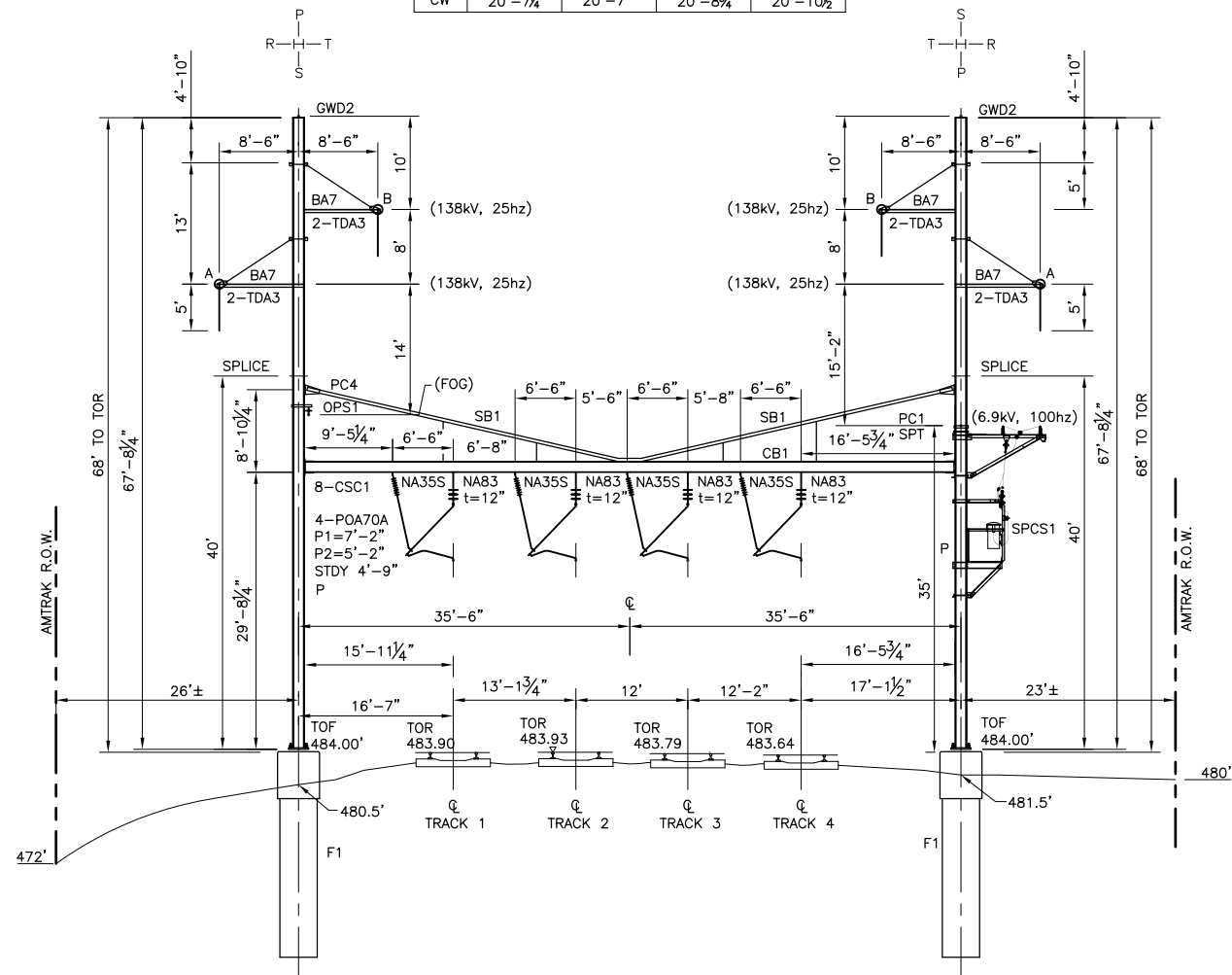


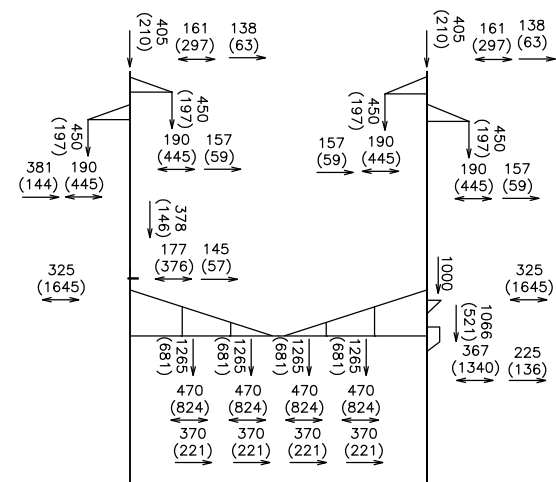
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-7 1/4"	26'-7"	26'-8 3/4"	26'-10 1/2"
CW	20'-7 1/4"	20'-7"	20'-8 3/4"	20'-10 1/2"



STRUCTURE ERECTION DIAGRAM T-378

903+20  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORM.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWD2	GROUND WIRE DEADEND	ET-1909	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPT	SIGNAL POWER TERMINATION	ET-1913	1	
SPCS1	SIGNAL POWER CUT SECTION	ET-1810	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC1	SLIDING CLAMP	S-5214	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA7	TRANSMISSION BRACKET	S-5205	4	
CSC1	SLIDING BRACKET	S-5214	8	

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30TH Street Station-Philadelphia, Pennsylvania 19104

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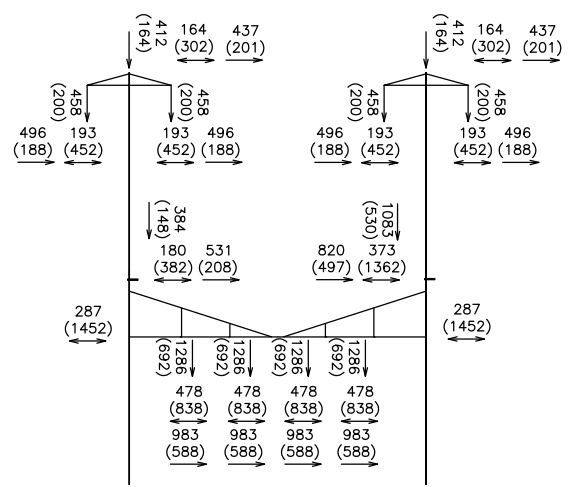
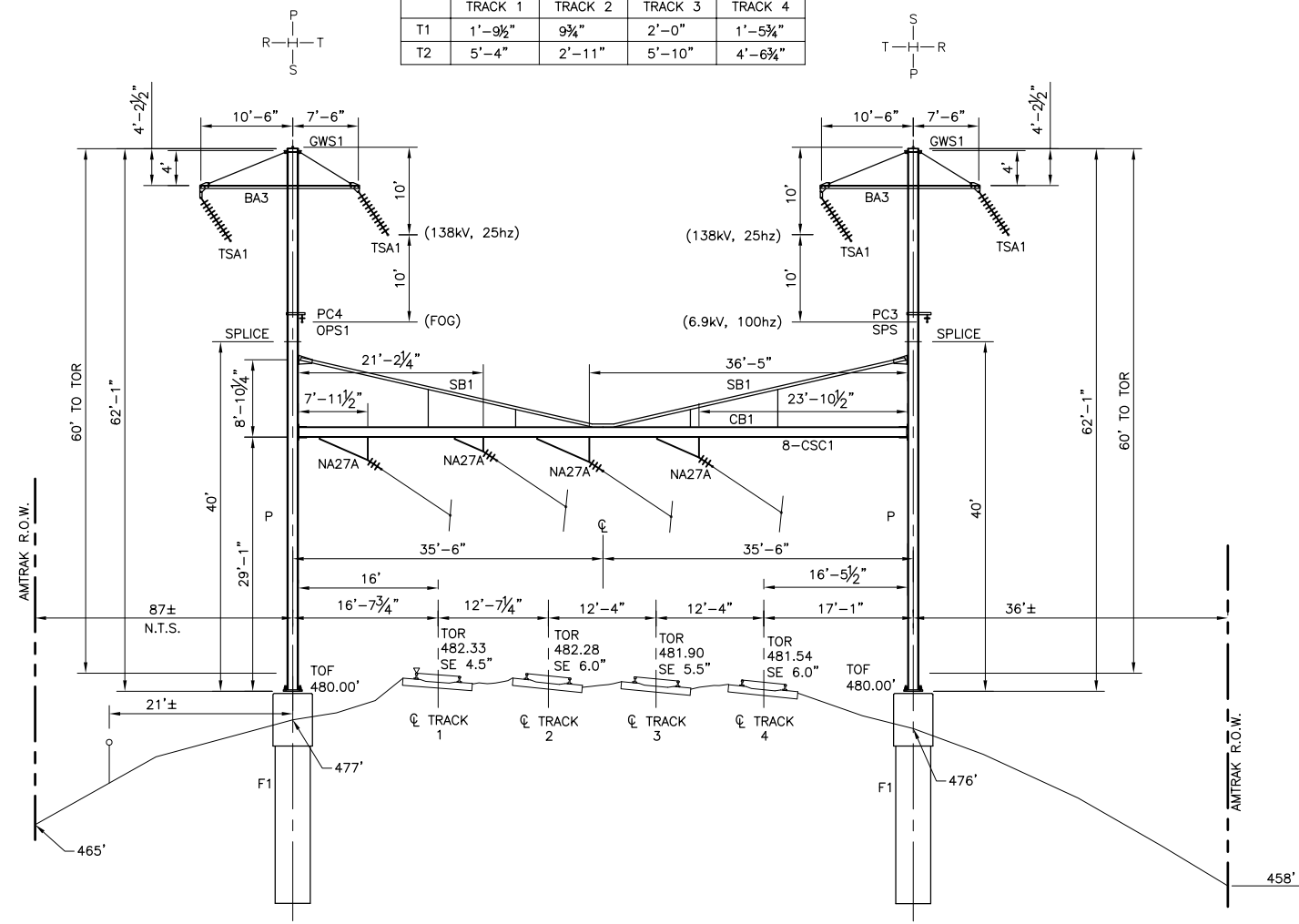
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-378  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1277.DWG  
Ref. No.: 2011-059  
Sheet No: 189 OF 565  
ET-1277

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-10 3/4"	24'-4 1/2"	23'-6 3/4"	24'-5 3/4"
CW	18'-7 1/4"	19'-1"	18'-4"	19'-2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-9 1/2"	9 3/4"	2'-0"	1'-5 3/4"
T2	5'-4"	2'-11"	5'-10"	4'-6 3/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 305' LOAD SPAN  
 (NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-377**

900+12  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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 National Railroad Passenger Corporation  
 30TH Street Station-Philadelphia, Pennsylvania 19104

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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-377**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1278.DWG  
 Ref. No.: 2011-059  
 Sheet No: 190 OF 565  
**ET-1278**

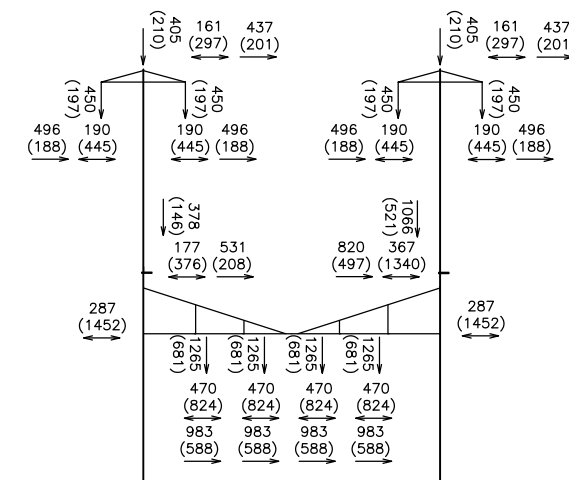


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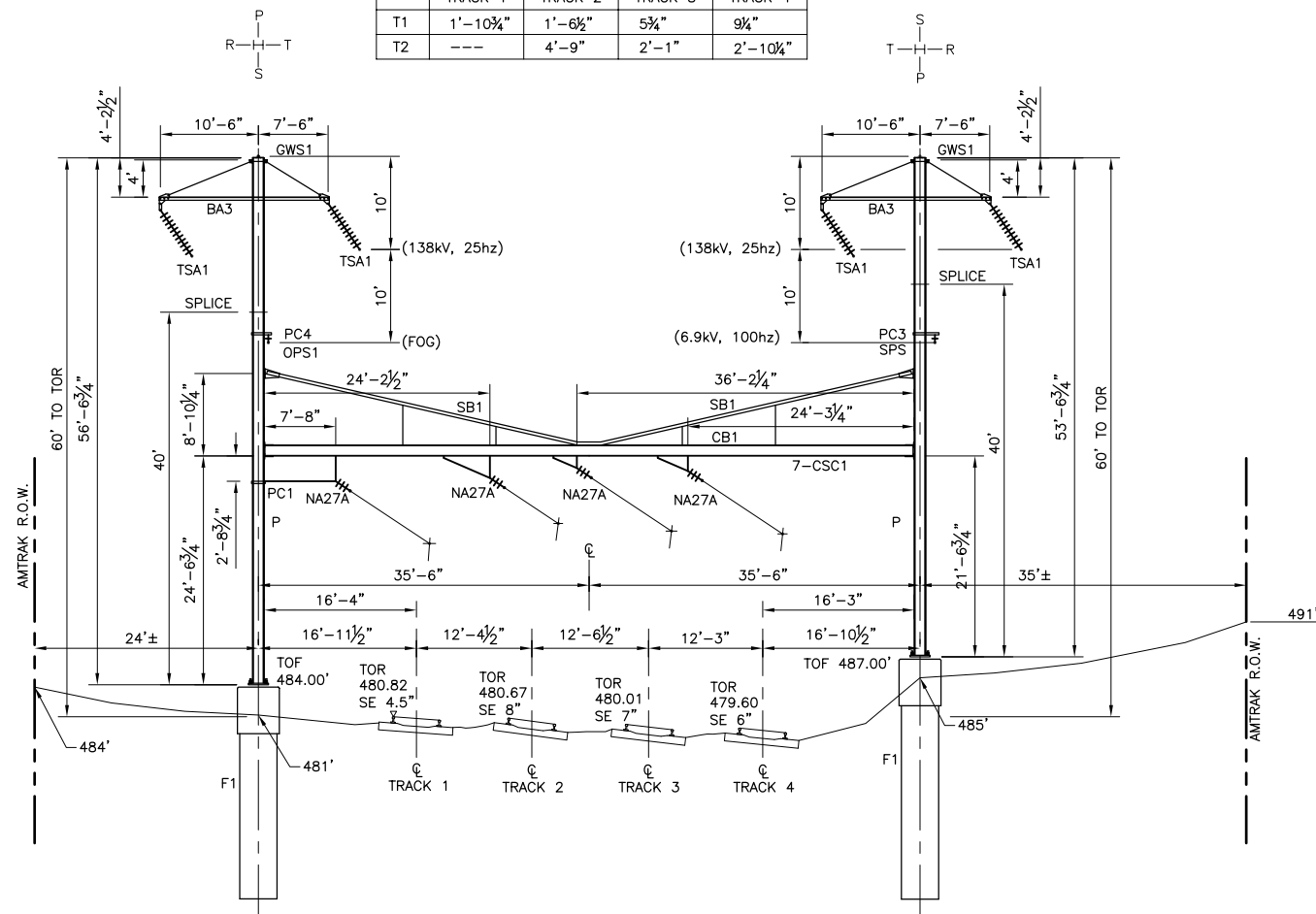
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC1	SLIDING CLAMP	S-5214	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	7

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-3"	24'-9"	26'-5 1/4"	26'-7"
CW	18'-7"	20'-10 1/4"	20'-9"	20'-10 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-10 3/4"	1'-6 1/2"	5 3/4"	9 1/4"
T2	---	4'-9"	2'-1"	2'-10 1/4"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE ERECTION DIAGRAM T-376

897+13  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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IN ASSOCIATION WITH



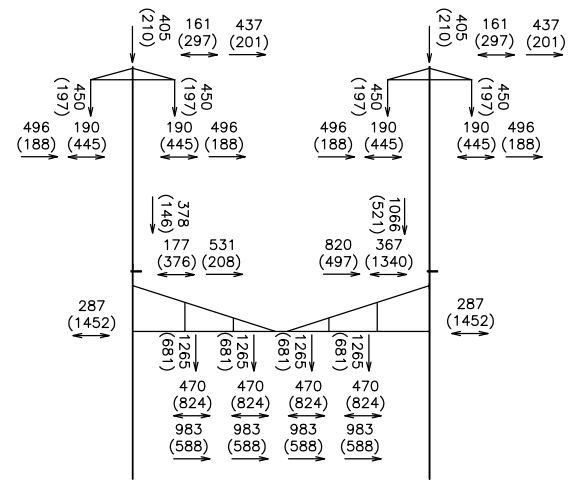
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-376

File No.: 2011-059-ET-1279.DWG  
Ref. No.: 2011-059  
Sheet No.: 191 OF 565

ET-1279

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

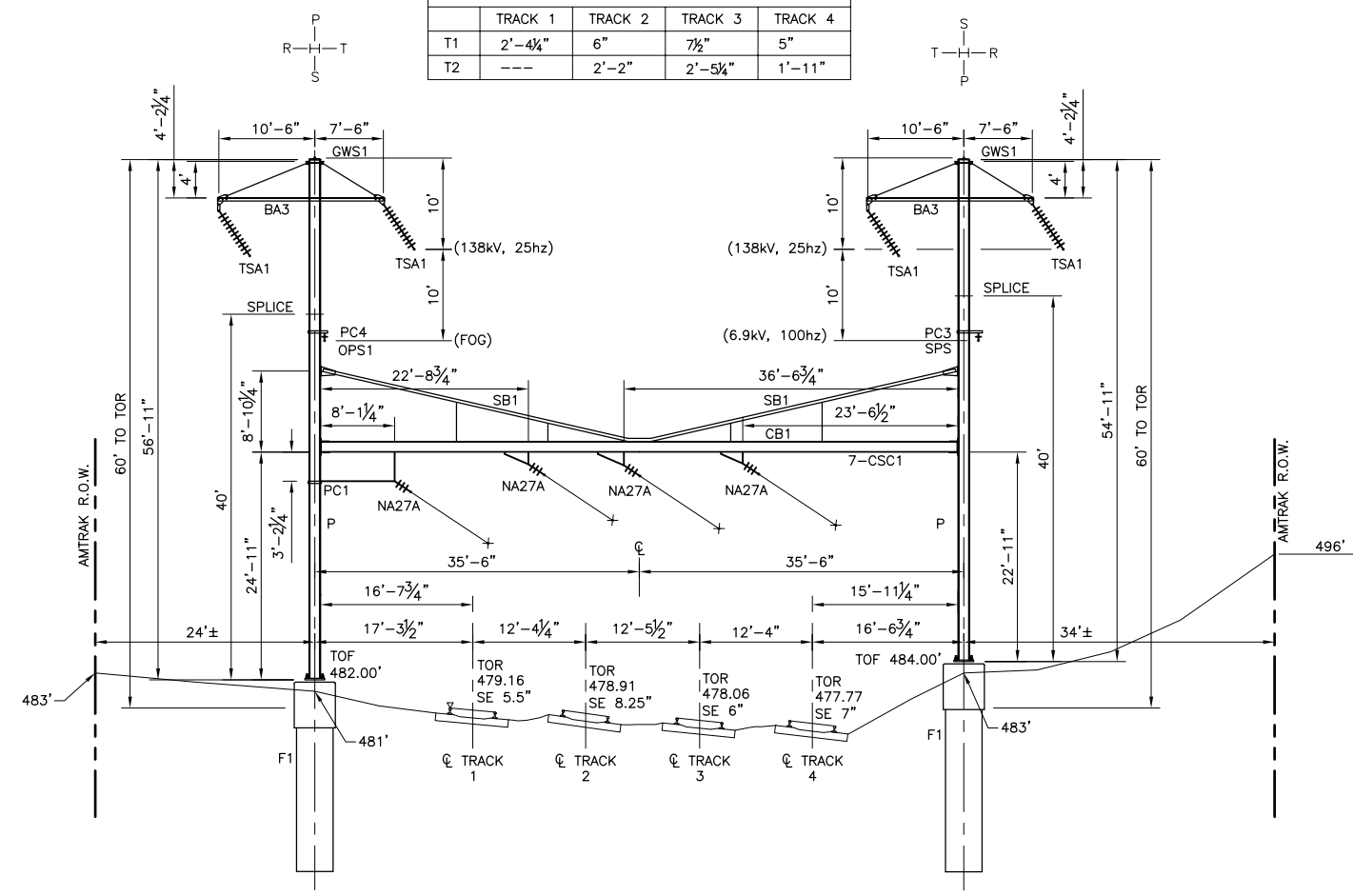
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC1	SLIDING CLAMP	S-5214	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	7



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-7 3/4"	25'-9"	26'-5 3/4"	26'-0"
CW	18'-0 1/4"	20'-9 1/2"	20'-8 3/4"	21'-4 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-4 1/4"	6"	7 1/2"	5"
T2	---	2'-2"	2'-5 3/4"	1'-11"



**STRUCTURE ERECTION DIAGRAM T-375**  
 894+12  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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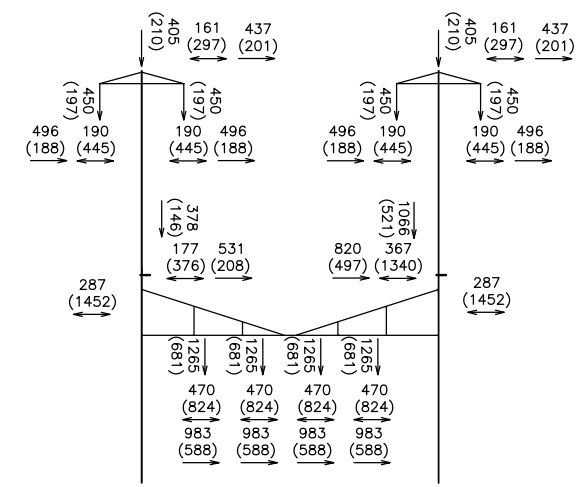
Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION**  
**ELECTRIFICATION**  
**STRUCTURAL ERECTION DIAGRAM**  
**T-375**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1280.DWG  
 Ref. No.: 2011-059  
 Sheet No: 192 OF 565  
**ET-1280**

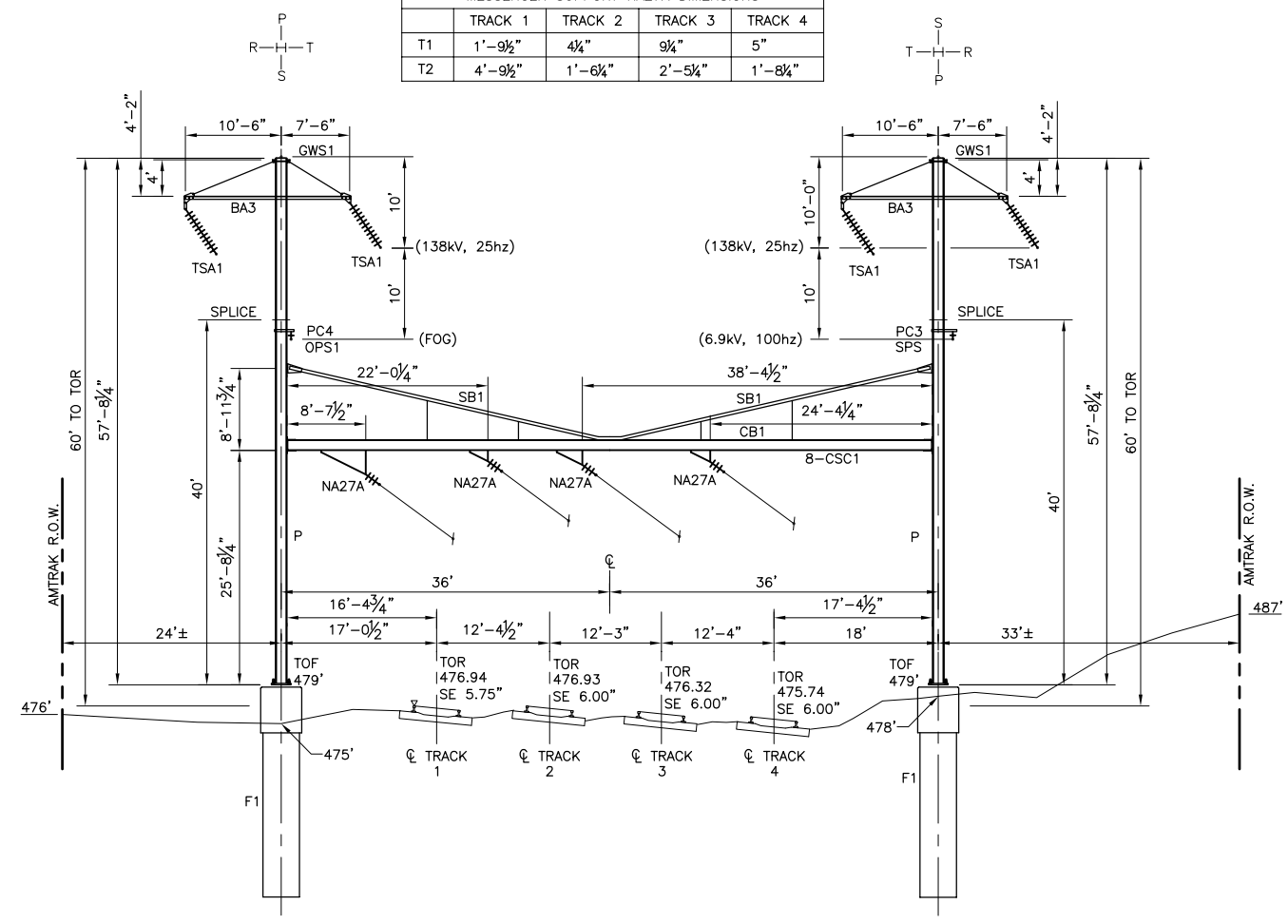
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-3 1/4"	25'-8 3/4"	25'-11 1/4"	26'-10 1/4"
CW	18'-3 3/4"	20'-3 3/4"	19'-2 1/4"	21'-2 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-9 1/2"	4 1/4"	9 1/4"	5"
T2	4'-9 1/2"	1'-6 1/4"	2'-5 1/4"	1'-8 3/4"



**STRUCTURE ERECTION DIAGRAM T-374**  
 891+12  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



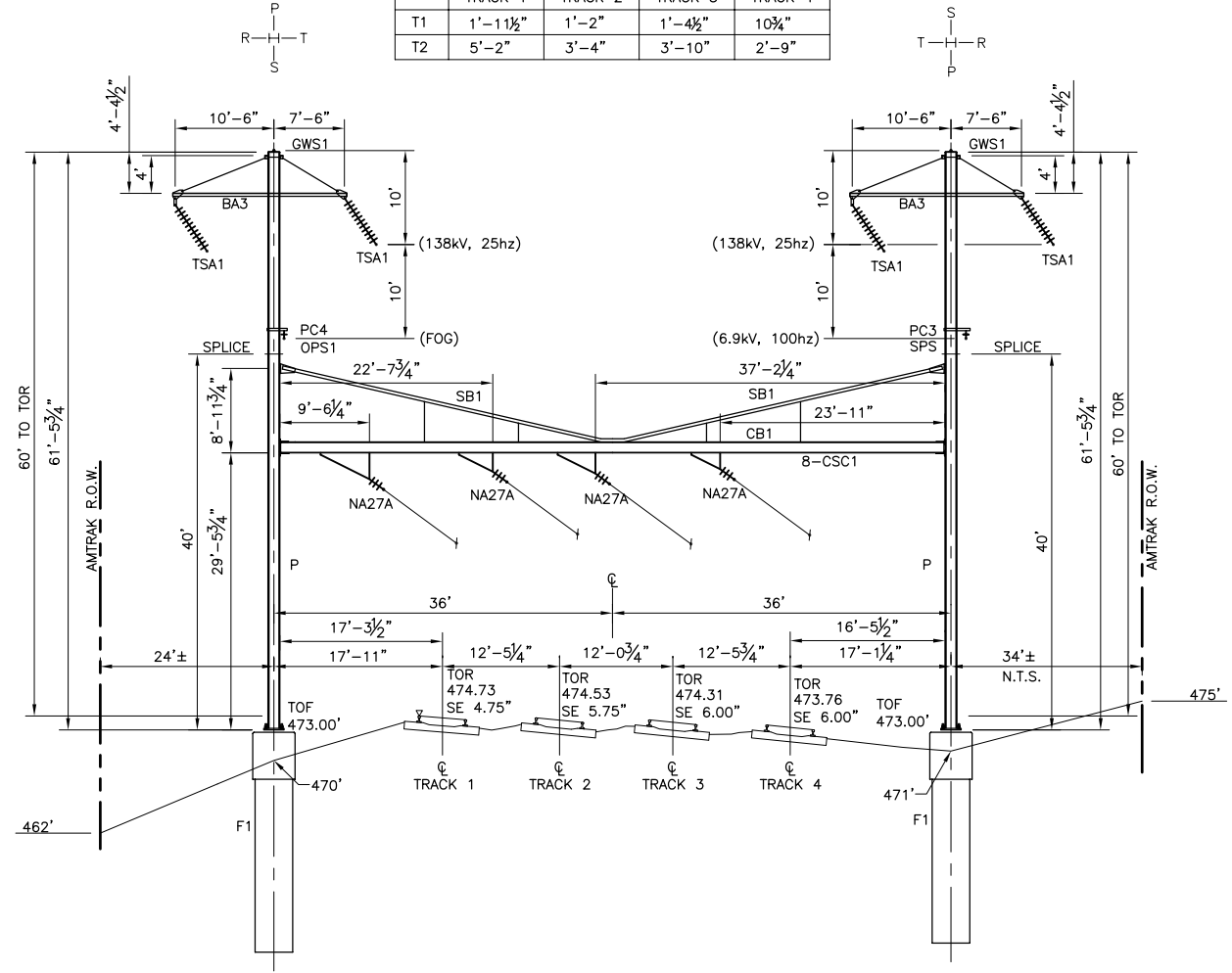
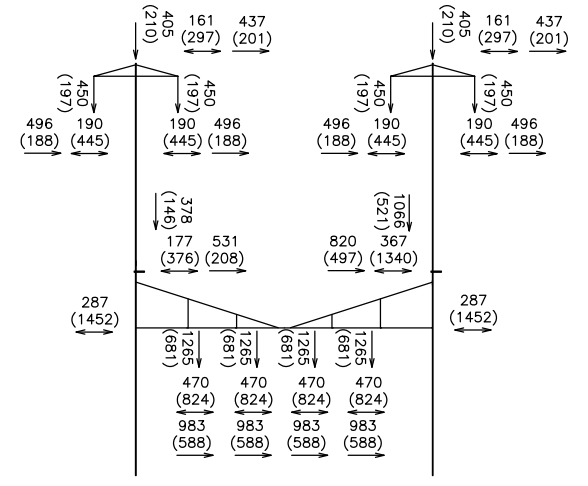
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-374**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1281.DWG  
 Ref. No.: 2011-059  
 Sheet No: 193 OF 565  
**ET-1281**

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-1 1/4"	25'-1 1/4"	25'-1 1/2"	26'-1 3/4"
CW	18'-4 3/4"	19'-6 3/4"	18'-8 3/4"	20'-2 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-11 1/2"	1'-2"	1'-4 1/2"	10 3/4"
T2	5'-2"	3'-4"	3'-10"	2'-9"



STRUCTURE ERECTION DIAGRAM T-373  
888+13  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

- WORK STATEMENT:**
- INSTALL FOUNDATIONS.
  - INSTALL POLES, CROSS BEAM AND SAG BRACES.
  - INSTALL TRANSMISSION BRACKETS.
  - INSTALL SIGNAL POWER SUPPORT BRACKET.
  - INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  - TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  - INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  - TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  - ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  - DEMO OLD CAT POLES AND FOUNDATIONS.

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Approved	Date

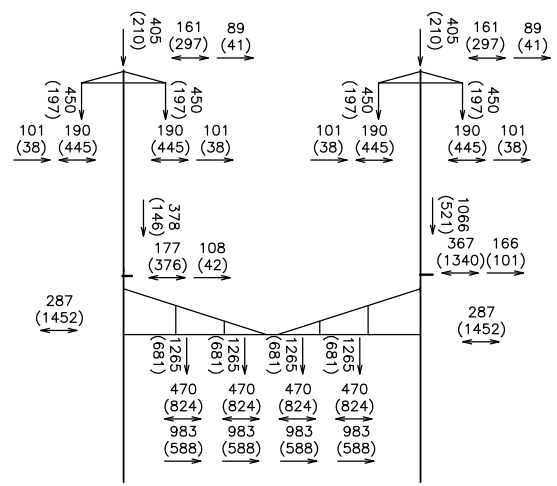


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-373**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1282.DWG
Ref. No.:	2011-059
Sheet No.:	194 OF 565
ET-1282	

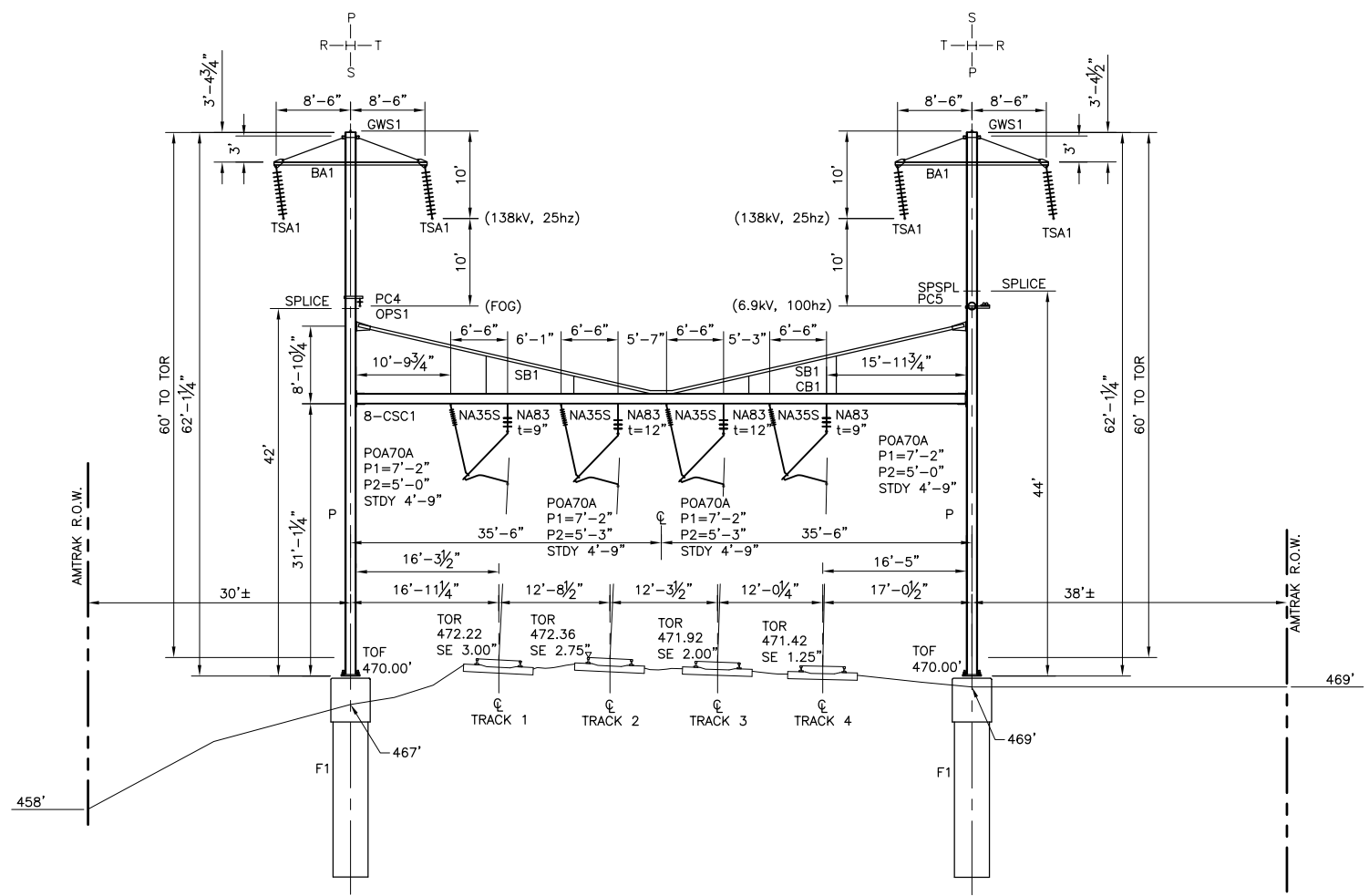
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPSPL	SIGNAL POWER SPLICE	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC4	SLIDING CLAMP	S-5215	1
PC5	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-11 3/4"	25'-7"	26'-0 1/4"	26'-9 1/4"
CW	19'-11 3/4"	19'-7"	20'-0 1/4"	20'-9 1/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.



