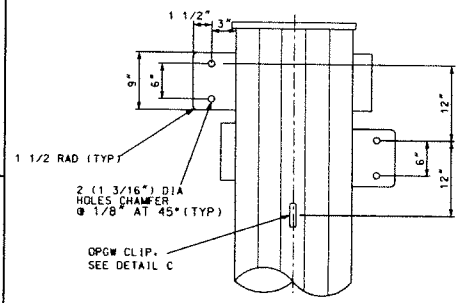
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

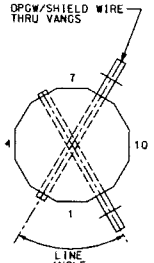
SHEET 10 OF 13 | C-269016-A3

EC# 177238

PLOT SCALE
FILE SCALE

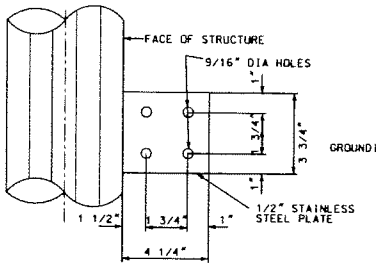
POWER DELIVERY ENGINEERING SERVICES



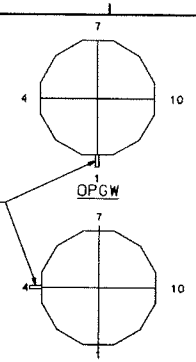


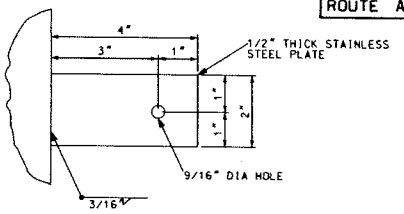
NOTE:
INSTALL AN EXTRA OPGW VANG FOR STR. 1-1 ONLY.

DETAIL A
DETAIL A - OPGW AND SHIELD WIRE DEADEND VANG

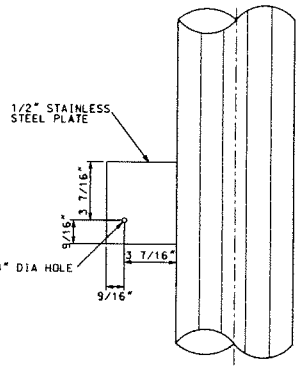


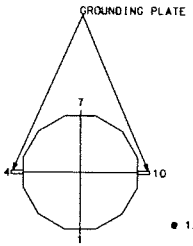
DETAIL B
STAINLESS STEEL GROUNDING PLATE - OPGW AND BASE OF POLE (4 HOLE NEMA PAD)



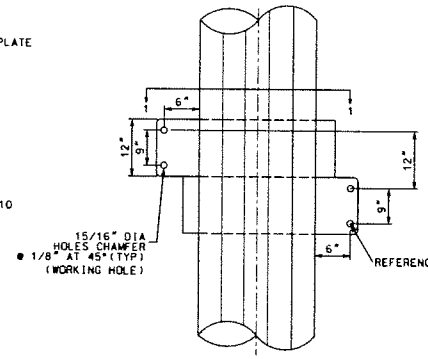


DETAIL C
OPGW CLIP VERTICAL ORIENTATION

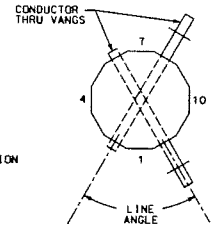




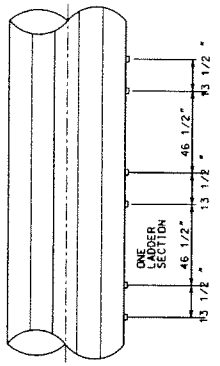
DETAIL D
STAINLESS STEEL GROUNDING PLATE - POLE FACE 4 OR 10

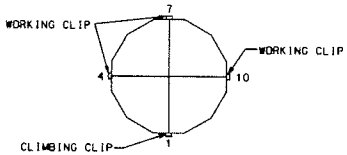


DETAIL E
DEADEND INSULATOR VANG

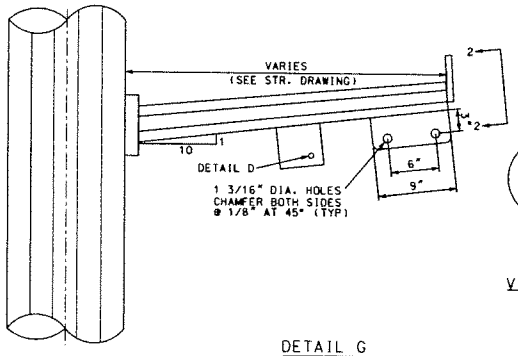


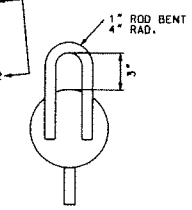
VIEW 1-1





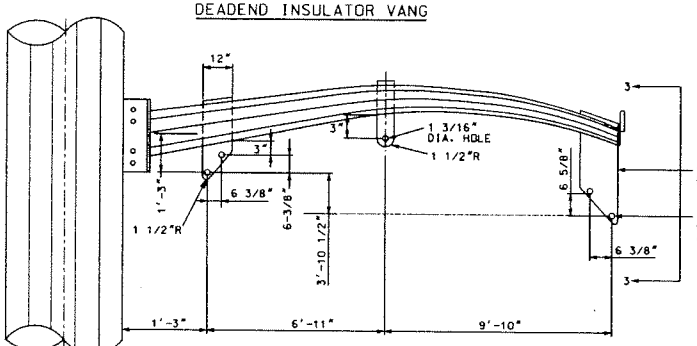
DETAIL F
CLIMBING AND WORKING LADDER CLIPS



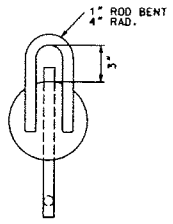


VIEW 2-2

DETAIL G
SUSPENSION INSULATOR VANG AT END OF DAVIT ARMS



DETAIL H
230kV RESTRAINED V-STRING CONDUCTOR ARM



VIEW 3-3

REFERENCE:
1) PLAN AND PROFILES - C-268987

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A102		WO-07662161 DEC-177238 PSPOWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	DVW	BRB	BRB
A207		WO-07662161 DEC-177238 PSPOWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL	DEW	CEO	BRB
A309		WO-07662161 DEC-177238 PSPOWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL	DEW	CEO	BRB

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING DETAILS 220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			12-11-19

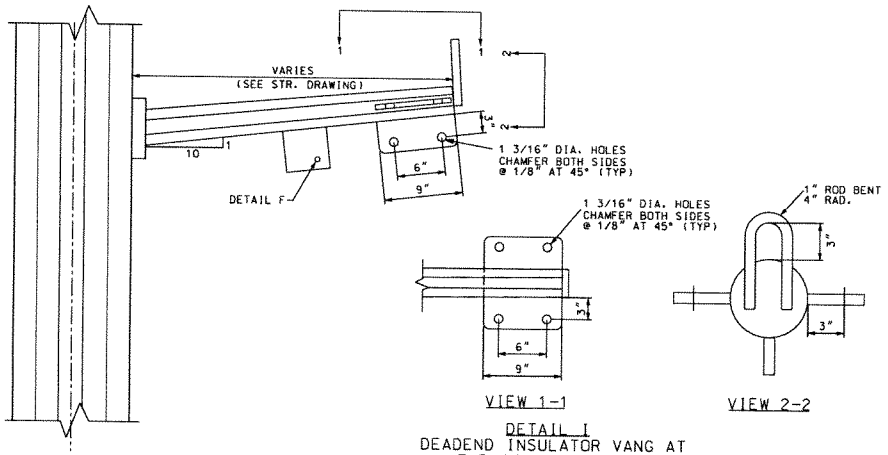
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 11 OF 13 | C-269016-A3

