



May 28, 2004

Ms. Pamela B. Katz  
Chairman  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**Re: Docket 272**

Dear Ms. Katz:

The Connecticut Light and Power Company and The United Illuminating Company (“the Companies”) have examined numerous options for EMF mitigation for all cross sections of the overhead portion of the Proposed Route and have prepared the attached filing in order to provide the Siting Council and interested parties with a basis of comparison for the various options. Enclosed are an original and 20 copies of EMF mitigation option data sheets for cross sections 1-8. These data sheets summarize the various options that have been examined and provide calculated fields for each option.

Please note that the magnetic field levels for cross section 1 for the “Proposed Lines on Existing ROW” (see page 1 of 13 attached) differ from the fields shown for cross section 1 in the Companies’ March 15, 2004 filing regarding magnetic field levels (“the March 15<sup>th</sup> EMF filing”). The reason for this difference is that the Companies have modified the configuration of structures in cross section 1 in order to eliminate crossings of 345-kV lines along this section of the ROW. This change provides not only electrical system benefits, but also reduces the height of some poles. The Companies will file a revised version of the March 15<sup>th</sup> EMF filing and update any other filings affected by this design change. No other cross sections are affected by this modification.

Sincerely,

Anne Bartosewicz  
Project Director  
The Connecticut Light & Power Company

John Prete  
Project Director  
The United Illuminating Company

Enclosure  
cc: Service List



**Connecticut  
Light & Power**

The Northeast Utilities System

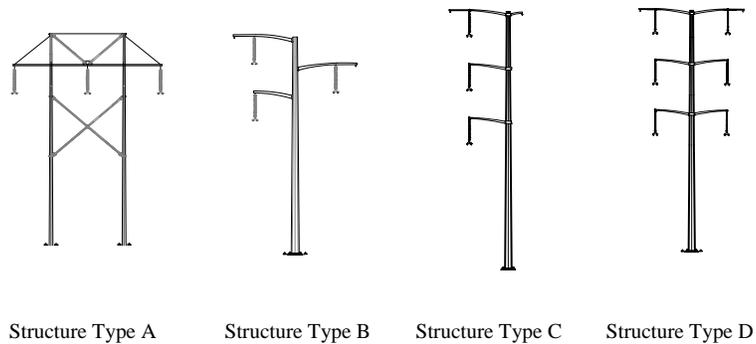


*The United Illuminating Company*

### Cross Section 1 (15GW Case)

#### Typical Segment – Scovill Rock S/S to Chestnut Junction (2.55 Miles long 335' ROW)

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW <sup>1</sup>	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		32.6	1.39	33.8	1.39	-	-	See Photo	80'
Proposed Lines on Existing ROW (For Reference)		18.6	1.44	30.1	1.40	2.1	-	ES,A	80'
OPTIONS									
1	345 kV Delta (optimized height & phasing)	6.2	0.75	28.8	1.39	2.1	0.0	ES, B	85'
2	345 kV Vertical	12.3	0.23	30.0	1.52	2.3	0.2	ES, C	105'
3	Vertical 345 kV Split Phase	7.5	0.05	29.6	1.45	3.1	1.0	ES, D	105'
4	Vertical 345 kV Split Phase 30 feet additional height	8.0	0.24	29.6	1.45	3.7	1.6	ES, D	135'



Existing ROW Cross Section

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)									
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance	
	Existing	Proposed	Existing	Proposed	Existing	Proposed		Proposed	Proposed
1	↓	↓	↓	↓	↑	↑	-		↓
2	↓	↓	↓	↓	↑	↑	↑		↓
3	↓	↓	↓	↓	↑	↑	↑		↑
4	↓	↓	↓	↓	↑	↑	↑		↑

<sup>1</sup> If existing structures “ES” are to remain in the transmission ROW it is represented by “ES” in the Structure Type in ROW column.