**STRUCTURE ERECTION DIAGRAM T-372**  
 885+13  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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**AMTRAK**

**OFFICE OF Chief Engineer Engineering**

National Railroad Passenger Corporation  
 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date

**Burns Baker**

BURNS ENGINEERING, INC. | 215 679-7700  
 TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
 PHILADELPHIA, PA 19103

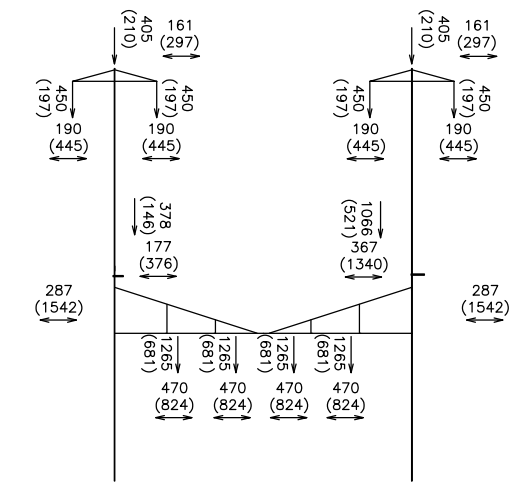
**AECOM**

**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-372**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

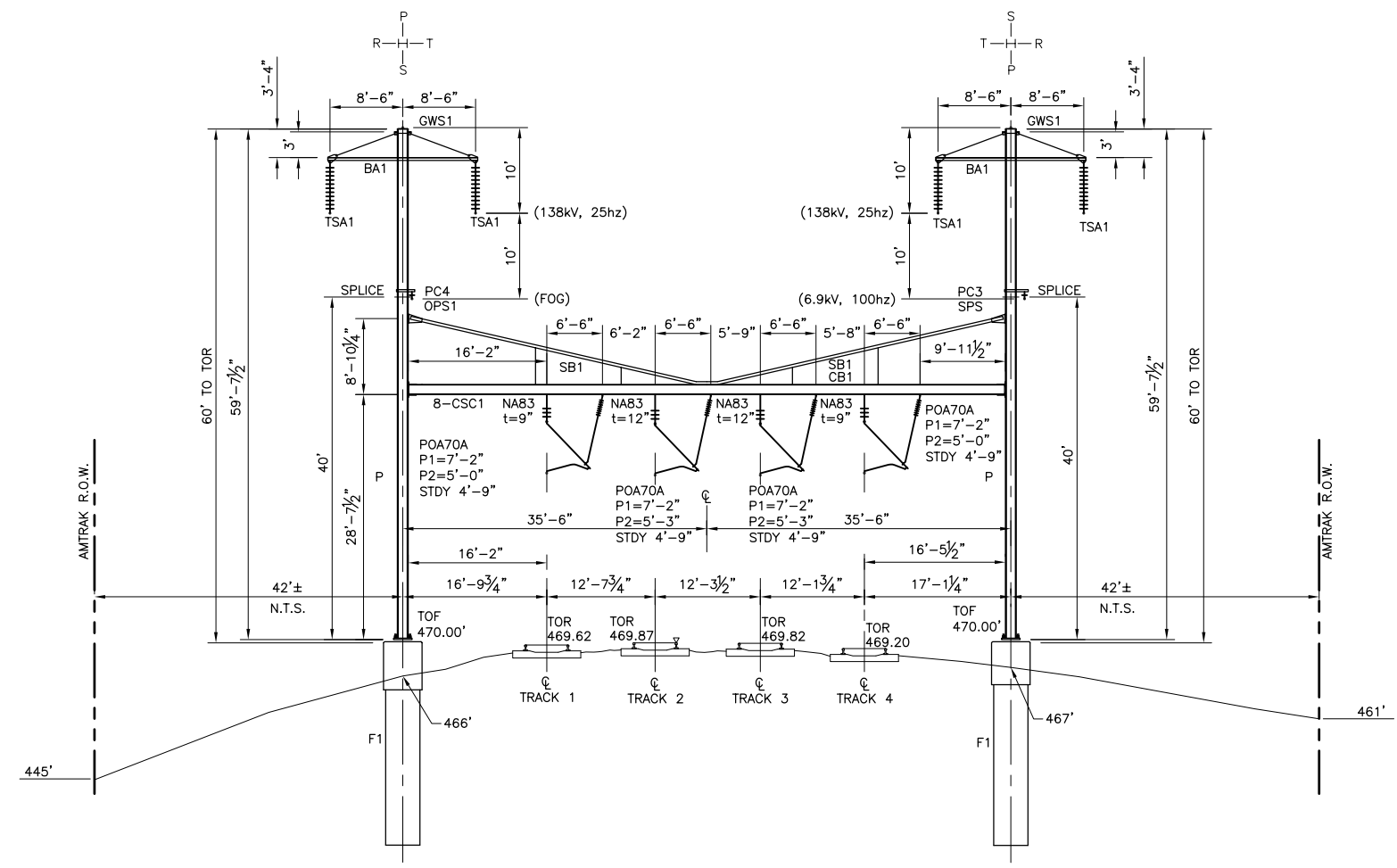
File No.:	2011-059-ET-1283.DWG
Ref. No.:	2011-059
Sheet No.:	195 OF 565
<b>ET-1283</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET-DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-1"	25'-7"	25'-7½"	26'-6"
CW	20'-1"	19'-7"	19'-7½"	20'-6"



**STRUCTURE ERECTION DIAGRAM T-371**  
 882+13  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 30TH Street Station-Philadelphia, Pennsylvania 19104

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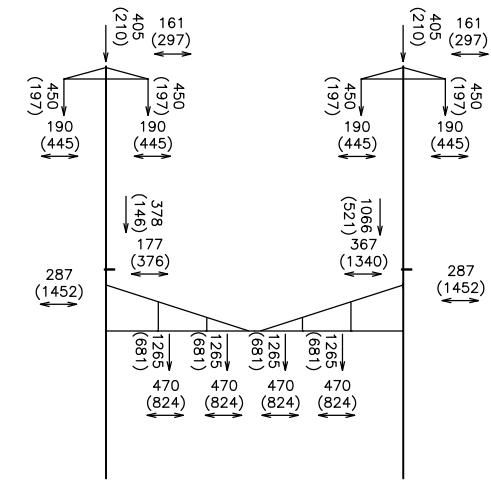


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-371**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

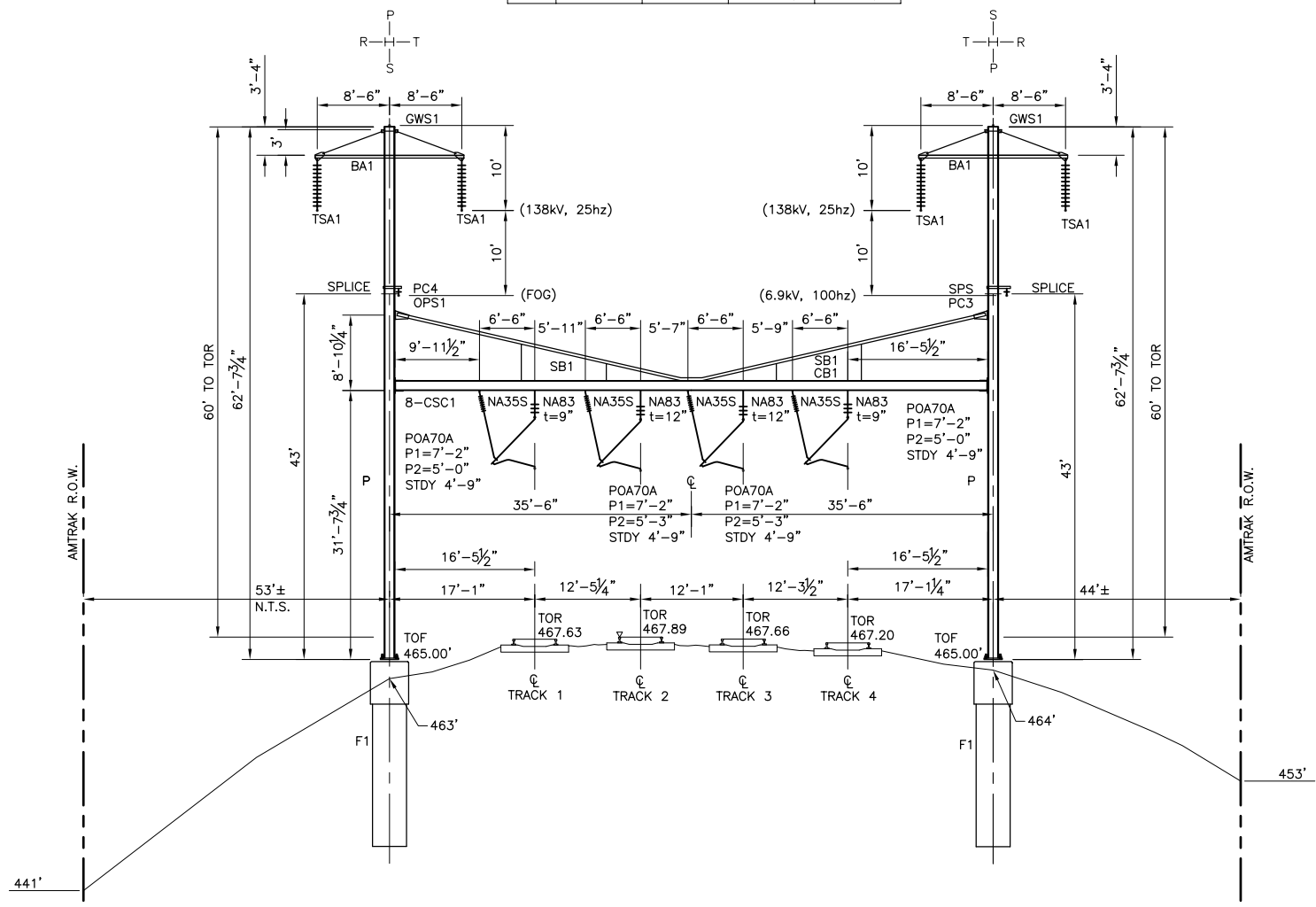
File No.: 2011-059-ET-1284.DWG  
 Ref. No.: 2011-059  
 Sheet No: 196 OF 565  
**ET-1284**

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	2
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	1
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-1"	25'-7"	25'-9 3/4"	26'-6 1/4"
CW	20'-1"	19'-7"	19'-9 3/4"	20'-6 1/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)



**STRUCTURE ERECTION DIAGRAM T-370**  
 879+13  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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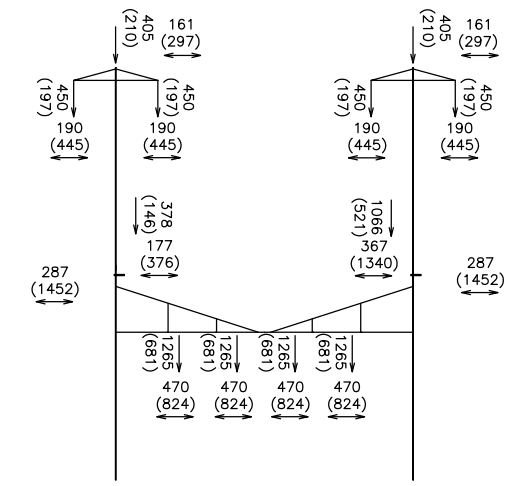
Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-370**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

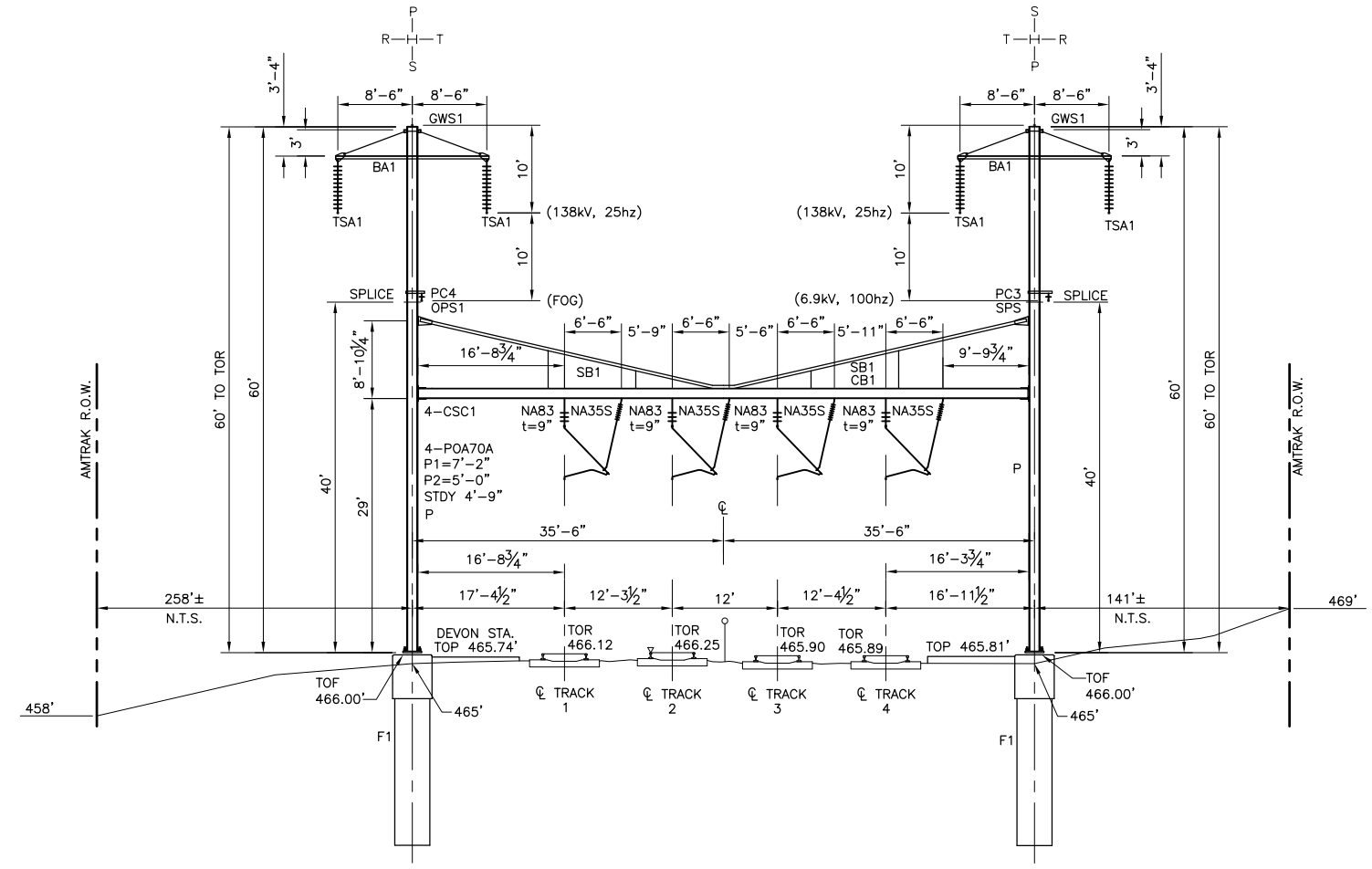
File No.:	2011-059-ET-1285.DWG
Ref. No.:	2011-059
Sheet No.:	197 OF 565
<b>ET-1285</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-11 1/2"	25'-10"	26'-2 1/4"	26'-2 1/4"
CW	19'-11 1/2"	19'-10"	20'-2 1/4"	20'-2 1/4"



**STRUCTURE ERECTION DIAGRAM T-369**  
 876+13  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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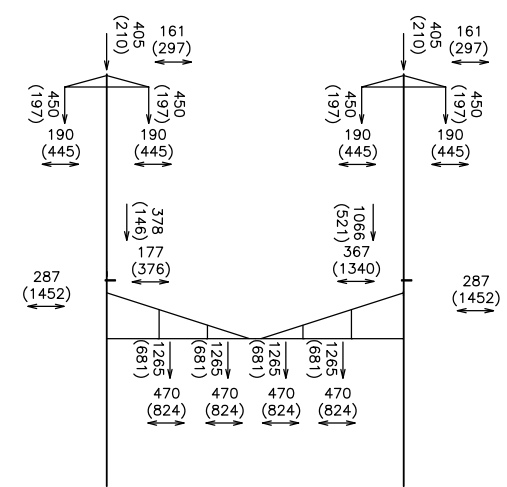


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-369**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1286.DWG
Ref. No.:	2011-059
Sheet No.:	198 OF 565
<b>ET-1286</b>	

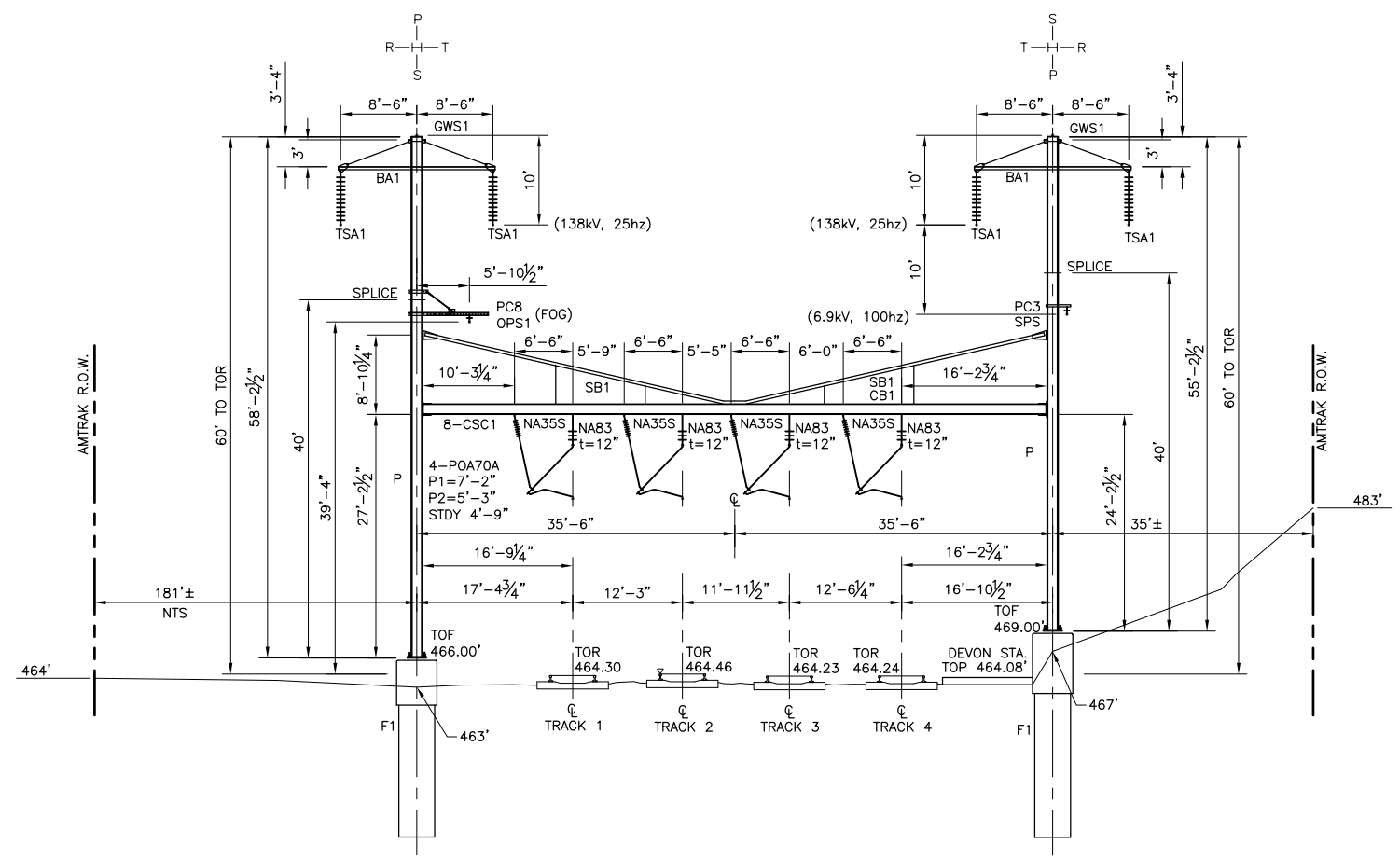


BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC8	SLIDING CLAMP	S-5240	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET-DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-9"	25'-7"	25'-9 3/4"	25'-9 3/4"
CW	19'-9"	19'-7"	19'-9 3/4"	19'-9 3/4"



**STRUCTURE ERECTION DIAGRAM T-368**  
 873+13  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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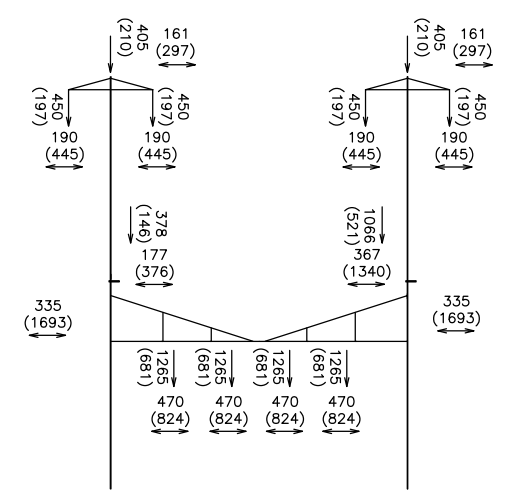
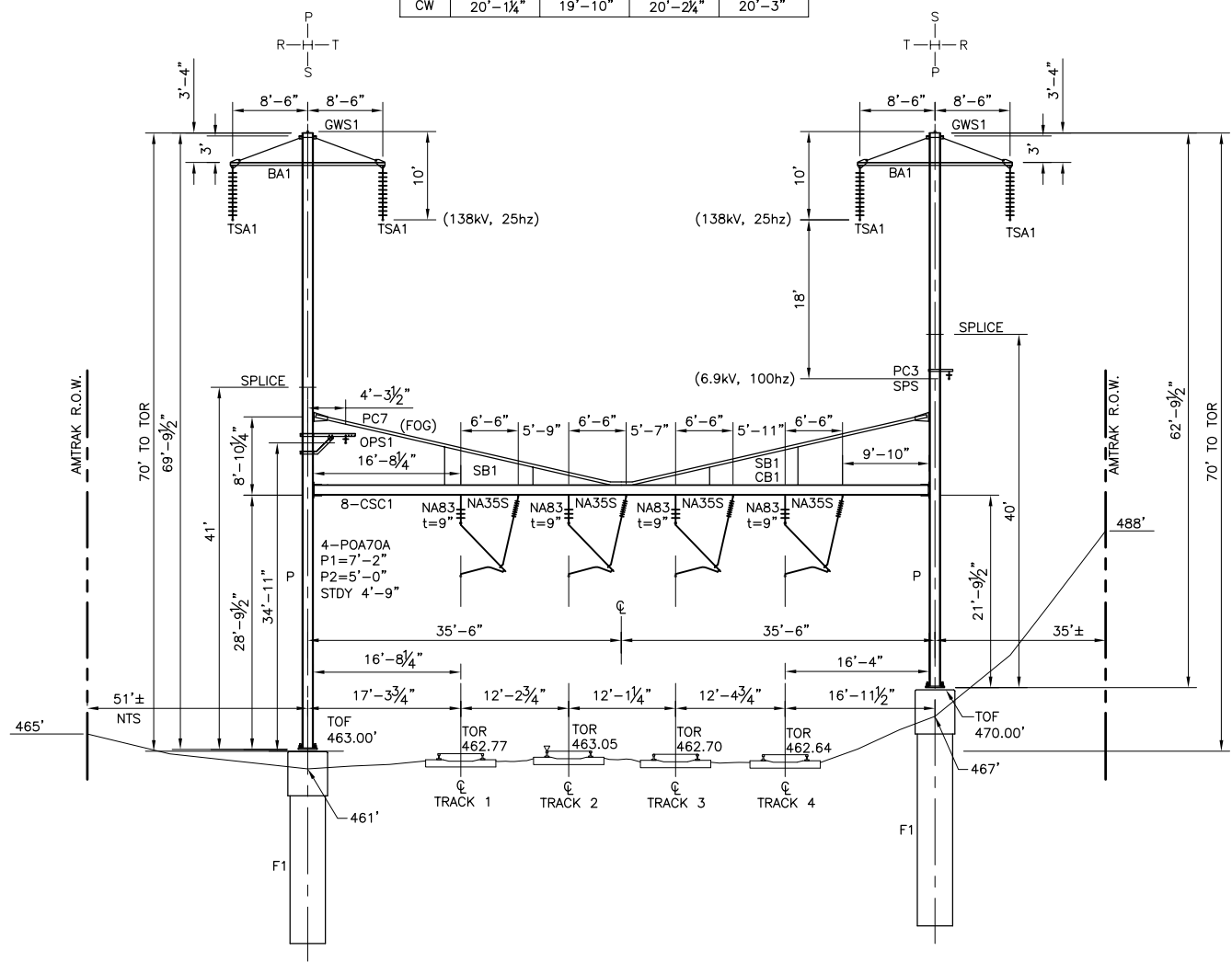


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-368**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1287.DWG
Ref. No.:	2011-059
Sheet No.:	199 OF 565
<b>ET-1287</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
PC7	SLIDING CLAMP	S-5239	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-1 1/4"	25'-10"	26'-2 1/4"	26'-3"
CW	20'-1 1/4"	19'-10"	20'-2 1/4"	20'-3"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-367**  
 870+13  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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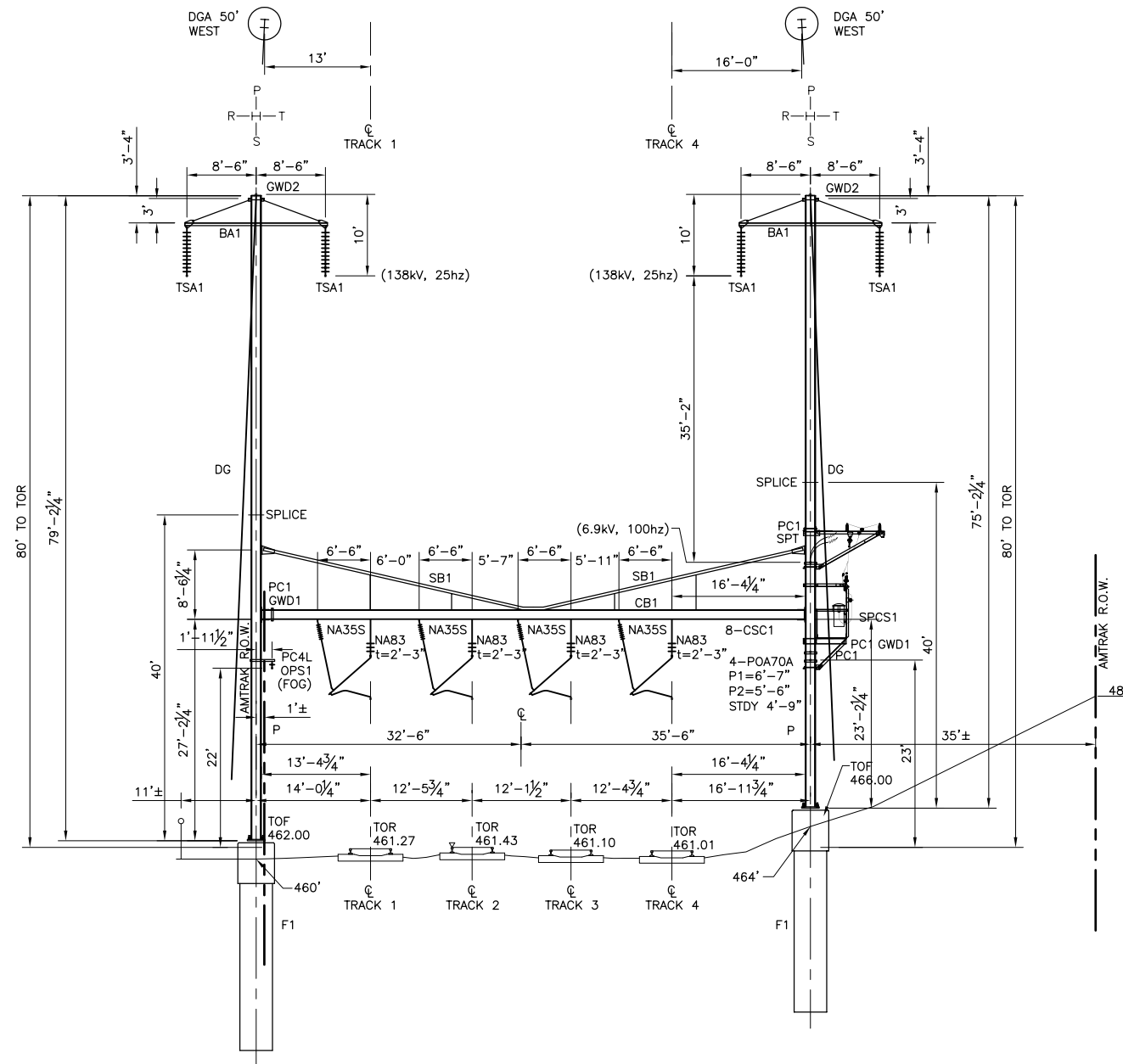
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-367**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1288.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 200 OF 565  
**ET-1288**

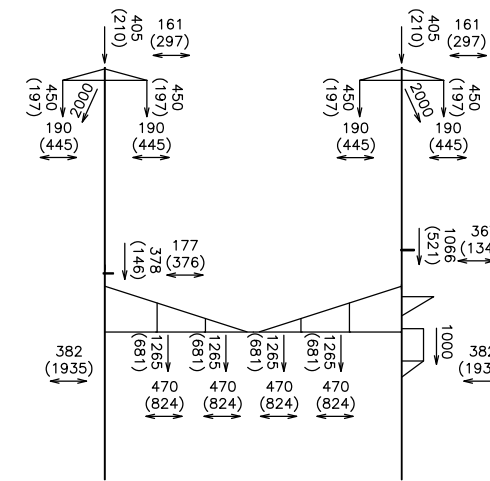
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
GWD1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPT	SIGNAL POWER TERMINATION	ET-1913	1
SPCS1	SIGNAL POWER CUT SECTION	ET-1810	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
DG	DOWNGUY	ET-1908	2
PC1	SLIDING CLAMP	S-5214	4
PC4L	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8
DGA	DOWNGUY FOUNDATION	S-5101	2

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-8"	23'-6"	23'-10"	23'-11"
CW	18'-5"	18'-3"	18'-7"	18'-8"



STRUCTURE ERECTION DIAGRAM T-366  
 867+23  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORM.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 30TH Street Station-Philadelphia, Pennsylvania 19104

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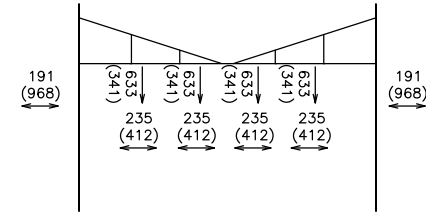


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-366  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

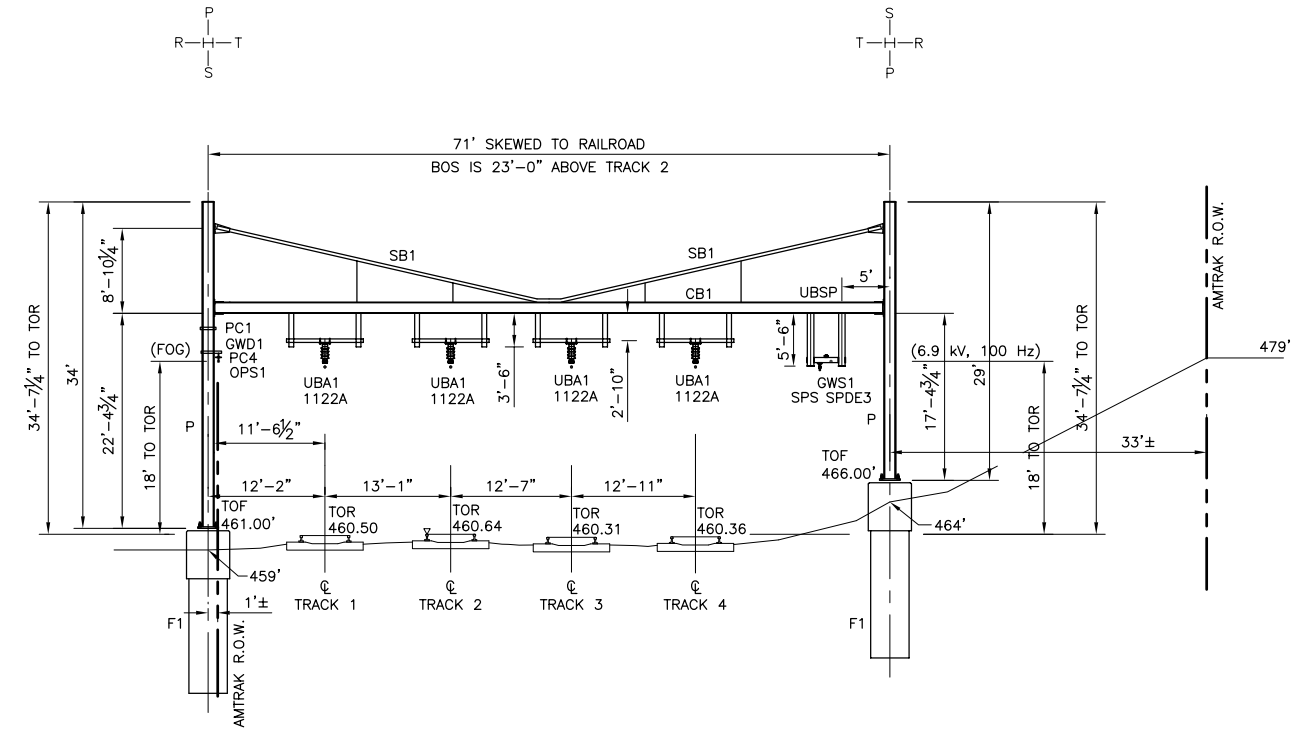
File No.: 2011-059-ET-1289.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 201 OF 565  
 ET-1289

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
1122A	MESSENGER SUPPORT	ET-1904	4
GWD1	GROUND WIRE ASSEMBLY	ET-1909	1
GWS1	GROUND WIRE ASSEMBLY	ET-1909	1
OPS1	FOG WIRE SUPPORT	ET-1606	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
SPDE3	SIGNAL POWER DEADEND	ET-1913	1
PC1	SLIDING CLAMP	S-5214	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
UBA1	BRIDGE BRACKET	S-5228	4
UBSP	SIGNAL POWER BRACKET	S-5240	1

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	18'- $\frac{3}{4}$ "	17'-11"	18'-3"	18'-2 $\frac{1}{2}$ "
CW	17'-6 $\frac{3}{4}$ "	17'-5"	17'-9"	17'-8 $\frac{1}{2}$ "



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 150' LOAD SPAN  
 (NOT TO SCALE)



**STRUCTURE ERECTION DIAGRAM T-365**  
 865+91  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
4. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
5. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
6. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
7. DEMO OLD CAT POLES AND FOUNDATIONS.

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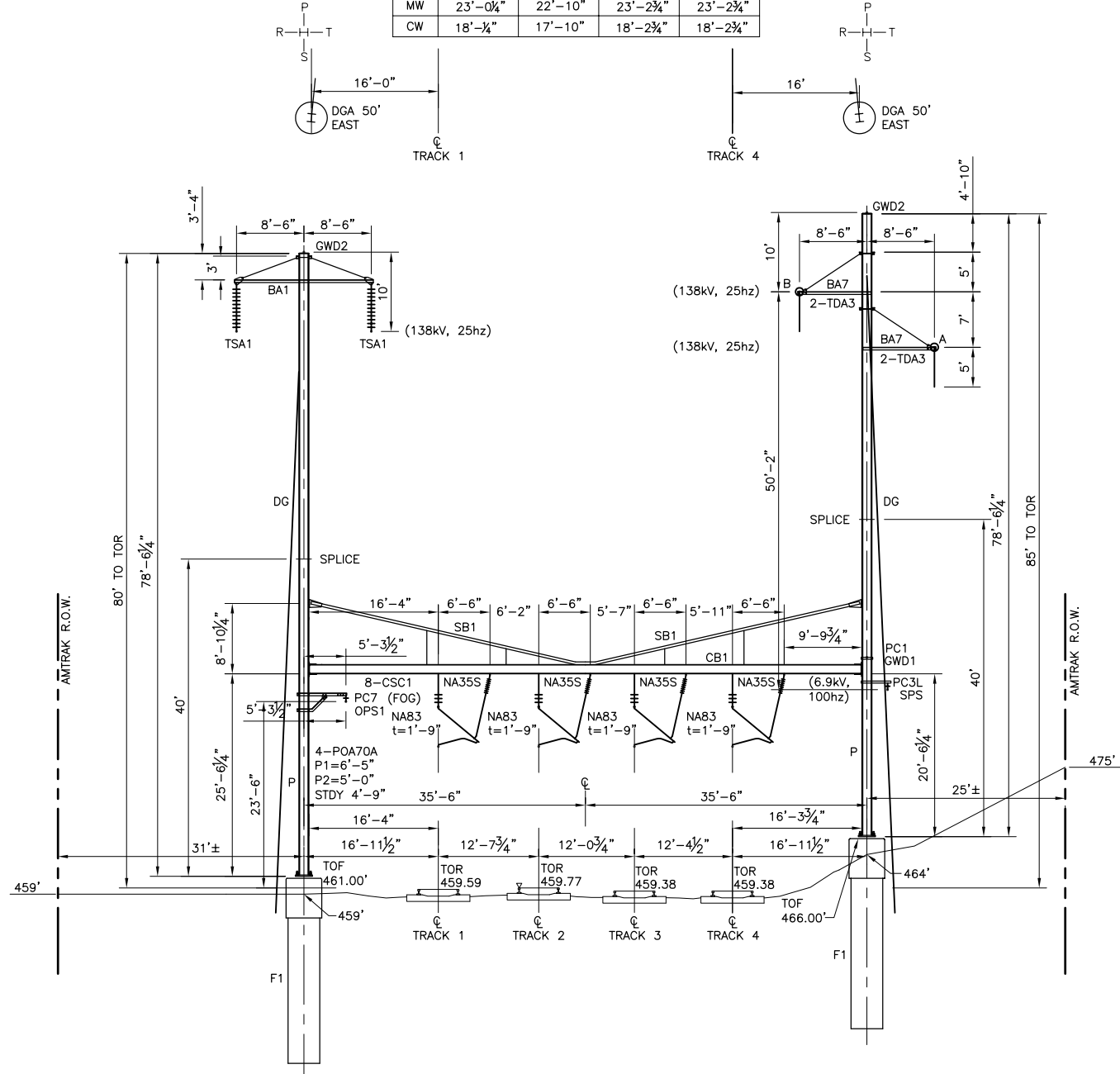
Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-365**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

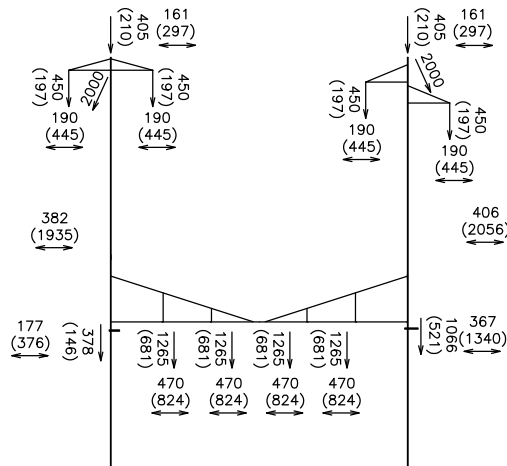
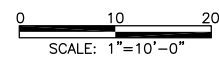
File No.:	2011-059-ET-1290.DWG
Ref. No.:	2011-059
Sheet No.:	202 OF 565
<b>ET-1290</b>	

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-0 1/4"	22'-10"	23'-2 3/4"	23'-2 3/4"
CW	18'-3/4"	17'-10"	18'-2 3/4"	18'-2 3/4"



STRUCTURE ERECTION DIAGRAM T-364

864+34  
LOOKING TOWARDS HARRISBURG



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD1	GROUND WIRE ASSEMBLY	ET-1909	1
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1909	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
DG	DOWNGUY	ET-1908	2
PC1	SLIDING CLAMP	S-5214	1
PC3L	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
PC7	SLIDING CLAMP	S-5239	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA7	TRANSMISSION BRACKET	S-5205	2
DGA	DOWNGUY ANCHOR	S-5101	2
CSC1	SLIDING BRACKET	S-5214	8

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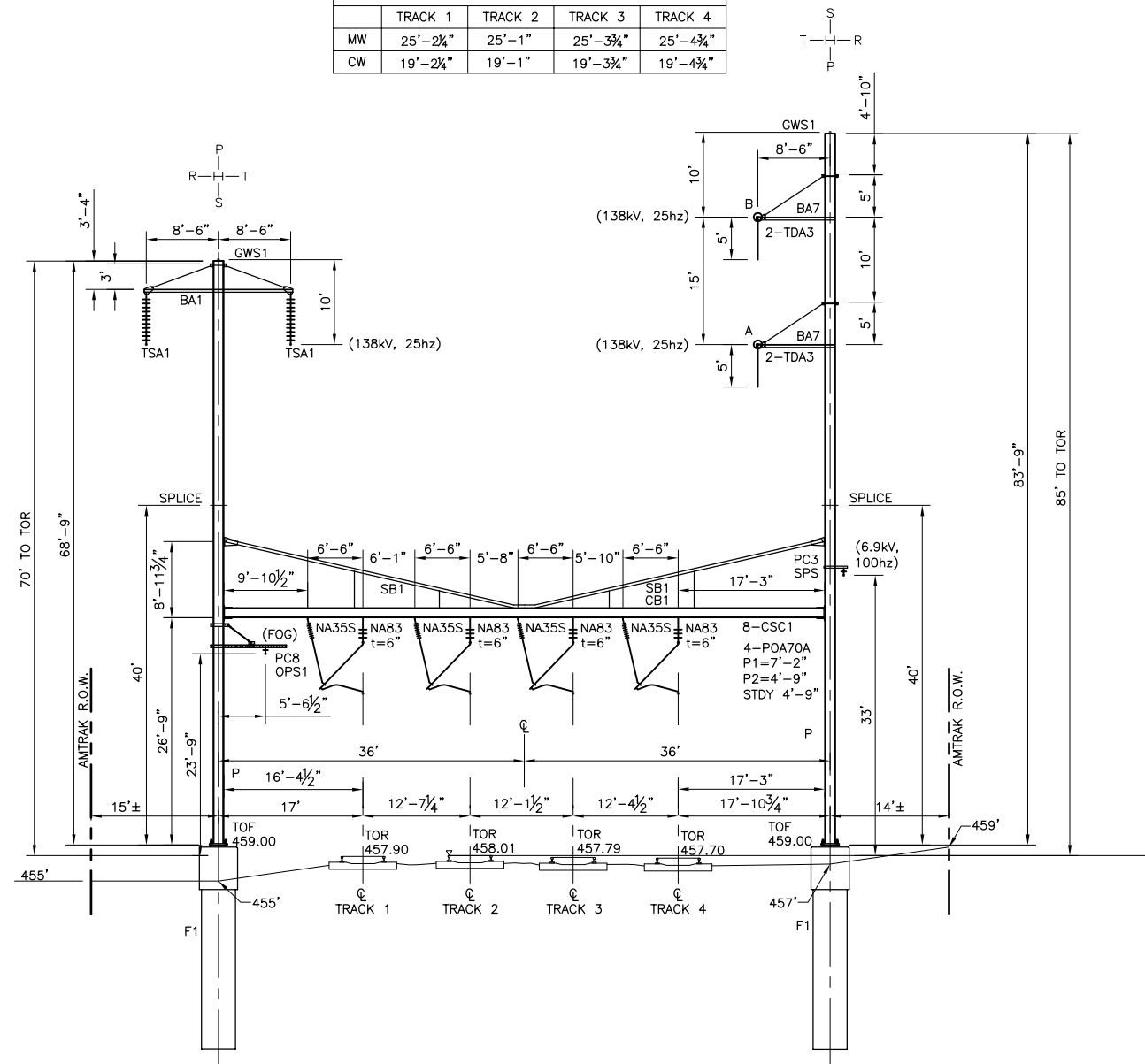
Approved	Date



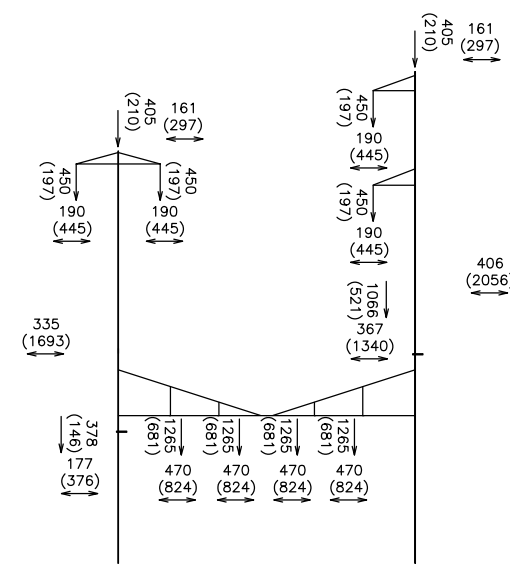
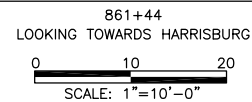
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-364  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1291.DWG  
Ref. No.: 2011-059  
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ET-1291

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-2 1/4"	25'-1"	25'-3 3/4"	25'-4 3/4"
CW	19'-2 1/4"	19'-1"	19'-3 3/4"	19'-4 3/4"



STRUCTURE ERECTION DIAGRAM T-363



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PCB	SLIDING CLAMP	S-5240	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET	S-5200	1	
BA7	TRANSMISSION BRACKET	S-5205	2	
CSC1	SLIDING BRACKET	S-5214	8	