EC# 177238

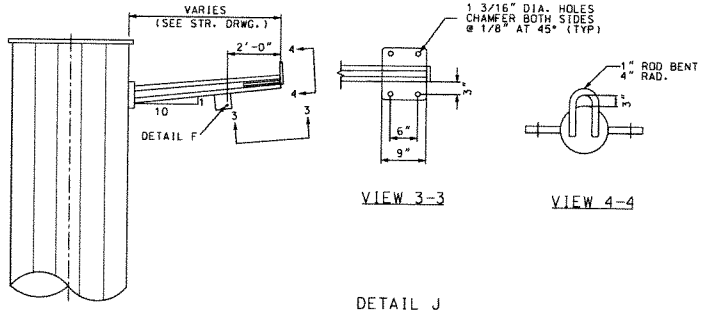
PLOT SCALE
FILE SCALE

POWER DELIVERY ENGINEERING SERVICES



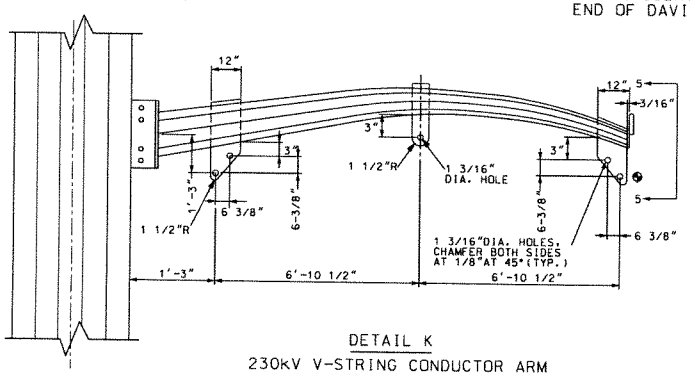
VIEW 1-1 VIEW 2-2

DETAIL I
DEADEND INSULATOR VANG AT
END OF DAVIT ARMS

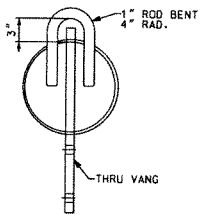


VIEW 3-3 VIEW 4-4

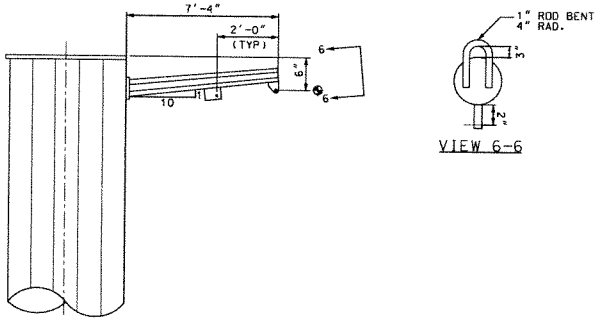
DETAIL J
OPGW AND SHIELD WIRE DEADEND
VANG AT END OF DAVIT ARM



DETAIL K
230kV V-STRING CONDUCTOR ARM

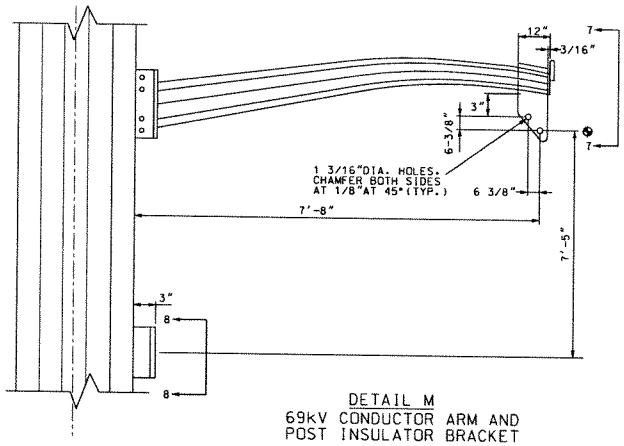


VIEW 5-5

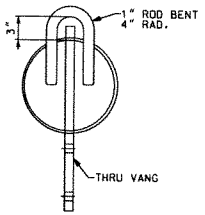


VIEW 6-6

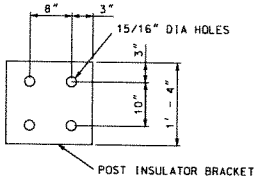
DETAIL L
SHIELD WIRE SUSPENSION VANG
AT END OF DAVIT ARM



DETAIL M
69kV CONDUCTOR ARM AND
POST INSULATOR BRACKET



VIEW 7-7



VIEW 8-8

REFERENCE:
1) PLAN AND PROFILES - C-268987

TABLE OF ADDITIONS & CHANGES USE ONLY PRINTS SHOWING LATEST DATE						
NO.	DATE	DESCRIPTION	REV	DES	CHK	APP
A1	02	WO-07662161	A	B	B	B
	02	EC-177238	I	R	R	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	M	B	B	B
A2	07	WO-07662161	D	C	B	B
	08	EC-177238	M	E	R	R
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW		D	B	B
A3	09	WO-07662161	D	C	B	B
	04	EC-177238	M	E	R	R
	15	POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL		O	B	B

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING
DETAILS
220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			05-20-14

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

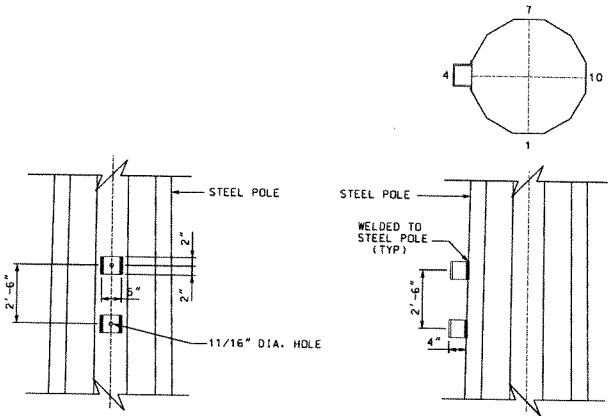
SHEET 12 OF 13 | C-269016-A3

EC# 177238

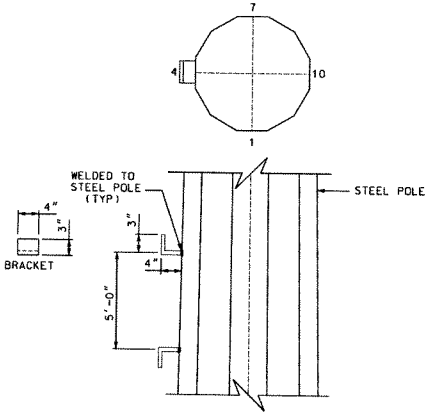
PLOT SCALE
FILE SCALE

POWER DELIVERY
ENGINEERING SERVICES

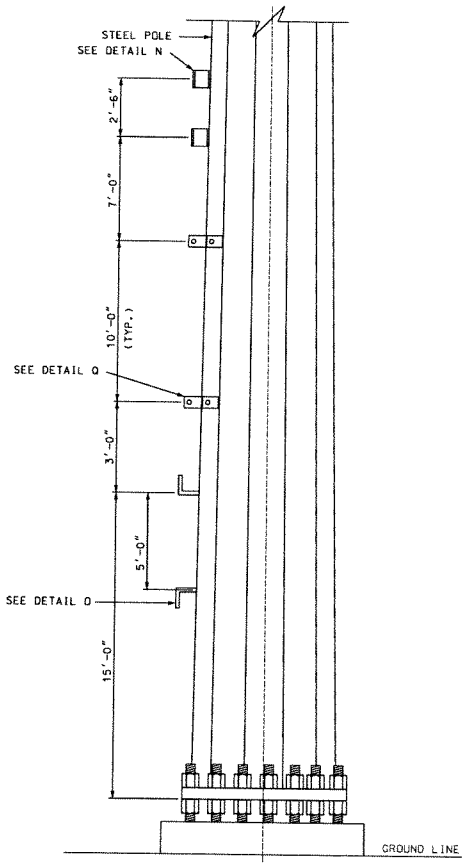
ROUTE ATLINEDC



DETAIL N
SPLICE CASE CLIPS
* STEEL FABRICATOR TO PROVIDE NUTS, BOLTS & LOCK WASHERS



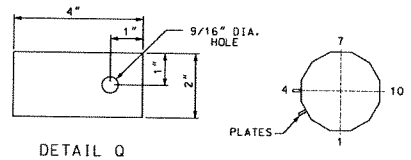
DETAIL O
OPGW COIL BRACKETS



DETAIL P
OPGW SPLICE CASE AND COIL ASSEMBLY

OPGW DOWN LEAD PLATE LOCATIONS		
POLE ELEVATION *	ELEVATION QUANTITY	POLE FACES LOCATED
138'	1	3
128'	1	3
118'	1	3
108'	1	3
98'	1	3
88'	1	3
78'	1	3
68'	1	3
58'	1	3
48'	1	3
38'	1	3
28'	2	3 AND 4
18'	2	3 AND 4

* OPGW DOWNLEAD PLATES TO START 2'-0" FROM TOP OF POLE AND BE EVENLY SPACED AT 10'-0" INTERVALS PER THE TABLE ABOVE.



DETAIL Q
OPGW DOWNLEAD ATTACHMENT PLATE

OPGW SPLICE LOCATIONS	
STR. NO.	STR. HEIGHT
1-1	120
1-12	120
3-1	125

REFERENCE:
1) PLAN AND PROFILES - C-268987

TABLE OF ADDITIONS & CHANGES USE ONLY PRINTS SHOWING LATEST DATE						
NO.	DATE	DESCRIPTION	DEV'D	CHK'D	APP'D
A102	20	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	DVW	BRB	BRB
A207	08 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ADDED: ISSUED FOR REVIEW	DMC	CEO	BRB
A309	04 15	WO-07662161 EC-177238 POWER ENGINEERS, INC. ISSUED FOR FINAL APPROVAL	DMC	CEO	BRB

STRUCTURAL | INDEX C-269249

STRUCTURE LOADING DETAILS 220-43 LINE

LINWOOD TO CHICHESTER
PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			02-09-15

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 13 OF 13 | C-269016-A3

1 PLOT SCALE
FILE SCALE

ECM 177238

POWER DELIVERY
ENGINEERING SERVICES

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

PECO Energy's Answers to Template Staff Data Requests

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3. Please provide a copy of any comments received from state or local officials.

As described at paragraphs 2-6 of the Letter of Notification, Lower Chichester Township previously filed a formal Commission complaint regarding this project. PECO resolved that formal complaint process by adopting the route identified by the Township. Copies of the complaint and the Township's withdrawal are attached to the Letter of Notification as Exhibits. PECO has not received any other comments from state or local officials.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

PECO Energy's Answers to Template Staff Data Requests

---

4. Please serve a copy of the application on the Delaware County Planning Commission, and Delaware County Commissioners.

   The Letter of Notification was originally served on the Delaware County Planning Commission on January 11, 2016. PECO supplemented service to include the Delaware County Commissioners on January 12, 2016.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

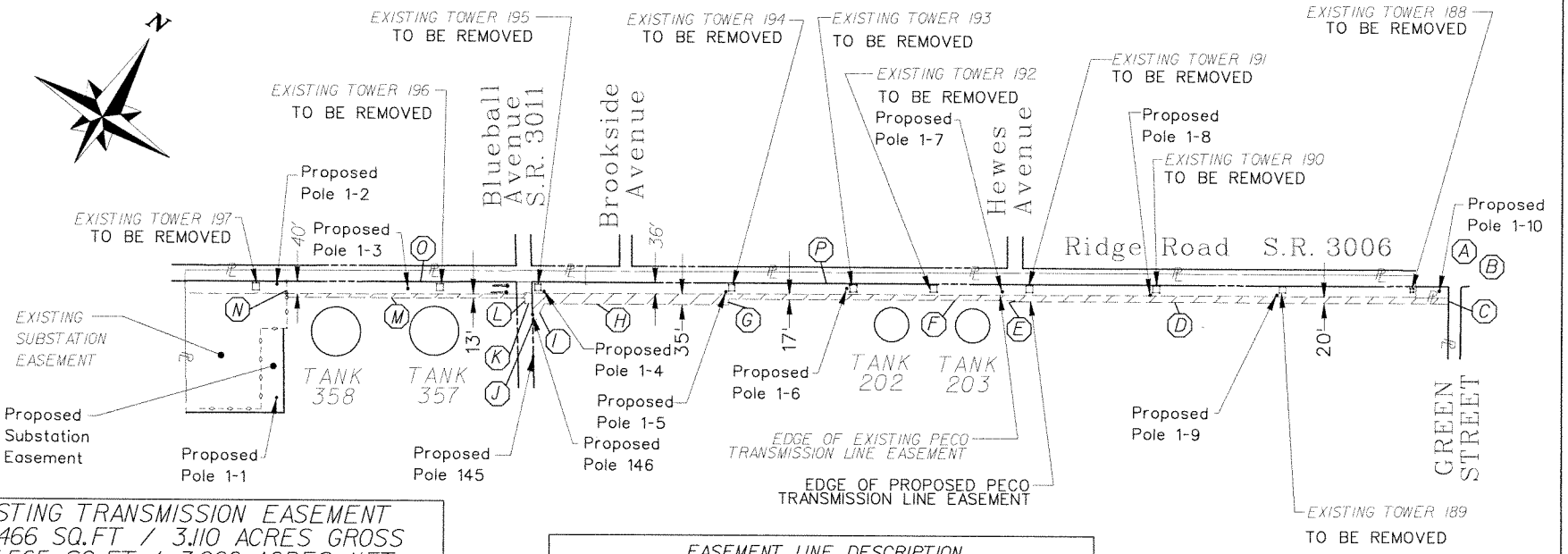
PECO Energy's Answers to Template Staff Data Requests

---

5. Please provide the right-of-way width and the location of the proposed HV line within each city, borough, town and township traversed.