### Cross Section 2 (15GW Case)

Typical Segment – Oxbow Jct. to Beseck S/S in the Towns of Haddam, Durham, Middlefield & Wallingford & the City of Middletown  
(7.01 Miles 125' ROW)

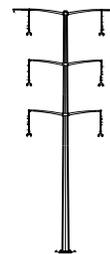
Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		9.2	0.67	13.9	0.91	-	-	See Photo	57'
Proposed Lines on Existing ROW (For Reference)		30.4	0.31	17.1	0.21	2.8	-	A	105'
OPTIONS									
1	Proposed Lines additional 30 feet in height	17.6	0.57	12.2	0.20	3.2	0.4	A	135'
2	345 kV Split-Phase centered on ROW 115 kV UG in street	12.4	0.68	12.4	0.68	7.5	4.7	B	105'
3	345 kV Split-Phase centered on ROW 115 kV UG in street Additional 30 feet in height	6.2	0.65	6.2	0.65	6.7	3.9	B	135'
4	345 kV Split-Phase centered on ROW 115 kV UG in street Additional 45 feet in height	4.4	0.54	4.4	0.54	8.2	5.4	B	150'
5	Combination 345/115 kV Split Phase	11.0	0.75	6.6	0.13	5.0	2.2	C	150'
6	New ROW (115kV lines remain EMF Values are for 115kV only)	8.3	0.67	12.4	0.91	TBD	TBD	TBD	TBD



Existing ROW Cross Section



Structure Type A



Structure Type B



Structure Type C

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↑	↓	↓	↓	↑	↑	↑	-
2	↑	↓	↓	↓	↑	-	↑	↑
3	↓	↓	↓	↓	↑	↑	↑	↑
4	↓	↓	↓	↓	↑	↑	↑	↑
5	↑	↓	↓	↓	↑	↑	↑	↑↑
6	↓	↓	↓	↓	TBD	TBD	TBD	TBD

### Cross Section 3 (15GW Case)

**Typical Segment – Black Pond Junction to East Meriden S/S in the City of Meriden  
(1.40 Miles 275' ROW)**

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile		Structure Type in ROW <sup>2</sup>	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		12.2	0.28	4.7	0.20	-	-	See Photo	130'
Proposed Lines on Existing ROW (For Reference)		5.9	0.15	12.9	0.29	2.4	-	ES, A, A	130'
OPTIONS									
1	Repositioned West Structures	2.6	0.07	14.6	0.24	2.4	0.0	ES, A, A	130'
2	As Proposed with strain insulators	6.1	0.15	11.4	0.15	2.5	0.1	ES, B, B	140'



Structure Type A



Structure Type B

**Existing ROW Cross Section Looking North**

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↓	↓	↑	↑	-	-	-	-
2	↓	↑	↑	↓	↑	↑	↑	↑

<sup>2</sup> If existing structures “ES” are to remain in the transmission ROW it is represented by “ES” in the Structure Type in ROW column.

### Cross Section 4 (15GW Case)

#### Typical Segment – East Meriden S/S to Beseck S/S in the Town of Wallingford (1.41 Miles 320' ROW)

Site Condition	ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW <sup>3</sup>	Typical Height	
	(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase			
Existing Lines (For Reference)	6.1	0.15	11.9	0.56	-	-	See Photo	130'	
Proposed Lines on Existing ROW (For Reference)	5.3	0.09	11.5	0.21	2.8	-	ES, A	130'	
OPTIONS									
1	As Proposed with strain insulators	5.0	0.09	10.1	0.38	2.8	0.0	ES, B, B	130'



Structure Type A



Structure Type B

Existing ROW Cross Section Looking North

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↓	↓	↓	↓	↑	↑	↑	↑

<sup>3</sup> If existing structures “ES” are to remain in the transmission ROW it is represented by “ES” in the Structure Type in ROW column.