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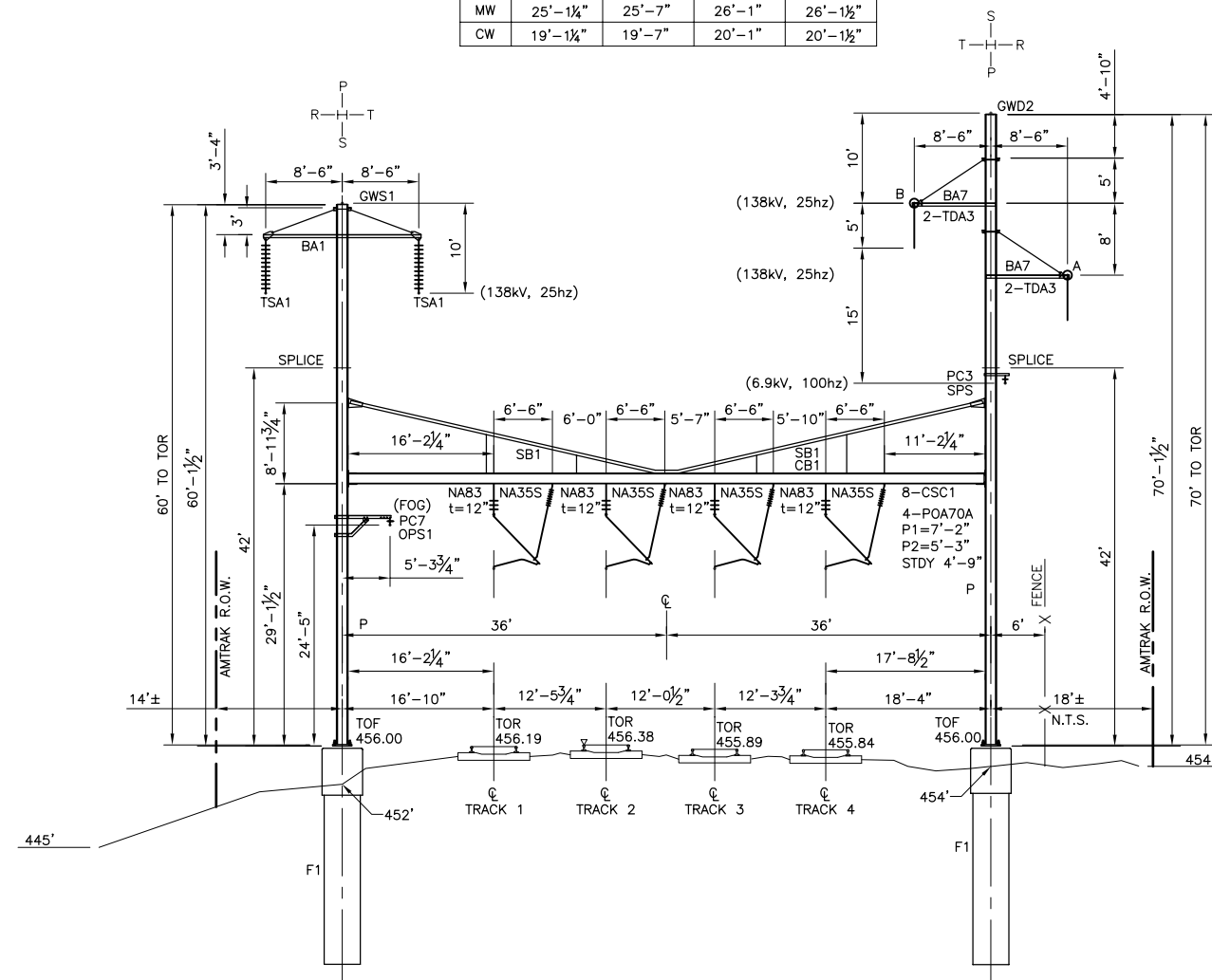
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-363**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1292.DWG  
Ref. No.: 2011-059  
Sheet No: 204 OF 565  
ET-1292

BILL OF MATERIALS

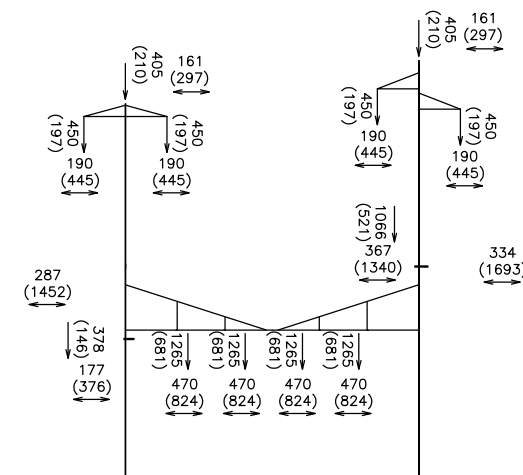
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	1
GWD2	GROUND WIRE DEADEND	ET-1909	1
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
PC7	SLIDING CLAMP	S-5239	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-1 1/4"	25'-7"	26'-1"	26'-1 1/2"
CW	19'-1 1/4"	19'-7"	20'-1"	20'-1 1/2"



STRUCTURE ERECTION DIAGRAM T-362

858+44  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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IN ASSOCIATION WITH



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-362

File No.: 2011-059-ET-1293.DWG

Ref. No.: 2011-059

Sheet No.: 205 OF 565

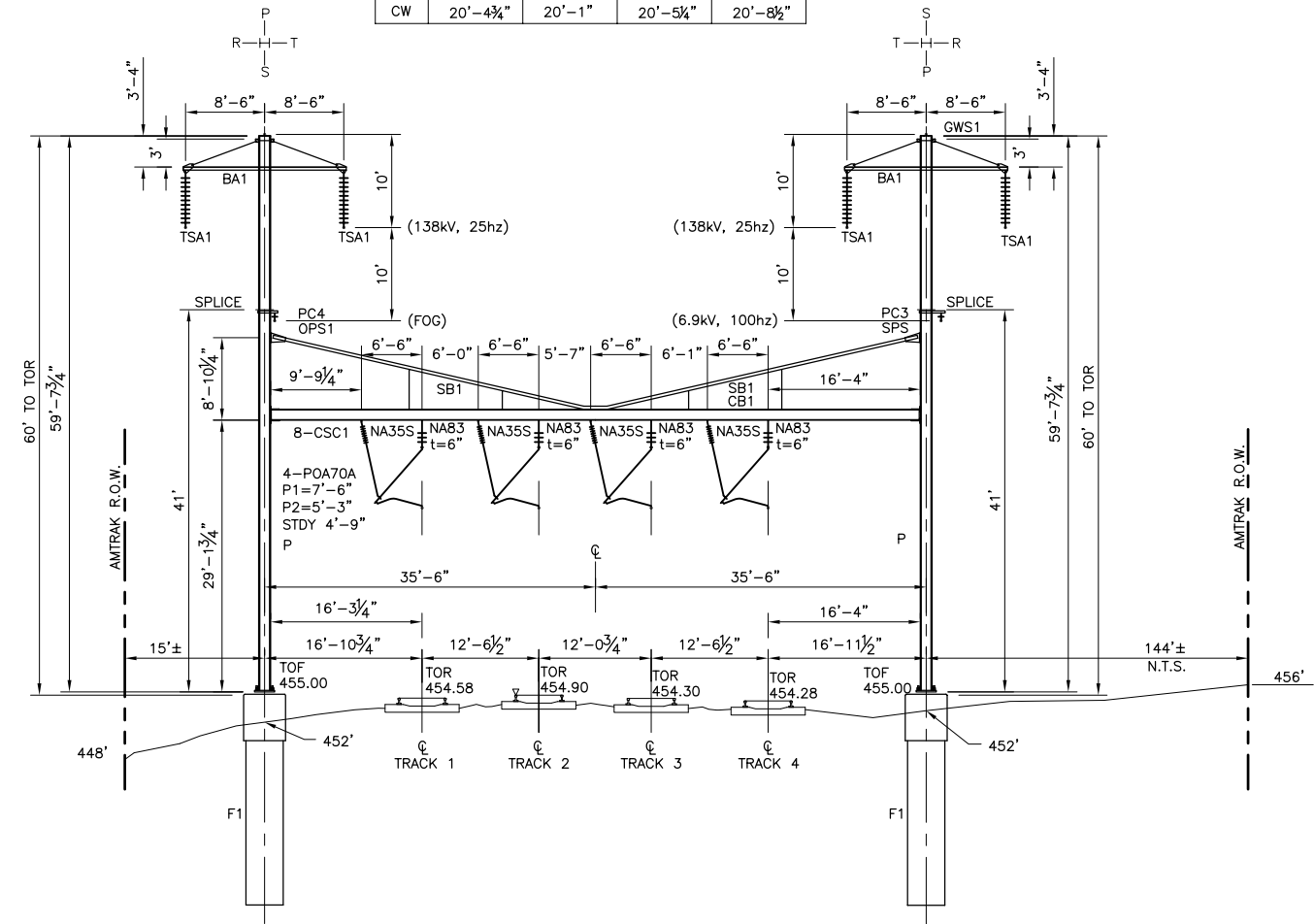
ET-1293

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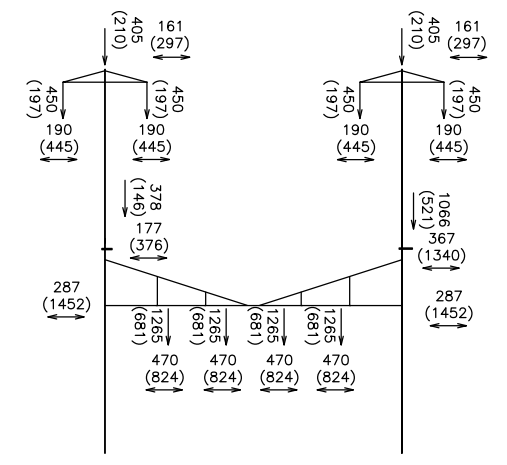
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-10 3/4"	26'-7"	26'-1 1/4"	27'-2 1/2"
CW	20'-4 3/4"	20'-1"	20'-5 1/4"	20'-8 1/2"



STRUCTURE ERECTION DIAGRAM T-361  
 855+44  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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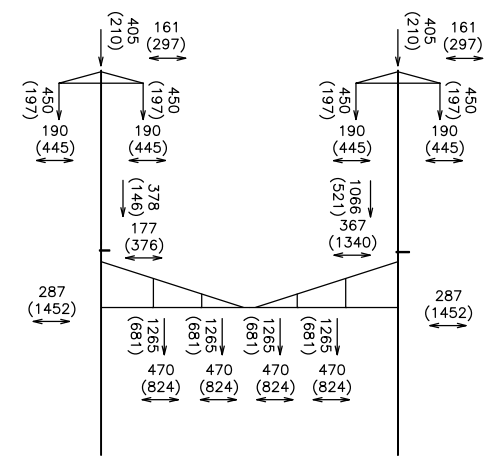


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-361  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1294.DWG  
 Ref. No.: 2011-059  
 Sheet No: 206 OF 565  
 ET-1294

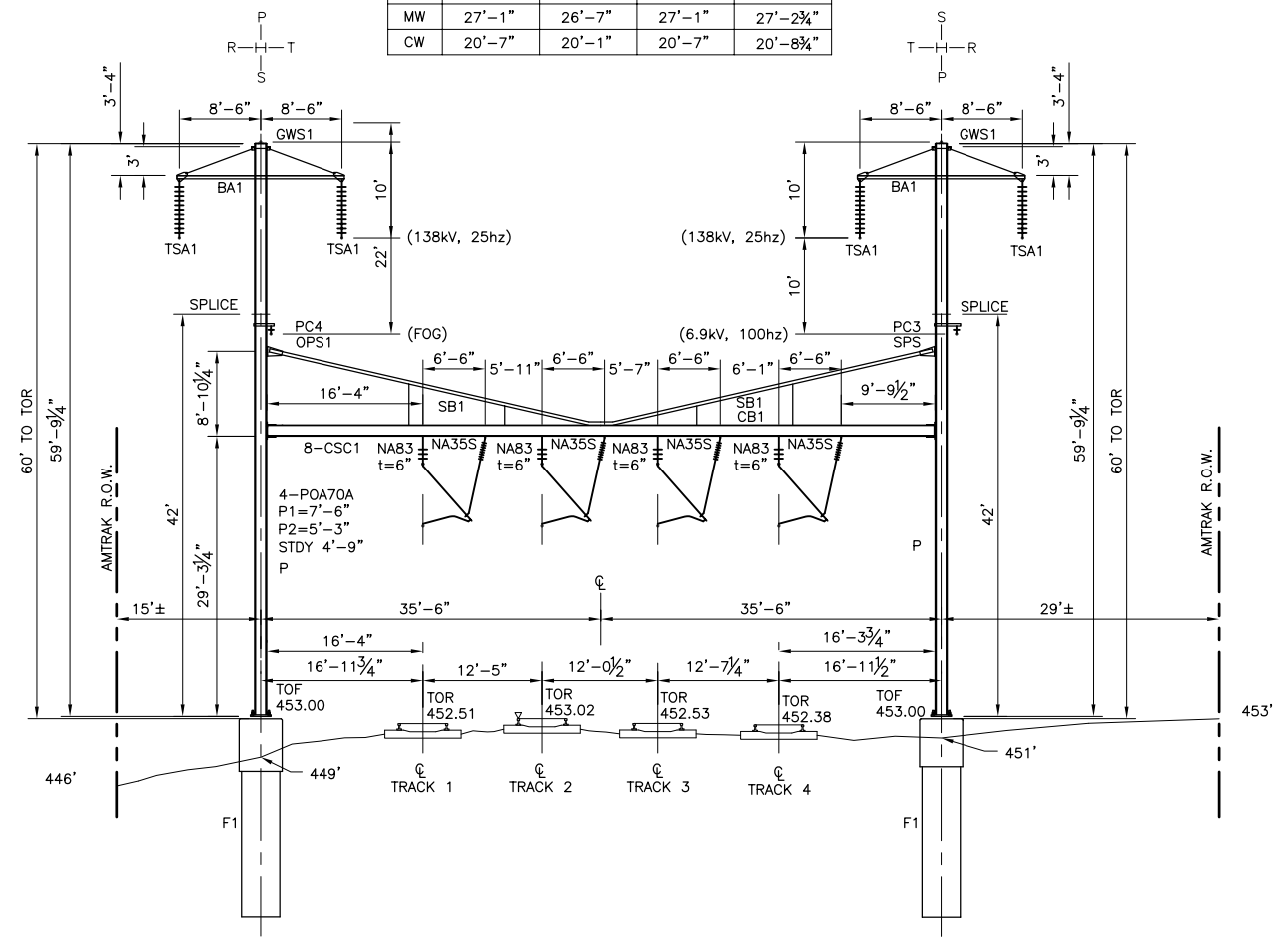


BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-1"	26'-7"	27'-1"	27'-2 3/4"
CW	20'-7"	20'-1"	20'-7"	20'-8 3/4"



**STRUCTURE ERECTION DIAGRAM T-360**  
 852+44  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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Approved	Date



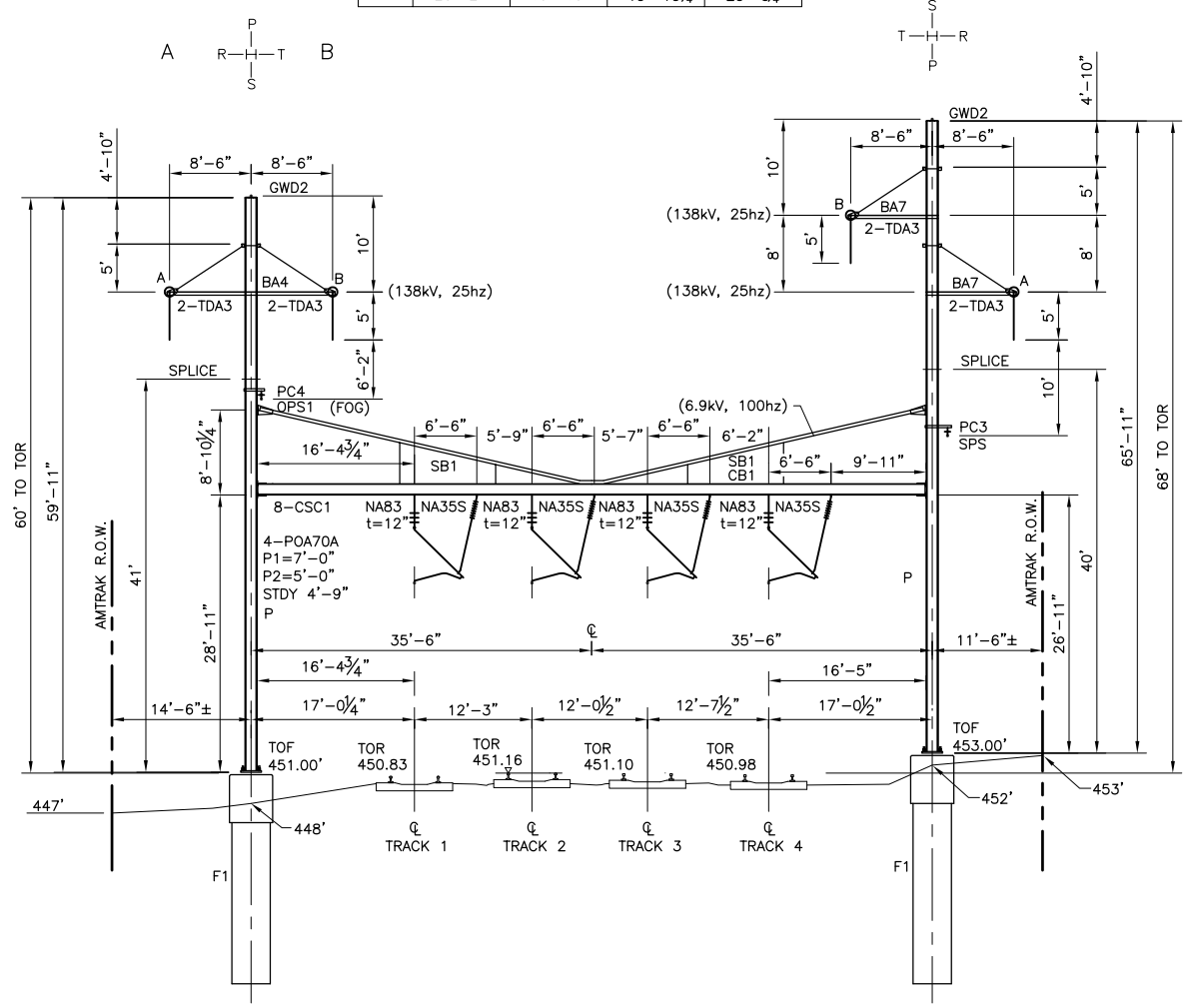
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-360**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1295.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 207 OF 565  
**ET-1295**

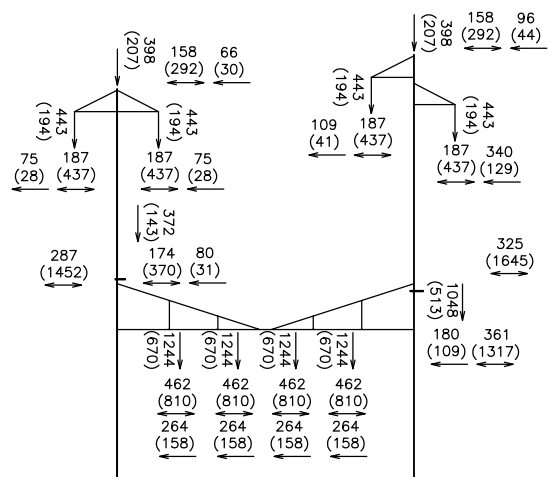
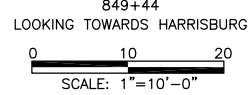
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-11"	25'-7"	25'-7 3/4"	25'-9 1/4"
CW	20'-2"	19'-10"	19'-10 1/4"	20'-0 1/4"

TRANSPOSITION  
T-359 TO T-356



STRUCTURE ERECTION DIAGRAM T-359



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
295' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWD2	GROUND WIRE DEADEND	ET-1909	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA4	TRANSMISSION BRACKET	S-5203	1	
BA7	TRANSMISSION BRACKET	S-5205	2	
CSC1	SLIDING BRACKET	S-5214	8	

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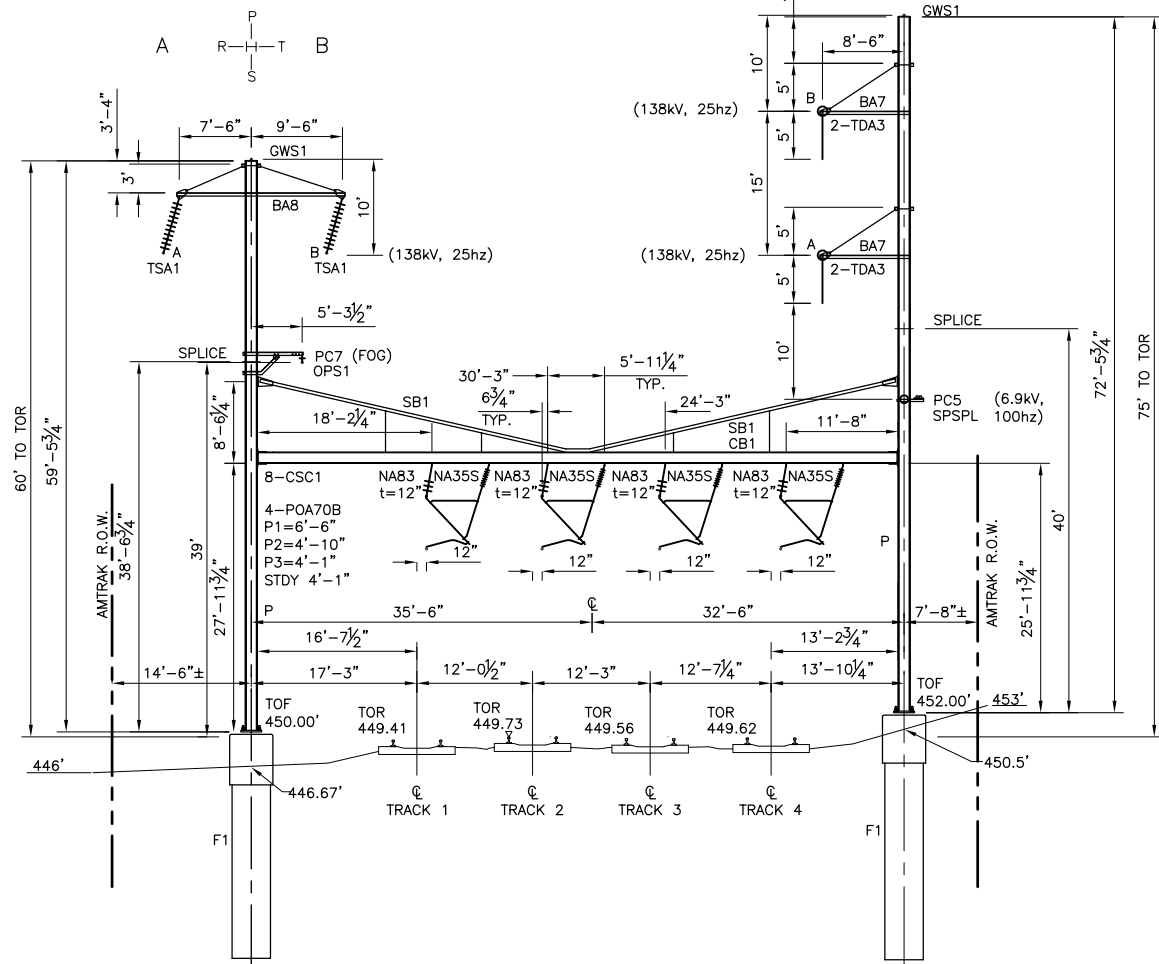


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-359  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1296.DWG  
Ref. No.: 2011-059  
Sheet No: 208 OF 565  
ET-1296

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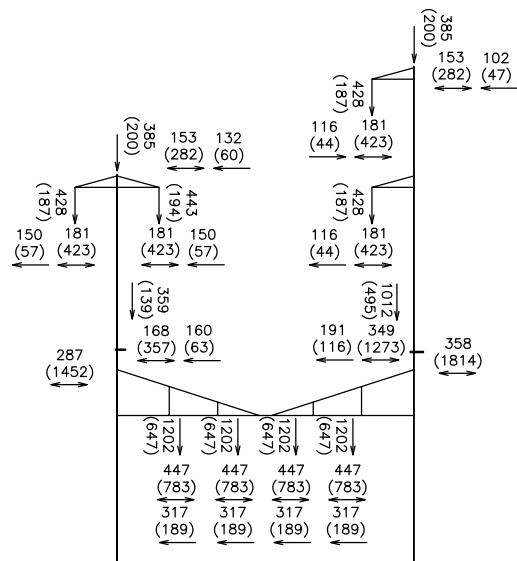
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-4 3/4"	25'-1"	25'-3"	25'-2 1/4"
CW	19'-10 1/4"	19'-7"	19'-9"	19'-8 1/4"



STRUCTURE ERECTION DIAGRAM T-358

846+55  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

TRANSPOSITION  
T-359 TO T-356



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
295' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPSPL	SIGNAL POWER SPLICE	ET-1913	1	
POA70B	REGISTRATION ASSEMBLY	ET-1902	4	
PC4	SLIDING CLAMP	S-5215	1	
PC5	SLIDING CLAMP	S-5215	1	
PC7	SLIDING CLAMP	S-5239	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA8	TRANSMISSION BRACKET	S-5206	1	
BA7	TRANSMISSION BRACKET	S-5205	2	
CSC1	SLIDING BRACKET	S-5214	8	

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30TH Street Station-Philadelphia, Pennsylvania 19104

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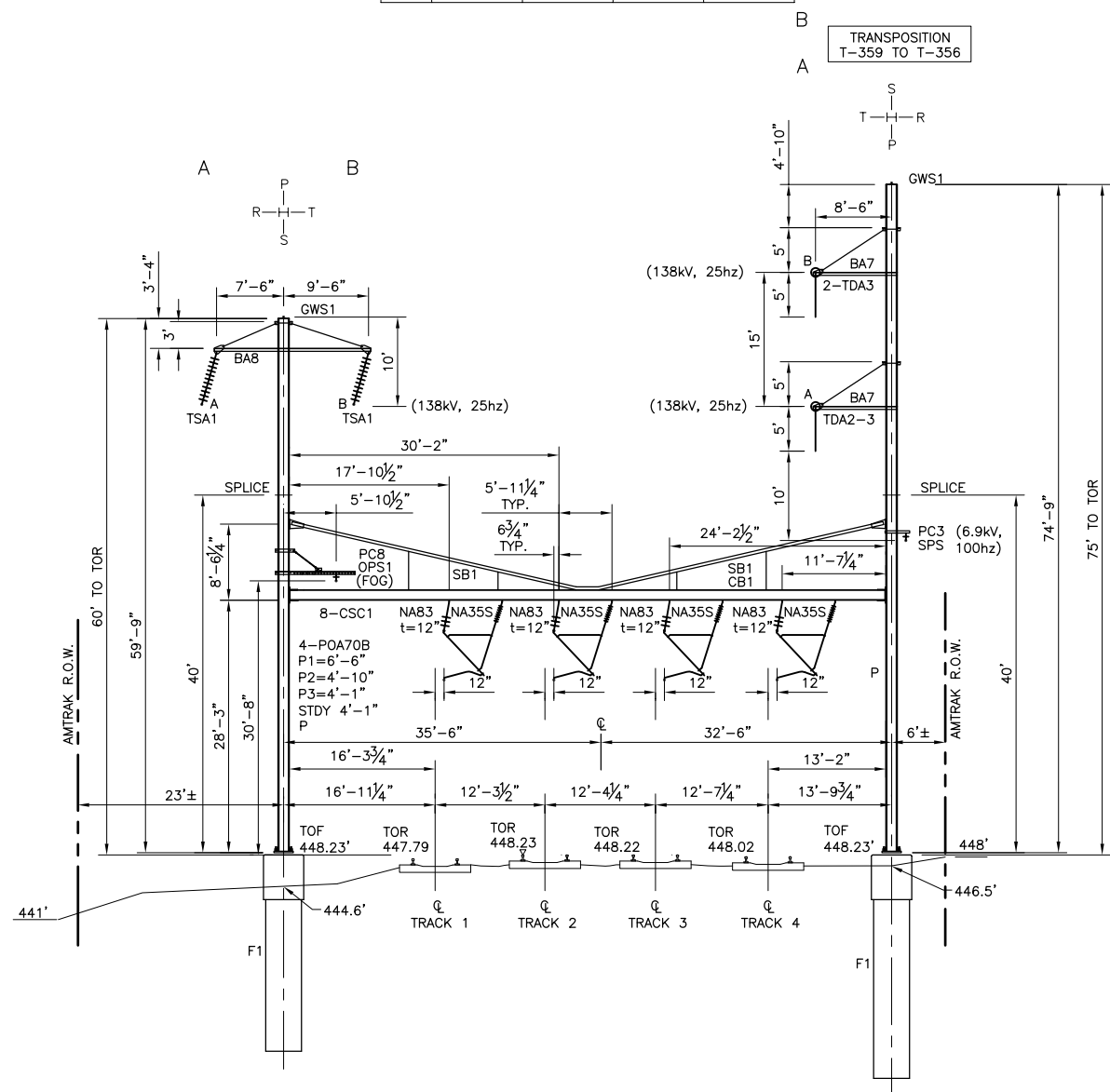


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-358  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

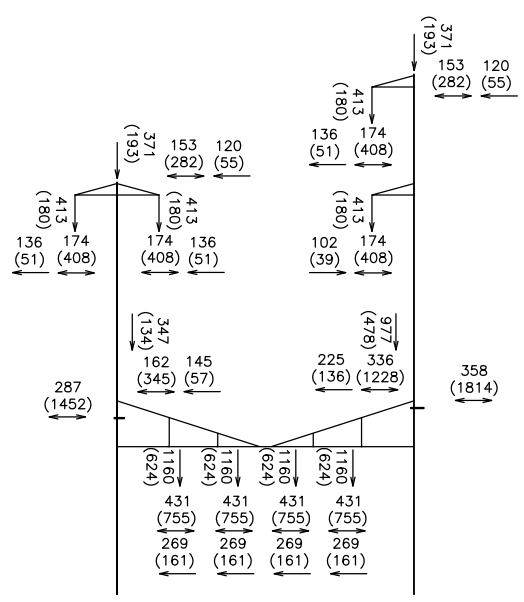
File No.: 2011-059-ET-1297.DWG  
Ref. No.: 2011-059  
Sheet No.: 209 OF 565  
ET-1297

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC8	SLIDING CLAMP	S-5240	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA8	TRANSMISSION BRACKET	S-5206	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-6 1/4"	25'-1"	25'-1"	25'-3 1/2"
CW	20'-0 1/4"	19'-7"	19'-7"	19'-9 1/2"



STRUCTURE ERECTION DIAGRAM T-357  
 843+76  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 275' LOAD SPAN  
 (NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 National Railroad Passenger Corporation  
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Approved	Date

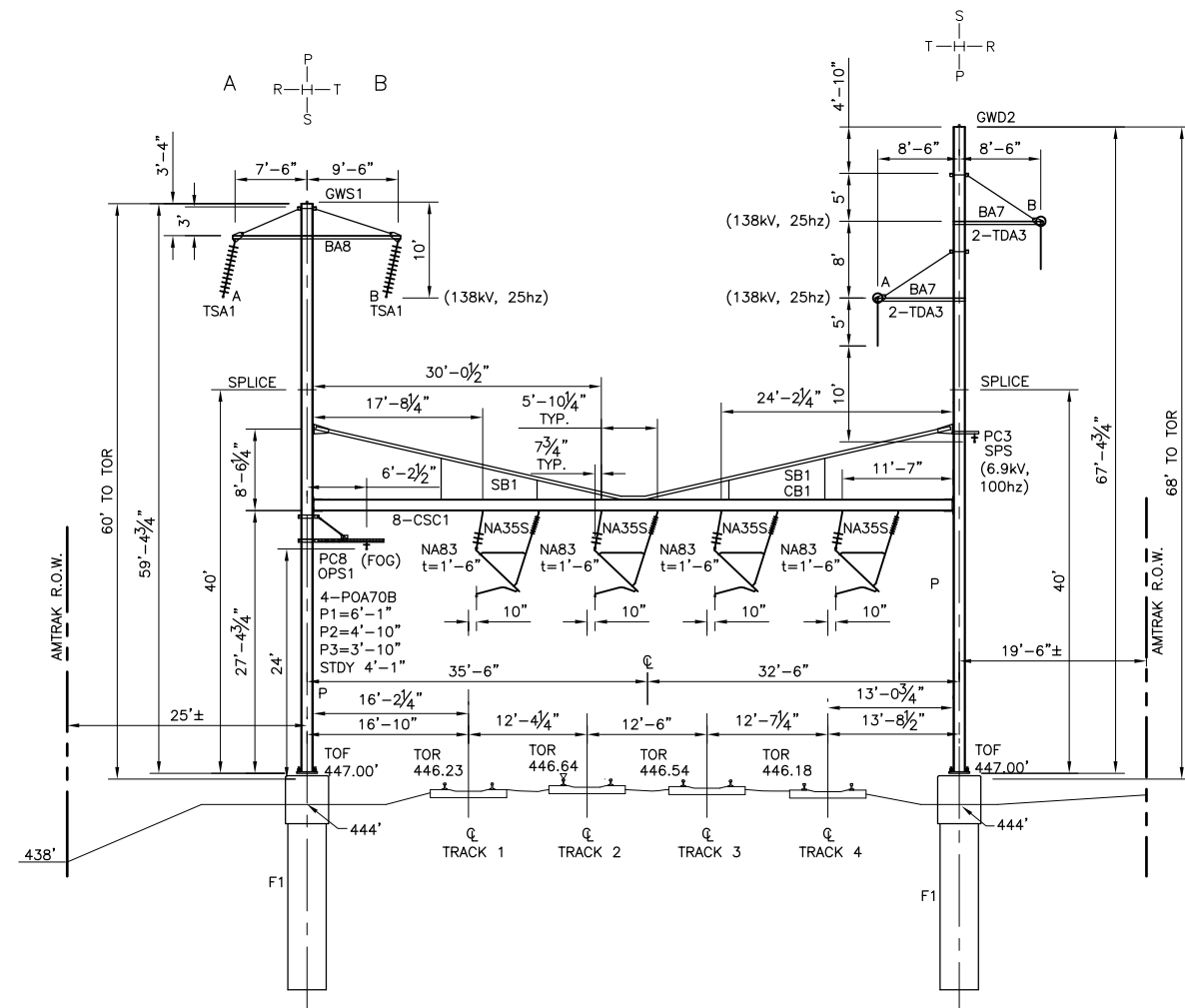


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-357  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1298.DWG  
 Ref. No.: 2011-059  
 Sheet No: 210 OF 565  
 ET-1298

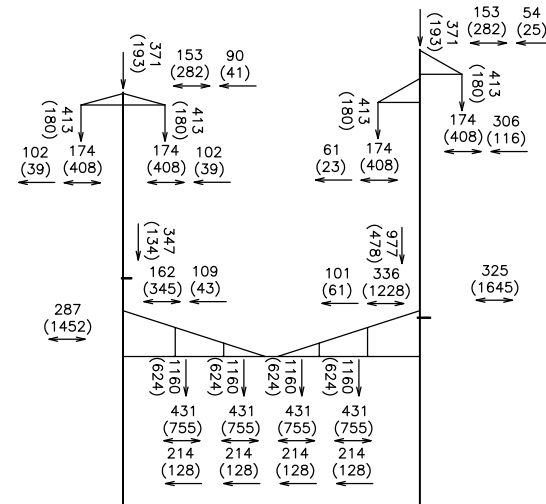
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-6"	24'-1"	24'-2 1/4"	24'-6 1/2"
CW	19'-6"	19'-1"	19'-2 1/4"	19'-6 1/2"



STRUCTURE ERECTION DIAGRAM T-356

841+05  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
275' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	1
GWD2	GROUND WIRE DEADEND	ET-1909	1
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC8	SLIDING CLAMP	S-5240	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA7	TRANSMISSION BRACKET	S-5205	2
BA8	TRANSMISSION BRACKET	S-5206	1
CSC1	SLIDING BRACKET	S-5214	8

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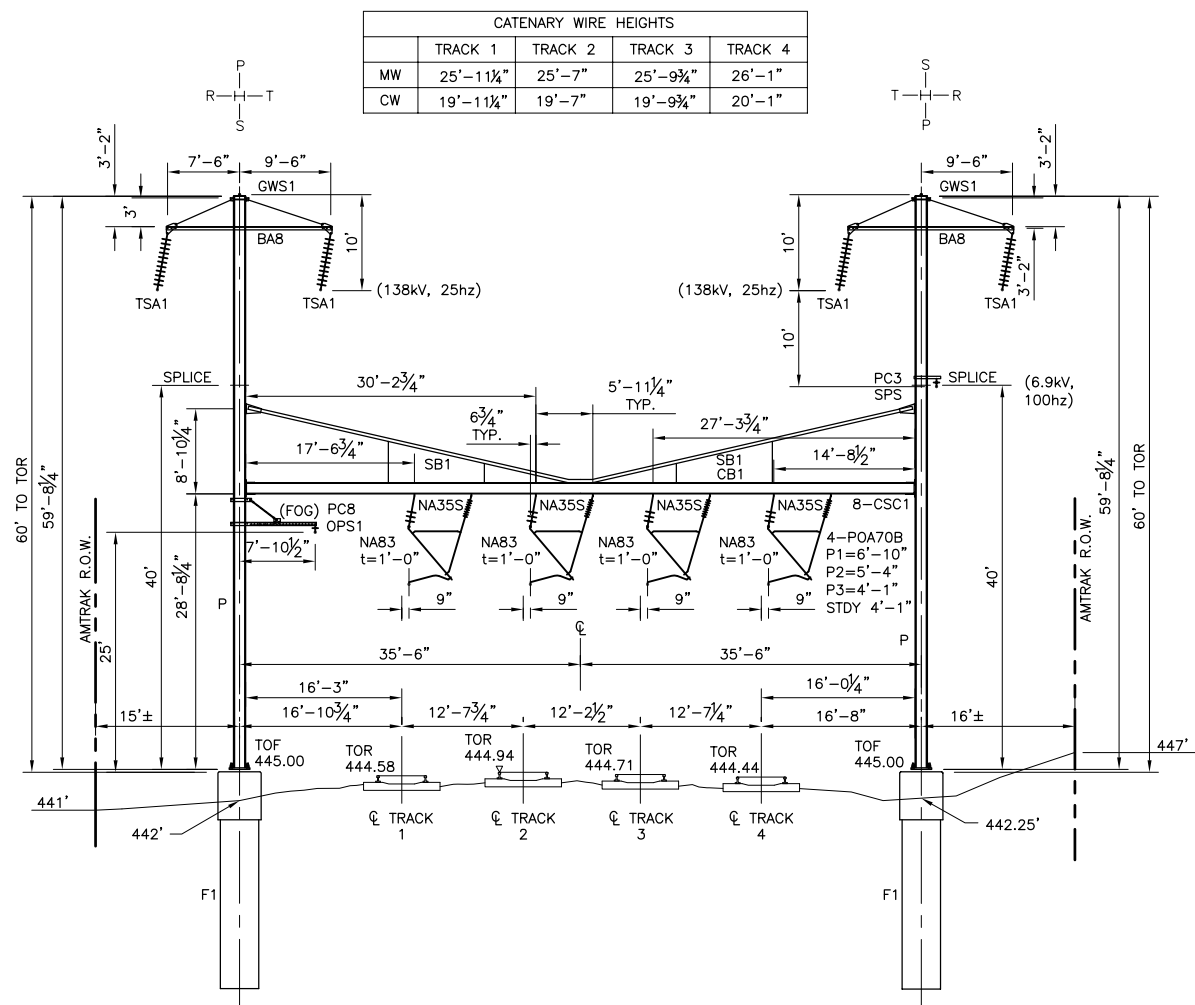
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-356  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

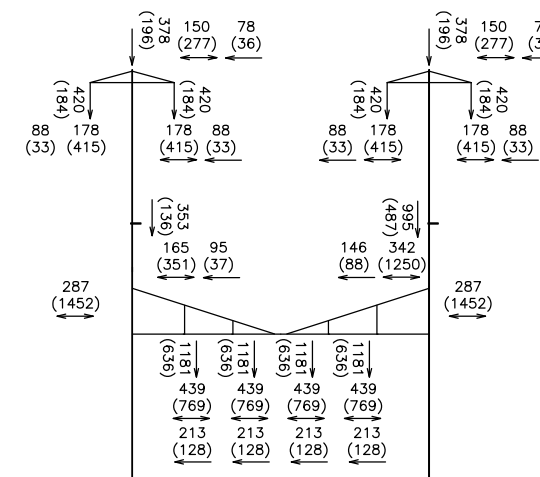
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Ref. No.:	2011-059
Sheet No.:	211 OF 565
ET-1299	

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STRUCTURE ERECTION DIAGRAM T-355

838+34  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
280' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70B	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PCB	SLIDING CLAMP	S-5240	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA8	TRANSMISSION BRACKET -DOUBLE	S-5206	2	
CSC1	SLIDING BRACKET	S-5214	8	