The proposed construction is a new 1.9 mile 230 kV line located Lower Chichester Township, and Trainer Township, Delaware County, PA. The right of way width varies along the line segments, and is shown in the enclosed easement drawings labelled:

- DR 5 Lin-Chi Transmission Line Easement Sheets 1-7
- DR 5 Lin-Chi ROW East of Green Street
- DR 5 Lin-Chi Congoleum Easement
- DR 5 Lin-Chi McGough Easement
- DR 5 Amtrak License Dwg



EXISTING TRANSMISSION EASEMENT
135,466 SQ.FT / 3.110 ACRES GROSS
133,565 SQ.FT./ 3.066 ACRES NET

REQUIRED TRANSMISSION EASEMENT
78,864 SQ. FT / 1.810 ACRE GROSS
77,664 SQ. FT. / 1.782 ACRE NET

NOTES:

1. THIS EASEMENT EXHIBIT PLAN DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY BY URS CORPORATION. PROPERTY LINES AND LEGAL RIGHT-OF-WAY LINES SHOWN HEREON ARE FROM AN ALTA / ASCM SURVEY MAP, PREPARED BY MILLMAN SURVEYING, INC., PREPARED FOR SUNOCO LOGISTICS.
2. PECO SUBSTATION EASEMENT LINE SHOWN FROM A PLAN OF "LINWOOD SUBSTATION EASEMENT", PREPARED BY PENNONI ASSOCIATES, DATED 7/31/02. THIS EASEMENT DOES NOT CLOSE BY 0.60'.
3. PECO TRANSMISSION EASEMENT LINE SHOWN FROM DEEDS OF RECORD SUPPLIED BY PECO ENERGY.
4. NET AREA SHOWN ABOVE IS THE GROSS AREA MINUS THE AREA WITHIN THE BLUEBALL AVENUE RIGHT-OF-WAY

EASEMENT LINE DESCRIPTION

A	N 59°07'58" E	774.01'	I	S 59°18'14" W	600.64'
B	N 32°07'17" W	4.00'	J	S 04°57'13" E	84.55'
C	N 59°18'14" E	3008.77'	K	N 32°07'17" W	76.18'
D	S 30°17'26" E	20.00'	L	S 59°18'14" W	25.01'
E	S 59°18'14" W	1408.37'	M	N 32°07'17" W	18.01'
F	N 30°41'46" W	3.00'	N	S 59°07'58" W	774.20'
G	S 59°18'14" W	935.12'	O	N 31°16'56" W	13.00'
H	S 30°41'46" E	18.00'	O	N 31°16'56" W	13.00'

LEGEND

- LEGAL R/W LINE
- PROPERTY LINE
- EXISTING PECO SUBSTATION EASEMENT LINE
- PROPOSED PECO TRANSMISSION LINE EASEMENT

350 0 350 700
SCALE IN FEET

PREPARED BY:
URS
CONSHOHOCKEN, PA.

DATE

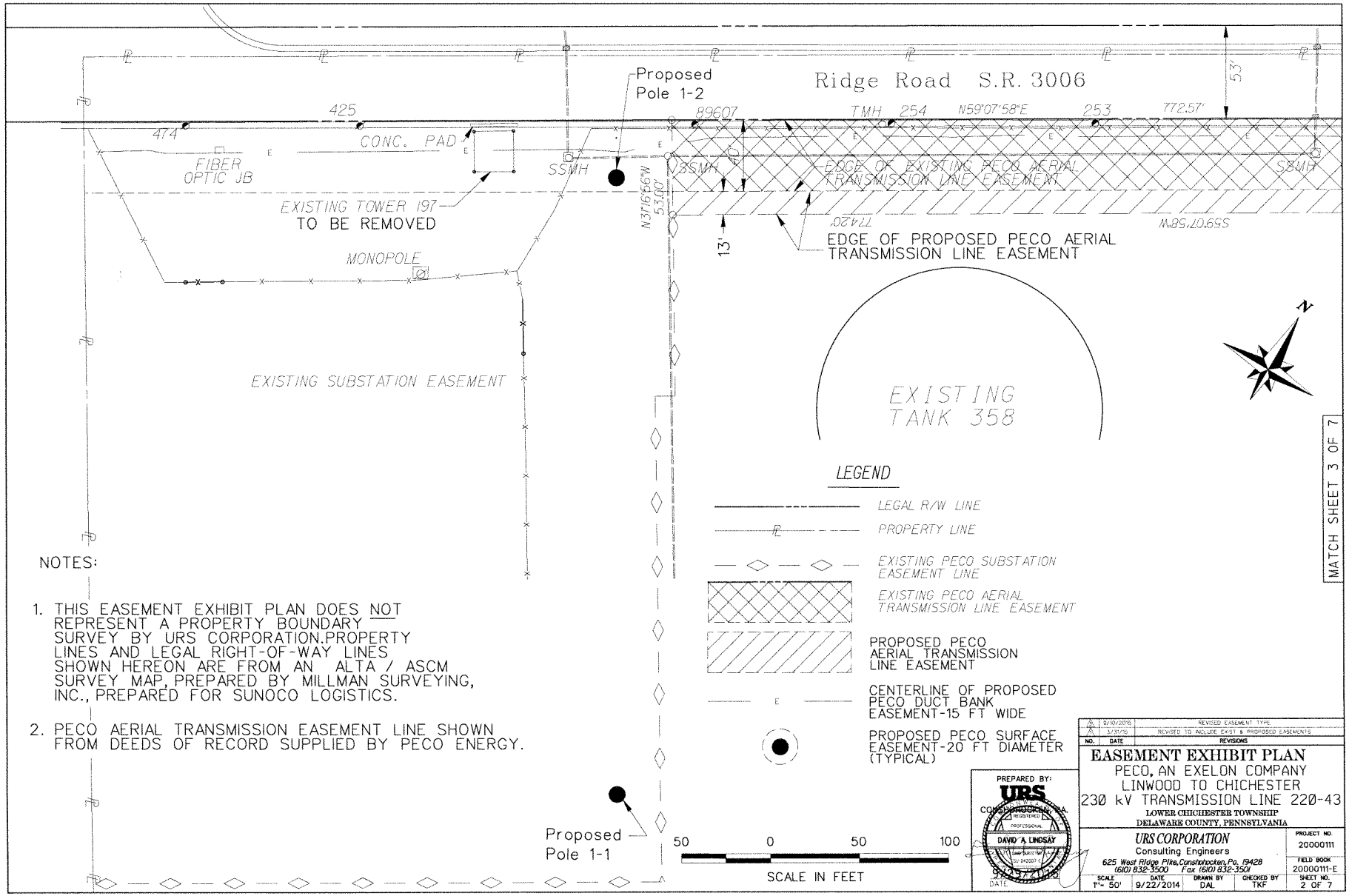
NO.	DATE	REVISIONS
1	4/21/2015	REVISED POLE 1-7 LOCATION, POLE NUMBERS 1-8 THRU 1-10

EASEMENT EXHIBIT PLAN

PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK	SCALE	DATE	DRAWN BY	CHECKED BY	SHEET NO.
20000111	20000111-E	1"= 350'	9/22/2014	DAL	TKF	1 OF 7



NOTES:

1. THIS EASEMENT EXHIBIT PLAN DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY BY URS CORPORATION. PROPERTY LINES AND LEGAL RIGHT-OF-WAY LINES SHOWN HEREON ARE FROM AN ALTA / ASCM SURVEY MAP, PREPARED BY MILLMAN SURVEYING, INC., PREPARED FOR SUNOCO LOGISTICS.