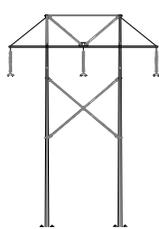
### Cross Section 5 (15GW Case)

#### Typical Segment – Beseck S/S to East Wallingford Junction in the Town of Wallingford (5.89 Miles 275' ROW)

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW <sup>4</sup>	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		5.2	0.13	24.7	1.21	-	-	See Photo	90'
Proposed Lines on Existing ROW (For Reference)		15.9	0.78	27.8	1.30	2.0	-	ES, A	90'
OPTIONS									
1	As Proposed with optimized phasing	6.6	0.69	20.0	1.17	2.0	0.0	ES, A	90'
2	345 kV Delta (optimized height & phasing)	4.2	0.48	21.2	1.16	2.0	0.0	ES, B	108'
3	345 kV Vertical – Inboard	5.5	0.30	23.8	1.05	2.2	0.2	ES, C	130'
4	Vertical 345 kV Split Phase	3.9	0.09	23.6	1.35	3.0	1.0	ES, D	130'
5	Horizontal split phase	4.0	0.47	23.8	1.33	3.9	1.9	ES, E	126'
6	Reconstructed ROW (Vertical Construction)	4.3	0.10	1.9	0.11	4.8	2.8	C, C	130'



Existing ROW Cross Section



Structure Type A



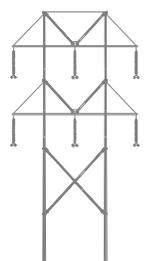
Structure Type B



Structure Type C



Structure Type D



Structure Type E

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↑	↓	↓	↓	-	-	-	-
2	↓	↓	↓	↓	↑	↑	-	↓
3	↑	↓	↓	↓	↑	↑	↑	↓
4	↓	↓	↓	↓	↑	↑	↑	↑
5	↓	↓	↓	↓	↑	↑	↑	↑
6	↓	↓	↓	↓	↑	↑	↑	↑

<sup>4</sup> If existing structures “ES” are to remain in the transmission ROW it is represented by “ES” in the Structure Type in ROW column.

## Cross Section 6 (15GW Case) East Segment

Typical Segment – East Wallingford Junction to North Haven Junction in the Town of Wallingford  
(1.40 Miles 200' ROW)

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		0.2	0.03	1.2	0.53	-	-	See Photo	57'
Proposed Lines on Existing ROW (For Reference)		5.4	0.25	14.3	0.20	3.3	-	A	105'
OPTIONS									
1	Composite with strain insulator	5.1	0.19	12.5	0.34	3.5	0.2	B	115'
2	As Proposed additional 30 feet in height	4.5	0.09	9.4	0.49	3.8	0.5	A	135'
3	Composite strain insulator structures additional 35 feet in height	4.1	0.04	7.7	0.51	4.1	0.8	B	150'



Structure Type A



Structure Type B

Existing ROW Cross Section Looking East

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↑	↓	↑	↓	↑	↑	↑	↑
2	↑	↓	↑	↓	↑	↑	↑	-
3	↑	↓	↑	↓	↑	↑	↑	↑

## Cross Section 6 (15GW Case) West Segment

Typical Segment – North Haven Junction to Wallingford Junction in the Town of Wallingford  
(.64 Miles 200' ROW)

Site Condition	ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW	Typical Height	
	(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase			
Existing Lines (For Reference)	0.3	0.03	2.4	0.52	-	-	See Photo	57'	
Proposed Lines on Existing ROW (For Reference)	5.1	0.25	12.4	0.20	3.3	-	A	105'	
OPTIONS									
1	Cross section does not run through residential or sensitive areas		-	-	-	-	-	-	-