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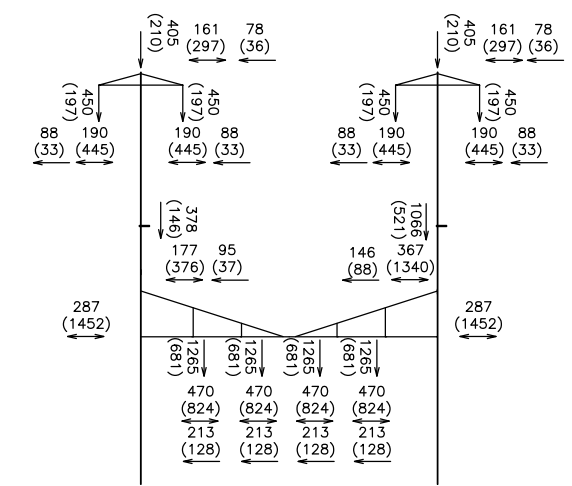
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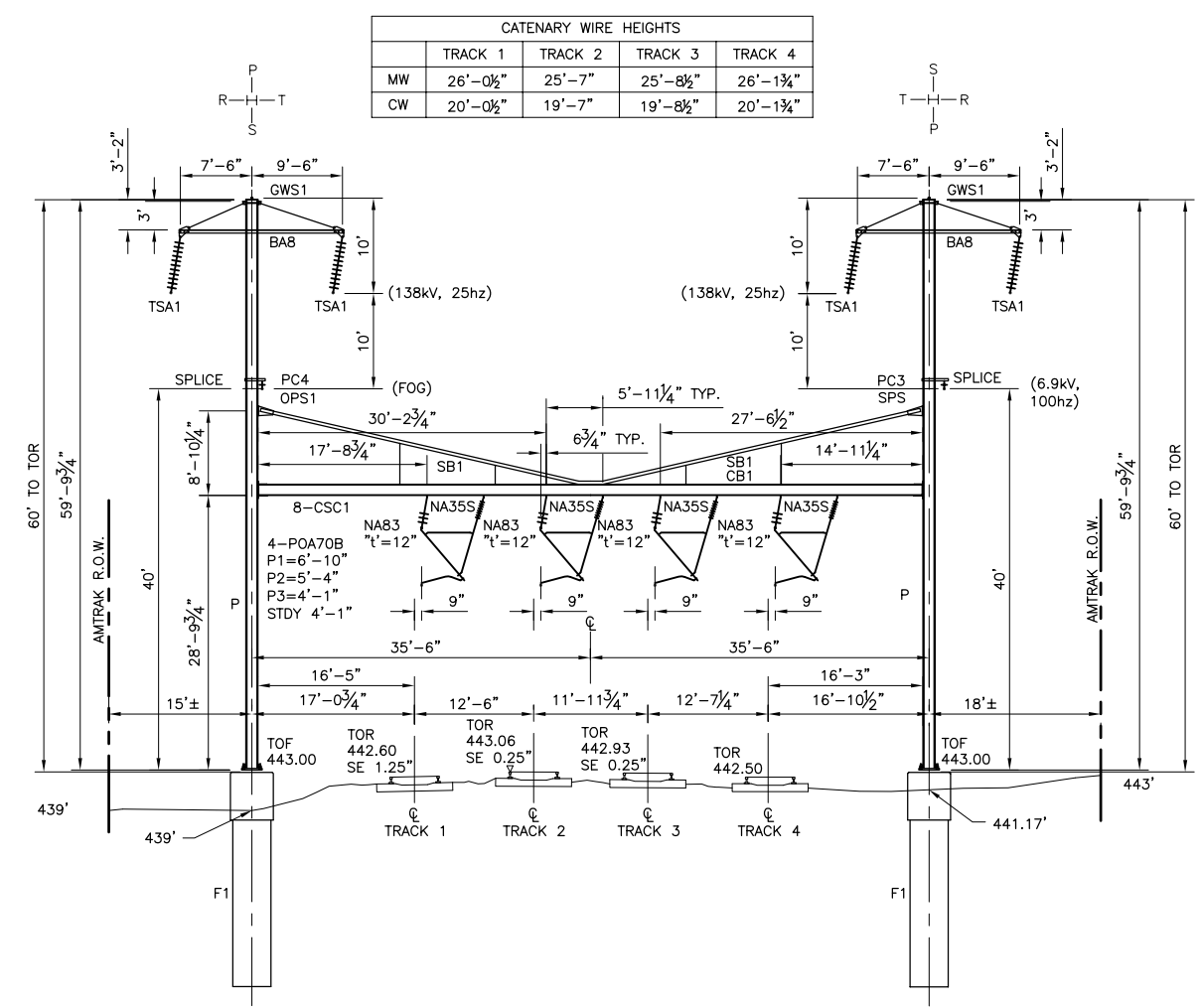
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-355  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1300.DWG
Ref. No.:	2011-059
Sheet No.:	212 OF 565
ET-1300	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA8	TRANSMISSION BRACKET -DOUBLE	S-5206	2
CSC1	SLIDING BRACKET	S-5214	8

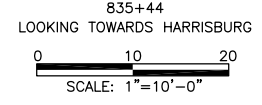


**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60F)  
 300' LOAD SPAN  
 (NOT TO SCALE)



CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-0 1/2"	25'-7"	25'-8 1/2"	26'-1 3/4"
CW	20'-0 1/2"	19'-7"	19'-8 1/2"	20'-1 3/4"

**STRUCTURE ERECTION DIAGRAM T-354**



**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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Approved	Date

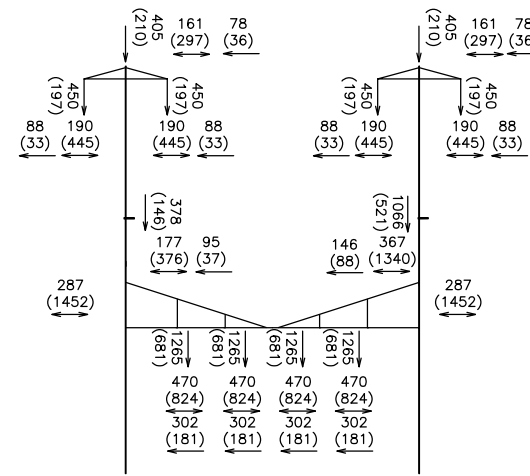


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-354**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1301.DWG
Ref. No.:	2011-059
Sheet No.:	213 OF 565
<b>ET-1301</b>	

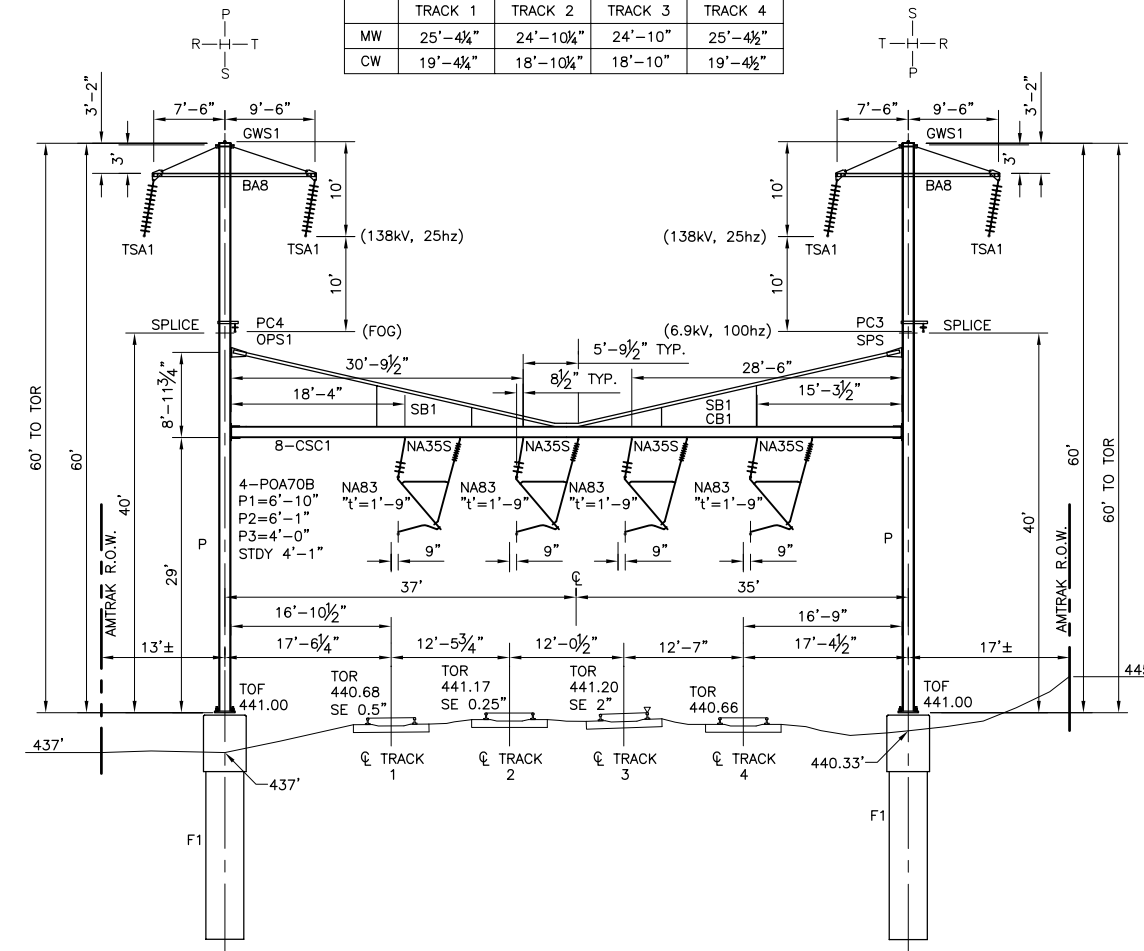
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA8	TRANSMISSION BRACKET --DOUBLE	S-5206	2
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°)  
300' LOAD SPAN  
(NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-4 1/4"	24'-10 1/4"	24'-10"	25'-4 1/2"
CW	19'-4 1/4"	18'-10 1/4"	18'-10"	19'-4 1/2"



STRUCTURE ERECTION DIAGRAM T-353  
832+44  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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30TH Street Station-Philadelphia, Pennsylvania 19104

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**Burns** IN ASSOCIATION WITH **Baker** **AECOM**

BURNS ENGINEERING, INC. | 215 939-7700  
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
PHILADELPHIA, PA 19103

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-353

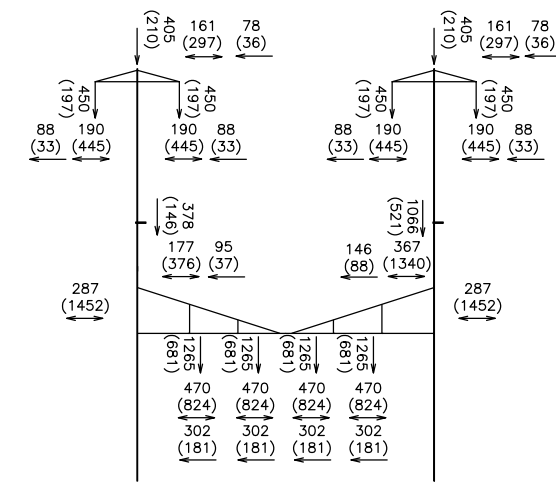
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1302.DWG  
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ET-1302



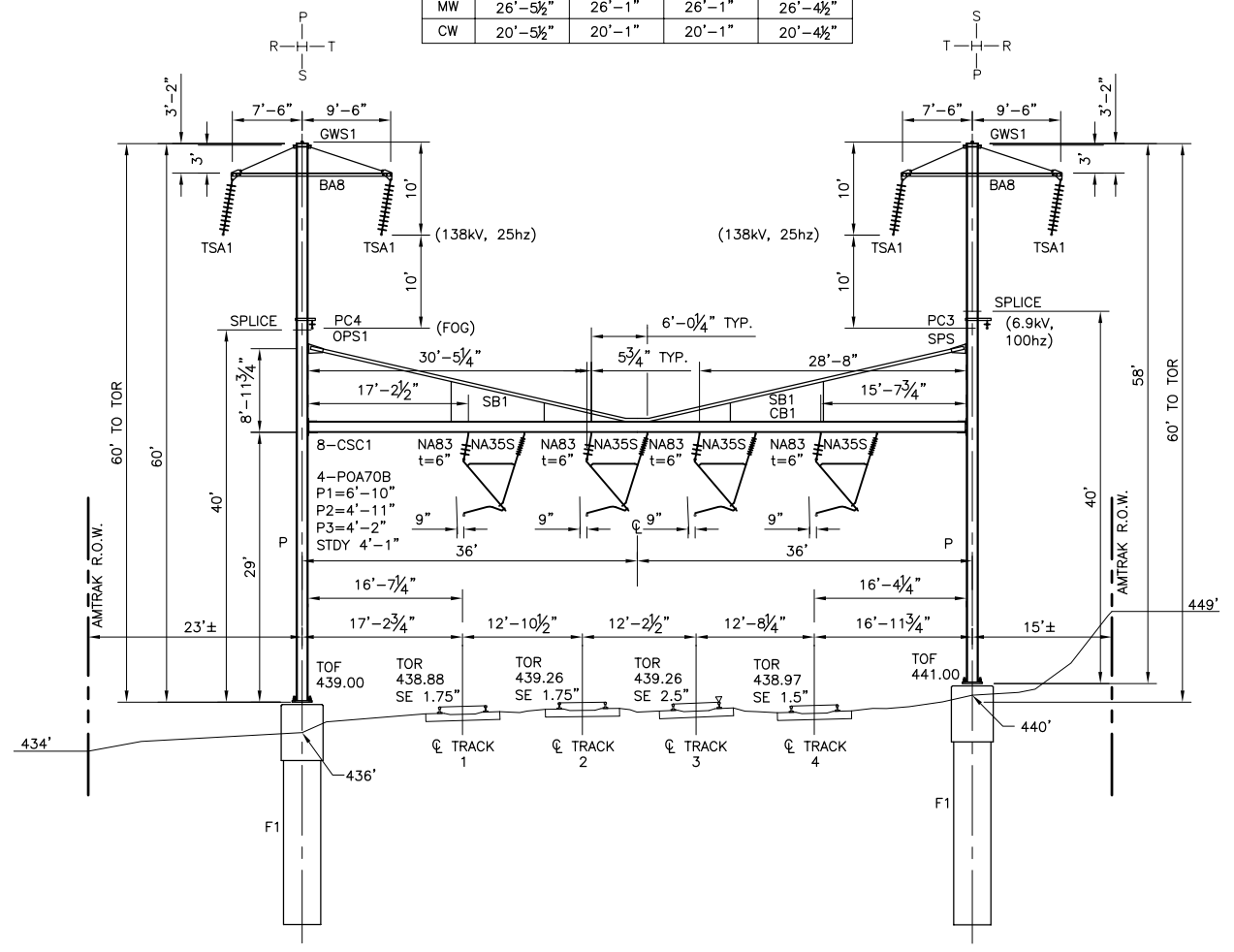
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA8	TRANSMISSION BRACKET -DOUBLE	S-5206	2
CSC1	SLIDING BRACKET	S-5214	8

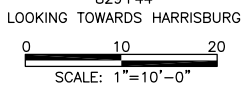


LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-5 1/2"	26'-1"	26'-1"	26'-4 1/2"
CW	20'-5 1/2"	20'-1"	20'-1"	20'-4 1/2"



STRUCTURE ERECTION DIAGRAM T-352  
829+44  
LOOKING TOWARDS HARRISBURG



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-352  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

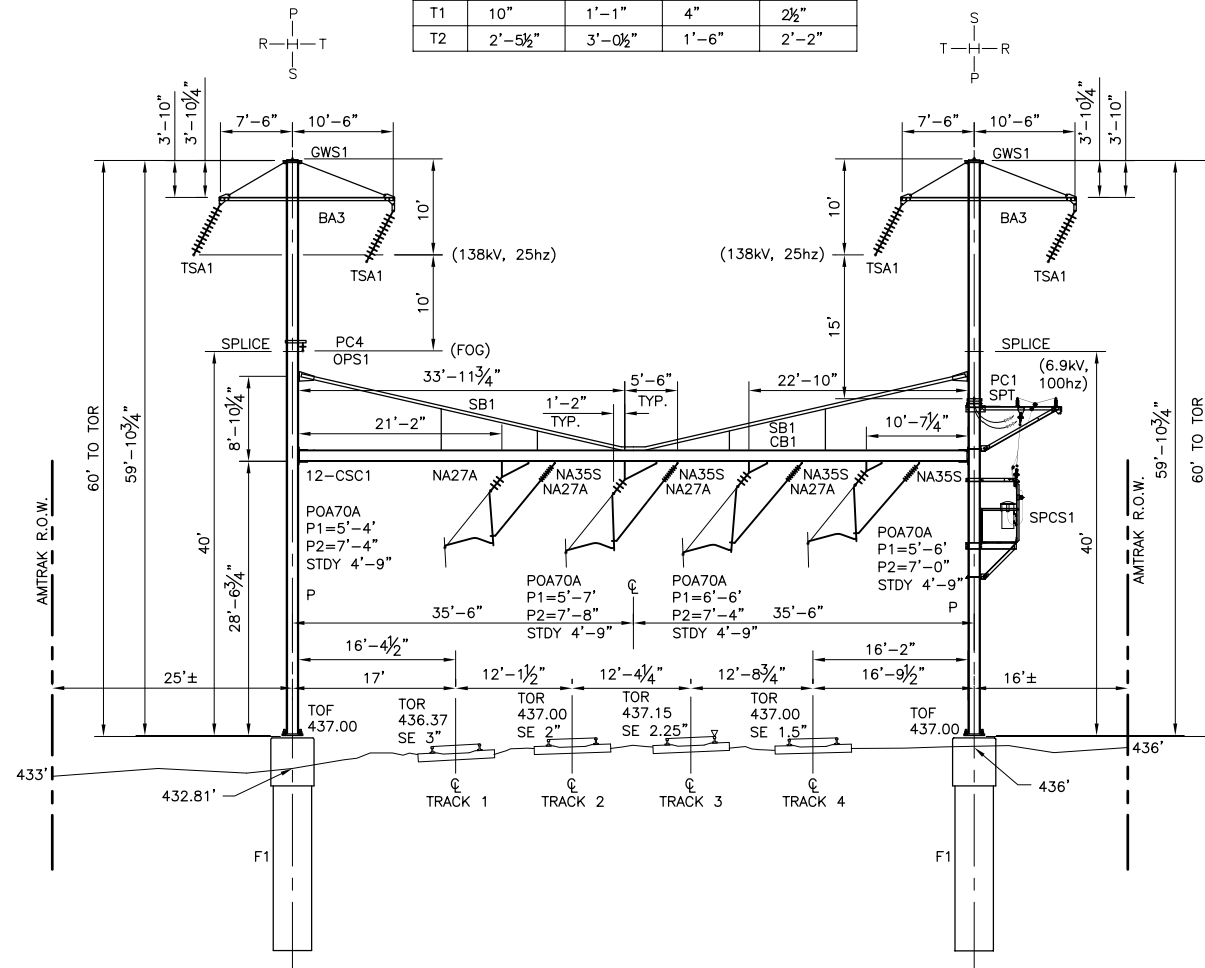
File No.: 2011-059-ET-1303.DWG  
Ref. No.: 2011-059  
Sheet No: 215 OF 565  
ET-1303

BILL OF MATERIALS

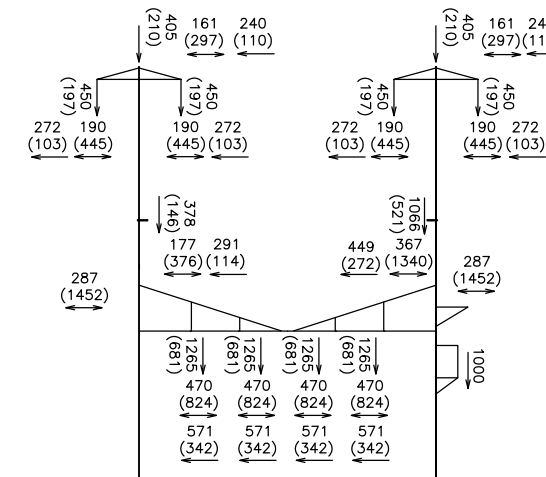
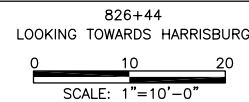
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
SPCS1	SIGNAL POWER CUT SECTION	ET-1810	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPT	SIGNAL POWER TERMINATION	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC1	SLIDING CLAMP	S-5214	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	12

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-4 1/2"	25'-5 1/2"	26'-0 1/4"	26'-4"
CW	20'-5 1/2"	19'-3 1/2"	18'-1 1/2"	20'-3"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	10"	1'-1"	4"	2 1/2"
T2	2'-5 1/2"	3'-0 1/2"	1'-6"	2'-2"



STRUCTURE ERECTION DIAGRAM T-351



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORM.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-351

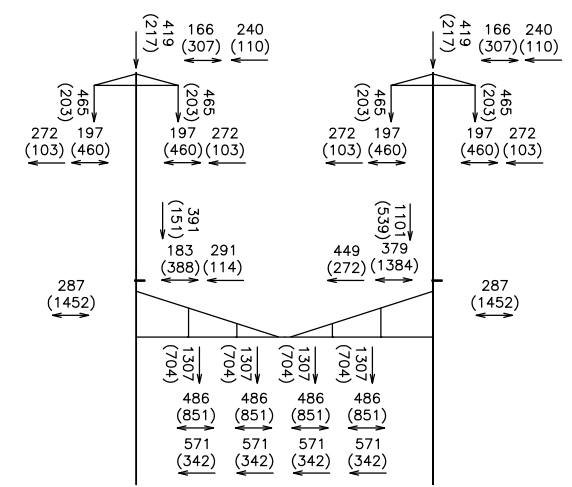
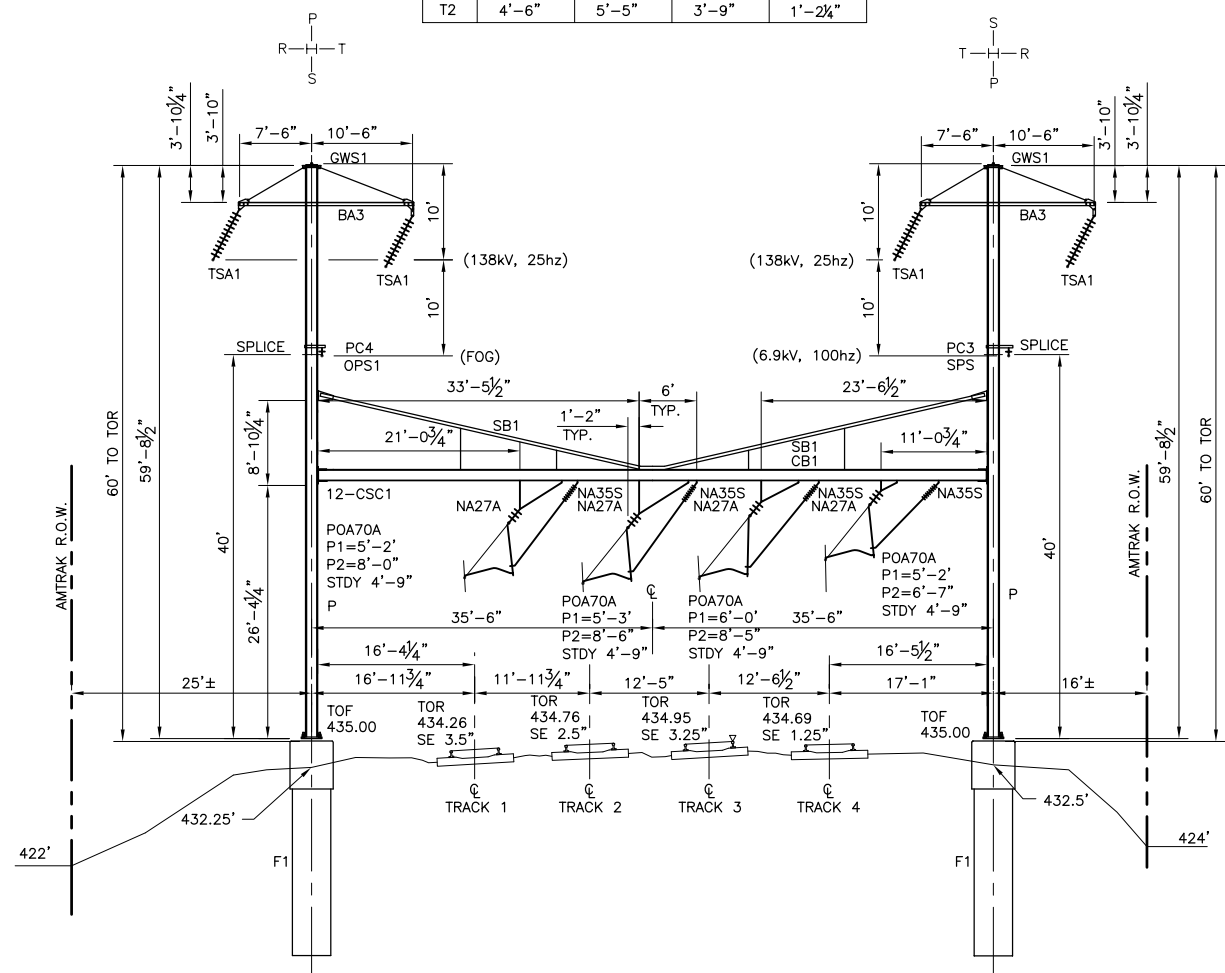
File No.:	2011-059-ET-1304.DWG
Ref. No.:	2011-059
Sheet No.:	216 OF 565
ET-1304	

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET -DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	12

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-5 1/4"	22'-5 1/4"	23'-6"	24'-11 1/4"
CW	17'-9"	16'-8"	16'-11 1/2"	19'-2 1/4"

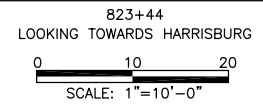
MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-2"	2'-7"	1'-4 1/2"	2 1/2"
T2	4'-6"	5'-5"	3'-9"	1'-2 1/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-350**



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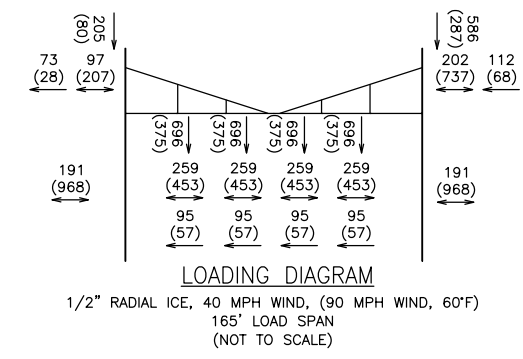
Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION**  
**ELECTRIFICATION**  
**STRUCTURAL ERECTION DIAGRAM**  
**T-350**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1305.DWG
Ref. No.:	2011-059
Sheet No.:	217 OF 565
<b>ET-1305</b>	

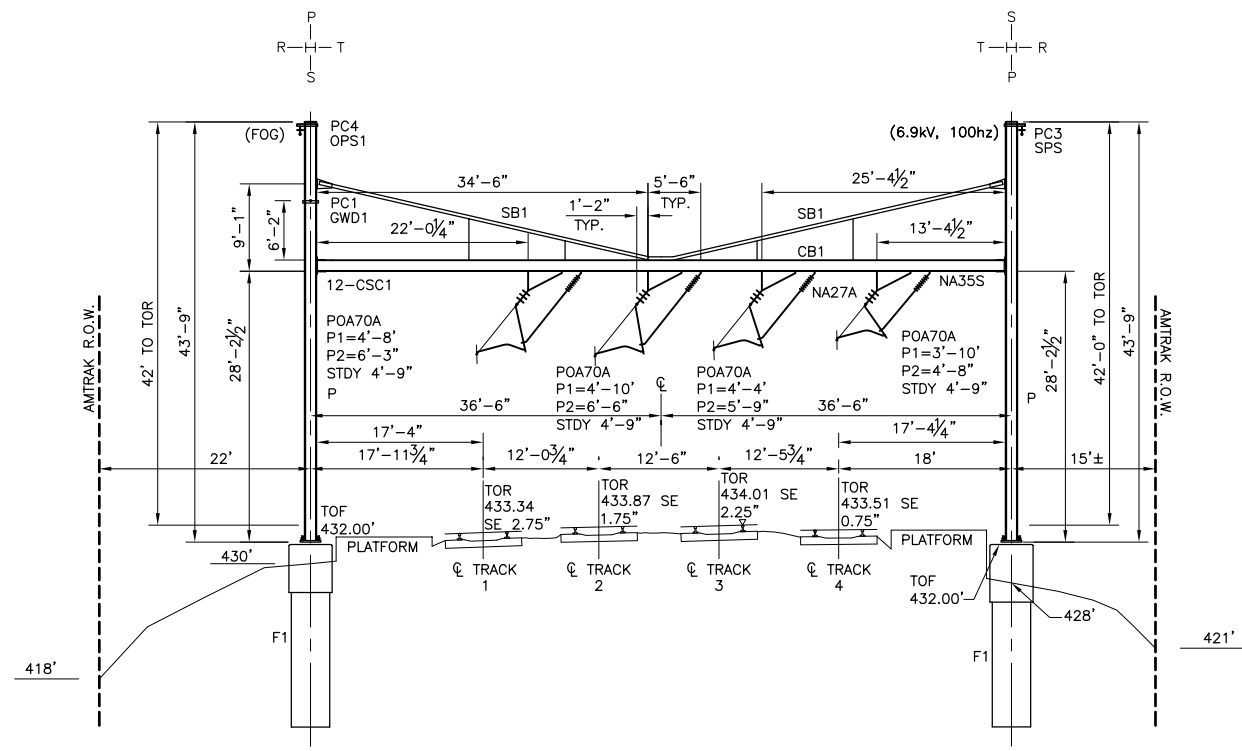
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD1	GROUND WIRE DEADEND	ET-1909	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC1	SLIDING CLAMP	S-5214	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
CSC1	SLIDING BRACKET	S-5214	12



CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-8 1/4"	23'-1 1/2"	23'-0"	23'-5 1/2"
CW	18'-6"	17'-9"	18'-3"	19'-9"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-2"	1'-2"	1'-2"	1'-2"
T2	3'-3"	3'-3"	3'-3"	3'-3"



- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  4. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  5. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  6. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  7. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-349  
 822+04  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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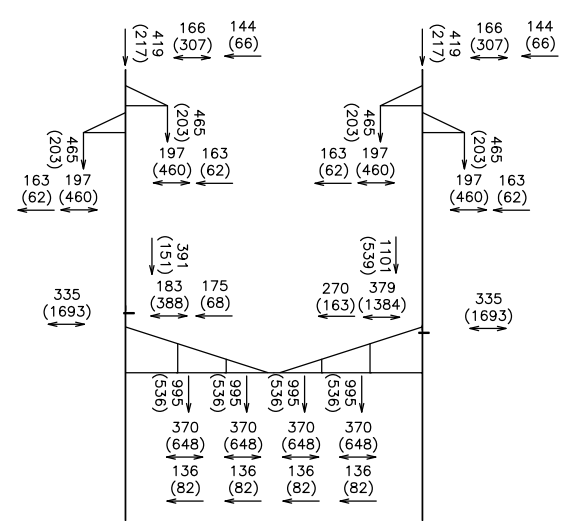
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-349**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1306.DWG
Ref. No.:	2011-059
Sheet No.:	218 OF 565
<b>ET-1306</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA7	TRANSMISSION BRACKET	S-5205	4
CSC1	SLIDING BRACKET	S-5214	12

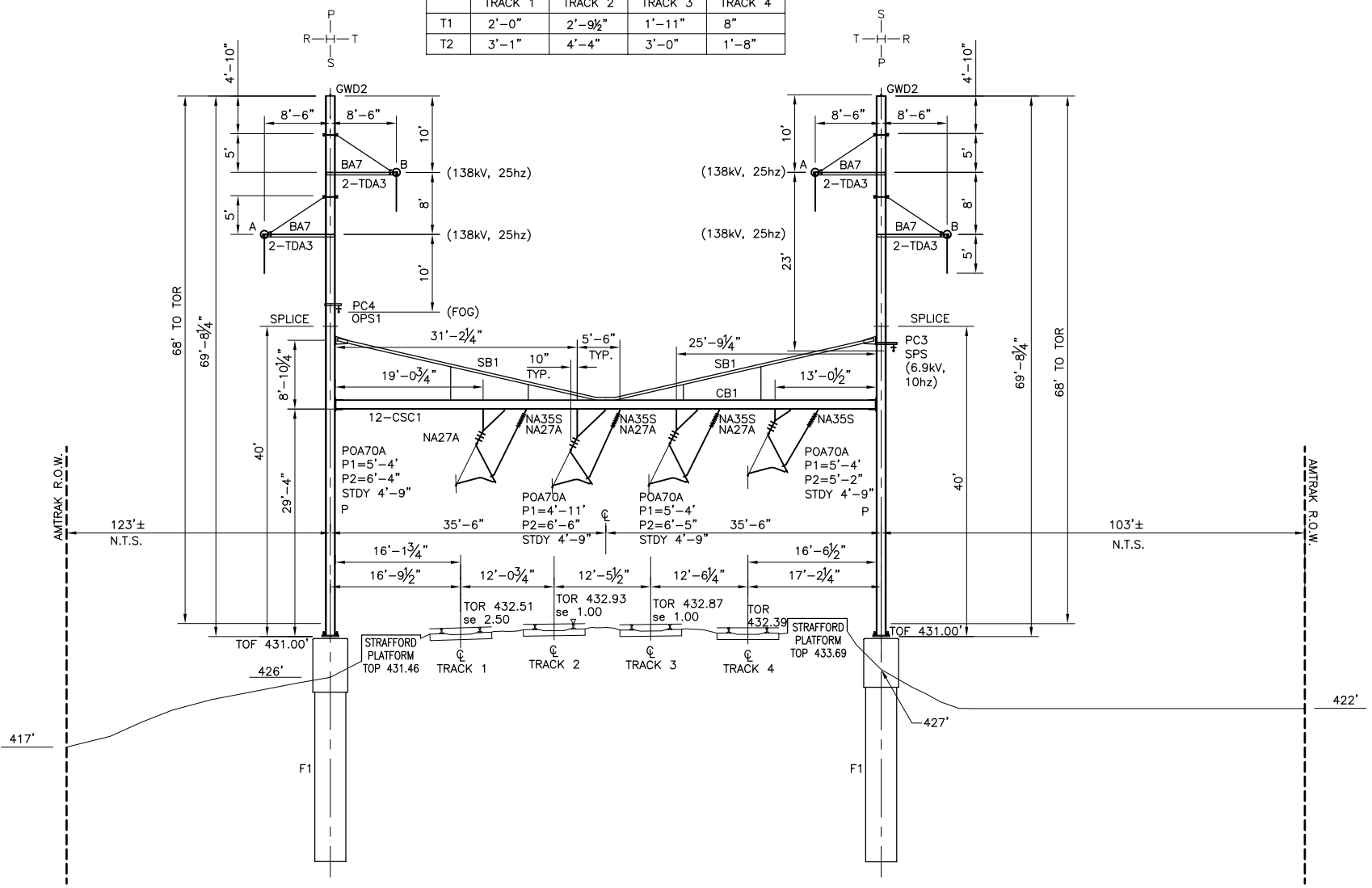
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-8"	22'-4 1/2"	23'-5 3/4"	25'-0 1/2"
CW	18'-3 3/4"	17'-7"	17'-10"	19'-7 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-0"	2'-9 1/2"	1'-11"	8"
T2	3'-1"	4'-4"	3'-0"	1'-8"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 310' LOAD SPAN  
 240' CATENARY LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.



STRUCTURE ERECTION DIAGRAM T-348  
 820+24  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-348  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1307.DWG
Ref. No.:	2011-059
Sheet No.:	219 OF 565
ET-1307	

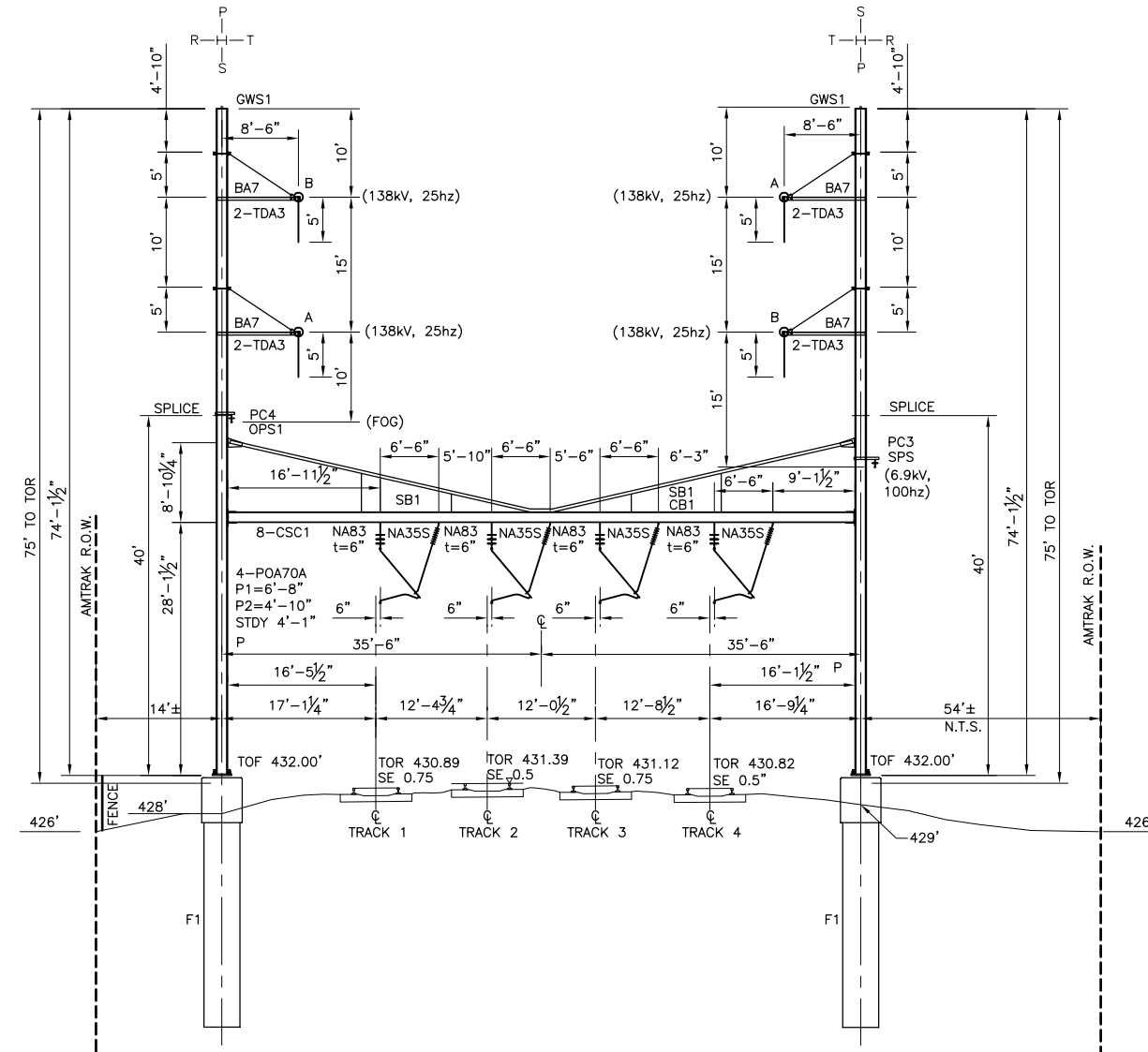
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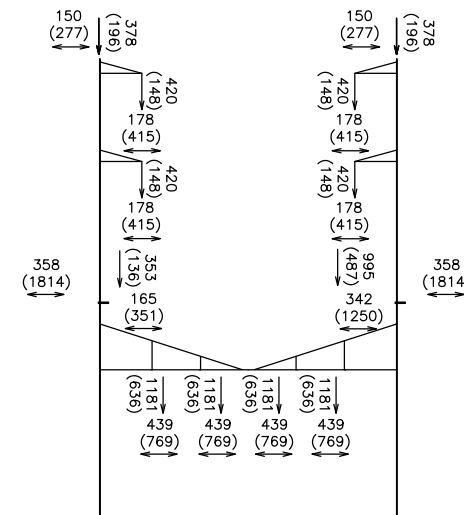
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA7	TRANSMISSION BRACKET	S-5205	4
CSC1	SLIDING BRACKET	S-5214	8

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-7"	26'-1"	26'-4 1/4"	26'-7 3/4"
CW	20'-7"	20'-1"	20'-4 1/4"	20'-7 3/4"



STRUCTURE ERECTION DIAGRAM T-347

817+34  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
280' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORM.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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30TH Street Station-Philadelphia, Pennsylvania 19104

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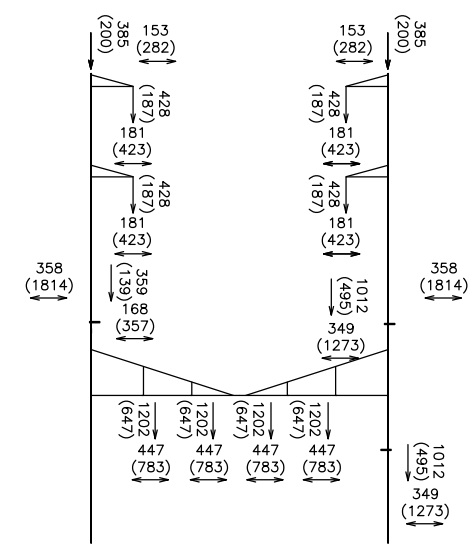
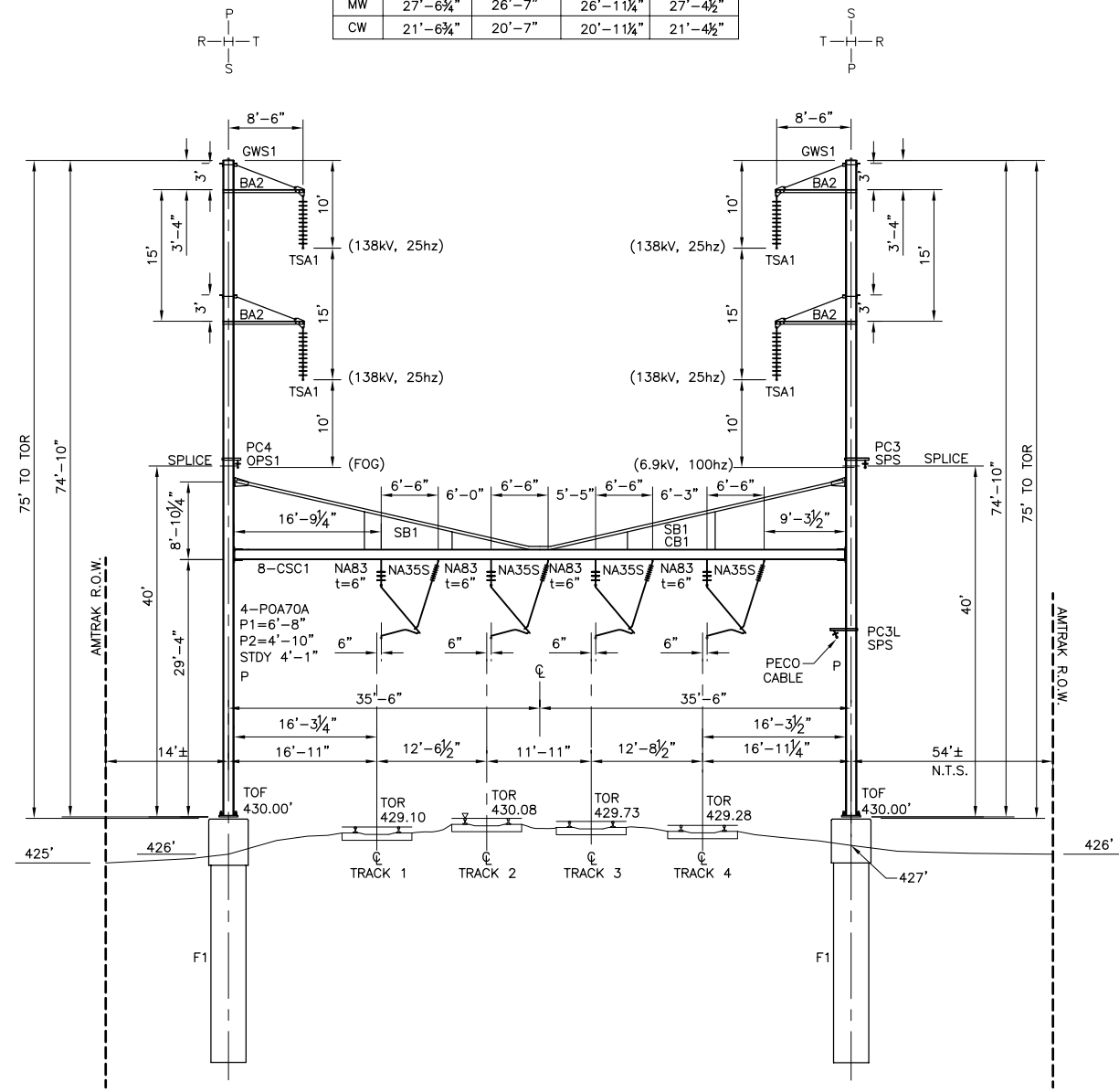