2. PECO AERIAL TRANSMISSION EASEMENT LINE SHOWN FROM DEEDS OF RECORD SUPPLIED BY PECO ENERGY.

PREPARED BY:
URS
CONSHOHOCKEN, PA
REGISTERED
PROFESSIONAL
DAVID A. LINDSAY
DATE

NO.	DATE	REVISIONS
2	9/10/2015	REVISED EASEMENT TYPE
1	3/31/15	REVISED TO INCLUDE EXIST & PROPOSED EASEMENTS

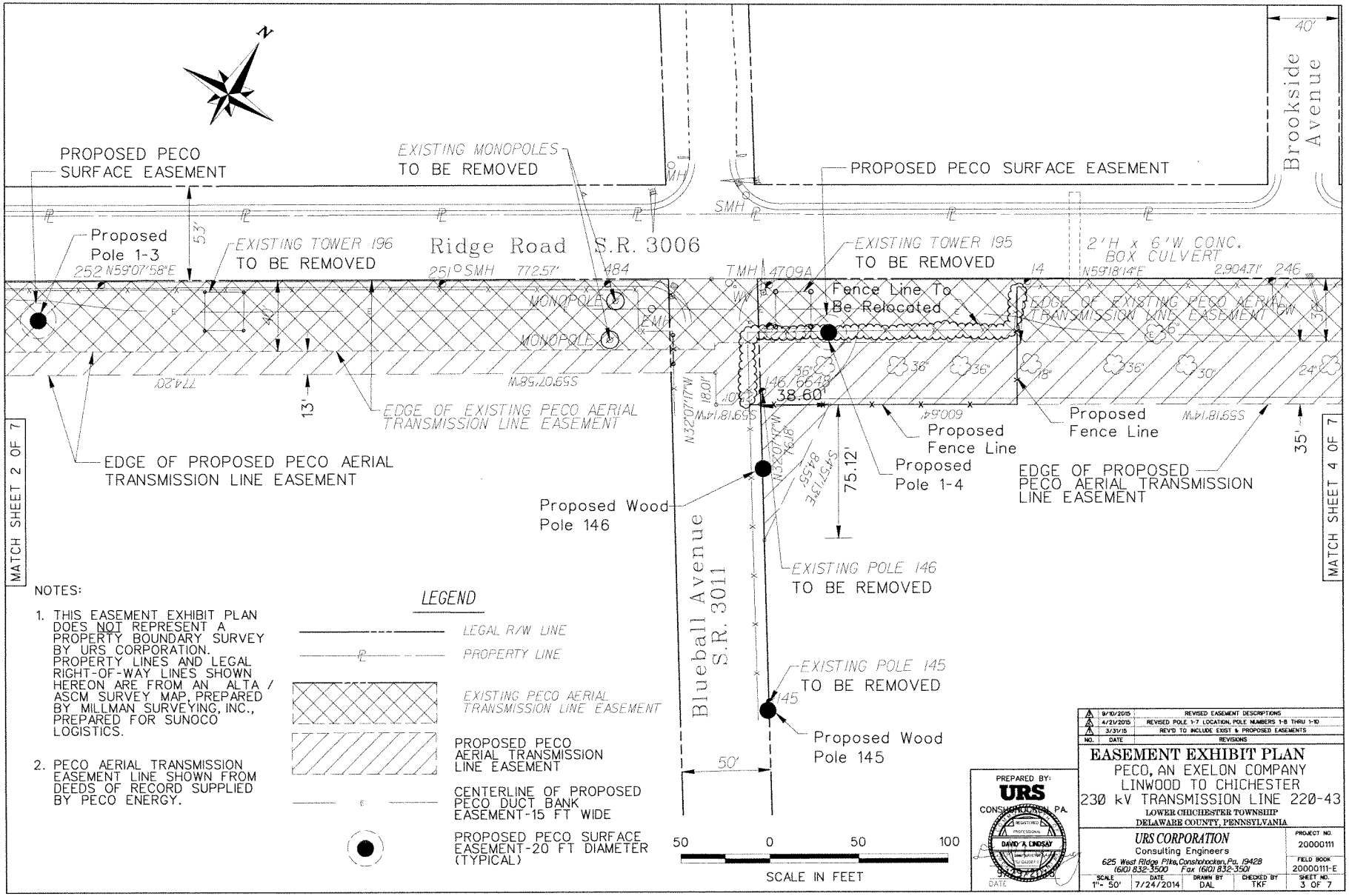
EASEMENT EXHIBIT PLAN

PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK	SHEET NO.
20000111	20000111-E	2 OF 7

SCALE	DATE	DRAWN BY	CHECKED BY
1"= 50'	9/22/2014	DAL	TKF



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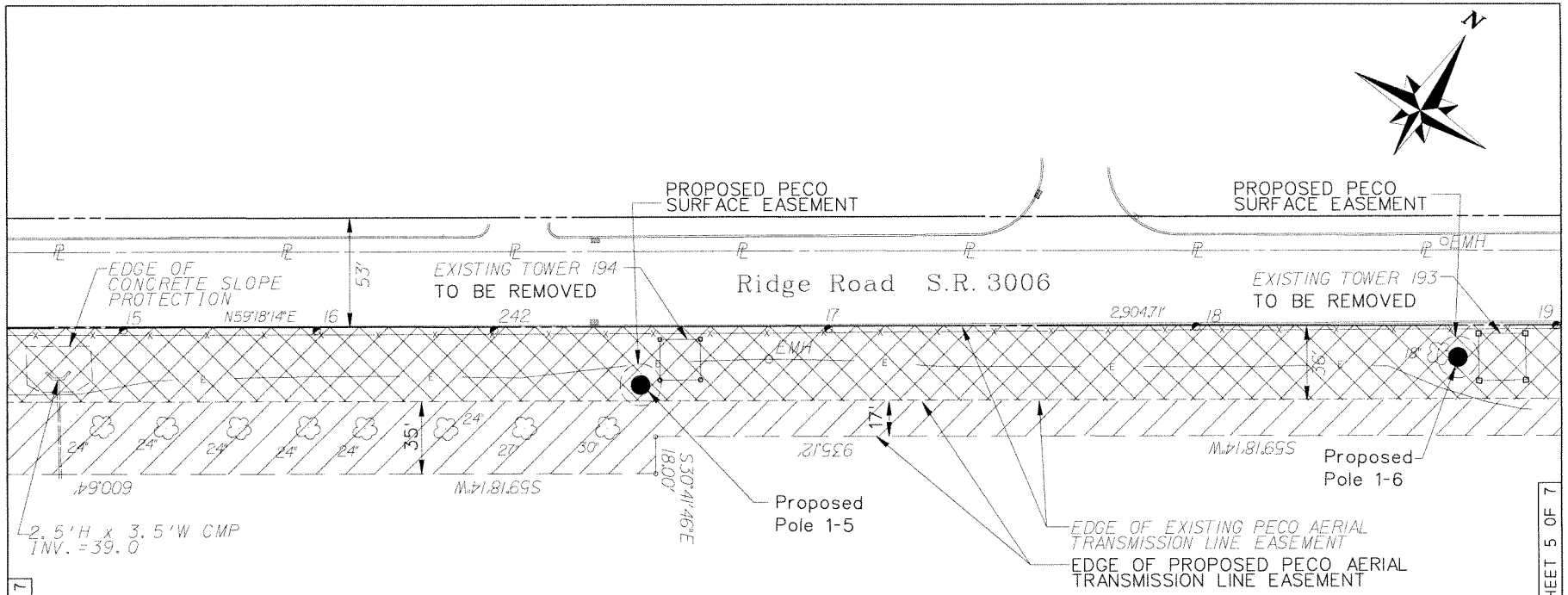

LEGEND

- LEGAL R/W LINE
- PROPERTY LINE
- EXISTING PECO AERIAL TRANSMISSION LINE EASEMENT
- PROPOSED PECO AERIAL TRANSMISSION LINE EASEMENT
- CENTERLINE OF PROPOSED PECO DUCT BANK EASEMENT-15 FT WIDE
- PROPOSED PECO SURFACE EASEMENT-20 FT DIAMETER (TYPICAL)

NOTES:

1. THIS EASEMENT EXHIBIT PLAN DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY BY URS CORPORATION. PROPERTY LINES AND LEGAL RIGHT-OF-WAY LINES SHOWN HEREON ARE FROM AN ALTA / ASCM SURVEY MAP, PREPARED BY MILLMAN SURVEYING, INC., PREPARED FOR SUNOCO LOGISTICS.
2. PECO AERIAL TRANSMISSION EASEMENT LINE SHOWN FROM DEEDS OF RECORD SUPPLIED BY PECO ENERGY.

50 0 50 100
SCALE IN FEET

NO.	DATE	REVISIONS
3	9/10/2015	REVISED EASEMENT DESCRIPTIONS
2	4/21/2015	REVISED POLE 1-7 LOCATION, POLE NUMBERS 1-8 THRU 1-10
1	3/31/15	REV'D TO INCLUDE EXIST & PROPOSED EASEMENTS

PREPARED BY: URS CORPORATION PA
DAVID A. LINDSAY PROFESSIONAL ENGINEER
DATE 9/25/2015

EASEMENT EXHIBIT PLAN

PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK	SHEET NO.
20000111	20000111-E	4 OF 7

SCALE	DATE	DRAWN BY	CHECKED BY
1"= 50'	9/22/2014	DAL	TKF

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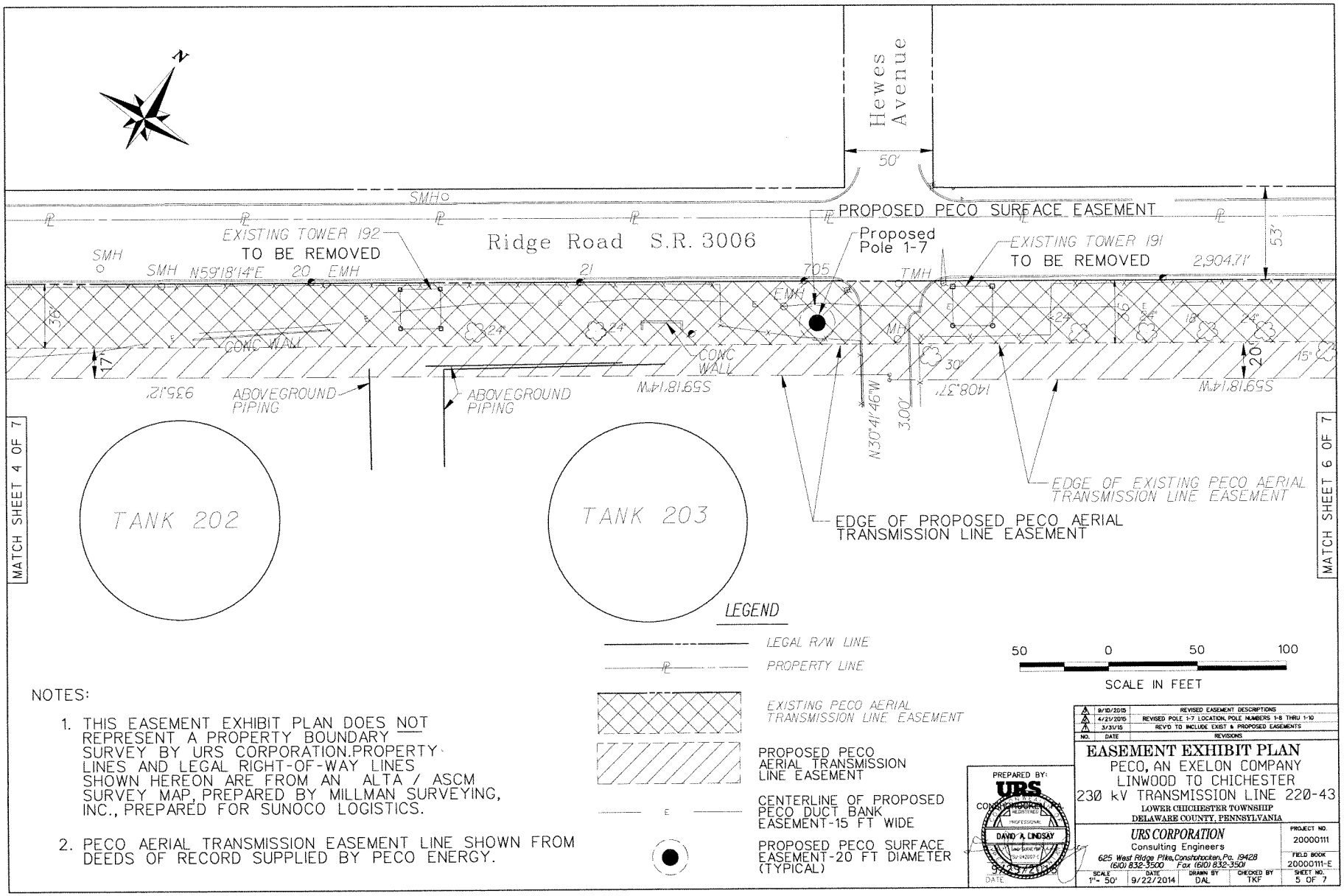

LEGEND

- LEGAL R/W LINE
- PROPERTY LINE
- EXISTING PECO AERIAL TRANSMISSION LINE EASEMENT
- PROPOSED PECO AERIAL TRANSMISSION LINE EASEMENT
- CENTERLINE OF PROPOSED PECO DUCT BANK EASEMENT-15 FT WIDE
- PROPOSED PECO SURFACE EASEMENT-20 FT DIAMETER (TYPICAL)

50 0 50 100

SCALE IN FEET

NOTES:

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2. PECO AERIAL TRANSMISSION EASEMENT LINE SHOWN FROM DEEDS OF RECORD SUPPLIED BY PECO ENERGY.