Structure Type A

Existing ROW Cross Section Looking West

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	-	-	-	-	-	-	-	-

### Cross Section 7 (15GW Case)

#### Typical Segment – Wallingford Junction to the Cheshire Town Line (2.42 Miles 200' ROW)

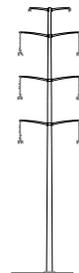
Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW <sup>5</sup>	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		0.4	0.01	4.4	0.09	-	-	See Photo	90'
Proposed Lines on Existing ROW (For Reference)		11.9	0.75	10.2	0.10	1.8	-	ES, A	108'
1	As Proposed Lines additional 20 feet in height	9.6	0.66	8.9	0.12	2.3	0.5	ES, A	128'
2	As Proposed Lines additional 50 feet in height	6.8	0.51	7.2	0.14	2.5	0.7	ES, A	158'
3	345 kV Vertical	7.7	0.28	4.4	0.16	1.9	0.1	ES, B	130'
4	345 kV Split Phase	3.6	0.12	4.4	0.03	2.9	1.1	ES, C	130'



Structure Type A



Structure Type B



Structure Type C

Existing ROW Cross Section

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↑	↓	↑	↓	↑	↑	↑	-
2	↑	↓	↑	↓	↑	↑	↑	↑
3	↑	↓	-	↓	↑	↑	↑	-
4	↑	↓	-	↓	↑	↑	↑	↑

<sup>5</sup> If existing structures “ES” are to remain in the transmission ROW it is represented by “ES” in the Structure Type in ROW column.

## Typical Segment – Cheshire Town line to Cook Hill Junction in the Town of Cheshire (.44 Miles 200' ROW)

Site Condition	ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW <sup>6</sup>	Typical Height		
	(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase				
Existing Lines (For Reference)	0.4	0.01	4.4	0.09	-	-	See Photo	90'		
Proposed Lines on Existing ROW (one 115kV is UG) (For Reference)	6.2	0.21	17.9	0.15	7.5	-	A	130'		
<b>OPTIONS</b>										
1	As Proposed Lines additional 20 feet in height (One 345 kV is UG)		5.5	0.12	13.4	0.22	8.1	0.6	A	150'
2	345 kV Split Phase (One 115kV is UG, one 115 kV remains on existing structure)		3.1	0.38	7.4	0.12	8.1	0.6	ES, B	130'



Existing ROW Cross Section



Structure Type A



Structure Type B

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↑	↓	↑	↓	↑	↑	↑	-
2	↑	↓	↑	↓	↑	-	↑	↑

<sup>6</sup> If existing structures “ES” are to remain in the transmission ROW it is represented by “ES” in the Structure Type in ROW column.

#### Typical Segment – Cook Hill Junction (Cheshire) to the Hamden Town Line (.42 Miles 165' ROW)

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		6.2	0.70	2.8	0.62	-	-	See Photo	57',57',80
Proposed Lines on Existing ROW – 115kV UG (For Reference)		5.0	0.16	16.0	0.31	8.4	-	A	105'
OPTIONS									
1	As Proposed Lines additional 20 feet in height – 115kV UG	4.3	0.11	11.2	0.55	9.0	0.6	A	125'
2	As Proposed Lines additional 50 feet in height – 115kV UG	3.3	0.10	6.7	0.52	9.5	1.1	A	155'
3	345 kV Split Phase (1) 115kV circuit OH	1.8	0.12	6.0	0.57	9.9	1.5	B, C	80',105'
4	345 kV split-phase additional 30 feet in height (1) 115kV circuit OH)	0.8	0.17	3.0	0.62	10.8	2.4	B, C	110', 135'
5	345 kV Split-Phase centered on ROW with 115 kV UG in street	3.6	0.15	3.6	0.15	12.5	4.1	C	105'



Structure Type A



Structure Type B



Structure Type C

#### Existing ROW Cross Section Looking South

Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↓	↓	↑	↓	↑	↑	↑	-
2	↓	↓	↑	↓	↑	↑	↑	↑
3	↓	↓	↑	↓	↑	-	↑	↑
4	↓	↓	↑	↓	↑	↑	↑	↑
5	↓	↓	↑	↓	↑	↑	↑	↑