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-347  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1308.DWG
Ref. No.:	2011-059
Sheet No.:	220 OF 565
ET-1308	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	2
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC3L	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	4
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-6 3/4"	26'-7"	26'-11 1/4"	27'-4 1/2"
CW	21'-6 3/4"	20'-7"	20'-11 1/4"	21'-4 1/2"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 285' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-346**  
 814+65  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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Approved	Date



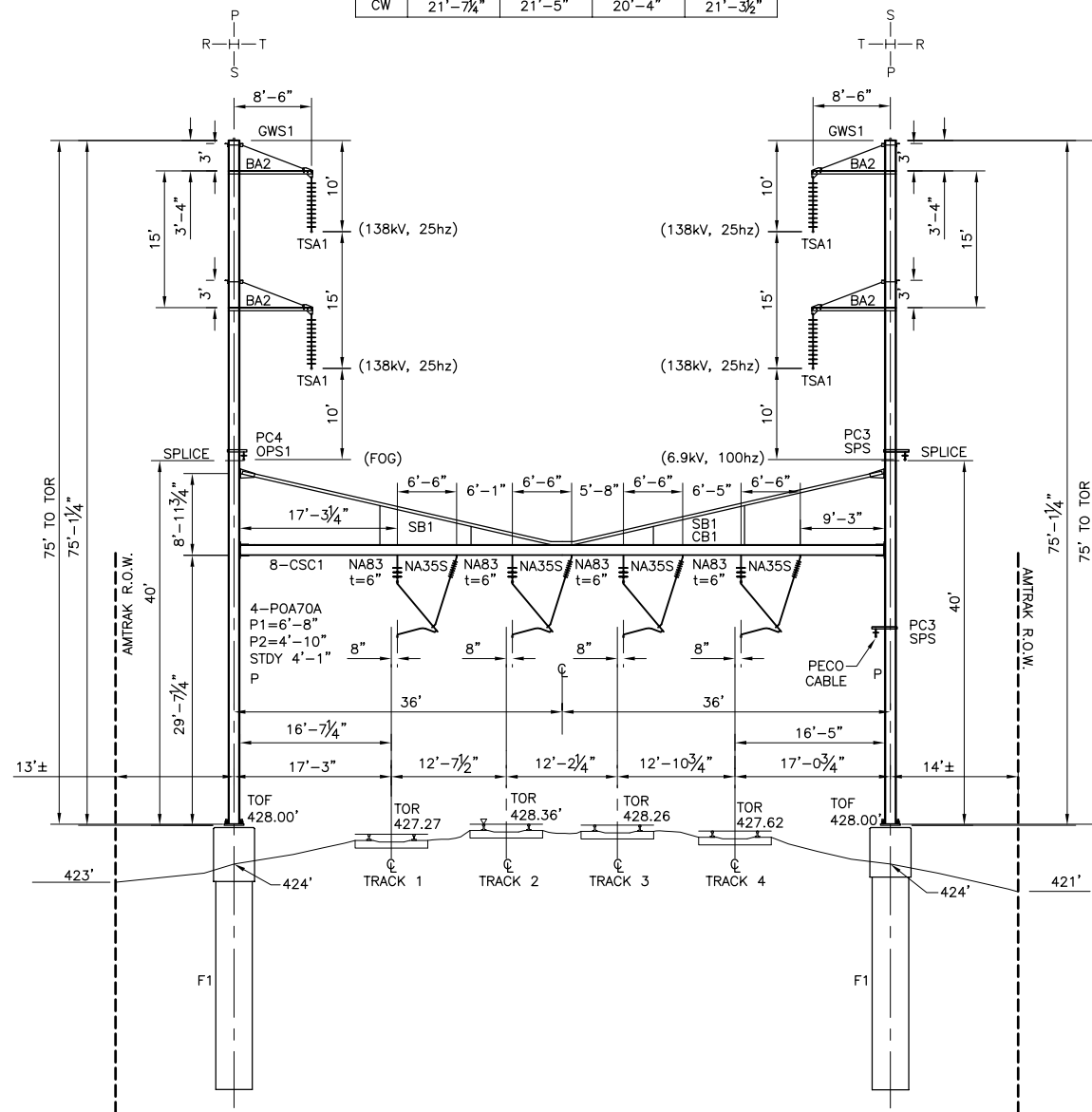
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-346**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1309.DWG
Ref. No.:	2011-059
Sheet No.:	221 OF 565
<b>ET-1309</b>	

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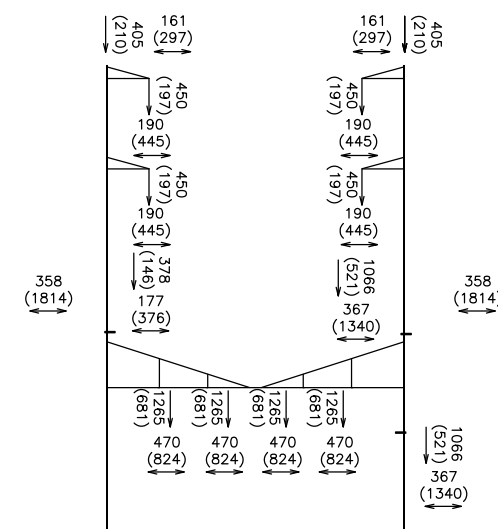
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	2
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	2
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	4
CSC1	SLIDING BRACKET	S-5214	8

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-1 3/4"	26'-10"	25'-8"	26'-9"
CW	21'-7 1/4"	21'-5"	20'-4"	21'-3 1/2"



STRUCTURE ERECTION DIAGRAM T-345

811+65  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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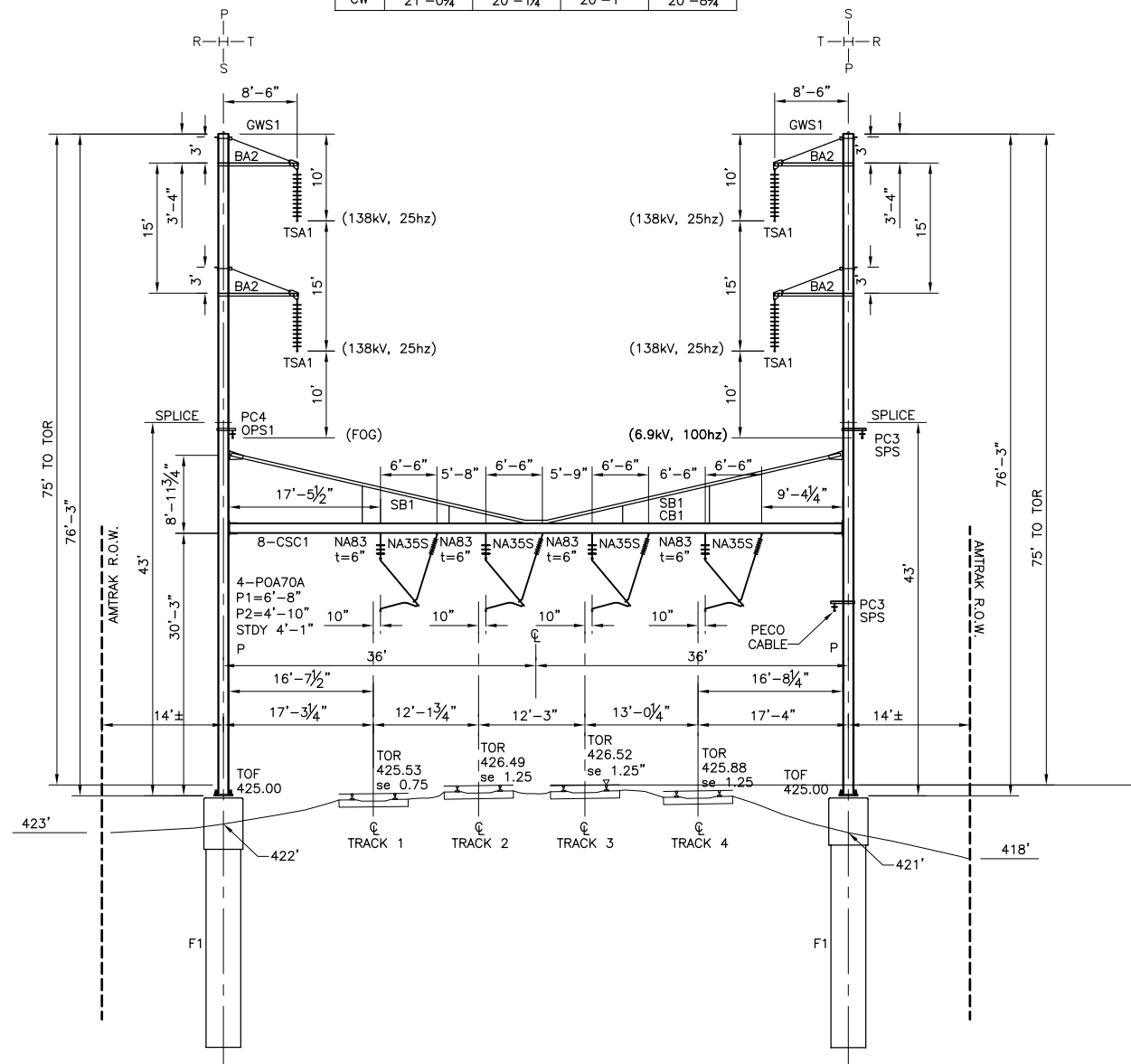


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-345  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1310.DWG
Ref. No.:	2011-059
Sheet No.:	222 OF 565
ET-1310	

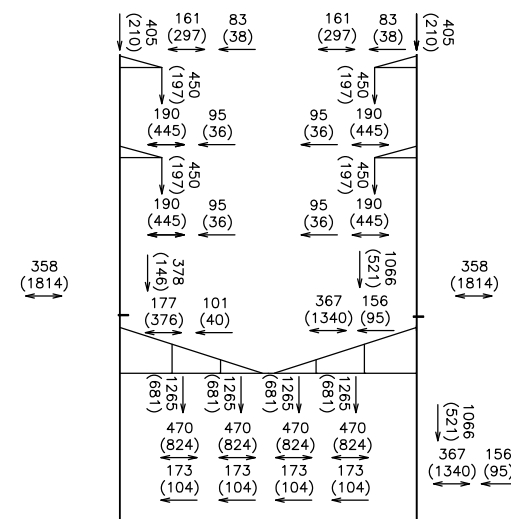


CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-0 3/4"	26'-1 1/4"	26'-1"	26'-8 3/4"
CW	21'-0 3/4"	20'-1 1/4"	20'-1"	20'-8 3/4"



STRUCTURE ERECTION DIAGRAM T-344

808+65  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	2
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	2
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	4
CSC1	SLIDING BRACKET	S-5214	8

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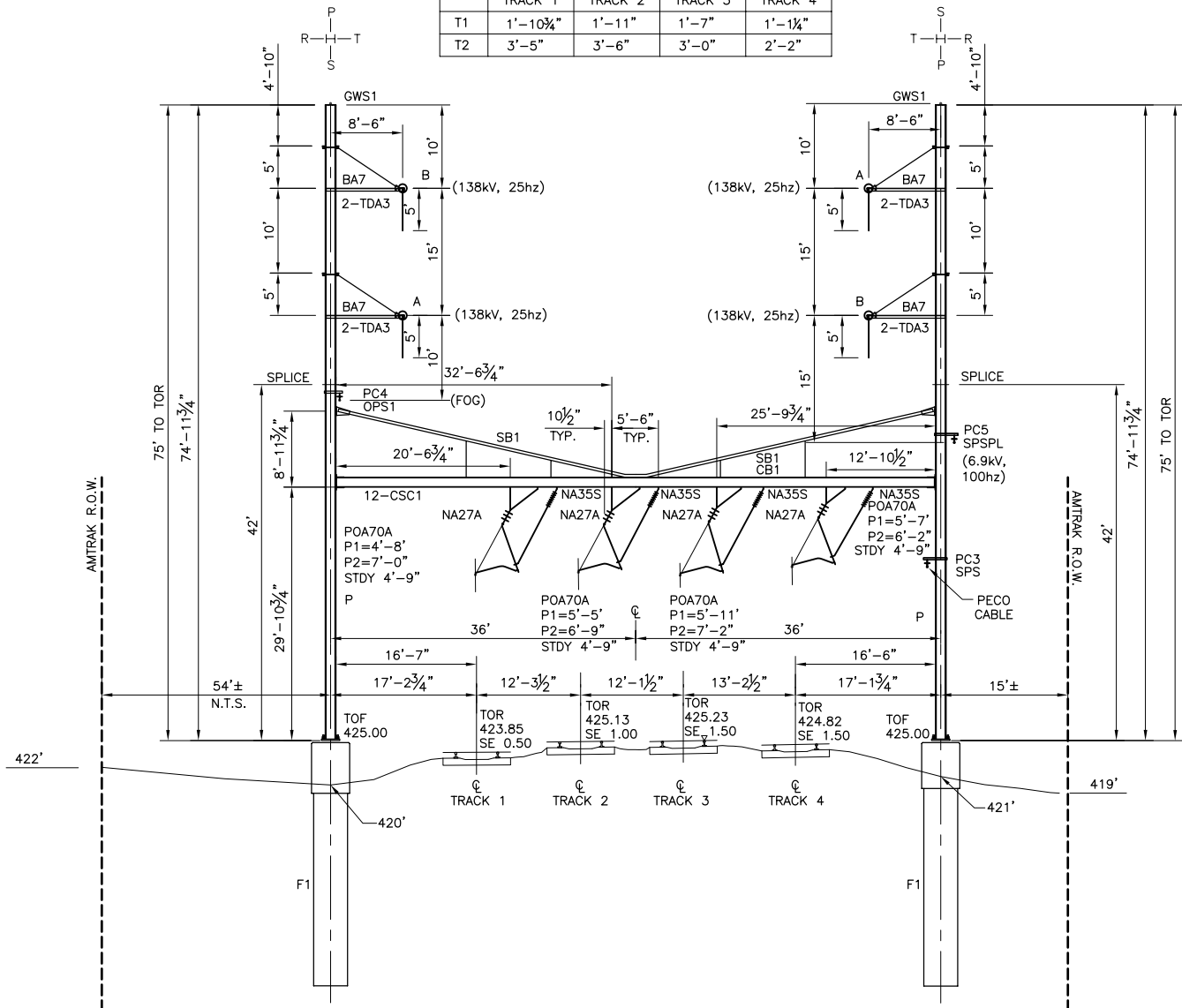
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-344  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1311.DWG  
Ref. No.: 2011-059  
Sheet No: 223 OF 565  
ET-1311

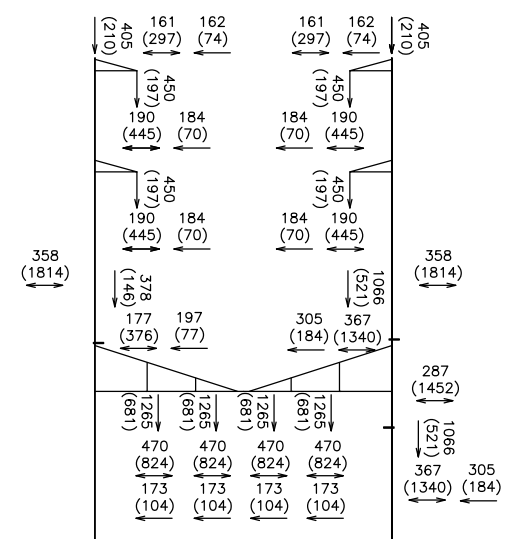
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
SPSPL	SIGNAL POWER SPLICE	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
PC5	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA7	TRANSMISSION BRACKET	S-5205	4
CSC1	SLIDING BRACKET	S-5214	12

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-11"	25'-7½"	25'-10¼"	26'-9"
CW	20'-1¼"	19'-1½"	19'-6"	20'-11"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-10¾"	1'-11"	1'-7"	1'-1¼"
T2	3'-5"	3'-6"	3'-0"	2'-2"



STRUCTURE ERECTION DIAGRAM T-343  
 805+64  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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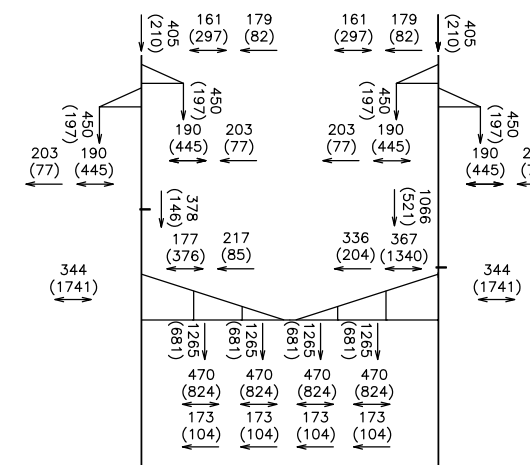


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-343  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1312.DWG  
 Ref. No.: 2011-059  
 Sheet No: 224 OF 565  
 ET-1312

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION WIRE SUPPORT	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA7	TRANSMISSION BRACKET	S-5205	4
CSC1	SLIDING BRACKET	S-5214	12

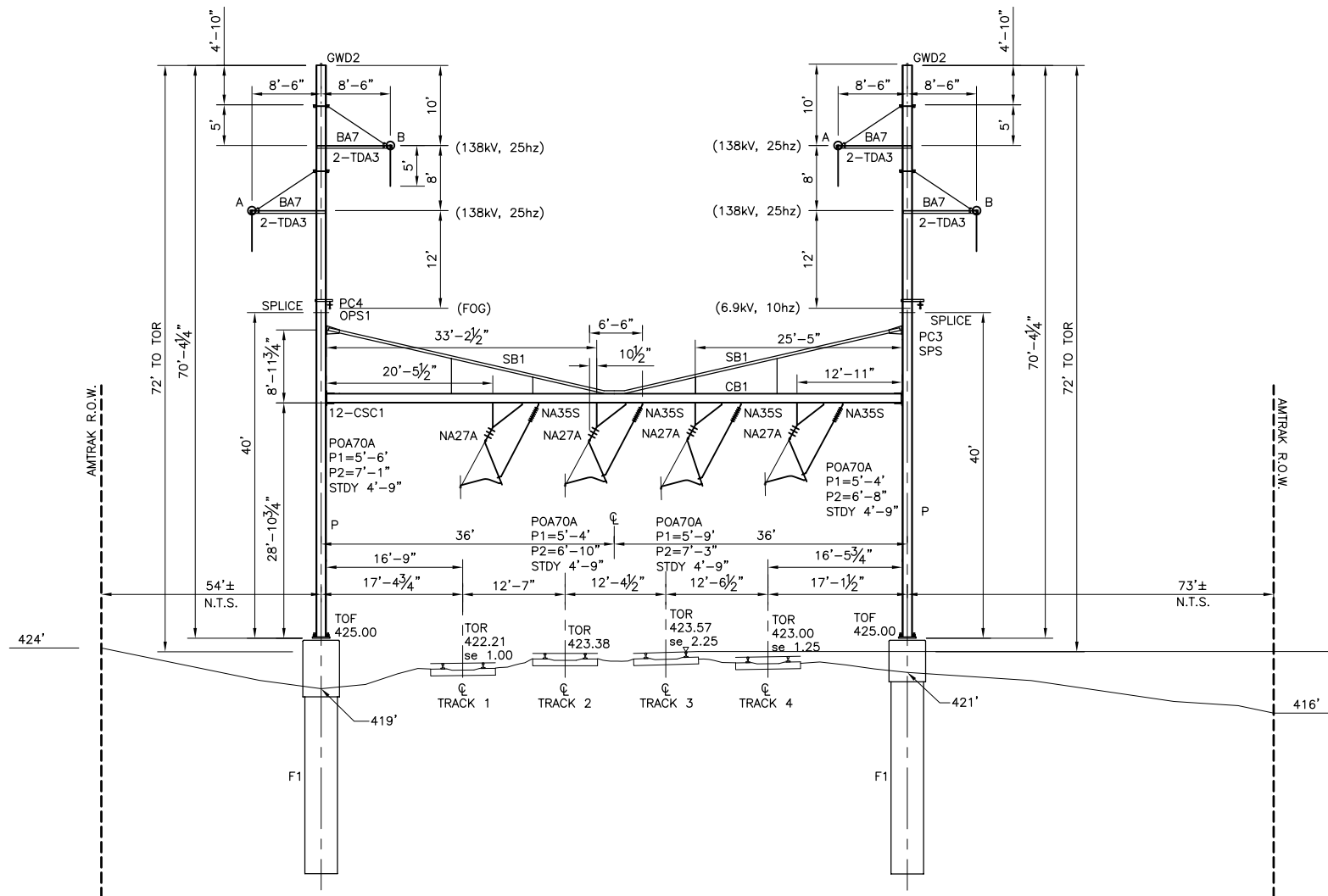


- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-3 3/4"	26'-2 1/4"	26'-2 3/4"	26'-9 1/4"
CW	21'-7"	20'-7 1/2"	20'-1"	21'-2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-2"	2'-1 1/2"	1'-10 3/4"	1'-11"
T2	3'-11"	3'-10"	3'-5"	3'-6"



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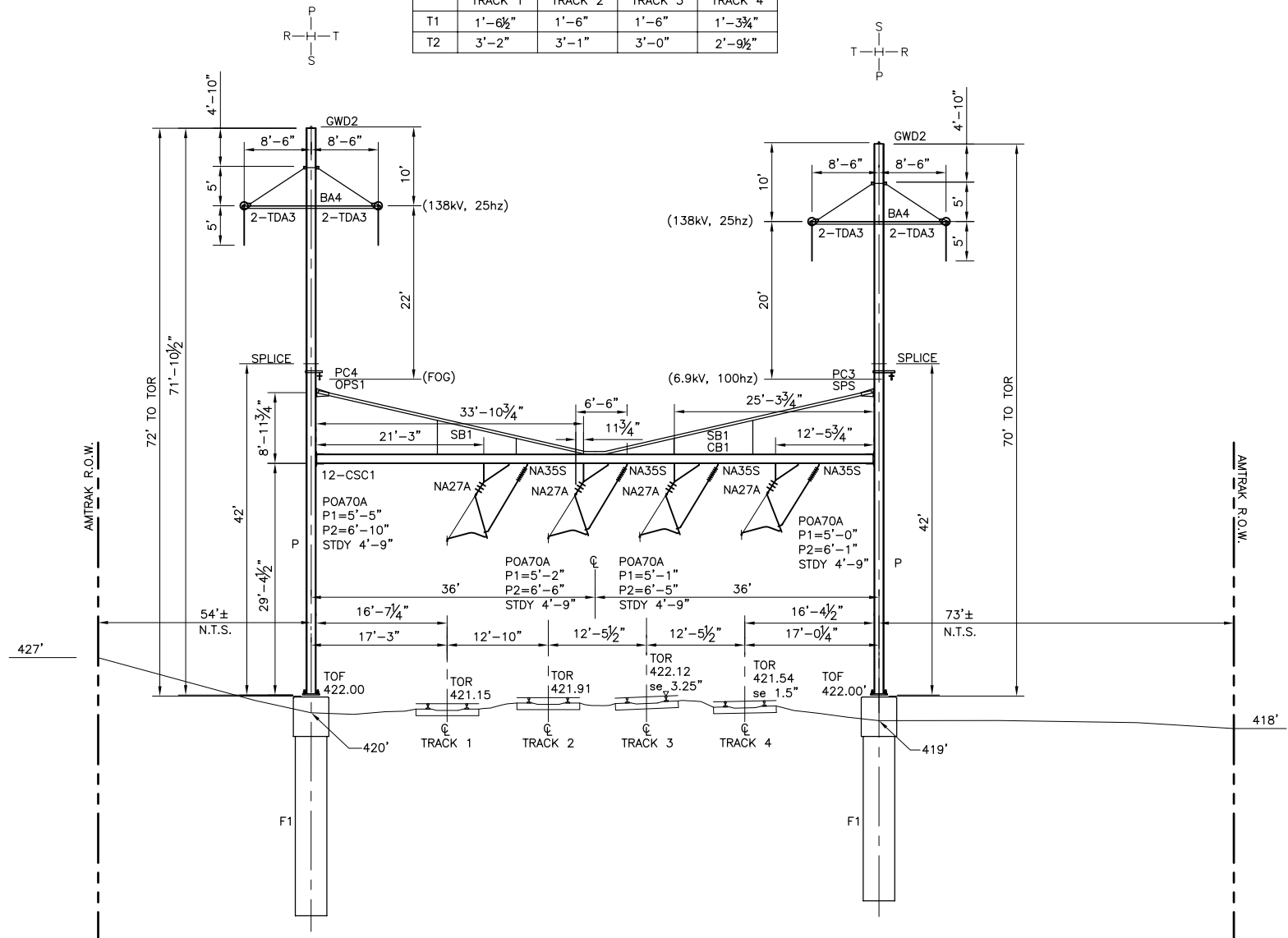
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-342  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1313.DWG
Ref. No.:	2011-059
Sheet No.:	225 OF 565
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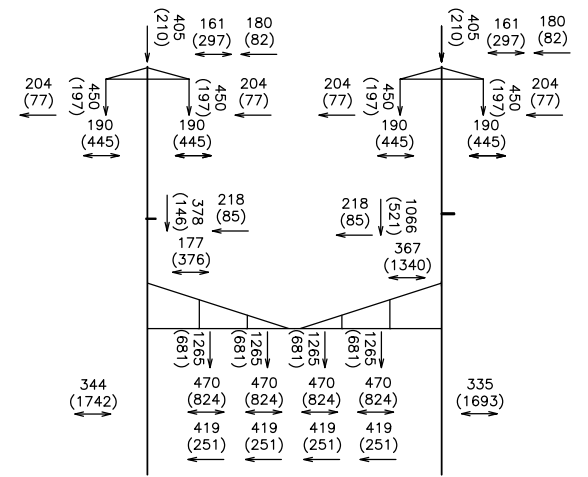
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-6 1/4"	25'-9 3/4"	25'-7"	26'-4 1/2"
CW	20'-8"	20'-2 3/4"	20'-2"	21'-0 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-6 1/2"	1'-6"	1'-6"	1'-3 3/4"
T2	3'-2"	3'-1"	3'-0"	2'-9 1/2"



STRUCTURE ERECTION DIAGRAM T-341  
799+64  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWD2	GROUND WIRE DEADEND	ET-1909	2	
TDA3	TRANSMISSION WIRE SUPPORT	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA4	TRANSMISSION BRACKET -DOUBLE	S-5203	2	
CSC1	SLIDING BRACKET	S-5214	12	

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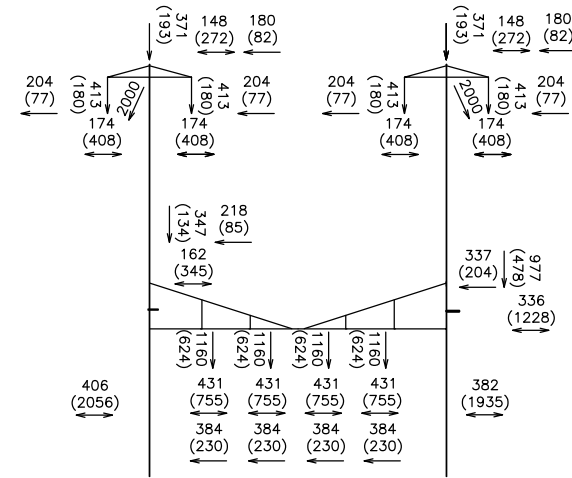


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-341  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1314.DWG
Ref. No.:	2011-059
Sheet No.:	226 OF 565
ET-1314	

BILL OF MATERIALS

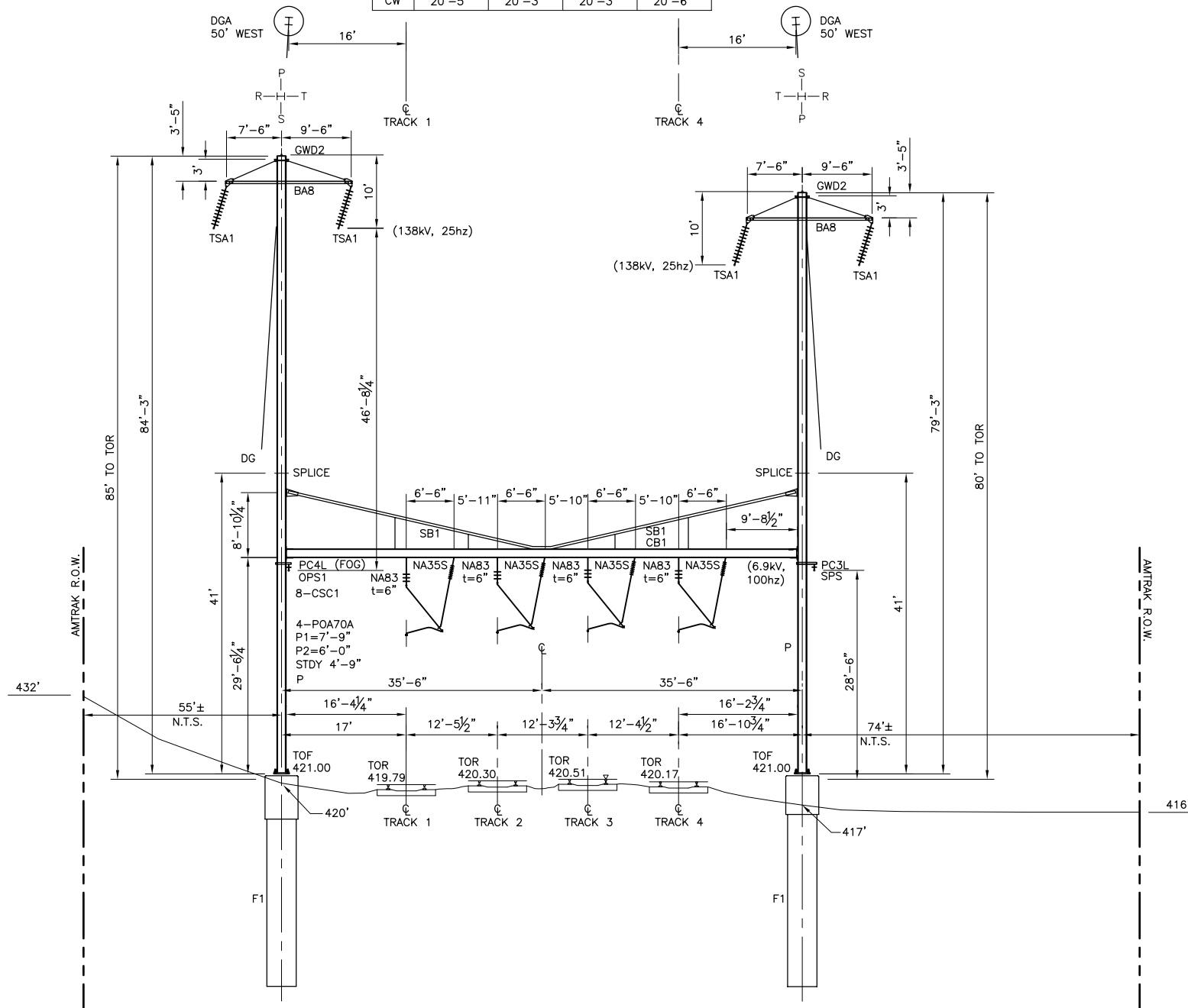
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
DG	DOWNGUY	ET-1908	2
PC3L	SLIDING CLAMP	S-5215	1
PC4L	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA8	TRANSMISSION BRACKET -DOUBLE	S-5206	2
CSC1	SLIDING BRACKET	S-5214	8
DGA	DOWNGUY ANCHOR	S-5101	2



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-11"	27'-9"	27'-9"	28'-3"
CW	20'-5"	20'-3"	20'-3"	20'-6"



STRUCTURE ERECTION DIAGRAM T-340

796+63  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"

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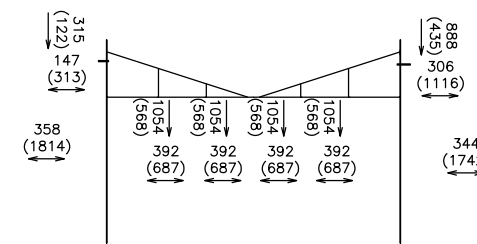


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-340  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1315.DWG
Ref. No.:	2011-059
Sheet No.:	227 OF 565
ET-1315	

BILL OF MATERIALS

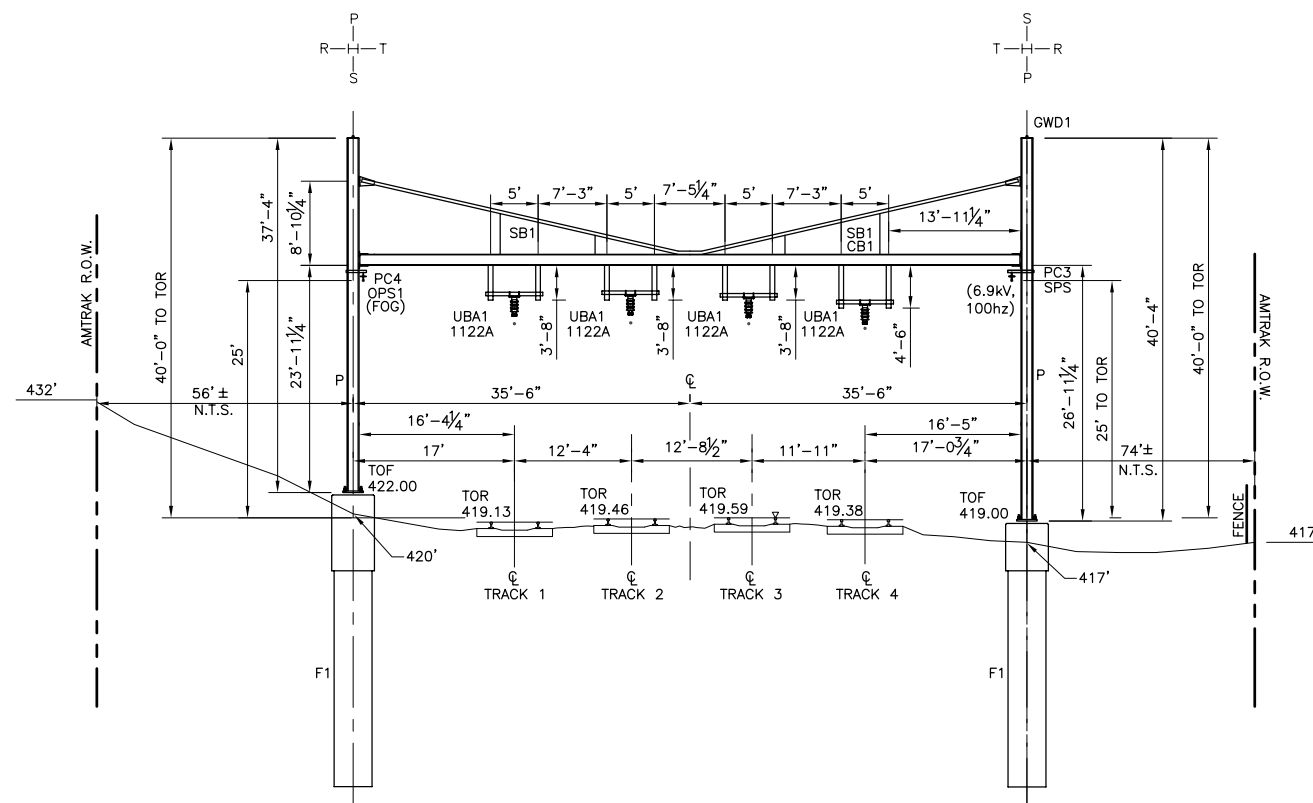
MARK	DESCRIPTION	REF. DWG.	QUANTITY
1122A	MESSENGER SUPPORT	ET-1904	4
GWD1	GROUND WIRE DEADEND	ET-1909	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
UBA1	UNDER BRIDGE BRACKET	S-5228	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
225' LOAD SPAN  
(NOT TO SCALE)

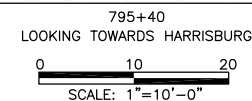
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	21'-9 5/8"	21'-7 7/8"	21'-2 3/8"	20'-8 3/8"
CW	20'-10 7/8"	20'-8"	20'-5 5/8"	20'-2"



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
4. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
5. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
6. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
7. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-339A



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IN ASSOCIATION WITH



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-339A

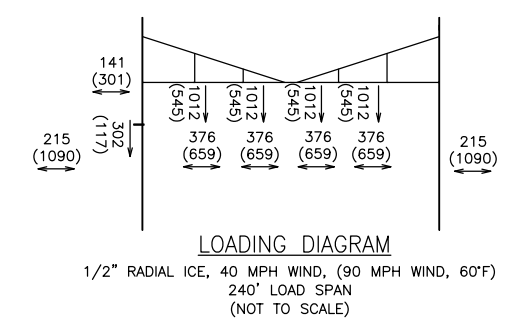
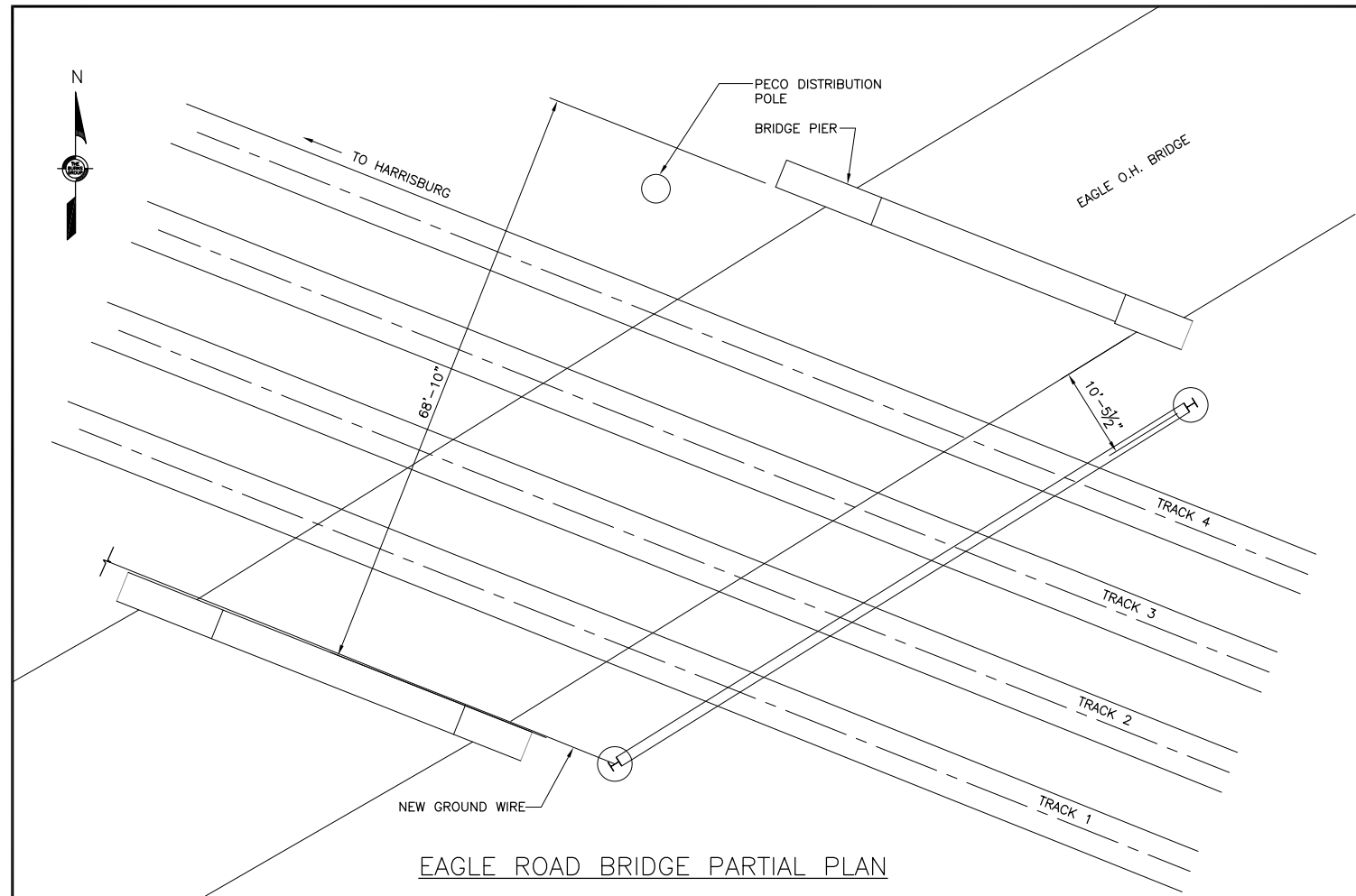
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File No.: 2011-059-ET-1315A/16  
Ref. No.: 2011-059  
Sheet No: 228 OF 565  
ET-1315A

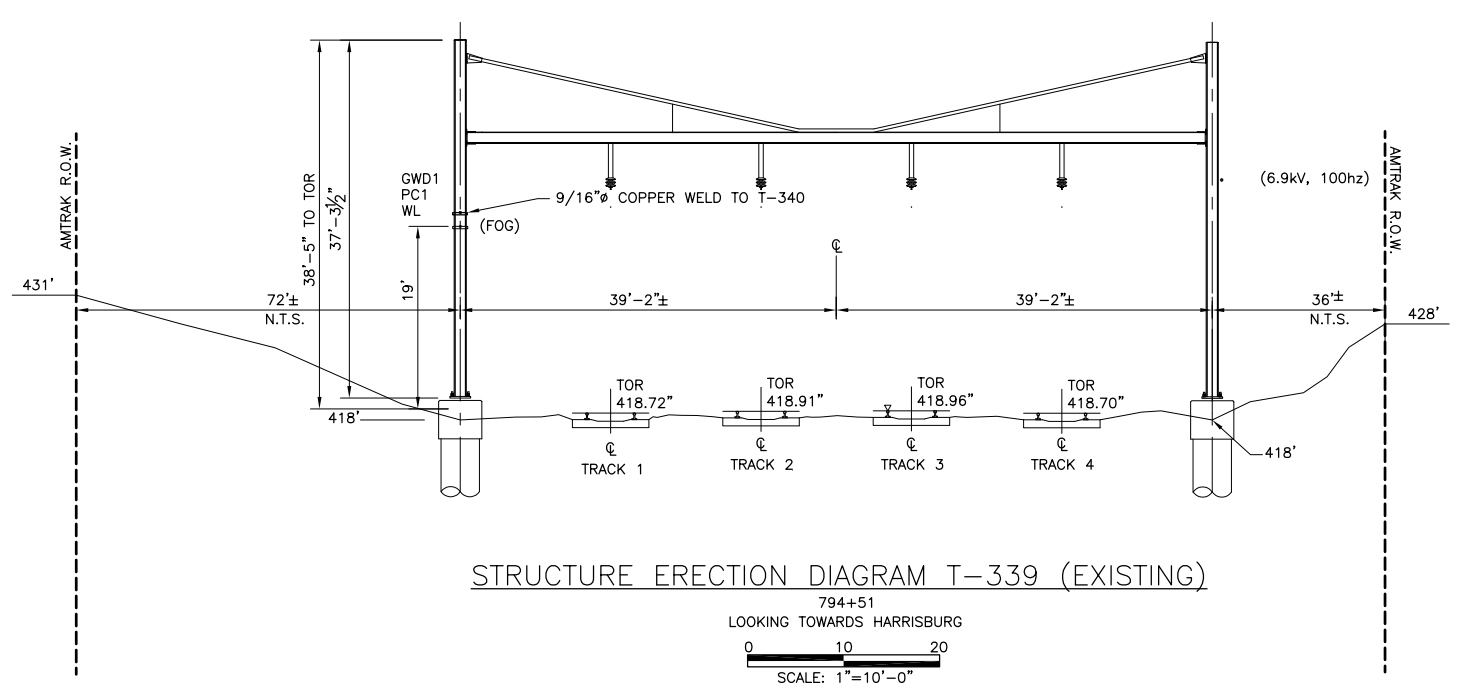
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BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
GWD1	GROUND WIRE ASSEMBLY	ET-1909	1
PC1	SLIDING CLAMP	S-5214	1
-	9/16" CU-CLAD STEEL	ET-0093	220



	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	21'-6 1/2"	22'-3"	21'-8"	21'-7 1/2"
CW	20'-9"	20'-6"	20'-3"	20'-0"



- WORK STATEMENT:**
- INSTALL SLIDING CLAMP AND GROUND WIRE.
- NOTES:**
- STRUCTURE IS AN EXISTING PORTAL, EAST SIDE OF EAGLE ROAD OVERHEAD BRIDGE.
  - NEW SIGNAL POWER WIRE IS SUPPORTED ON ADJACENT CATENARY STRUCTURE T-338.