NO.	DATE	REVISIONS
1	9/10/2015	REVISED EASEMENT DESCRIPTIONS
2	4/21/2015	REVISED POLE 1-7 LOCATION, POLE NUMBERS 1-8 THRU 1-10
3	3/31/15	REV'D TO INCLUDE EXIST & PROPOSED EASEMENTS

PREPARED BY: URS CORPORATION — DAVID A. LINDSAY — DATE

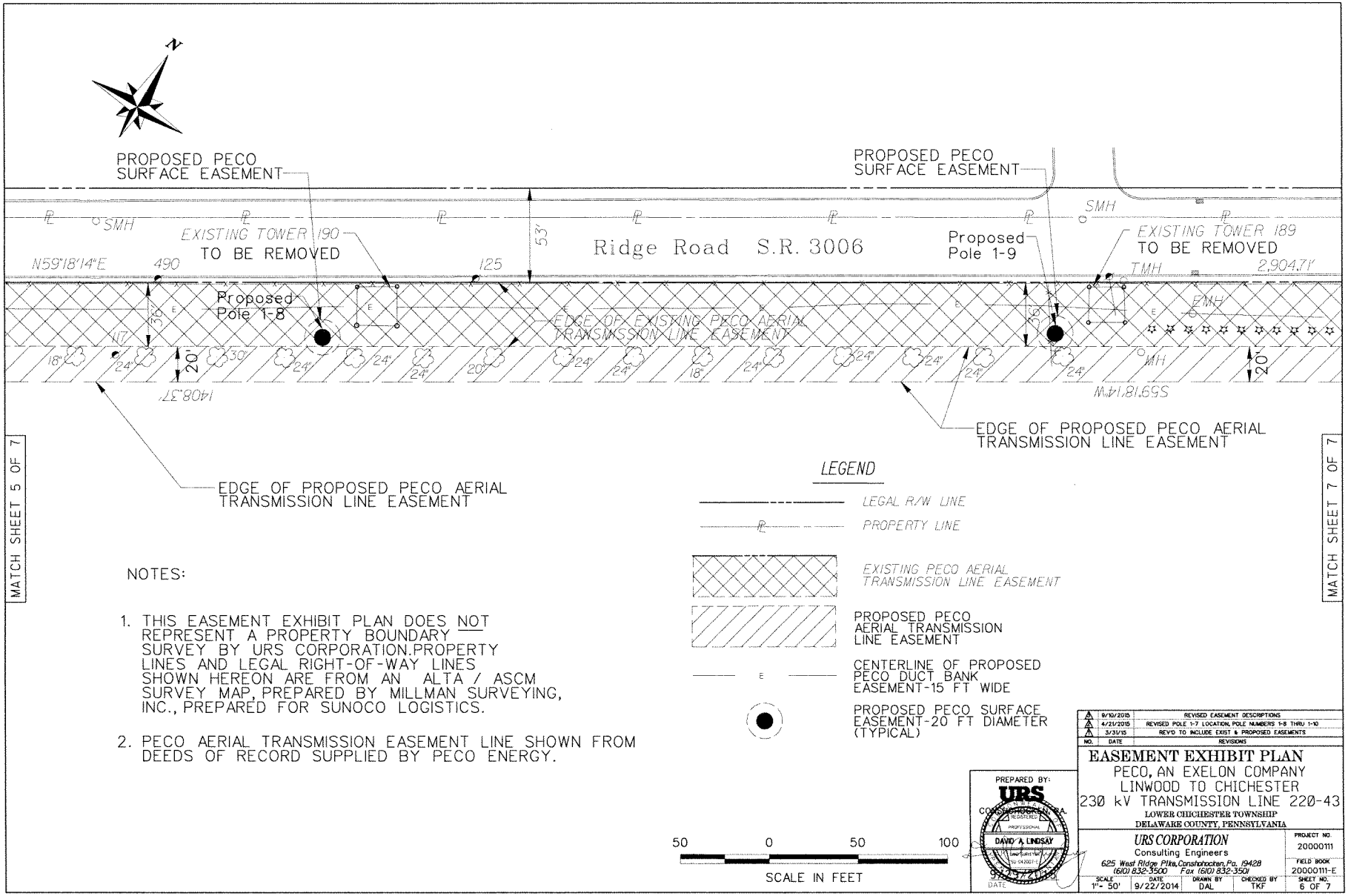
EASEMENT EXHIBIT PLAN

PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

SCALE	DATE	DRAWN BY	CHECKED BY
1"= 50'	9/22/2014	DAL	TKF

PROJECT NO. 20000111
FIELD BOOK 20000111-E
SHEET NO. 5 OF 7



LEGEND

- LEGAL R/W LINE
- PROPERTY LINE
- EXISTING PECO AERIAL TRANSMISSION LINE EASEMENT
- PROPOSED PECO AERIAL TRANSMISSION LINE EASEMENT
- CENTERLINE OF PROPOSED PECO DUCT BANK EASEMENT-15 FT WIDE
- PROPOSED PECO SURFACE EASEMENT-20 FT DIAMETER (TYPICAL)

NOTES:

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2. PECO AERIAL TRANSMISSION EASEMENT LINE SHOWN FROM DEEDS OF RECORD SUPPLIED BY PECO ENERGY.

50 0 50 100
SCALE IN FEET

NO.	DATE	REVISIONS
3	9/10/2015	REVISED EASEMENT DESCRIPTIONS
2	4/21/2015	REVISED POLE 1-7 LOCATION, POLE NUMBERS 1-8 THRU 1-10
1	3/31/15	REV'D TO INCLUDE EXIST & PROPOSED EASEMENTS

PREPARED BY: URS CORPORATION, CONSHOHOCKEN, PA. REGISTERED PROFESSIONAL DAVID A. LINDSAY DATE 9/22/2014

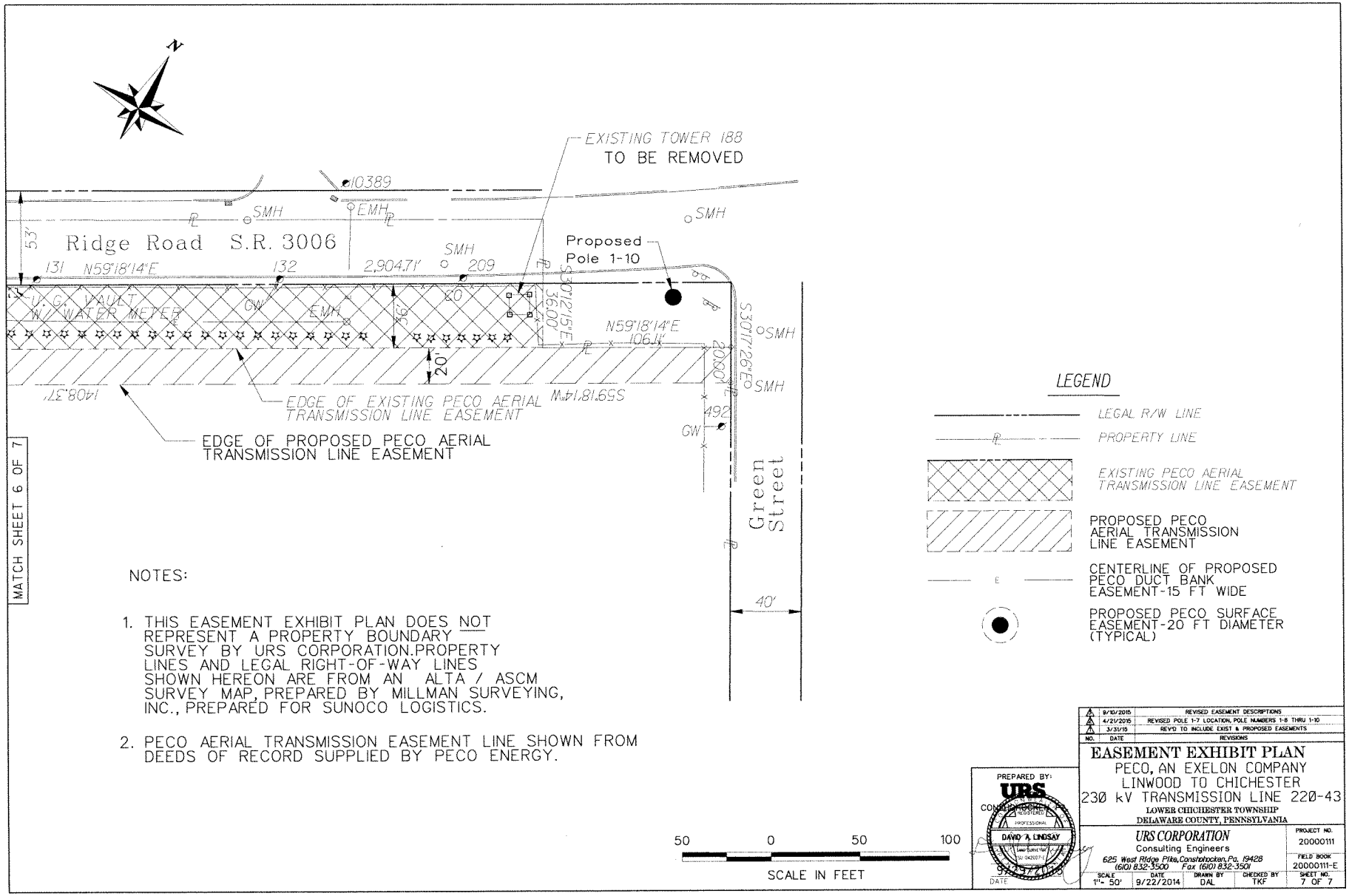
EASEMENT EXHIBIT PLAN

PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK
20000111	20000111-E

SCALE	DATE	DRAWN BY	CHECKED BY	SHEET NO.
1" = 50'	9/22/2014	DAL	TKF	6 OF 7



NOTES:

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2. PECO AERIAL TRANSMISSION EASEMENT LINE SHOWN FROM DEEDS OF RECORD SUPPLIED BY PECO ENERGY.