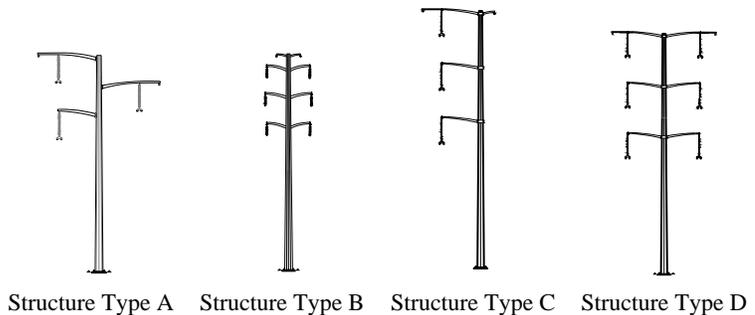
## Cross Section 8 (15GW Case) North Segment

### Typical Segment – Cheshire / Hamden Town Line to Glen Lake Junction (Woodbridge) (7.13 Miles 165' ROW)

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		4.7	0.70	2.6	0.62	-	-	See Photo	57',57',80
Proposed Lines on Existing ROW (For Reference)		8.7	0.45	15.7	1.48	3.8	-	A,B	85',80'
OPTIONS									
1	As Proposed Lines additional 20 feet in height	7.4	0.43	11.7	1.15	4.6	0.8	A,B	105',100'
2	As Proposed Lines additional 50 feet in height	5.4	0.26	7.5	0.73	5.4	1.6	A,B	135', 130'
3	345 kV Vertical Compact Construction	9.5	0.31	16.6	0.09	4.2	0.4	C,B	105', 80'
4	345 kV Split Phase	2.5	0.39	5.8	0.56	5.0	1.2	D,B	105', 80'
5	345 kV Split Phase additional 30 feet in height	0.9	0.34	2.9	0.62	5.5	1.7	D,B	135', 110'
6	345 kV Split-Phase centered on ROW with 115 kV UG in street (115 kV XLPE)	3.6	0.15	3.6	0.15	10.2	6.4	D	105'



Existing ROW Cross Section Looking South



Comparison Table (↑ = Increase ↓ - Decrease - Neutral)									
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed	
1	↑	↓	↑	↓	↑	↑	↑	-	
2	↑	↓	↑	↓	↑	↑	↑	↑	
3	↑	↑	↑	↑	↑	↑	↑	-	
4	↓	↓	↑	↓	↑	↑	↑	↑	
5	↓	↓	↑	↓	↑	↑	↑	↑	
6	↓	↓	↑	↓	↑	↑	↑↑	↑↑	

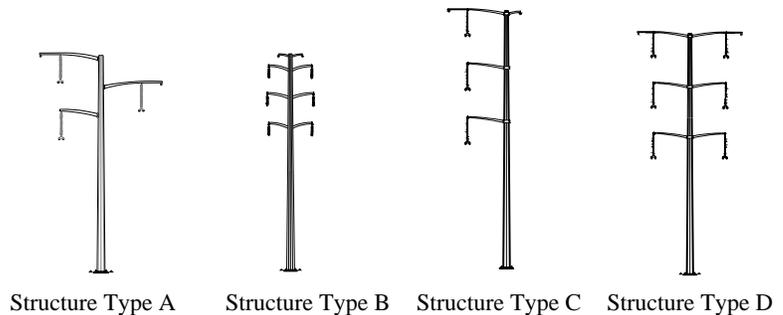
## Cross Section 8 (15GW Case) Middle Segment

Typical Segment – Glen Lake Junction (Woodbridge) to Pease Road Junction (Woodbridge) Segment “B”  
(2.91 Miles 165' ROW)

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		6.2	0.70	2.8	0.62	-	-	See Photo	57', 57', 80'
Proposed Lines on Existing ROW (For Reference)		8.7	0.45	15.7	1.48	3.8	-	A,B	85', 80'
OPTIONS									
1	As Proposed Lines additional 20 feet in height	7.4	0.43	11.7	1.15	4.6	0.8	A,B	105', 100'
2	As Proposed Lines additional 50 feet in height	5.4	0.26	7.5	0.73	5.4	1.6	A,B	135', 130'
3	345 kV Vertical Compact Construction	9.6	0.31	16.6	0.09	4.2	0.4	C,B	105', 80'
4	345 kV Split Phase	2.7	0.39	5.8	0.56	5.0	1.2	D,B	105', 80'
5	345 kV Split Phase additional 30 feet in height	0.9	0.34	2.9	0.62	5.5	1.7	D,B	135', 110'
6	345 kV Split-Phase centered on ROW with 115 kV UG in street	3.6	0.15	3.6	0.15	10.2	6.4	D	105'