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**OFFICE OF  
Chief Engineer  
Engineering**

National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

Approved \_\_\_\_\_ Date \_\_\_\_\_

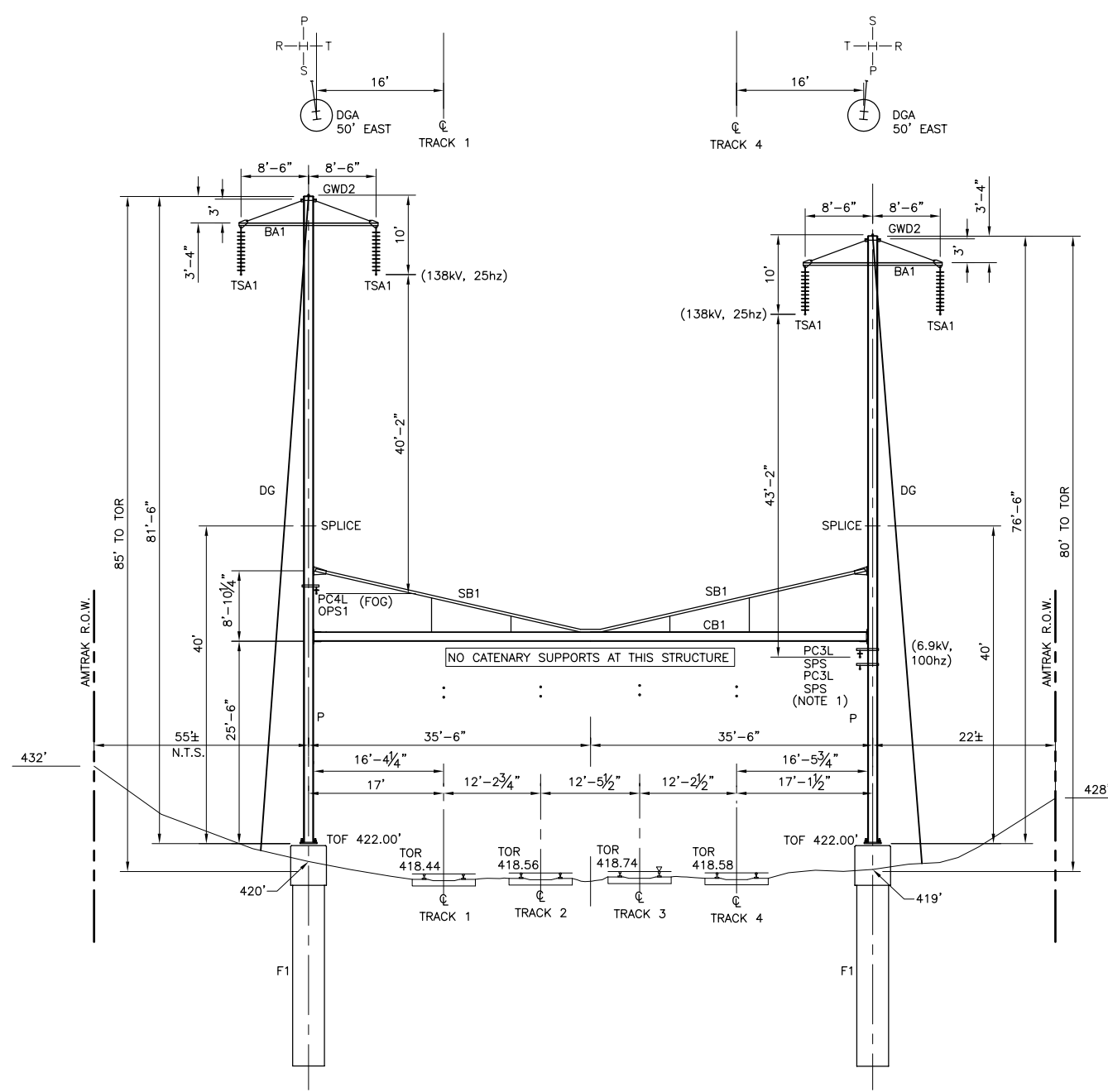
BURNS ENGINEERING, INC. | 215 879-7700  
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
PHILADELPHIA, PA 19103

**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-339 (EXISTING)**

Recommended: DP    Drawn: WJC    Checked: MJM    Date: 03/17/16

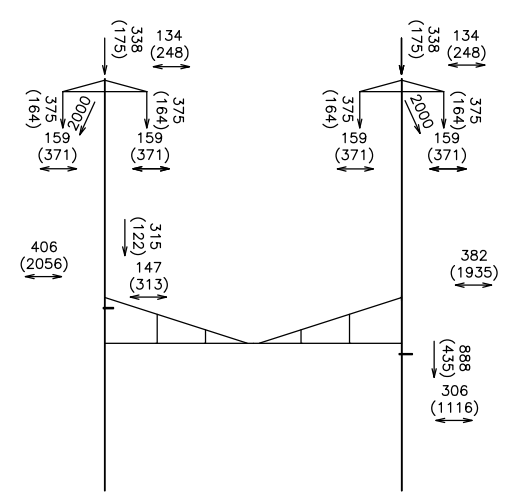
File No.:	2011-059-ET-1316.DWG
Ref. No.:	2011-059
Sheet No.:	229 OF 565
<b>ET-1316</b>	

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STRUCTURE ERECTION DIAGRAM T-338

794+13  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
250' LOAD SPAN  
(NOT TO SCALE)

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	2
DG	DOWNGUY	ET-1908	2
PC3L	SLIDING CLAMP	S-5215	2
PC4L	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
DGA	DOWNGUY ANCHOR	S-5101	2

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKETS.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. TRANSFER EXISTING SIGNAL POWER WIRES TO NEW BRACKET MOUNTED BELOW NEW SIGNAL POWER CABLE.
8. DEMO OLD CAT POLES AND FOUNDATIONS.

**NOTE:**

1. USE PC3L AND SPS FOR TEMPORARY SUPPORT OF EXISTING SIGNAL POWER CABLE.

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30TH Street Station-Philadelphia, Pennsylvania 19104

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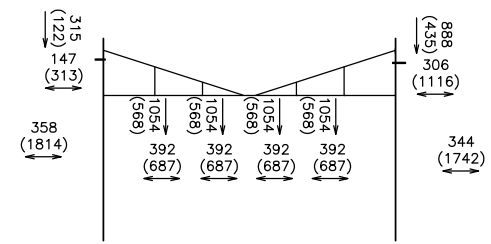


**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-338**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1317.DWG
Ref. No.:	2011-059
Sheet No.:	230 OF 565
<b>ET-1317</b>	

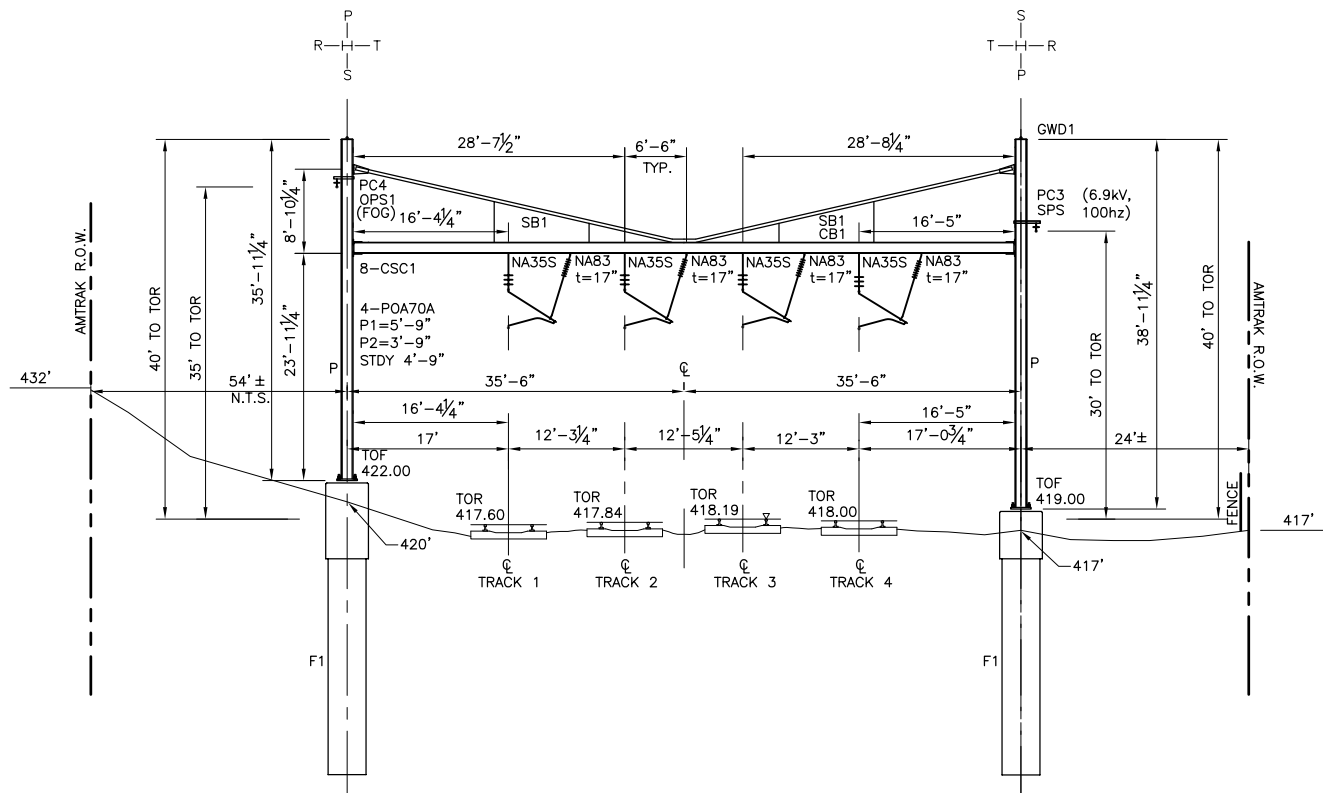


BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD1	GROUND WIRE DEADEND	ET-1909	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 125' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-9"	24'-6"	24'-3"	24'-5"
CW	20'-9"	20'-6"	20'-3"	20'-5"



**STRUCTURE ERECTION DIAGRAM T-337A**  
 793+18  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
4. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
5. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
6. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
7. DEMO OLD CAT POLES AND FOUNDATIONS.

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 National Railroad Passenger Corporation  
 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



**100% DESIGN SUBMISSION**

PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-337A

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

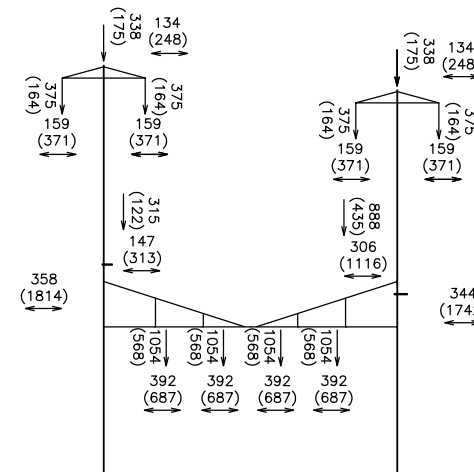
File No.:	2011-059-ET-1317A
Ref. No.:	2011-059
Sheet No.:	231 OF 565
ET-1317A	

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BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE DEADEND	ET-1909	2
TDA3	TRANSMISSION WIRE SUPPORT	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC4	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4	TRANSMISSION BRACKET --DOUBLE	S-5203	2
CSC1	SLIDING BRACKET	S-5214	8

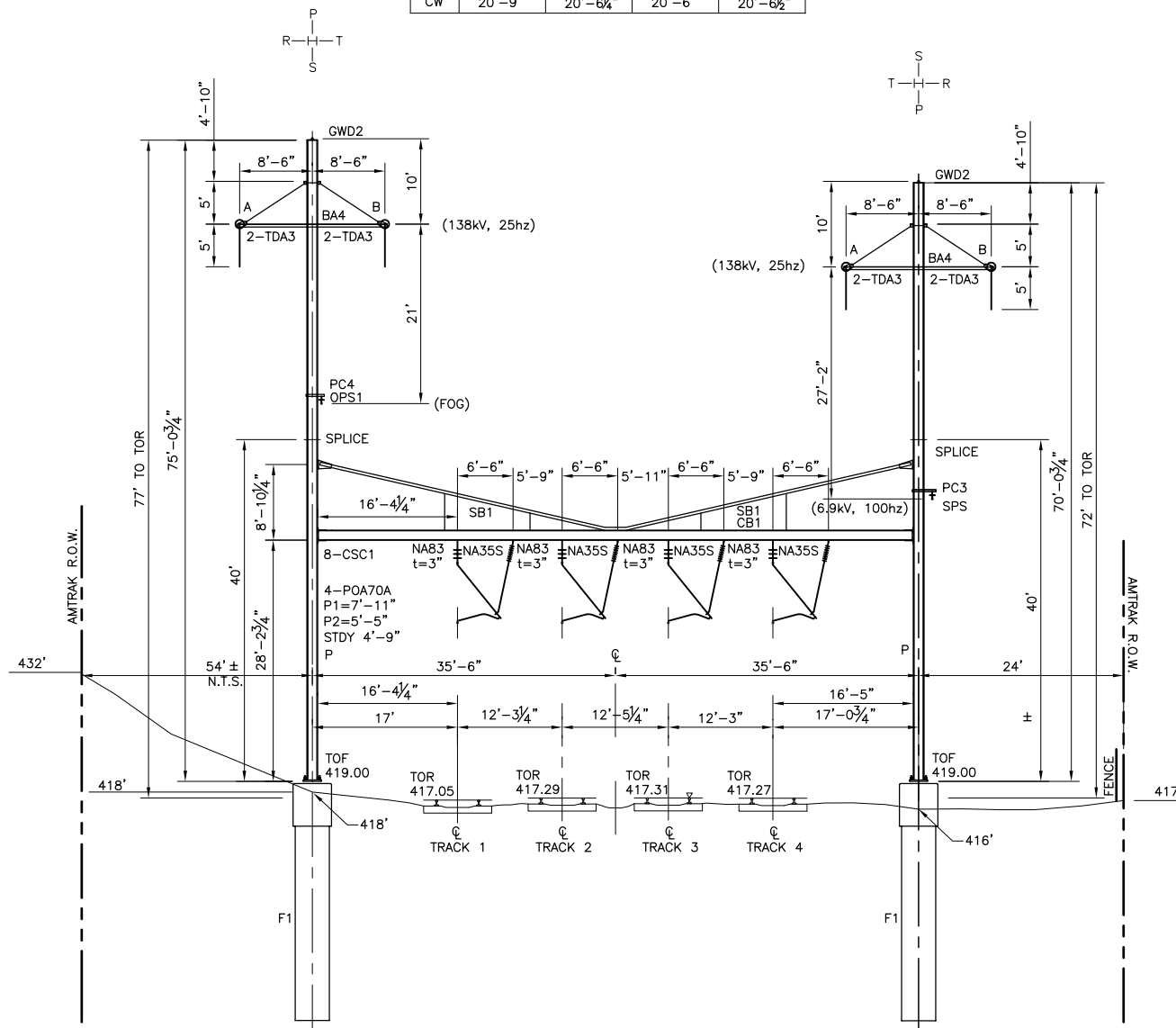
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-9"	27'-6 1/4"	27'-6"	27'-6 1/2"
CW	20'-9"	20'-6 1/4"	20'-6"	20'-6 1/2"



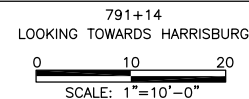
LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
250' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.



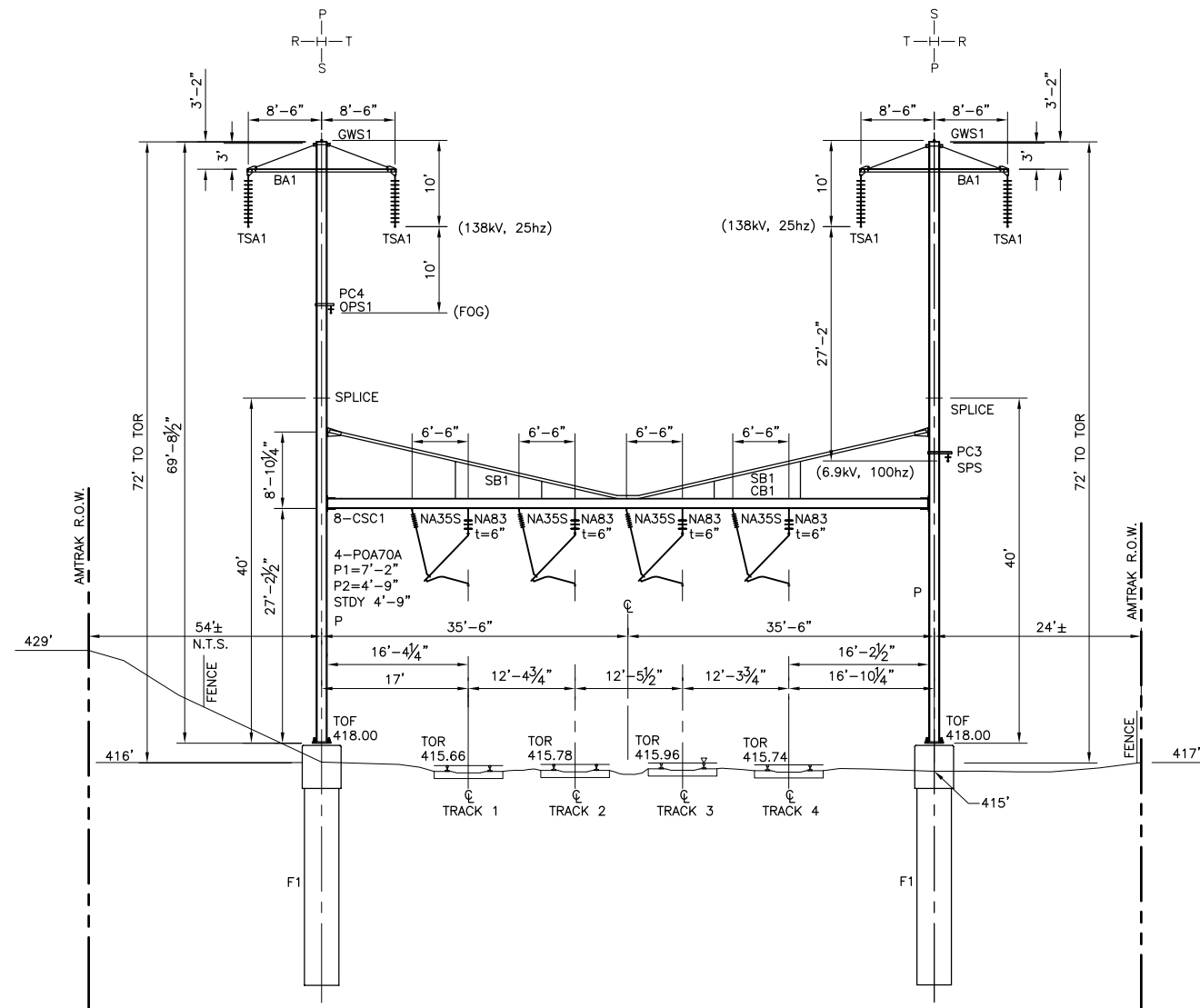
STRUCTURE ERECTION DIAGRAM T-337



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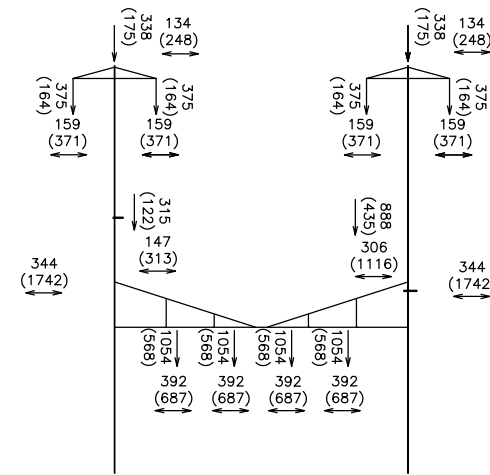
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No	Revisions	Date	By																																		
				<p>Recommended: DP Drawn: VJC Checked: MJM Date: 03/17/16</p>		<p>ET-1318</p>																															

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-10 1/2"	26'-9 1/4"	26'-7"	26'-9 3/4"
CW	20'-10 1/2"	20'-9 1/4"	20'-7"	20'-9 3/4"



STRUCTURE ERECTION DIAGRAM T-336

788+69  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
250' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER TERMINATION	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2	
CSC1	SLIDING BRACKET	S-5214	8	

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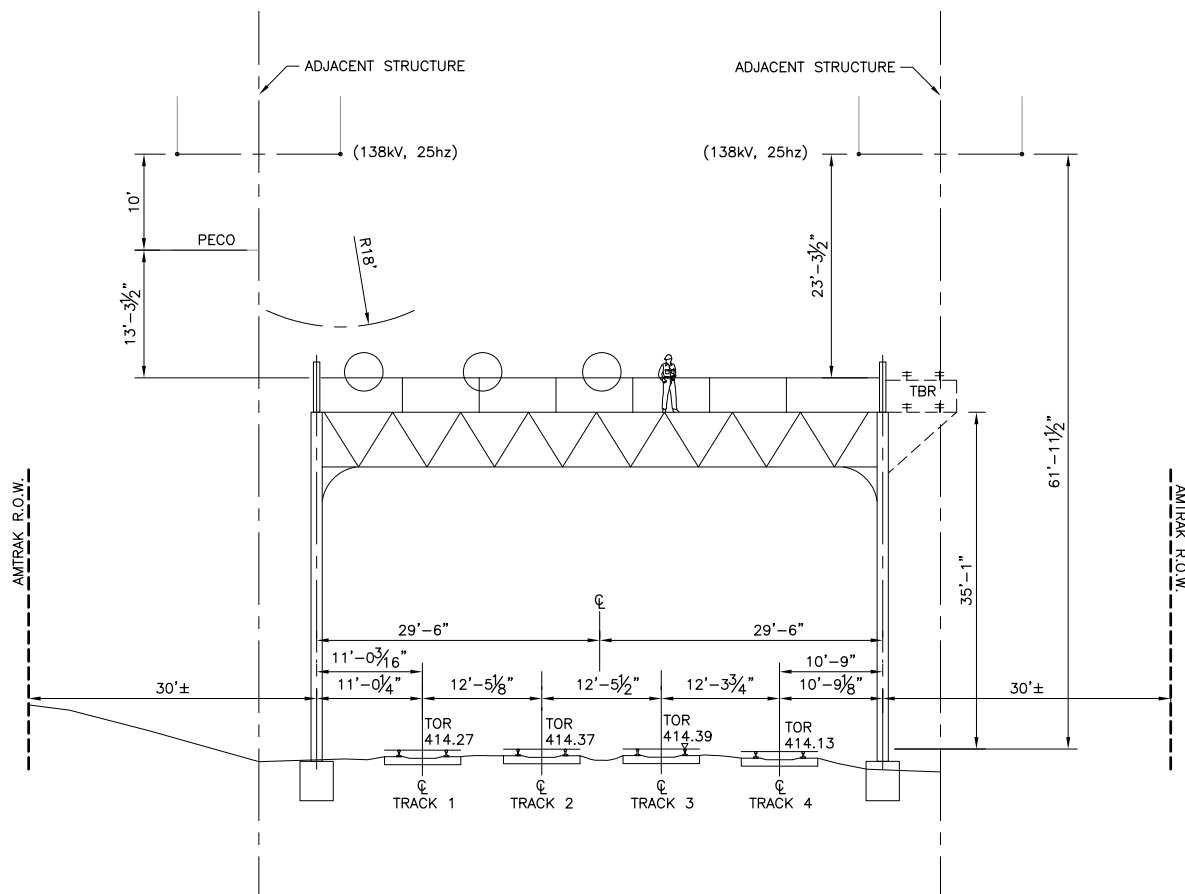
**Burns** IN ASSOCIATION WITH **Baker** **AECOM**

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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-336**

Recommended: DP Drawn: VJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1319.DWG  
Ref. No.: 2011-059  
Sheet No: 233 OF 565  
ET-1319



STRUCTURE ERECTION DIAGRAM T-335 SB (EXISTING P-179 SB)  
 STATION 787+10  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

WORK STATEMENT:

1. GROUND STRUCTURE.
2. REMOVE PECO DISTRIBUTION WIRES AND INSULATORS.

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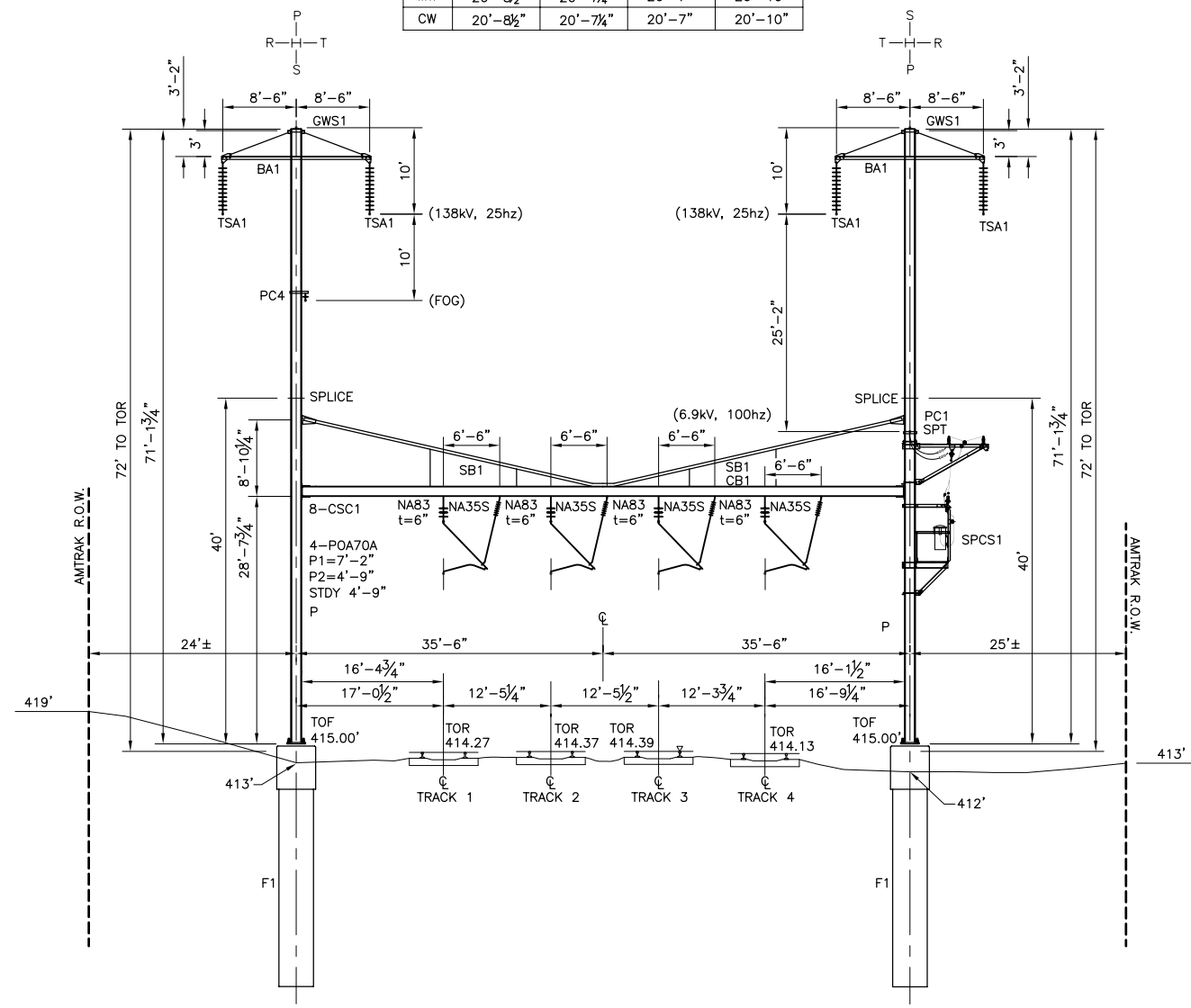
**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-335 SB (P-179 SB)**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1320.DWG
Ref. No.:	2011-059
Sheet No.:	234 OF 565
<b>ET-1320</b>	

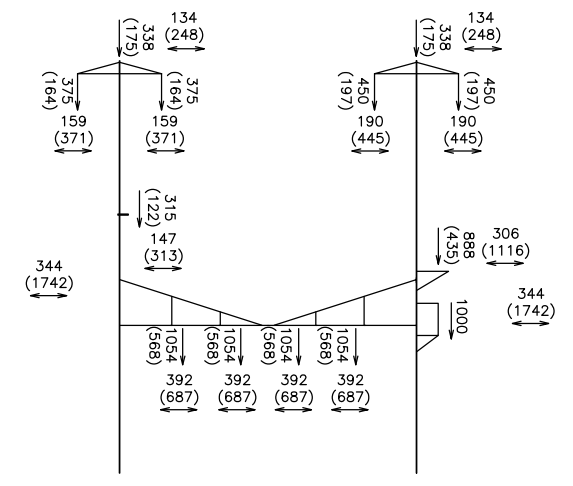
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPT	SIGNAL POWER TERMINATION	ET-1913	1
SPCS1	SIGNAL POWER CUT SECTION	ET-1810	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC1	SLIDING CLAMP	S-5214	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-8 1/2"	26'-7 1/4"	26'-7"	26'-10"
CW	20'-8 1/2"	20'-7 1/4"	20'-7"	20'-10"



STRUCTURE ERECTION DIAGRAM T-334  
786+44  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
250' LOAD SPAN  
(NOT TO SCALE)

- WORK STATEMENT:
- INSTALL FOUNDATIONS.
  - INSTALL POLES, CROSS BEAM AND SAG BRACES.
  - INSTALL TRANSMISSION BRACKETS.
  - INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORM.
  - INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  - TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  - INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  - TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  - ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  - DEMO OLD CAT POLES AND FOUNDATIONS.

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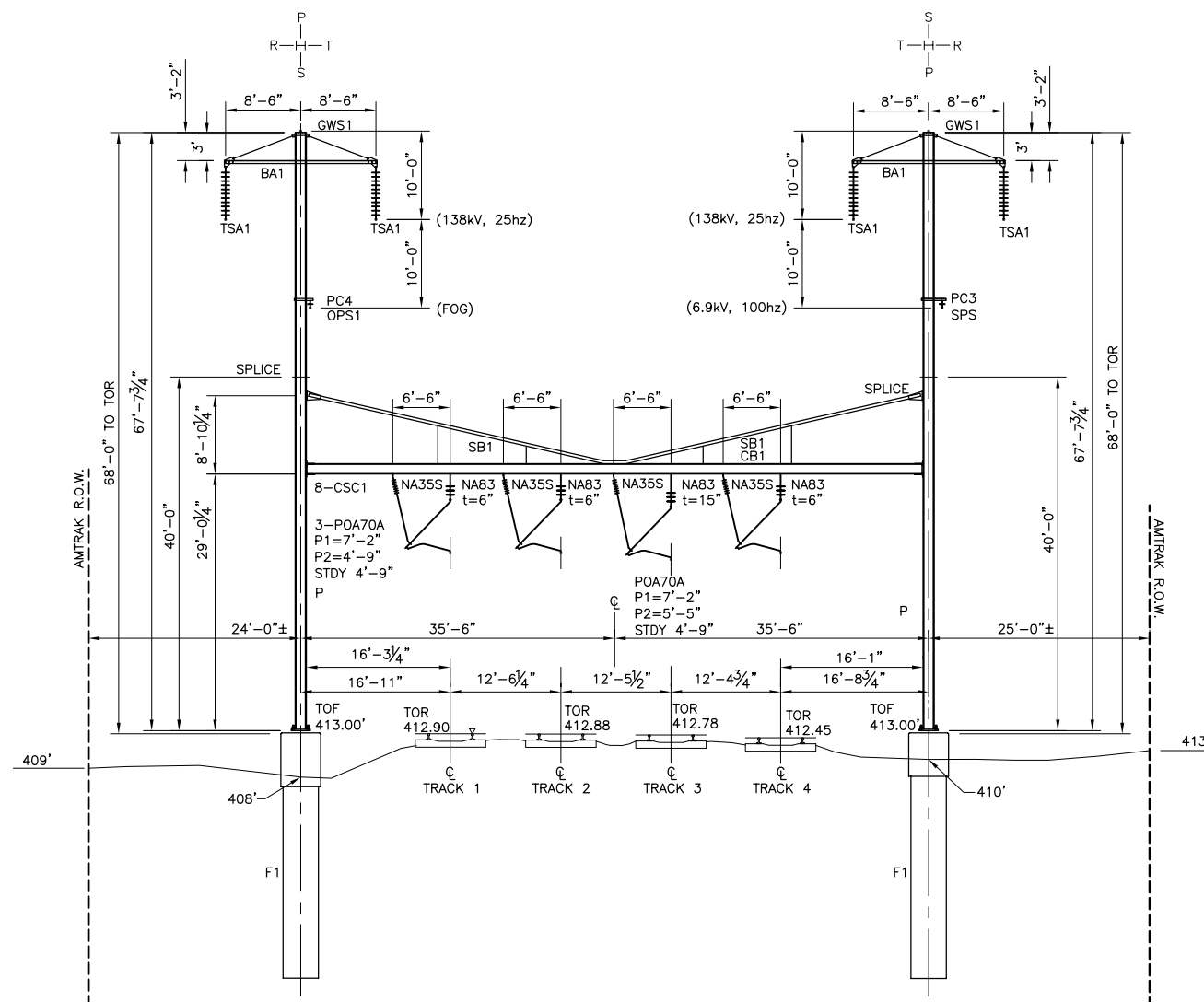
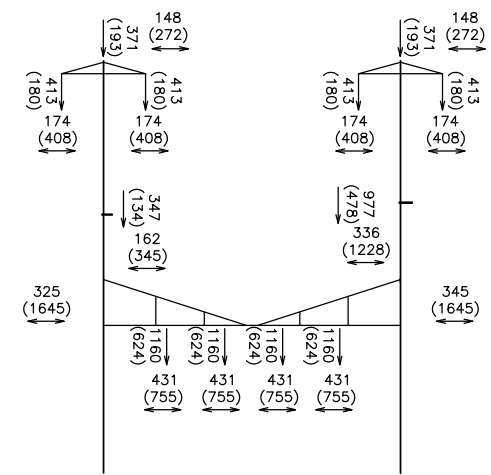
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-334  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1321.DWG  
Ref. No.: 2011-059  
Sheet No: 235 OF 565  
ET-1321

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER TERMINATION	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5214	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-5 1/2"	26'-5 3/4"	25'-10"	26'-11"
CW	20'-5 1/2"	20'-5 3/4"	19'-10"	20'-11"



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

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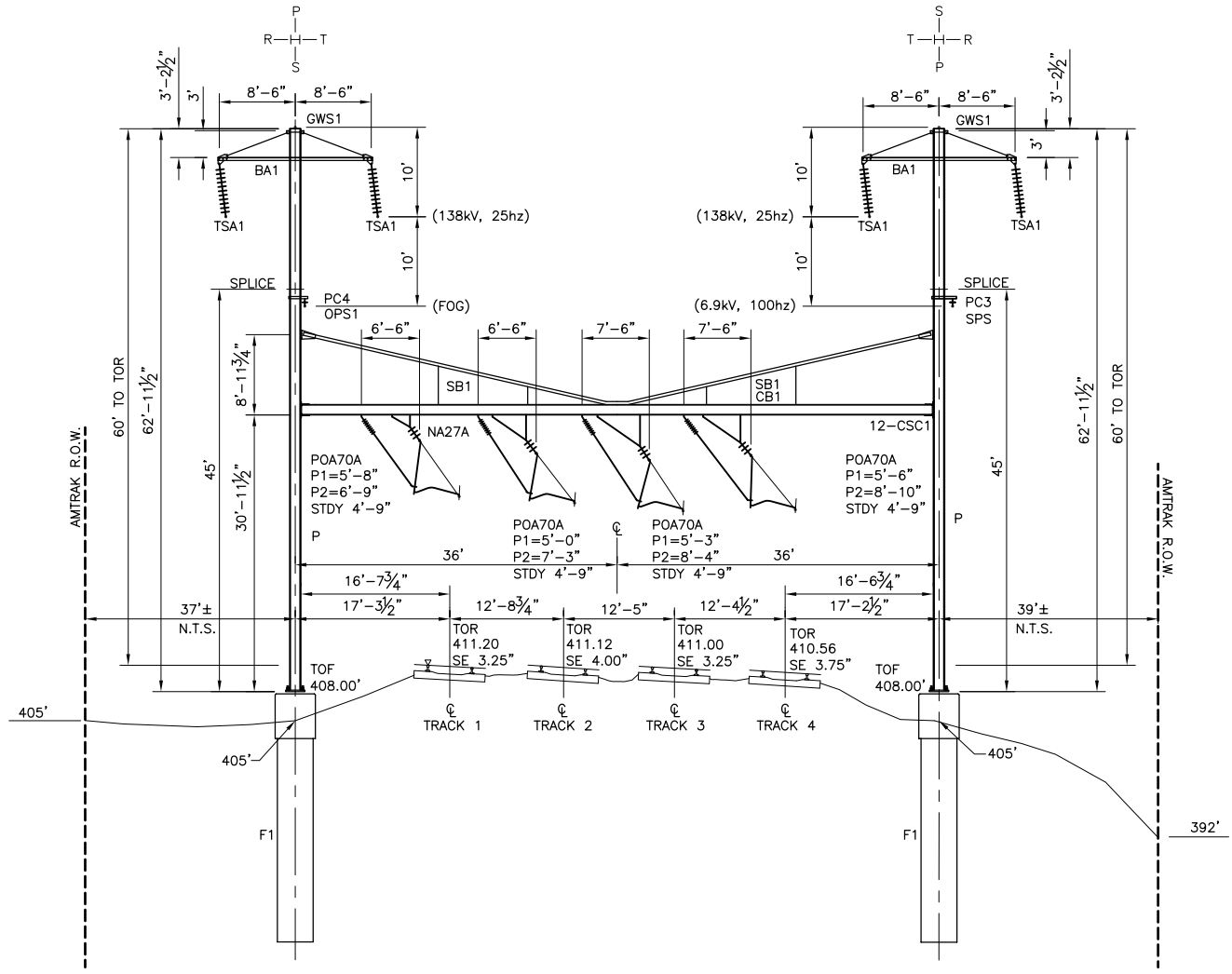
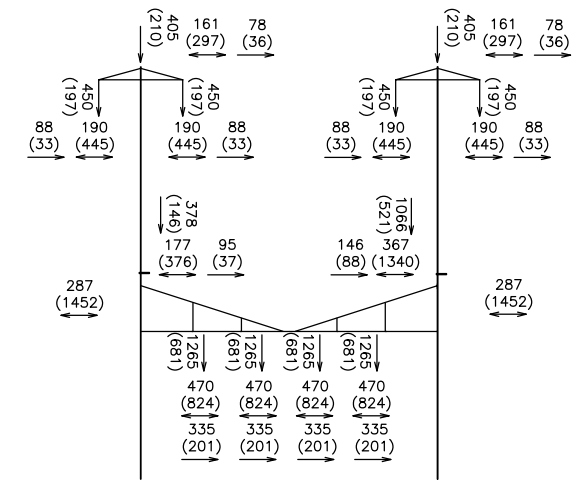
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-333  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1322.DWG
Ref. No.:	2011-059
Sheet No.:	236 OF 565
ET-1322	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	12