NO.	DATE	REVISIONS
3	9/30/2015	REVISED EASEMENT DESCRIPTIONS
2	4/21/2015	REVISED POLE 1-7 LOCATION, POLE NUMBERS 1-8 THRU 1-10
1	3/31/15	REV'D TO INCLUDE EXIST & PROPOSED EASEMENTS

PREPARED BY:
URS
COMMONWEALTH OF PENNSYLVANIA
REGISTERED
PROFESSIONAL
DAVID A. LINDSAY
DATE

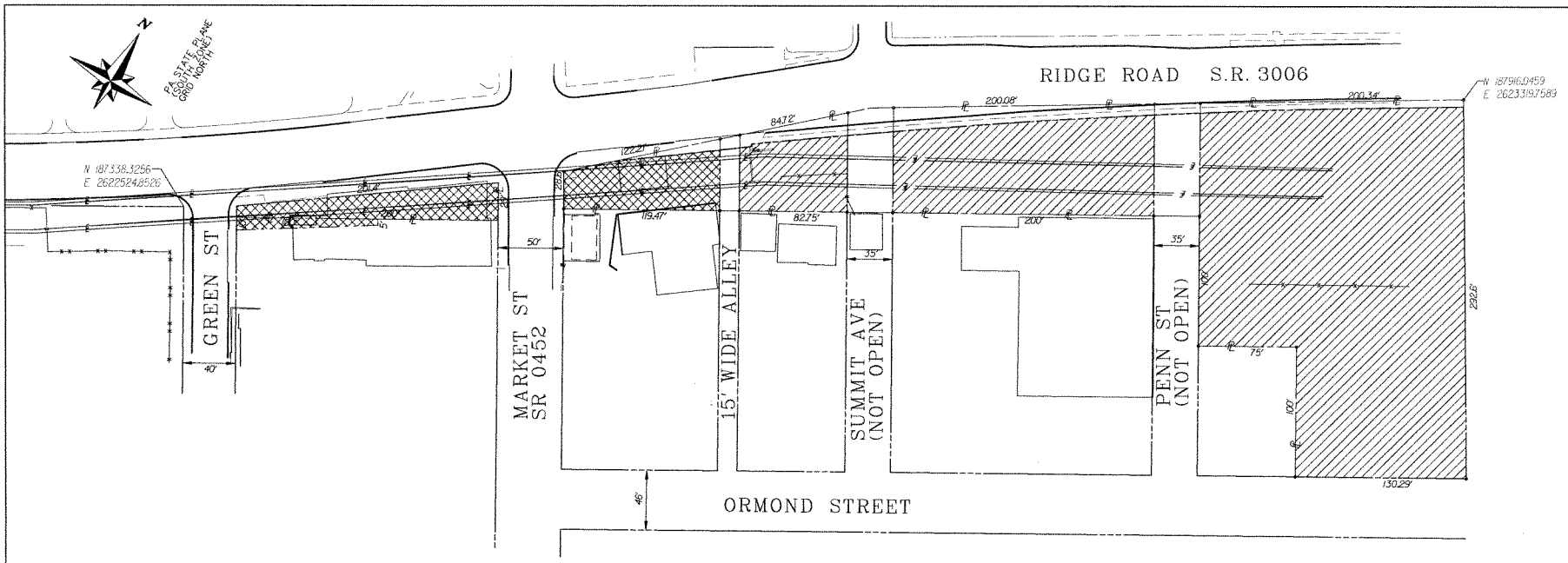
EASEMENT EXHIBIT PLAN

PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK	SHEET NO.
20000111	20000111-E	7 OF 7

SCALE	DATE	DRAWN BY	CHECKED BY
1"= 50'	9/22/2014	DAL	TKF



NOTES:

1. THIS EASEMENT EXHIBIT PLAN DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY BY URS CORPORATION. PROPERTY LINES AND LEGAL RIGHT-OF-WAY LINES SHOWN HEREON ARE FROM A COMPILATION OF PECO RECORDS, DELAWARE COUNTY RECORDER OF DEEDS RECORDS AND PENNDOT PLANS OF SR 3006.

2. HORIZONTAL DATUM IS TIED TO THE PENNSYLVANIA STATE PLANE (SOUTH ZONE) COORDINATE SYSTEM WHICH HAS BEEN ADJUSTED TO THE NORTH AMERICAN DATUM (NAD) OF 1983 BY GPS METHODS.

3. EXISTING EASEMENTS OF PECO ENERGY SHOWN HEREON ARE PLOTTED FROM RECORDS AND PLANS PROVIDED BY PECO ENERGY. NOT ALL OF THE INFORMATION CONTAINED IN THESE RECORDS AND PLANS WAS COMPLETE.

LEGEND

- APPROXIMATE LEGAL R/W LINE
- APPROXIMATE PROPERTY LINE
- E — EXISTING OVERHEAD WIRES
- PECO EASEMENT
- PECO FEE

40 0 40 80
SCALE IN FEET

NO.	DATE	REVISIONS

EASEMENT EXHIBIT PLAN
PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
EXISTING RIDGE ROAD EASEMENTS
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK
20000669	20000669-E

SCALE	DATE	DRAWN BY	CHECKED BY	SHEET NO.
1"=40'	4/10/2015	TKF	DAL	1 OF 1

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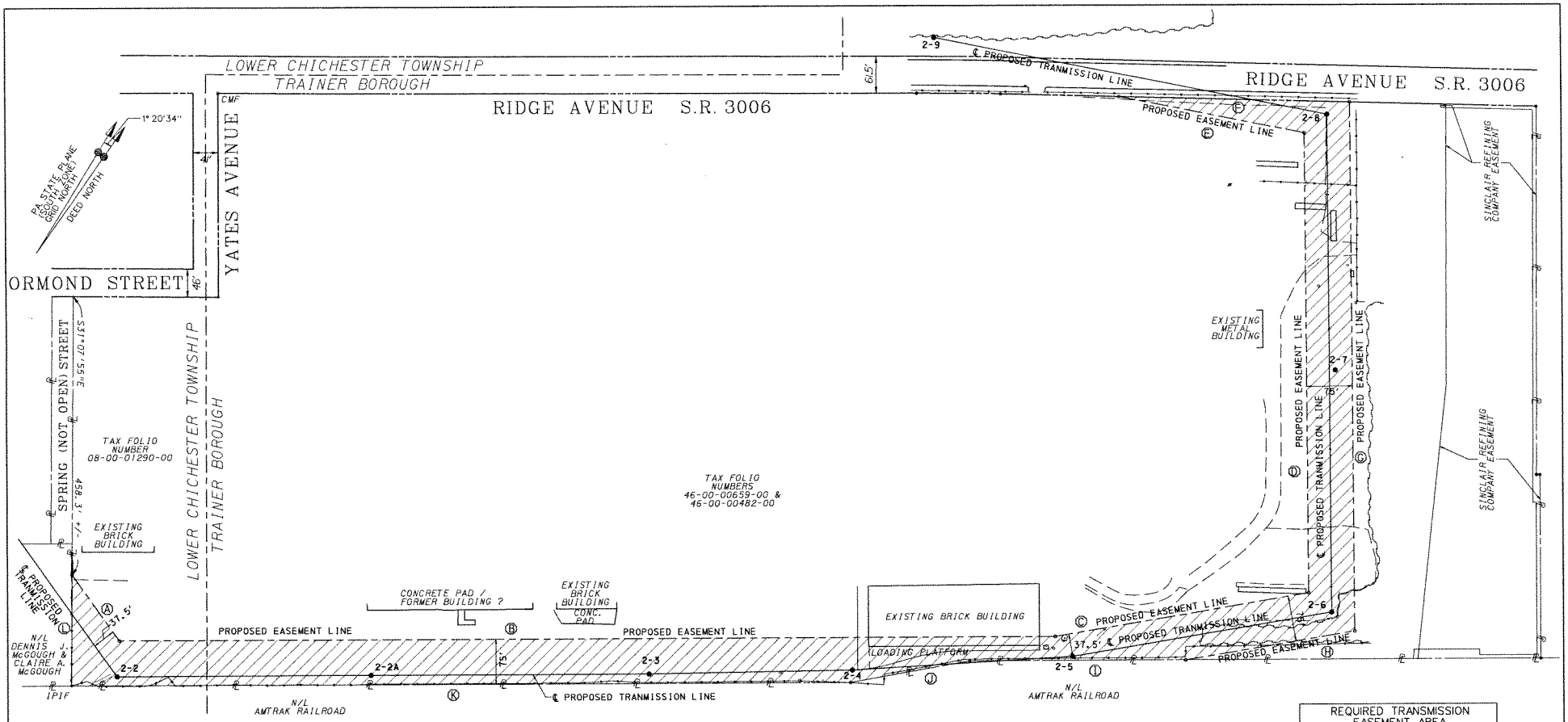

REQUIRED TRANSMISSION EASEMENT AREA
219,509 SQ. FT. / 5.039 ACRES

80 0 80 160
SCALE IN FEET

EASEMENT LINE DESCRIPTION

A	S 66°54'11" E	133.23'	G	S 31°55'25" E	875.72'
B	N 58°20'45" E	1,542.01'	H	S 48°47'47" W	281.64'
C	N 48°47'47" E	422.61'	I	S 58°20'45" W	355.51'
D	N 31°55'25" W	761.05'	J	S 48°16'02" W	200.00'
E	S 69°40'22" W	309.91'	K	S 58°20'45" W	1,282.47'
F	N 59°47'45" E	378.75'	L	N 31°07'55" W	183.81'

NOTES:

1. THIS EASEMENT EXHIBIT PLAN DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY BY URS CORPORATION. PROPERTY LINES AND LEGAL RIGHT-OF-WAY LINES SHOWN HEREON ARE FROM AN ALTA / ASCM SURVEY MAP, PREPARED BY NATIONWIDE LAND SERVICES, LLC, PREPARED FOR CONGOLEUM CORPORATION, DATED 9/25/09.
2. HORIZONTAL DATUM IS TIED TO THE PENNSYLVANIA STATE PLANE (SOUTH ZONE) COORDINATE SYSTEM, WHICH HAS BEEN ADJUSTED TO THE NORTH AMERICAN DATUM (NAD) OF 1983 BY GPS METHODS.
3. EASEMENT LINE BEARINGS SHOWN HEREON ARE BASED ON PENNSYLVANIA STATE PLANE GRID NORTH AND ARE ROTATED CLOCKWISE 1°20'34" FROM DEEDS OF RECORD AND THE ALTA / ASCM SURVEY MAP, PREPARED BY NATIONWIDE LAND SERVICES, LLC, PREPARED FOR CONGOLEUM CORPORATION, DATED 9/25/09.
4. *THIS PLAN IS VALID ONLY IF PRINT HAS ORIGINAL SEAL AND SIGNATURE OF THE SURVEYOR.*
5. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS PART OF THIS SURVEY.
6. EXISTING FEATURES SHOWN HEREON ARE FROM AN ACTUAL FIELD SURVEY, PERFORMED BY URS CORPORATION DURING NOVEMBER 2014.
7. EXISTING EASEMENTS OF SINCLAIR REFINING COMPANY SHOWN HEREON ARE PLOTTED FROM DEEDS PROVIDED IN A TITLE COMMITMENT, PROVIDED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY, FILE # PHL-14-2924HSE/19 64.3 628, SCHEDULE B, SECTION 2, EXCEPTION 6 NO OTHER EXCEPTIONS FROM SCHEDULE B, SECTION 2 CAN BE ADDRESSED BY THIS PLAN.
8. MUNICIPAL BOUNDARY OF LOWER CHICHESTER TOWNSHIP AND TRAINER BOROUGH SHOWN HEREON IS FROM DELAWARE COUNTY GIS INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE ONLY.

LEGEND

- *APPROXIMATE LEGAL R/W LINE*
- *APPROXIMATE PROPERTY LINE*
- PROPOSED PECO TRANSMISSION LINE EASEMENT

PREPARED BY:
URS
CONSHOHOCKEN, PA.

DATE

NO.	DATE	REVISIONS

EASEMENT EXHIBIT PLAN
PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
CONGOLEUM CORPORATION PARCEL
LOWER CHICHESTER TOWNSHIP & TRAINER BOROUGH
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK	SCALE	DATE	DRAWN BY	CHECKED BY	SHEET NO.
20000669	20000669-E	1"=30'	12/02/2014	TKF	DAL	1 OF 1

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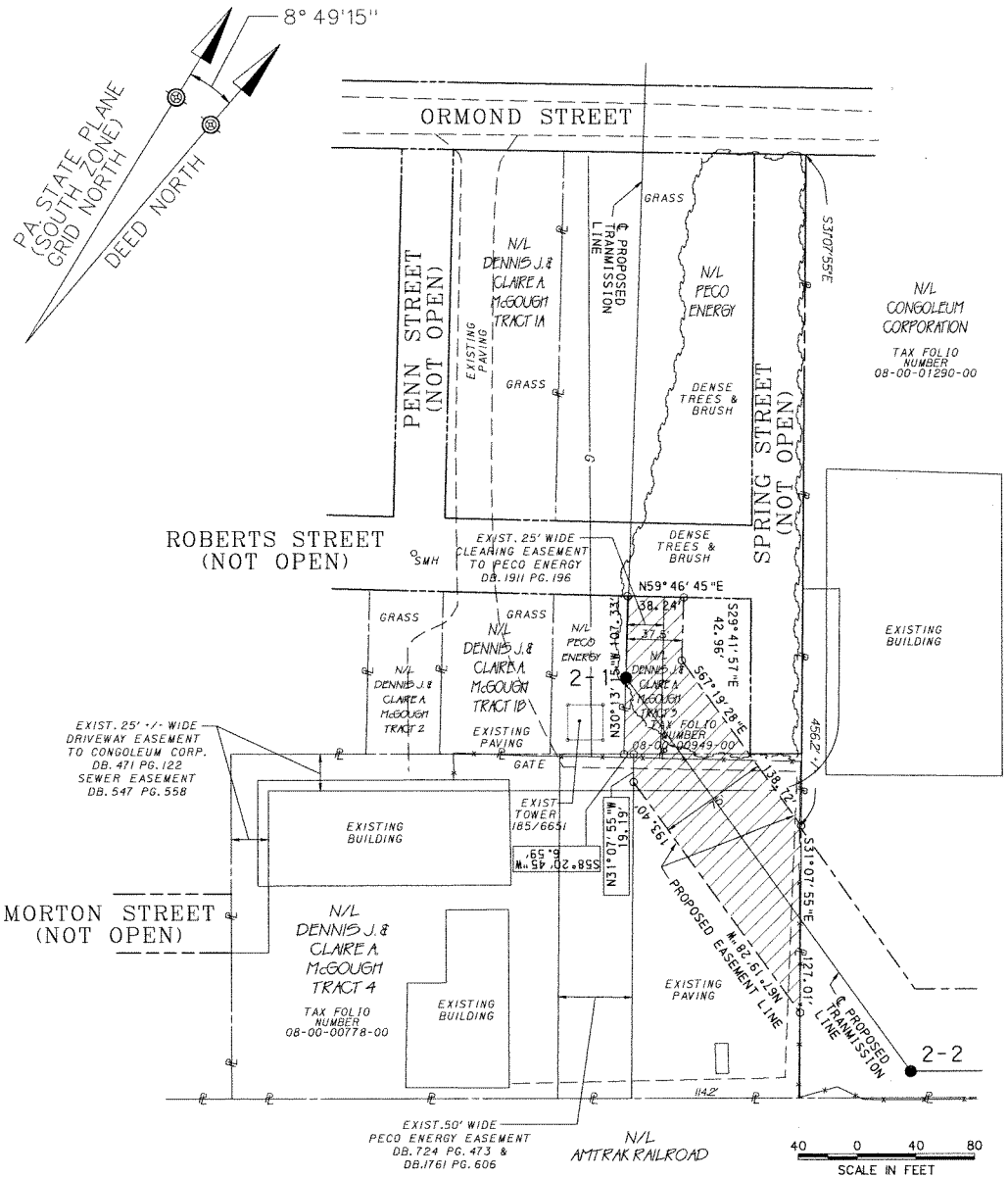


NOTES:

1. THIS EASEMENT EXHIBIT PLAN DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY BY URS CORPORATION. PROPERTY LINES AND LEGAL RIGHT-OF-WAY LINES SHOWN HEREON ARE FROM A PLAN OF PROPERTY, PREPARED BY G.D. HOUTMAN AND SON INC., PREPARED FOR LINWOOD CONTAINER CORPORATION, DATED 3/12/1987 AND FIELD TIED TO EXISTING IRON PIPES SHOWN THEREON.
2. HORIZONTAL DATUM IS TIED TO THE PENNSYLVANIA STATE PLANE (SOUTH ZONE) COORDINATE SYSTEM WHICH HAS BEEN ADJUSTED TO THE NORTH AMERICAN DATUM (NAD) OF 1983 BY GPS METHODS.
3. EASEMENT LINE BEARINGS SHOWN HEREON ARE BASED ON PENNSYLVANIA STATE PLANE GRID NORTH AND ARE ROTATED CLOCKWISE 8° 49'15" FROM DEEDS OF RECORD AND PLAN OF PROPERTY, PREPARED BY G.D. HOUTMAN AND SON INC., PREPARED FOR LINWOOD CONTAINER CORPORATION, DATED 3/12/1987.
4. *THIS PLAN IS VALID ONLY IF PRINT HAS ORIGINAL SEAL AND SIGNATURE OF THE SURVEYOR.*
5. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS PART OF THIS SURVEY.
6. EXISTING FEATURES SHOWN HEREON ARE FROM AN ACTUAL FIELD SURVEY, PERFORMED BY URS CORPORATION DURING FEBRUARY 2015. EXCLUDING BUILDING LOCATIONS.
7. EXISTING BUILDINGS SHOWN HEREON ARE FROM LIDAR TOPOGRAPHIC SURVEY SUPPLIED BY POWER ENGINEERS, INC.
8. EXISTING UNDERGROUND GAS LINE SHOWN HEREON ARE FROM LOCATION OF TWO GAS LINE MARKER POSTS ONLY. URS CORPORATION DOES NOT GUARANTEE THE LOCATION OF THIS GAS LINE.
9. EXISTING EASEMENTS ARE PLOTTED FROM DEEDS PROVIDED IN A TITLE COMMITMENT, PROVIDED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY, FILE # PHL-14-29245HSE/19 643 693, SCHEDULE B, SECTION 2, A PORTION OF EXCEPTION 7 DEED BOOK 926, PAGE 209, EXCEPTIONS 12 AND 13 ARE NOT ADDRESSED BY THIS PLAN.

ALL THAT CERTAIN tract or parcel of ground situate in Lower Chichester Township, Delaware County, Commonwealth of Pennsylvania, as shown on a plan titled " Revised Easement Exhibit Plan, 230kV Transmission Line 220-43 McGough Parcel", prepared by URS Corporation, dated 5/21/2015, more particularly described as follows, to-wit:

BEGINNING at a point, said point being measured S31° 07' 55" E, a distance of 456.2 feet , more or less from a corner of lands now or late of Congoleum Corporation Tax Folio 08-00-01290-00 on the southerly right-of-way line of Ormond Street (46 feet wide R.O.W), in line of a certain Spring Street right-of-way (Not Open) thence from said point of BEGINNING along said lands now or late of Congoleum Corporation, Tax Folio 08-00-01290-00 and along said lands now or late of Dennis J. McGough & Claire A. McGough Tax Folio 08-00-00778-00 S31° 07' 55" E, a distance of 127.01 feet to a point; thence leaving said lands now or late of Congoleum Corporation, Tax Folio 08-00-01290-00 and passing through said lands now or late of Dennis J. McGough & Claire A. McGough Tax Folio 08-00-00778-00 and 08-00-00949-00, of which these lands are a part, the following seven (7) courses and distances:

1. N67° 19' 28" W, a distance of 193.40 feet to a point in line of an existing 50 ' wide easement to PECO Energy as recorded in deed book 724, page 472 and deed book 1761, page 606 ; thence along said existing easement
2. N31° 07' 55" W, a distance of 19.19 feet to a point; thence along said existing easement
3. S58° 20' 45" W, a distance of 6.59 feet to a point in line of lands now or late of PECO Energy Tax Folio 08-00-00821-01; thence leaving said existing easement and passing along lands now or late of PECO Energy Tax Folio 08-00-00821-01
4. N30° 13' 15" W, a distance of 107.33 feet to a point on the Legal Right-of-Way line of Roberts Street (Not Open); thence along said Roberts Street and lands now or late of Dennis J. McGough & Claire A. McGough Tax Folio 08-00-00949-00
5. N59° 46' 45"E, a distance of 38.24 feet to a point; thence leaving said Robert Street and still passing through said lands now or late of Dennis J. McGough & Claire A. McGough Tax Folio 08-00-00949-00 and 08-00-00778-00
6. S29° 41' 57" E, a distance of 42.96 feet to a point; thence
7. S67° 19' 28" E, a distance of 138.72 feet to the point and place of BEGINNING.