Existing ROW Cross Section Looking South

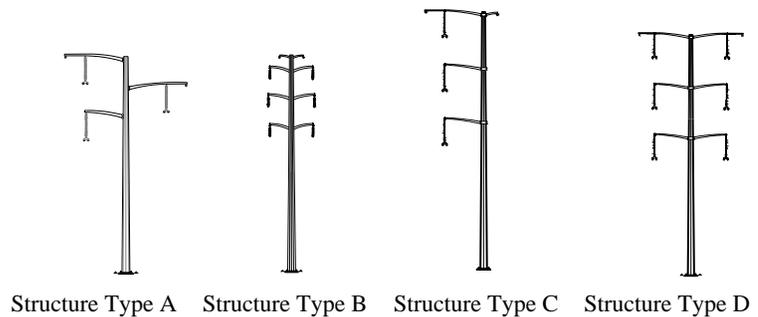


Comparison Table (↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↑	↓	↑	↓	↑	↑	↑	-
2	↓	↓	↑	↓	↑	↑	↑	↑
3	↑	↑	↑	↑	↑	↑	↑	-
4	↓	↓	↑	↓	↑	↑	↑	↑
5	↓	↓	↑	↓	↑	↑	↑	↑
6	↓	↓	↑	↓	↑	↑	↑↑	↑↑

## Cross Section 8 (15GW Case) South Segment

**Typical Segment – Pease Road Junction (Woodbridge) to East Devon S/S (Milford) Segment “C”**  
**(12.0 Miles 165' ROW)**

Site Condition		ROW Edge S/E		ROW Edge N/W		Cost / Mile (Million)		Structure Type in ROW	Typical Height
		(mG)	(kV/m)	(mG)	(kV/m)	Direct	Increase		
Existing Lines (For Reference)		3.9	0.70	1.6	0.62	-	-	See Photo	57', 57', 80
Proposed Lines on Existing ROW (For Reference)		11.2	0.45	16.0	1.48	3.8	-	A,B	85', 80'
OPTIONS									
1	As Proposed Lines additional 20 feet in height	8.7	0.43	11.9	1.15	4.6	0.8	A,B	105', 100'
2	As Proposed Lines additional 50 feet in height	6.1	0.26	7.7	0.73	5.4	1.6	A,B	135', 130'
3	345 kV Vertical Compact Construction	5.4	0.31	16.7	0.09	4.2	0.4	C,B	105', 80'
4	345 kV Split Phase	1.7	0.29	5.9	0.61	5.0	1.2	D,B	105', 80'
5	345 kV Split Phase additional 30 feet in height	0.6	0.44	2.9	0.62	5.5	1.7	D,B	135', 110'
6	345 kV Split-Phase centered on ROW with 115 kV UG in street	3.6	0.15	3.6	0.15	10.2	6.4	D	105'



**Existing ROW Cross Section Looking South**

Comparison Table								
(↑ = Increase ↓ - Decrease - Neutral)								
Option	Magnetic Fields S/E		Magnetic Fields N/W		Height		Cost	Construction & Maintenance
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Proposed	Proposed
1	↑	↓	↑	↓	↑	↑	↑	-
2	↑	↓	↑	↓	↑	↑	↑	↑
3	↑	↓	↑	↑	↑	↑	↑	-
4	↓	↓	↑	↓	↑	↑	↑	↑
5	↓	↓	↑	↓	↑	↑	↑	↑
6	↓	↓	↑	↓	↑	↑	↑↑	↑↑