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-1 1/2"	23'-9 1/2"	23'-1 3/4"	24'-1 1/2"
CW	18'-10 1/2"	18'-2 3/4"	17'-5 1/2"	18'-0 1/2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	6"	2'-0"	2'-8"	2'-3"
T2	1'-8"	3'-11"	5'-2"	4'-5"



**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-332  
781+18  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

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Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-332**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

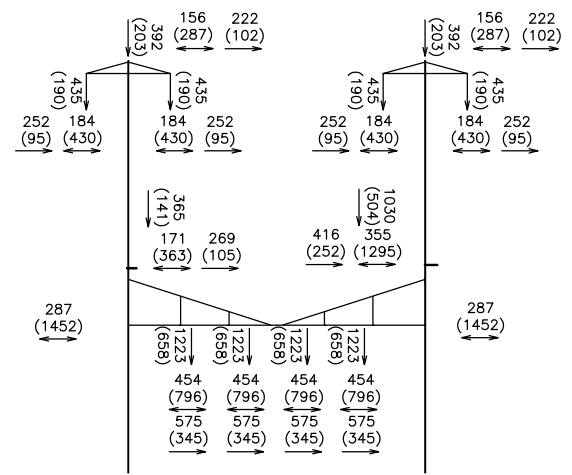
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Ref. No.: 2011-059  
Sheet No.: 237 OF 565  
ET-1323

BILL OF MATERIALS

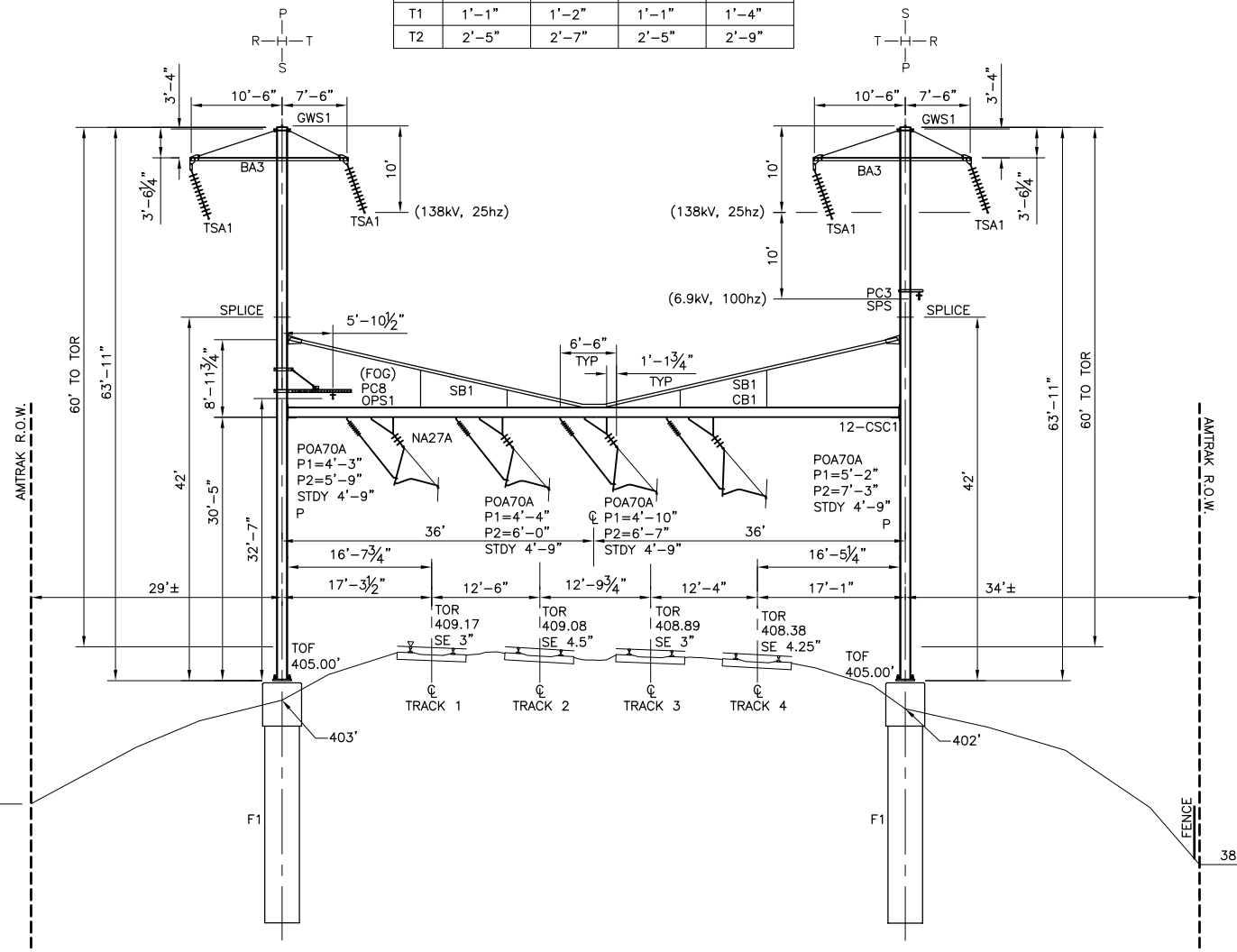
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC8	SLIDING CLAMP	S-5240	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET-DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	12

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-1 1/2"	23'-1 1/2"	23'-4 3/4"	23'-8 1/2"
CW	18'-4 1/2"	18'-3"	18'-0"	17'-11 1/2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-1"	1'-2"	1'-1"	1'-4"
T2	2'-5"	2'-7"	2'-5"	2'-9"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
290' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE ERECTION DIAGRAM T-331  
778+28  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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National Railroad Passenger Corporation  
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Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-331  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1324.DWG  
Ref. No.: 2011-059  
Sheet No.: 238 OF 565  
ET-1324

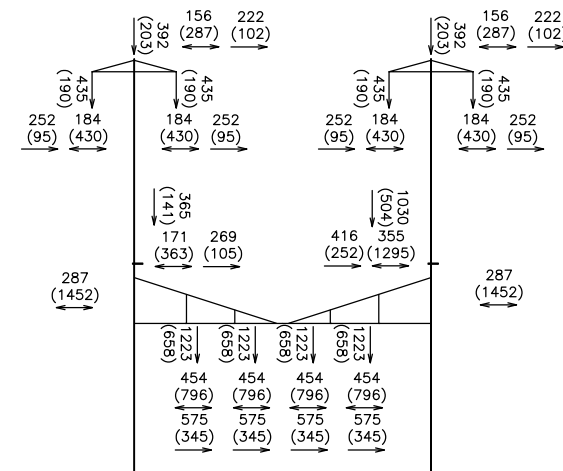


BILL OF MATERIALS

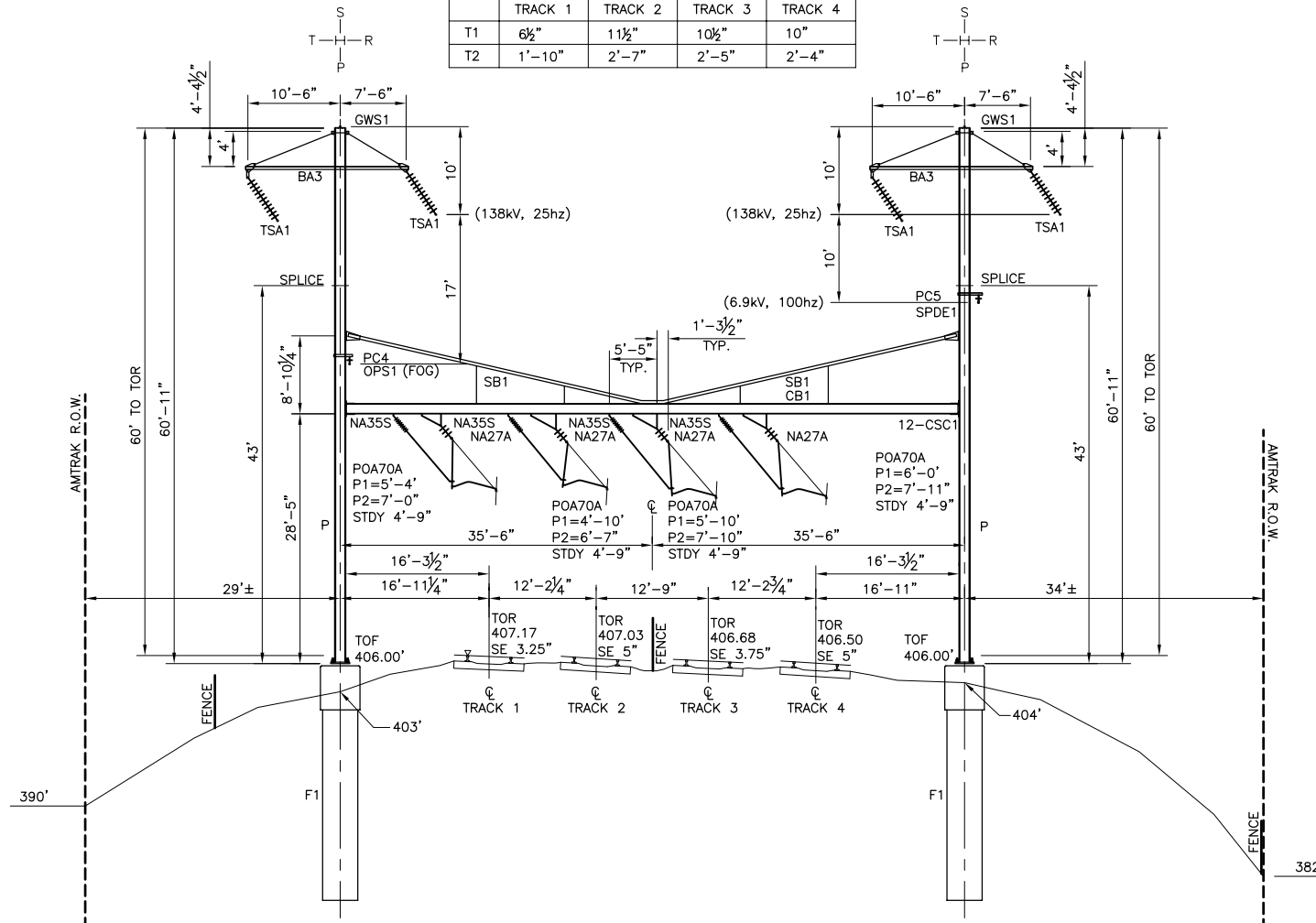
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPDE1	SIGNAL POWER DEADEND	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC4	SLIDING CLAMP	S-5215	1
PC5	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5210	12

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-8 1/2"	24'-5 3/4"	24'-10 1/2"	25'-1 3/4"
CW	18'-9"	19'-1 1/4"	18'-5 1/2"	18'-7 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	6 1/2"	11 1/2"	10 1/2"	10"
T2	1'-10"	2'-7"	2'-5"	2'-4"

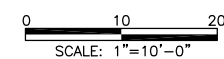


LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
290' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE ERECTION DIAGRAM T-330

775+59  
LOOKING TOWARDS HARRISBURG



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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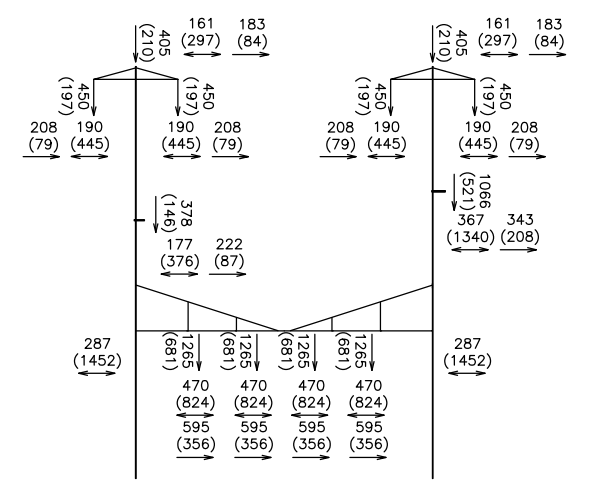
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-330  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

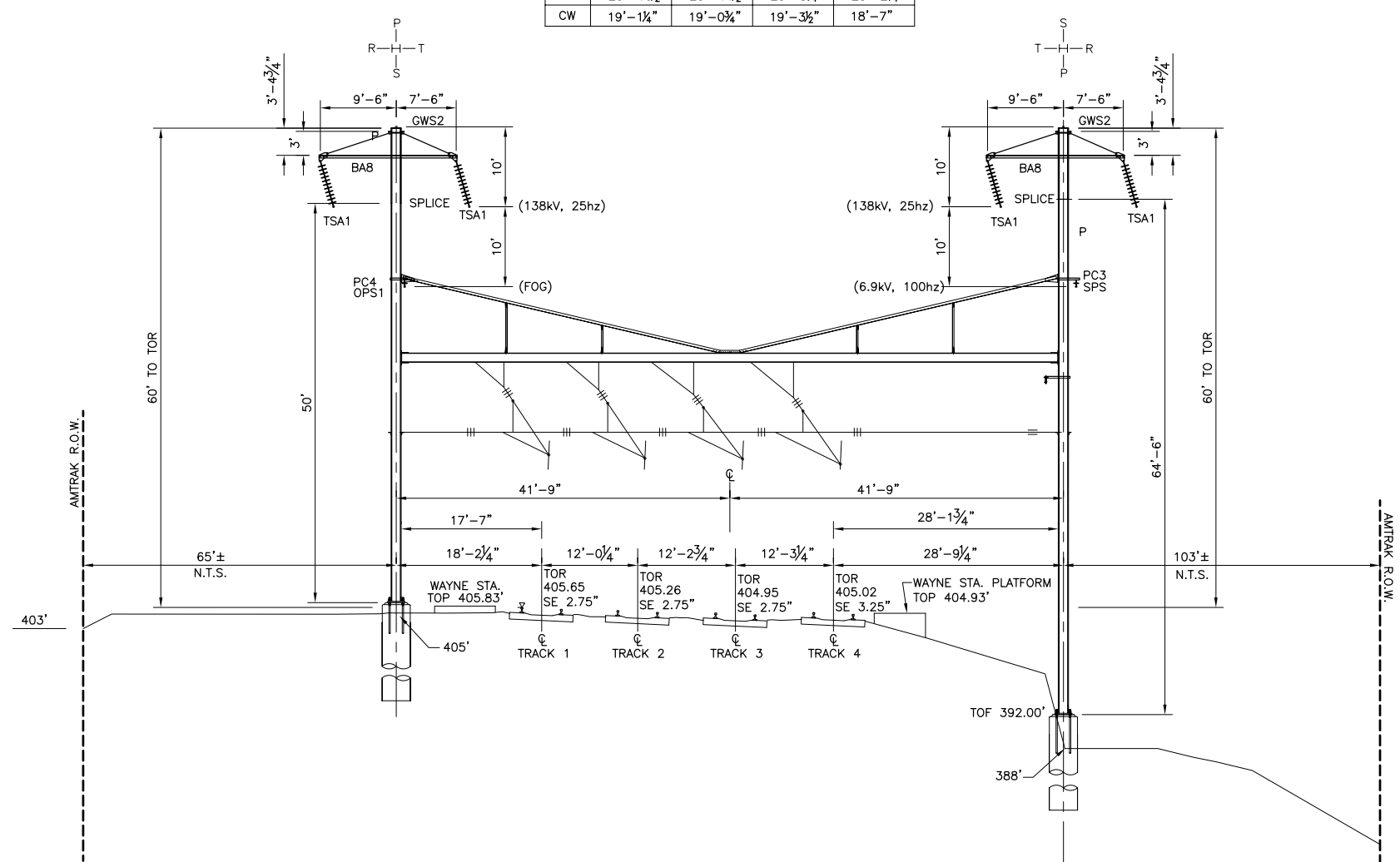
File No.: 2011-059-ET-1325.DWG  
Ref. No.: 2011-059  
Sheet No: 239 OF 565  
ET-1325

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
GWS2	GROUND WIRE ASSEMBLY	ET-1909	2
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE EXTENSION	S-5103	2
BA8	TRANSMISSION BRACKET	S-5206	2

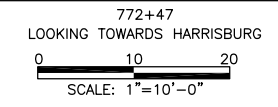


**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-10 1/2"	25'-11 1/2"	25'-8 3/4"	25'-2 3/4"
CW	19'-1 1/4"	19'-0 3/4"	19'-3 1/2"	18'-7"



STRUCTURE ERECTION DIAGRAM T-329 (EXISTING P-174A)



- WORK STATEMENT:**
- INSTALL POLE EXTENSIONS.
  - INSTALL TRANSMISSION BRACKETS.
  - INSTALL PECO BRACKET.
  - INSTALL SIGNAL POWER SUPPORT BRACKET.
  - INSTALL STATIC, TRANSMISSION, PECO AND INSULATED SIGNAL POWER WIRES.
  - TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  - INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  - ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.

- NOTE:**
- EXISTING STRUCTURE WAS P-174A IN WAYNE STATION

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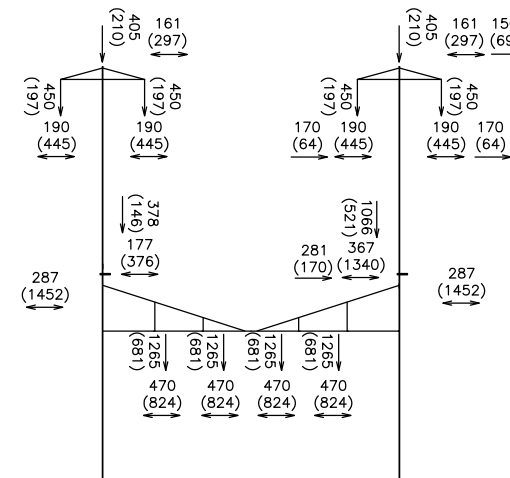
**PAOLI TO BRYN MAWR TRANSMISSION**  
**ELECTRIFICATION**  
**STRUCTURAL ERECTION DIAGRAM**  
**T-329**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1326.DWG  
 Ref. No.: 2011-059  
 Sheet No: 240 OF 565  
**ET-1326**

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET--DOUBLE	S-5200	1
BA8	TRANSMISSION BRACKET--DOUBLE	S-5206	1
CSC1	SLIDING BRACKET	S-5214	8

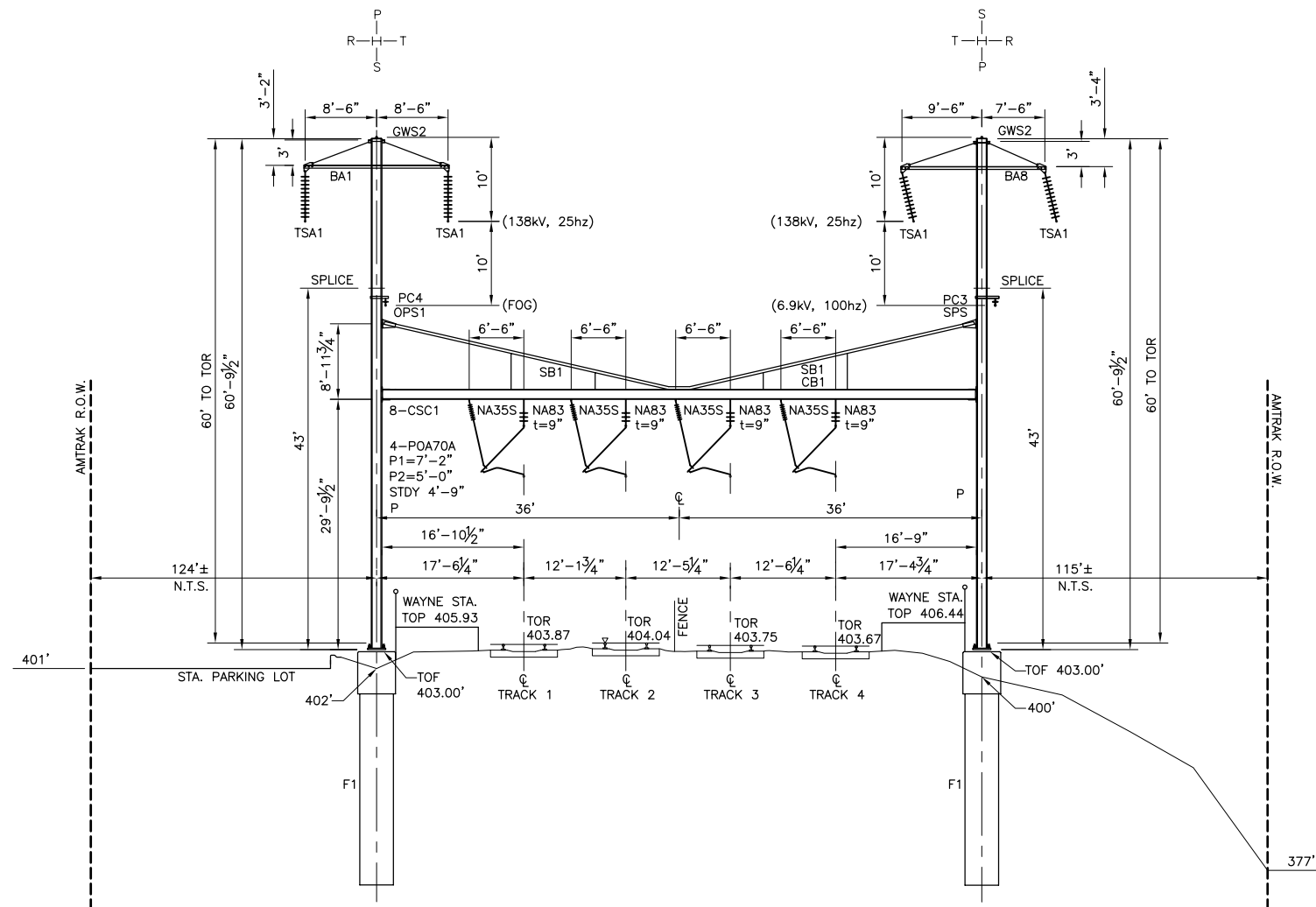
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-0"	25'-10"	26'-1½"	26'-2½"
CW	20'-0"	19'-10"	20'-1½"	20'-2½"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.



**STRUCTURE ERECTION DIAGRAM T-328**

769+52  
 LOOKING TOWARDS HARRISBURG  
 0 10 20  
 SCALE: 1"=10'-0"

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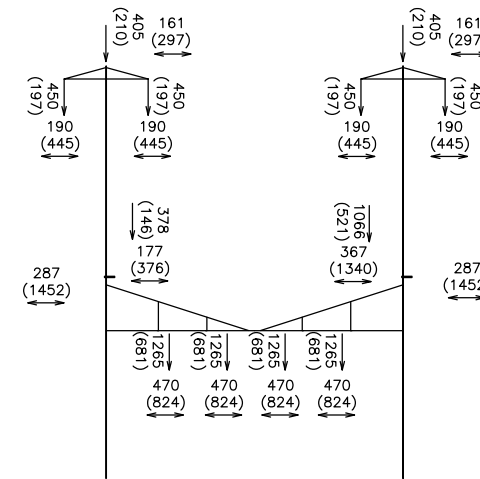
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-328**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1327.DWG
Ref. No.:	2011-059
Sheet No.:	241 OF 565
<b>ET-1327</b>	

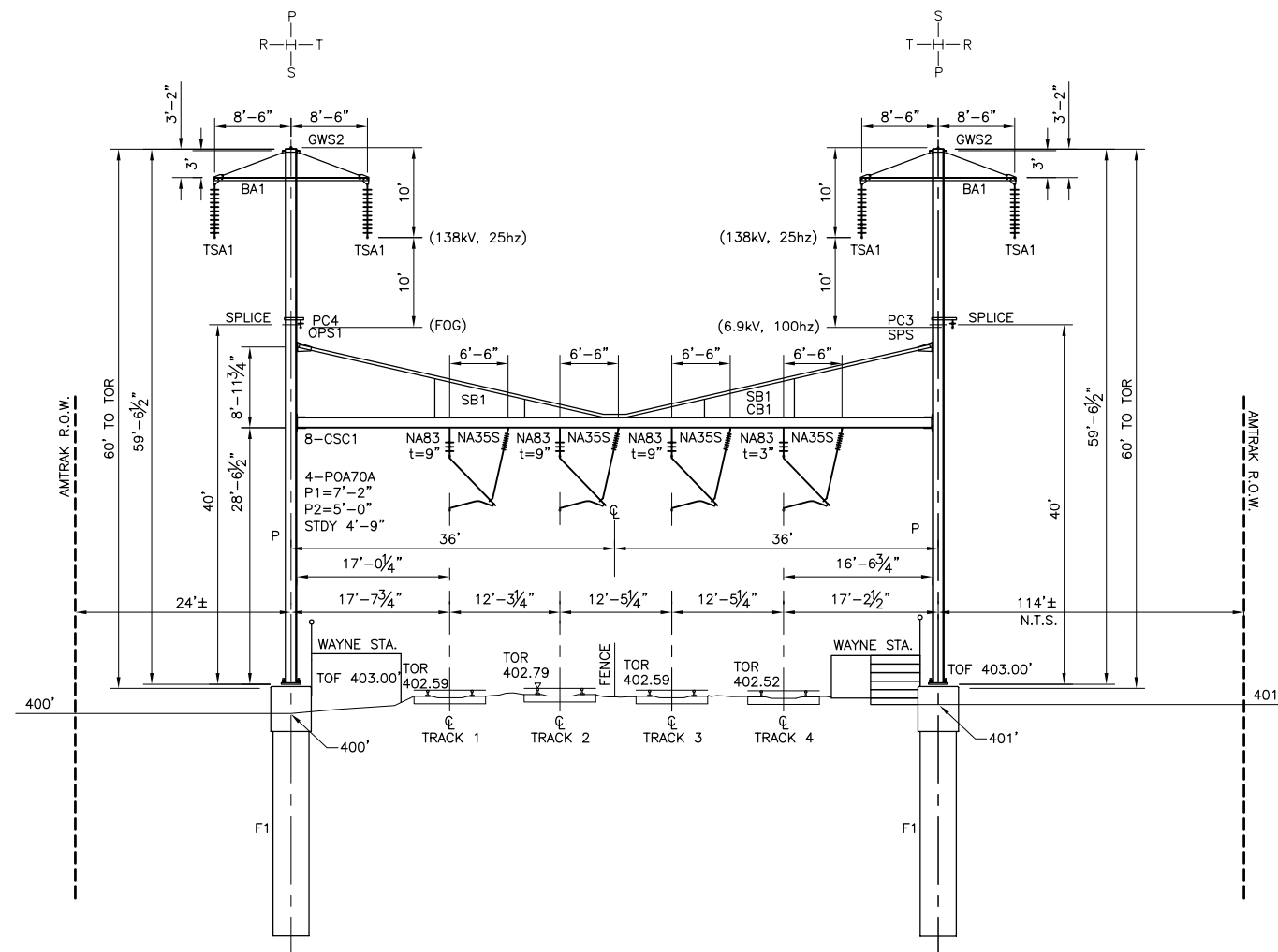
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	4

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-0 1/2"	25'-10"	26'-1"	26'-0 3/4"
CW	20'-0 1/2"	19'-10"	20'-1"	20'-0 3/4"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE ERECTION DIAGRAM T-327

766+52  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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National Railroad Passenger Corporation  
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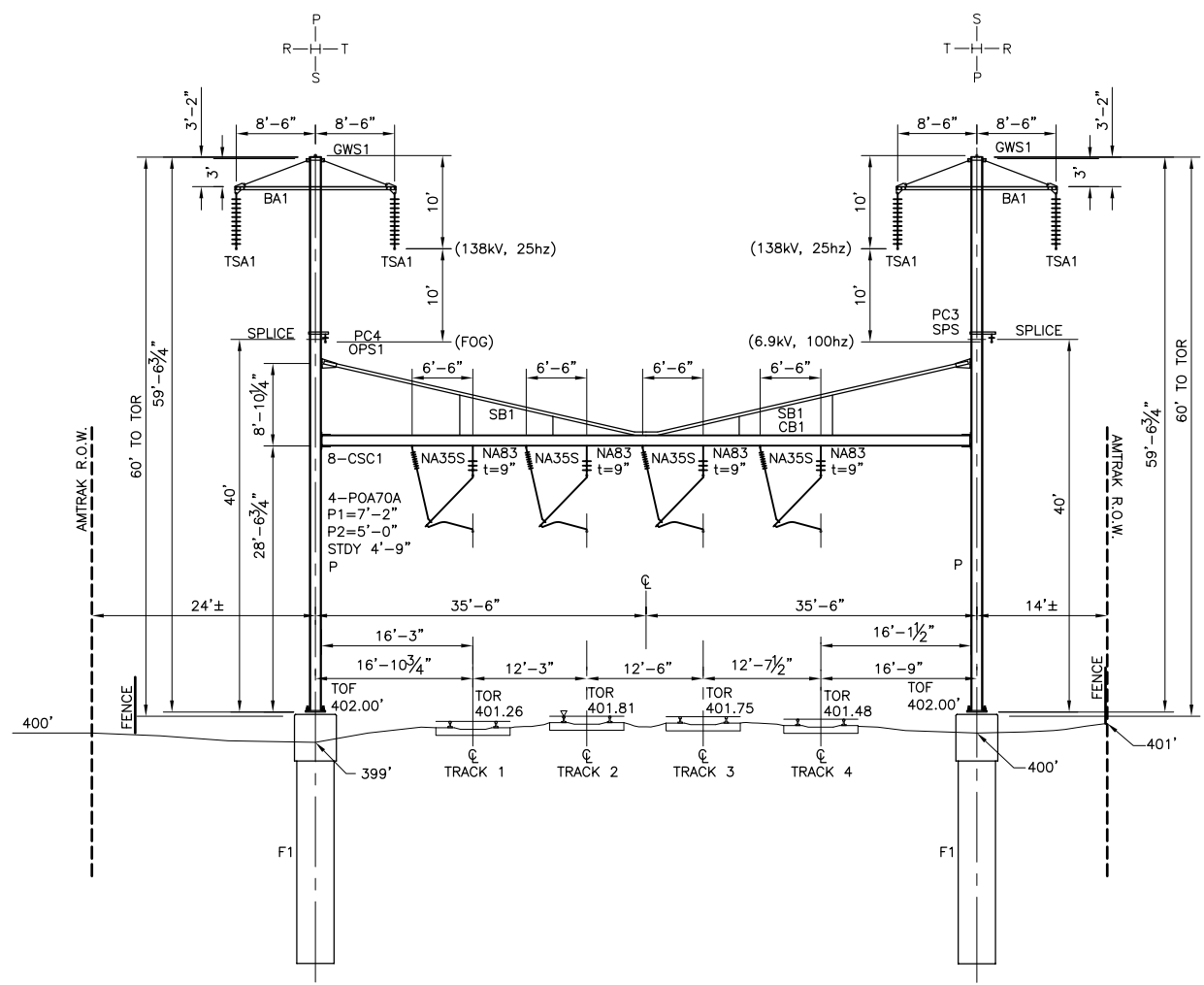


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-327  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

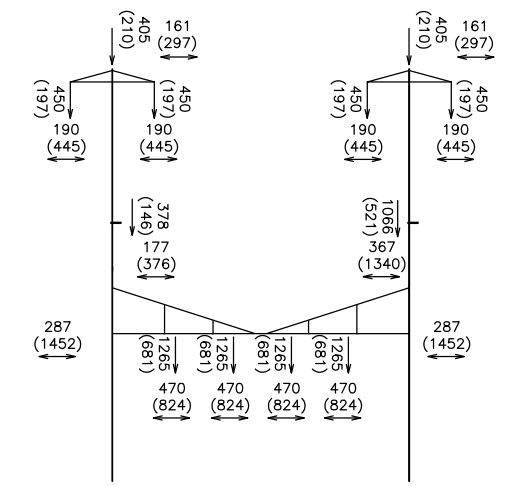
File No.:	2011-059-ET-1328.DWG
Ref. No.:	2011-059
Sheet No.:	242 OF 565
ET-1328	

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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-4 1/2"	25'-10"	25'-10 1/4"	26'-2"
CW	20'-4 1/2"	19'-10"	19'-10 1/4"	20'-2"



STRUCTURE ERECTION DIAGRAM T-326  
763+50  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2	
CSC1	SLIDING BRACKET	S-5214	8	

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date

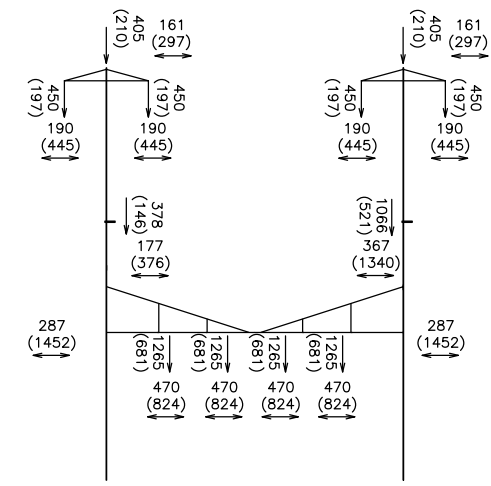


**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-326**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

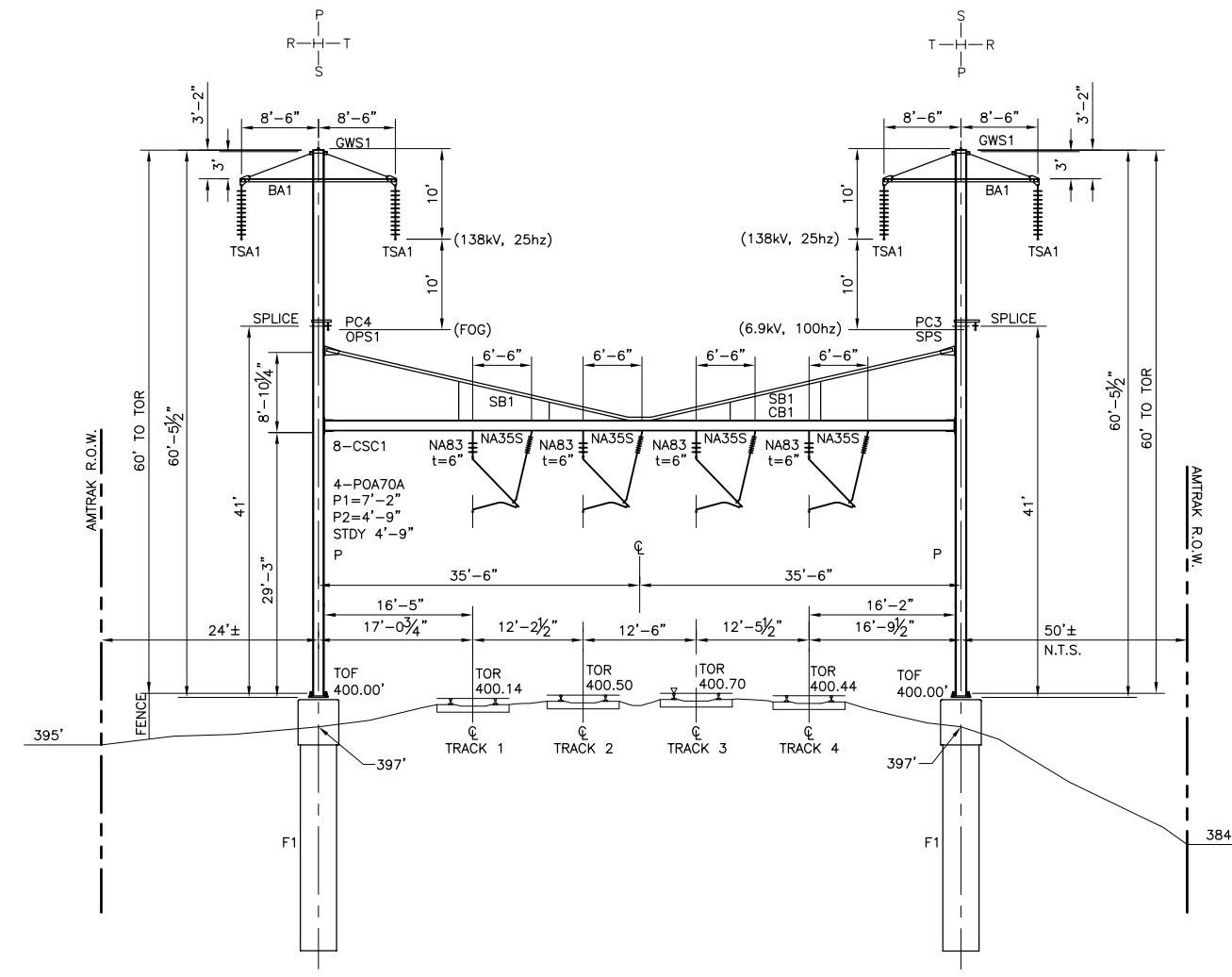
File No.:	2011-059-ET-1329.DWG
Ref. No.:	2011-059
Sheet No.:	243 OF 565
<b>ET-1329</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-7 1/4"	26'-3 1/2"	26'-1"	26'-4"
CW	20'-7 1/4"	20'-3 1/2"	20'-1"	20'-4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)



**STRUCTURE ERECTION DIAGRAM T-325**  
 760+50  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 National Railroad Passenger Corporation  
 30TH Street Station - Philadelphia, Pennsylvania 19104

Approved	Date

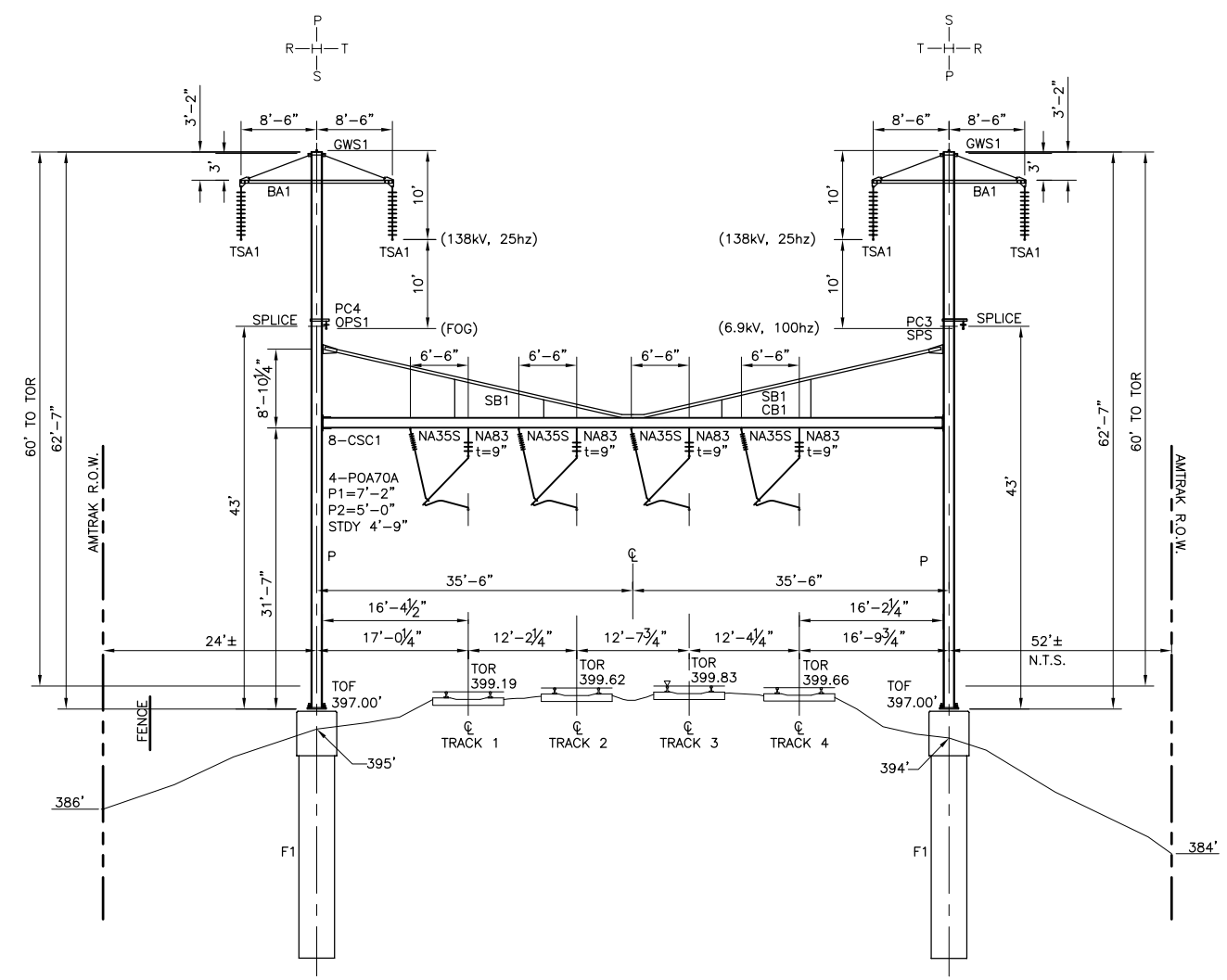


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-325**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