CONTAINING 15,826 Square Feet or 0.363 acre of land, more or less.

REQUIRED TRANSMISSION EASEMENT AREA
15,826 SQ. FT. / 0.363 ACRES

LEGEND

- APPROXIMATE LEGAL R/W LINE
- APPROXIMATE PROPERTY LINE
- PROPOSED PECO TRANSMISSION LINE EASEMENT
- G — UNDERGROUND GAS LINE
- TREE / BRUSH LINE
- EXISTING PAVING LINE

PREPARED BY:
URS
CONSHOHOCKEN, PA.

REVISIONS

REVISED EASEMENT EXHIBIT PLAN

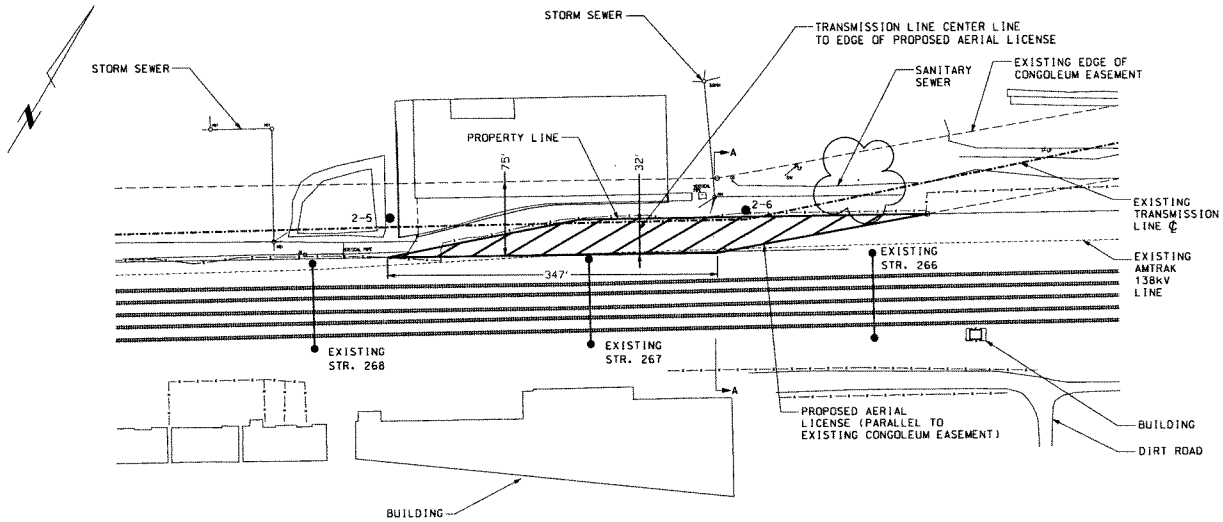
PECO, AN EXELON COMPANY
LINWOOD TO CHICHESTER
230 kV TRANSMISSION LINE 220-43
McGOUGH PARCEL
LOWER CHICHESTER TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA

URS CORPORATION
Consulting Engineers
625 West Ridge Pike, Conshohocken, Pa. 19428
(610) 832-3500 Fax (610) 832-3501

PROJECT NO.	FIELD BOOK	SCALE	DATE	DRAWN BY	CHECKED BY	SHEET NO.
20000669	20000669-E	1"=40'	05/21/2015	TKF	DAL	1 OF 1

S:\Projects\Private Sector\PECO\20000669_Lin-Ch_Congoleum_Survey\CAD\REVISED McGough Easement.dgn
7:47:17 AM
10/14/2015

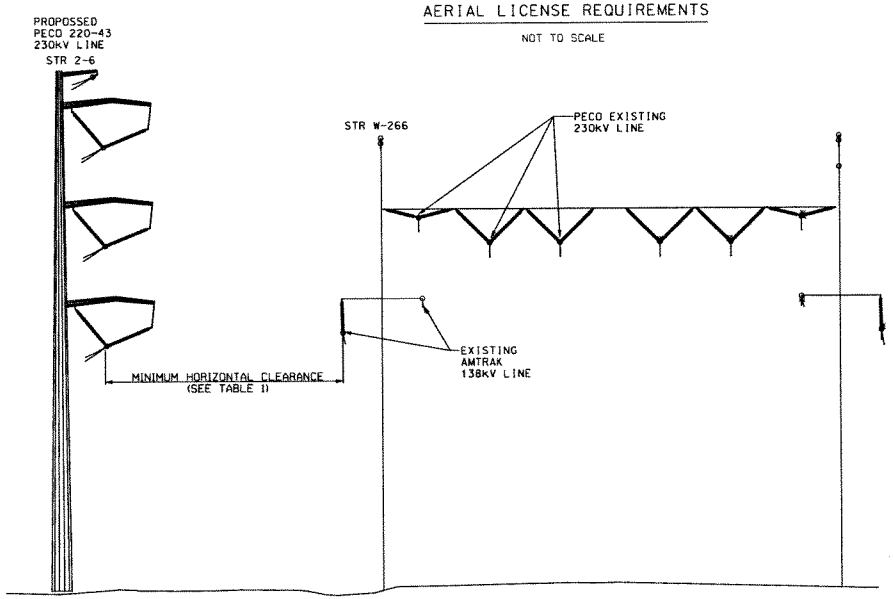
ROUTE ATLINEDC



DETAIL A

AERIAL LICENSE REQUIREMENTS

NOT TO SCALE



SECTION A-A

NOT TO SCALE

TABLE 1

MINIMUM HORIZONTAL CLEARANCE

PECO 230kV COND.	AMTRAK 138kV COND.	MIN. HORZ. CLEARANCE
60°F	60°F	28.9
60°F, 6PSF WIND	60°F	28.3
60°F	60°F, 6PSF WIND	25.2

03/11/15
ISSUED FOR APPROVAL

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

NO.	DATE	DESCRIPTION	REV'D	CHK'D	APP'D
A10	03	WO-07662161	AIM	DIV	BRB
	11	EC-177238			
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR APPROVAL			
A10	09	WO-07662161	DM	CIO	BRB
	14	EC-177238			
	15	POWER ENGINEERS, INC. ADDED: ISSUED FOR FINAL APPROVAL			

TRANSMISSION LINE | INDEX C-269249

LICENSE DETAILS
LINWOOD TO CHICHESTER
230kV TRANSMISSION LINE 220-43

PECO Energy Company

SCALE	DESIGN	CADD	CHECKED	INSPECTED	APPROVED	DATE
NONE	PEI	PEI	PEI			07-09-14

APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____
APPROVED _____ APPROVED _____

SHEET 1 OF 1 | C-000000-A1

PLOT SCALE
FILE SCALE

EC #177238

POWER DELIVERY
ENGINEERING SERVICES

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

PECO Energy's Answers to Template Staff Data Requests

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6. If applicable, what is the PJM project ID No. for the proposed project? Has this project been submitted to the PJM Transmission Expansion Advisory Committee (TEAC)? If so, please provide a description of the project as submitted to the TEAC. If this project is part of a larger project, explain in detail the larger project of which the instant LON is a part. Please describe how this project will mitigate potential planning criteria violations.

This information is provided in paragraphs 10 and 11, and Exhibit 5, to the Letter of Notification.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

PECO Energy's Answers to Template Staff Data Requests

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7. Provide a breakdown of project costs. Please explain who will own, finance and build the proposed project. Please provide copies of any applicable Affiliated Interest Agreements.

   Below is an overall projected cost breakdown, which includes work at the remote-ends:

   - Material costs - $7.0M
   - Electric Installation costs – $11.0M
   - Civil Installation costs – $5.5M
   - Design Engineering and Permitting costs – $3.5M
   - Contingency – $2.4M
   - Overhead & Indirects – $7.3M

   There are no applicable affiliated interest agreements.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

Verification of PECO Energy Company's Responses to Staff Data Requests

I, Ward L. Smith, hereby state that the facts above set forth are true and correct (or are true and correct to the best of my knowledge, information and belief) and that I expect PECO Energy Company to be able to prove the same at any hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Date: January 13, 2016

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PECO Energy Company Pursuant to 52 Pa. Code Chapter 57 Subchapter G to Construct theLinwood-Chichester 230kV Line of Less Than Two Miles in Length	:	**Docket No. A-2016-2523055**

CERTIFICATE OF SERVICE

Copies of PECO's Responses to Staff Data Requests have been served, first class mail, on the following:

Francis T. Sbandi
Solicitor
Lower Chichester Township
Jamestown Building
102 Chesley Drive
Suite 1-A
Media, PA 19063
Attn: Chief executive officer, governing body and the body charged with the duty of planning land use.

Trainer Borough
842 Main Street
Trainer, PA 19061
Attn: Chief executive officer, governing body and the body charged with the duty of planning land use.

The Department of Environmental Resources,
Attention: Bureau of Environmental Planning
400 Market Street
Harrisburg, Pennsylvania 17101

Secretary, Department of Transportation,
400 North St.
Harrisburg, Pennsylvania 17120

Chairman, Historical and Museum Commission,
Post Office Box 1026,
Harrisburg, Pennsylvania 17120

Delaware County Commissioners

201 West Front Street
Media, PA 19063
Attn: Chief executive officer, governing body and the body charged with the duty of planning land use.

Delaware County Planning Commission
Delaware County Planning Department
Court House/Government Center
201 W. Front Street
Media, Pennsylvania 19063

JoMarie Jenkins, Sr. Right of Way Specialist
Sunoco Pipeline L.P
525 Fritztown Road
Sinking Spring, PA 19608

Kim D. Dalgliesh, Associate General Counsel
Amtrak Law Department, 2929 Arch St, Suite 300
Philadelphia, PA 19104

Mark W. Kulling, Vice President
Sheet Vinyl Operations
Congoleum Corporation
4401 Ridge Road
Trainer, PA 19061

K. Kirk Karagelian, Esq.
Carroll & Karagelian LLP
15 West Front Street
P.O. Box 1440
Media, PA 19063
(for McGough landowners)

Attorney for PECO Energy Company

Dated: January 13, 2016