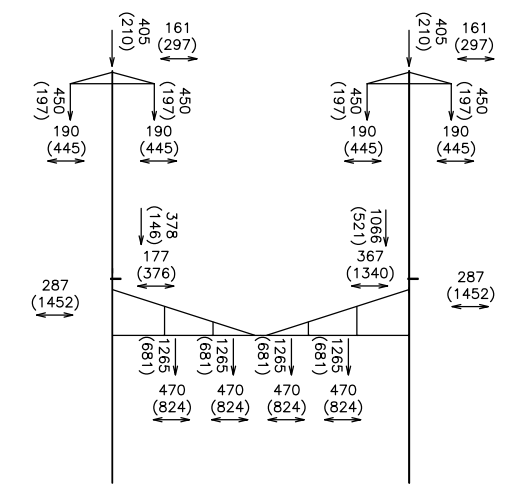
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Ref. No.:	2011-059
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<b>ET-1330</b>	

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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-5 3/4"	26'-0 1/2"	25'-10"	26'-0"
CW	20'-5 3/4"	20'-0 1/2"	19'-10"	20'-0"



STRUCTURE ERECTION DIAGRAM T-324  
757+50  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2	
CSC1	SLIDING BRACKET	S-5214	8	

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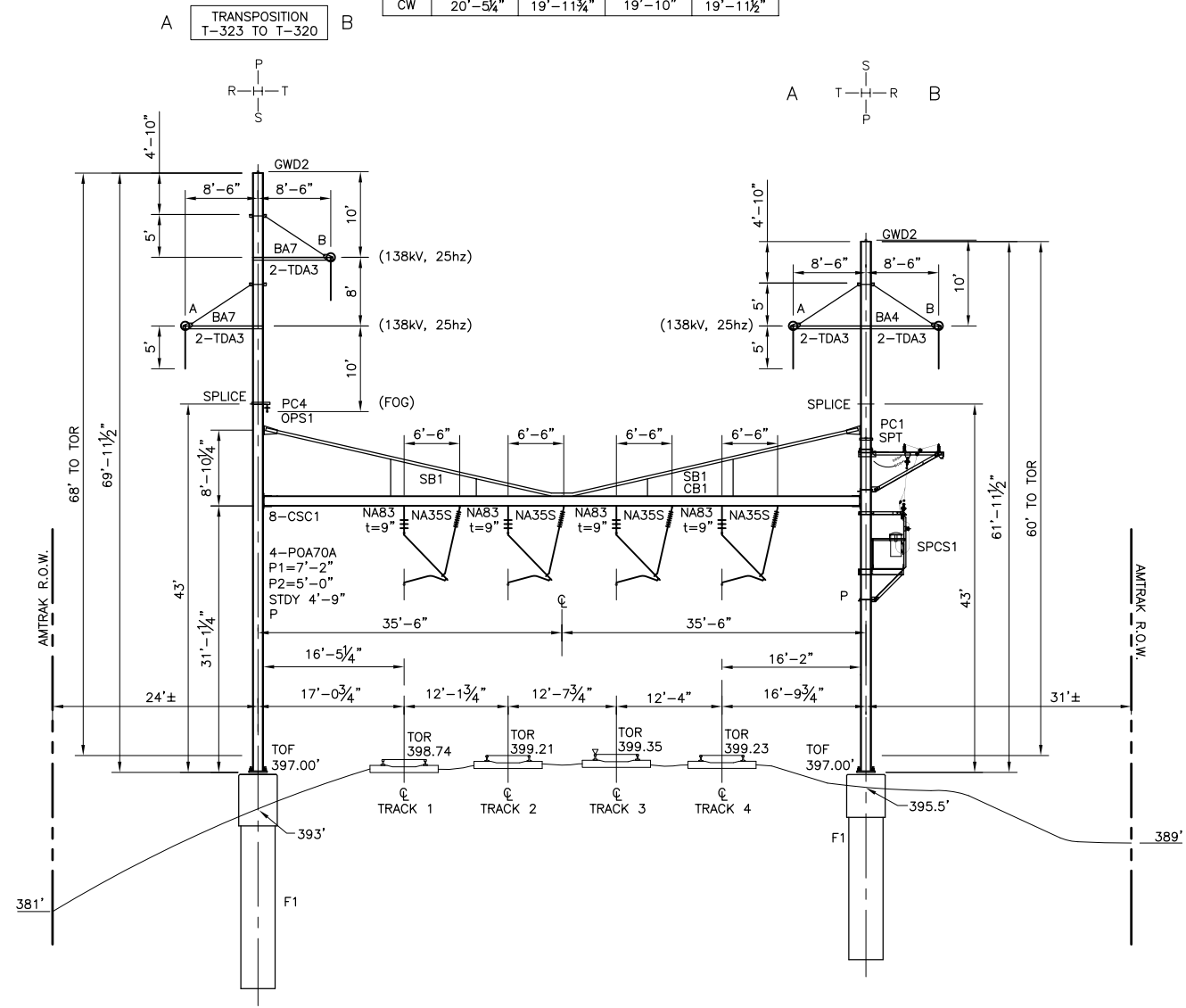


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-324  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

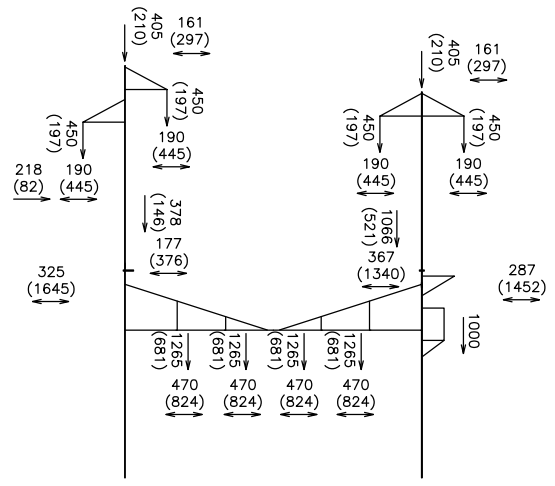
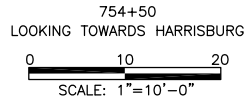
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Ref. No.: 2011-059  
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-5 3/4"	25'-11 3/4"	25'-10"	25'-11 1/2"
CW	20'-5 1/4"	19'-11 3/4"	19'-10"	19'-11 1/2"



STRUCTURE ERECTION DIAGRAM T-323



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWD2	GROUND WIRE DEADEND	ET-1909	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPT	SIGNAL POWER TERMINATION	ET-1913	1	
SPCS1	SIGNAL POWER CUT SECTION	ET-1810	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC1	SLIDING CLAMP	S-5214	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA4	TRANSMISSION BRACKET	S-5203	1	
BA7	TRANSMISSION BRACKET	S-5205	2	
CSC1	SLIDING BRACKET	S-5214	8	

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

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**PAOLI TO BRYN MAWR TRANSMISSION**  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-323  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

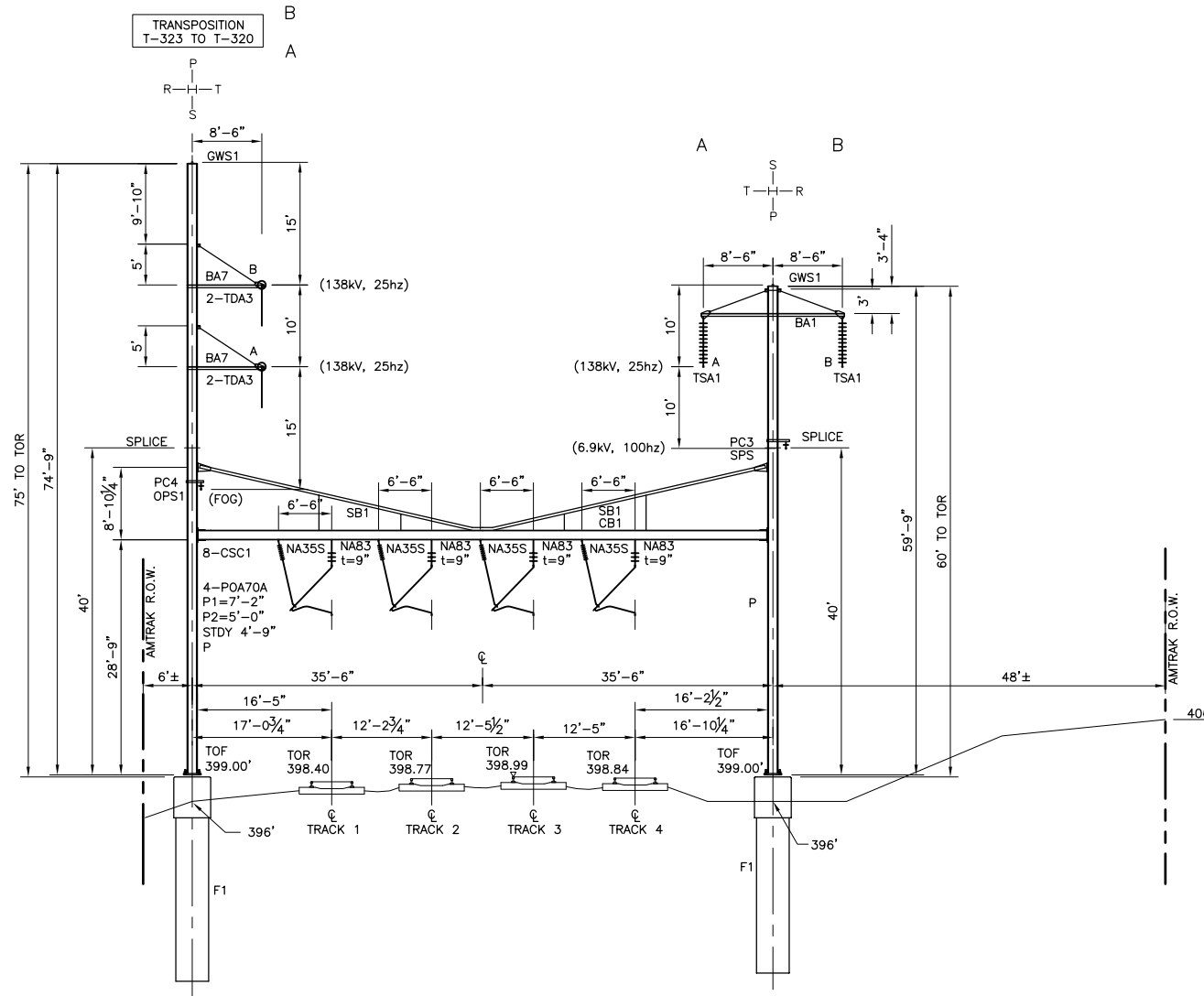
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Sheet No: 246 OF 565  
ET-1332



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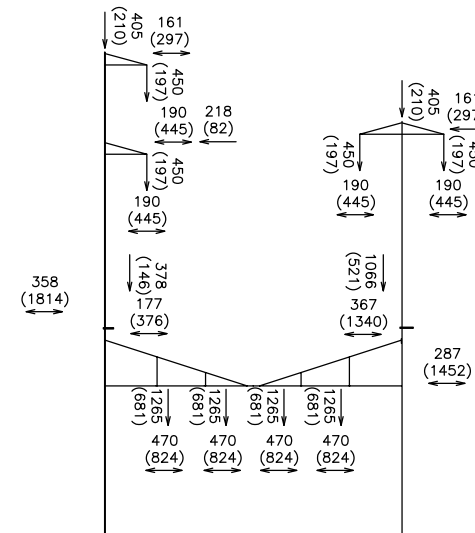
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	1
BA7	TRANSMISSION BRACKET -SINGLE	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-5"	26'-0 3/4"	25'-10"	25'-11 1/4"
CW	20'-5"	20'-0 3/4"	19'-10"	19'-11 1/4"



STRUCTURE ERECTION DIAGRAM T-322

751+50  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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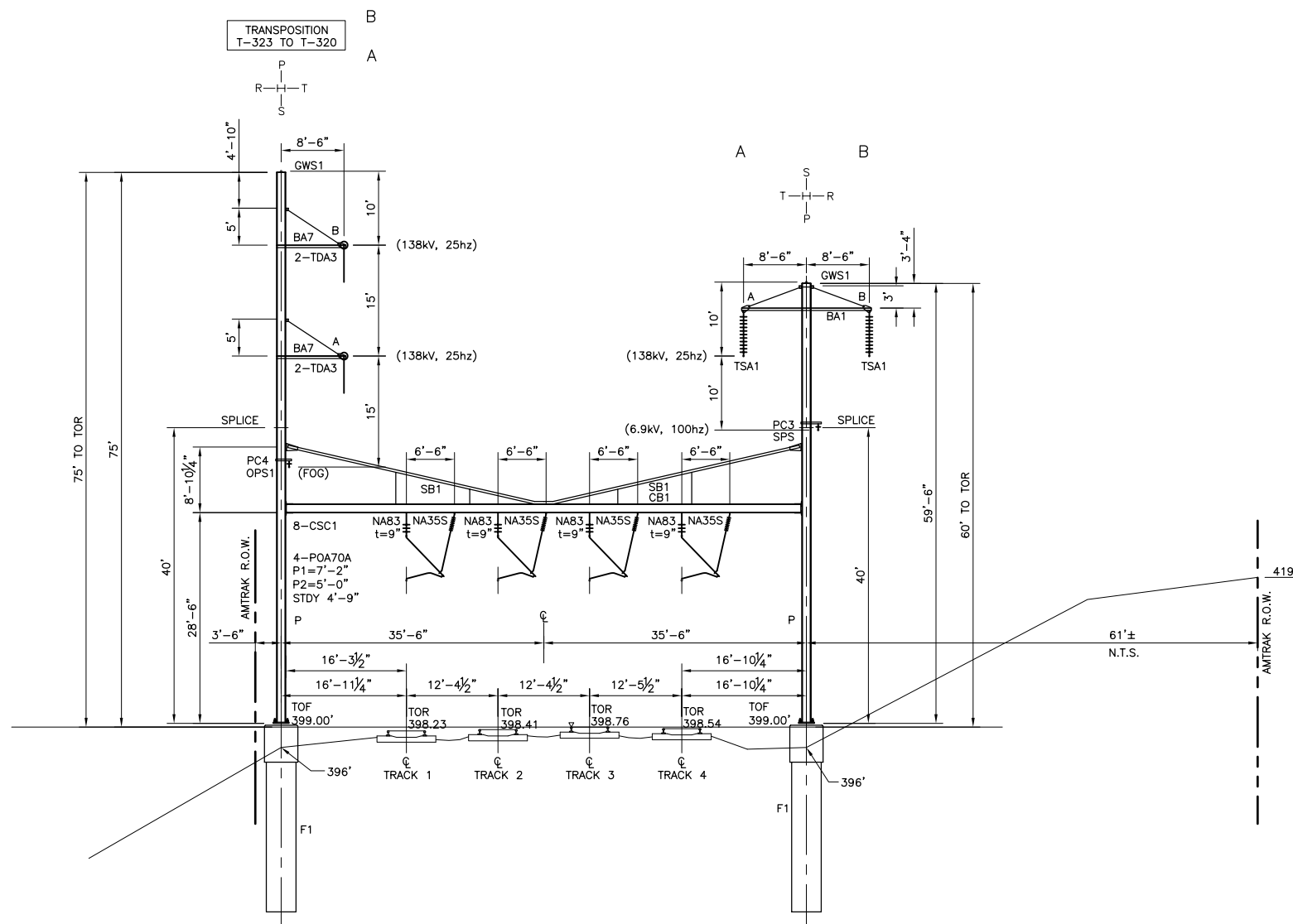
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-322  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

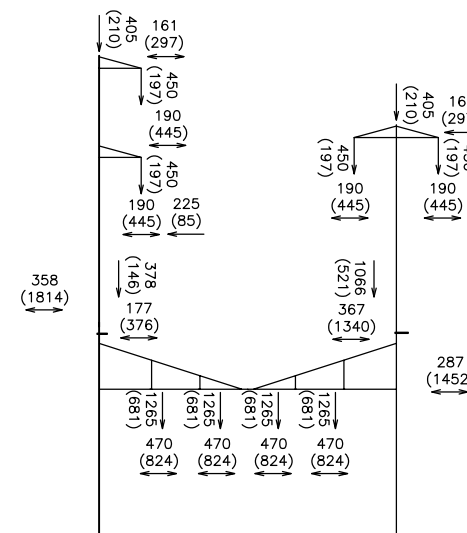
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Ref. No.: 2011-059  
Sheet No: 247 OF 565  
ET-1333

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-4 1/4"	26'-2 1/4"	25'-10"	26'-0 3/4"
CW	20'-4 1/4"	20'-2 1/4"	19'-10"	20'-0 3/4"



STRUCTURE ERECTION DIAGRAM T-321

748+50  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	1	
BA7	TRANSMISSION BRACKET -SINGLE	S-5205	2	
CSC1	SLIDING BRACKET	S-5214	8	

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IN ASSOCIATION WITH



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-321

File No.: 2011-059-ET-1334.DWG  
Ref. No.: 2011-059  
Sheet No.: 248 OF 565

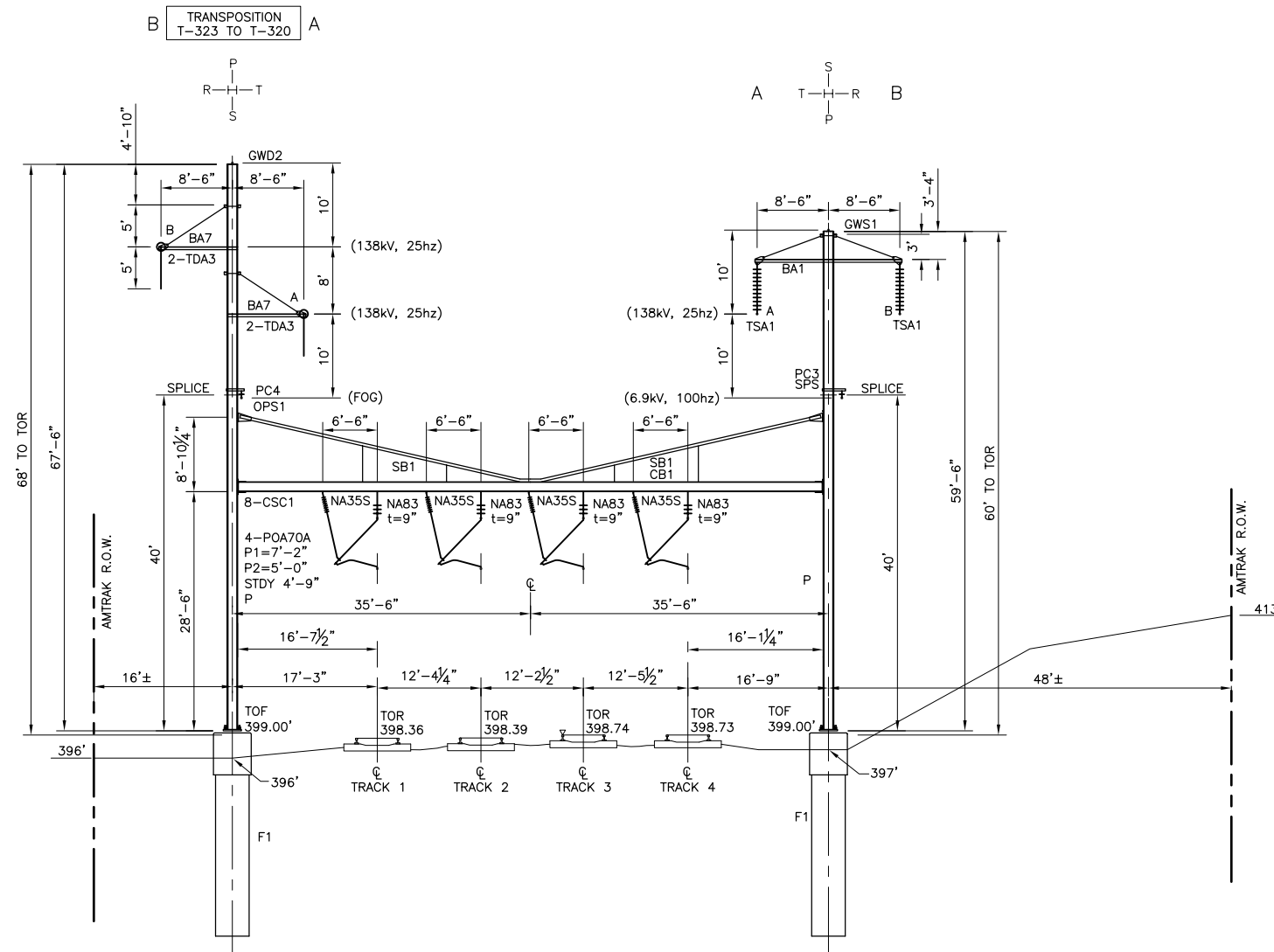
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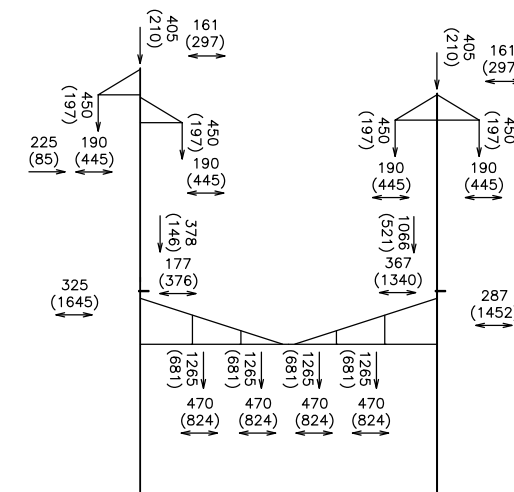
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	1
GWD2	GROUND WIRE DEADEND	ET-1909	1
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 1/2"	26'-2 1/4"	25'-10"	25'-10"
CW	20'-2 1/2"	20'-2 1/4"	19'-10"	19'-10"



STRUCTURE ERECTION DIAGRAM T-320

745+50  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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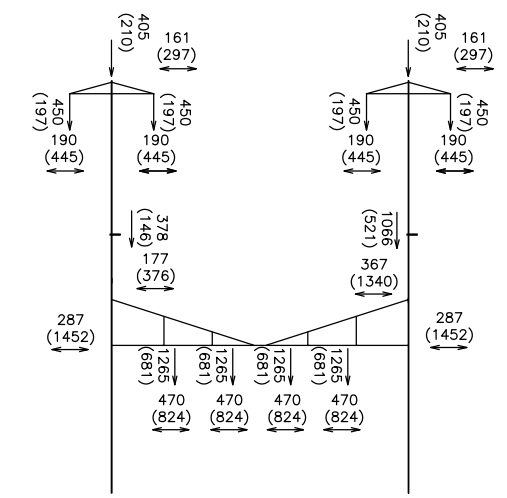
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-320  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

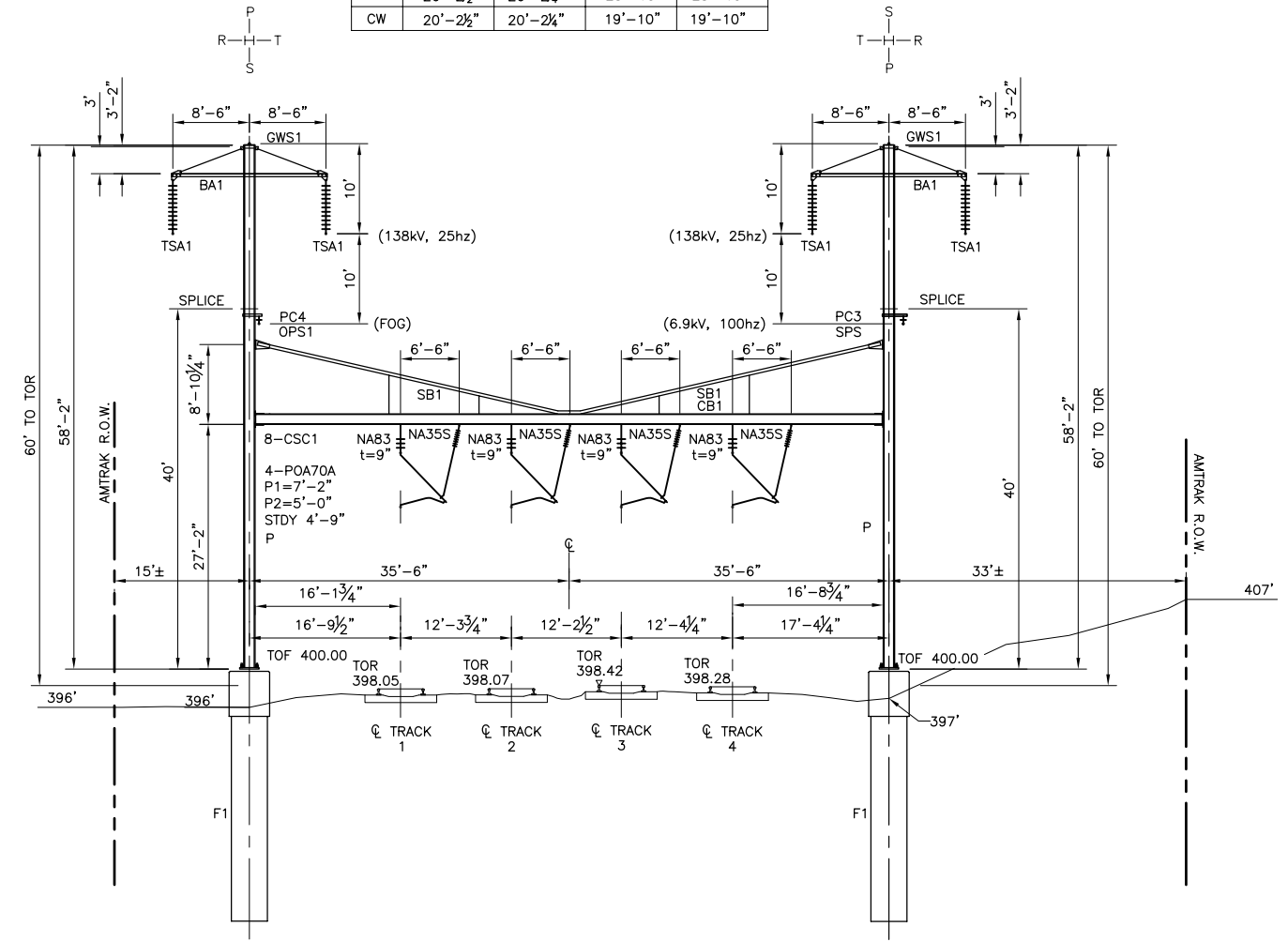
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ET-1335	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 1/2"	26'-2 1/4"	25'-10"	25'-10"
CW	20'-2 1/2"	20'-2 1/4"	19'-10"	19'-10"



**STRUCTURE ERECTION DIAGRAM T-319**  
 742+50  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 30TH Street Station-Philadelphia, Pennsylvania 19104

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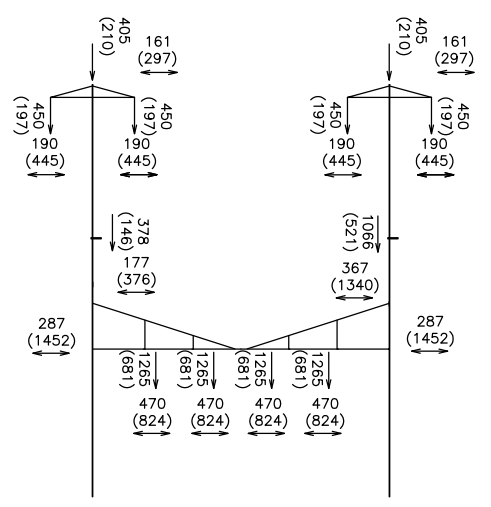


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-319**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

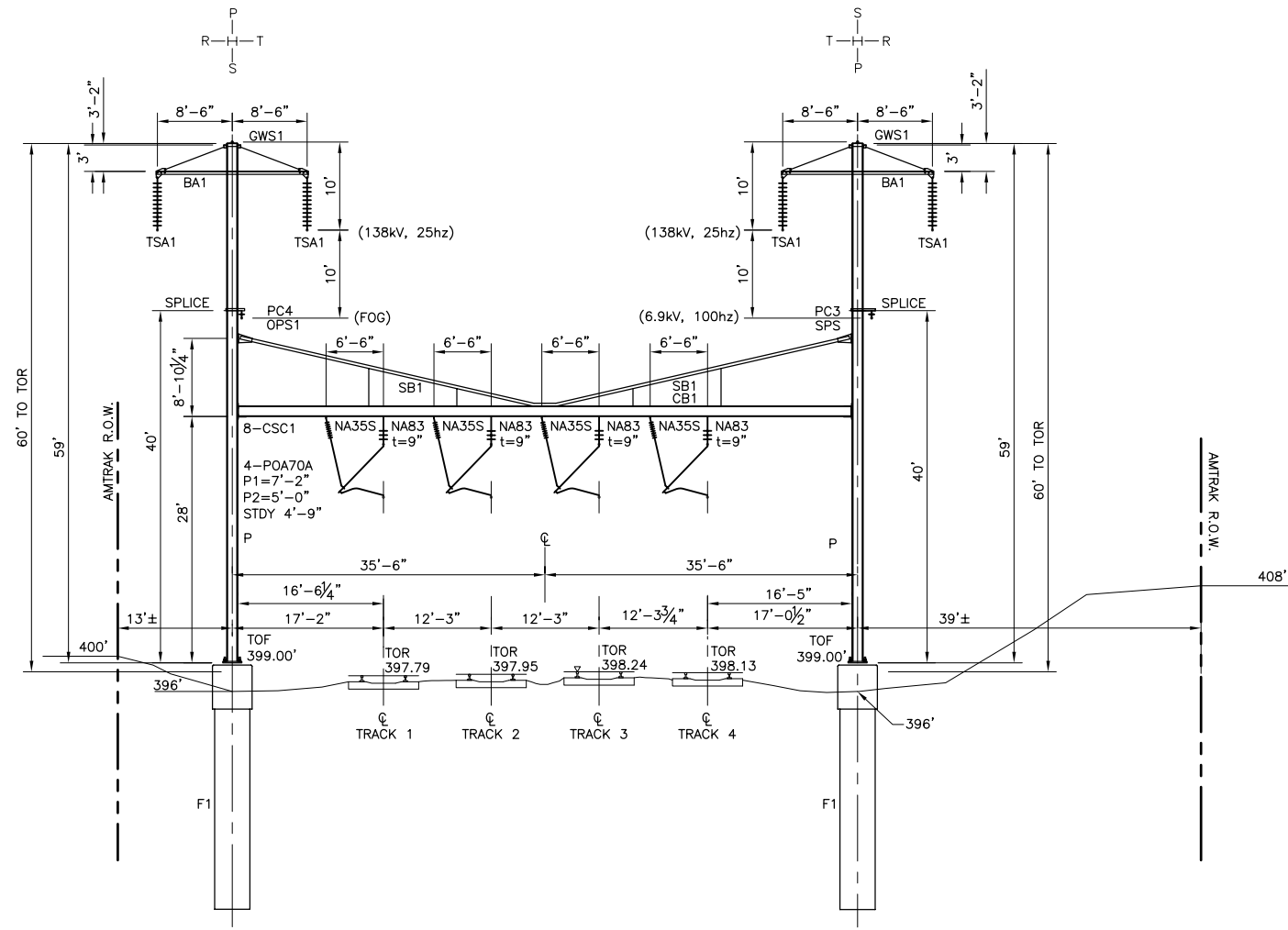
File No.:	2011-059-ET-1336.DWG
Ref. No.:	2011-059
Sheet No.:	250 OF 565
<b>ET-1336</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-3 1/4"	26'-1 1/4"	25'-10"	26'-1 1/4"
CW	20'-3 1/4"	20'-1 1/4"	19'-10"	20'-1 1/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)



**STRUCTURE ERECTION DIAGRAM T-318**  
 739+50  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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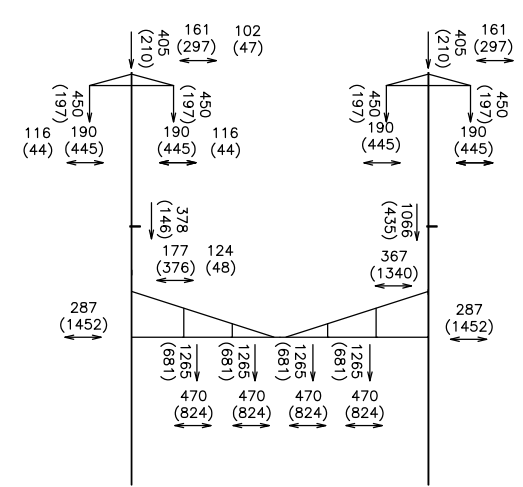
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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-318**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

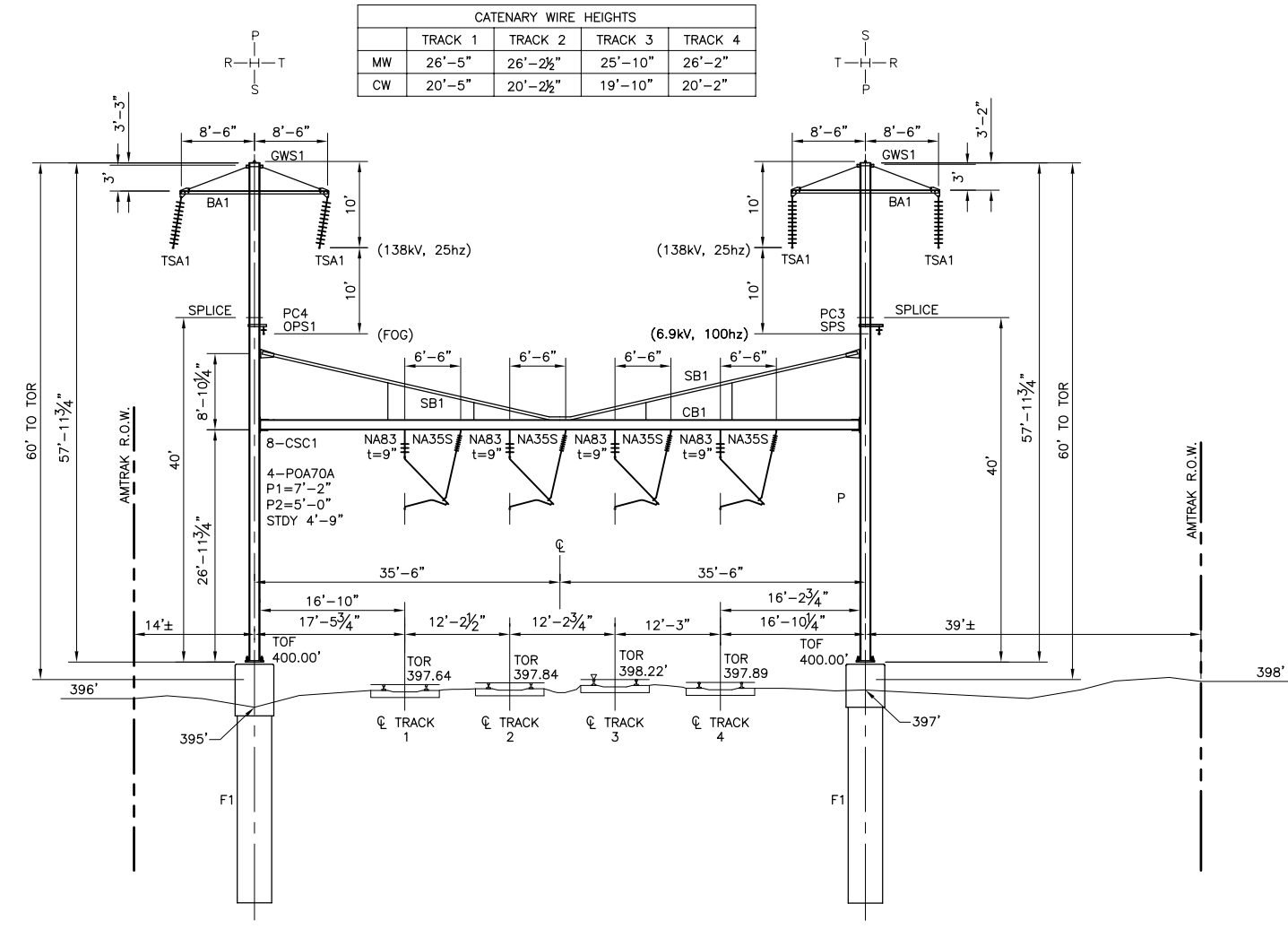
File No.: 2011-059-ET-1337.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 251 OF 565  
**ET-1337**

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	4



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°)  
 250' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-5"	26'-2½"	25'-10"	26'-2"
CW	20'-5"	20'-2½"	19'-10"	20'-2"



- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-317**  
 736+51  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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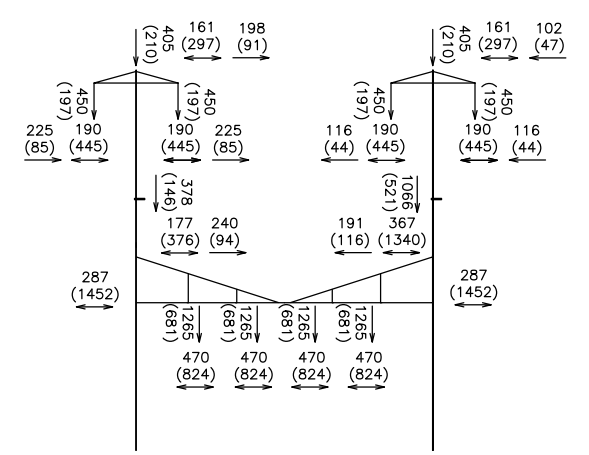
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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-317**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

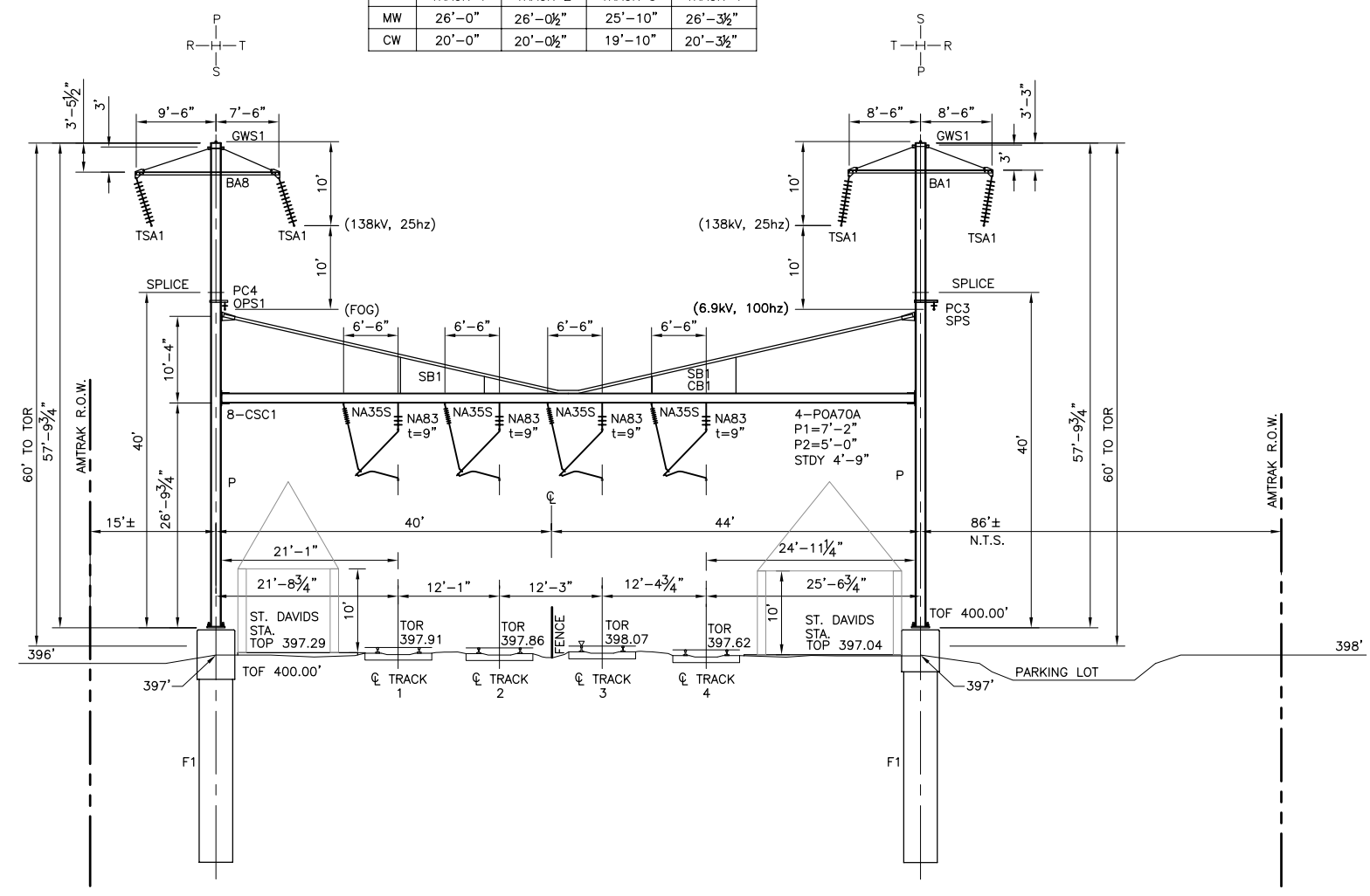
File No.: 2011-059-ET-1338.DWG  
 Ref. No.: 2011-059  
 Sheet No: 252 OF 565  
**ET-1338**

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	1
BA8	TRANSMISSION BRACKET - DOUBLE	S-5206	1
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-0"	26'-0½"	25'-10"	26'-3½"
CW	20'-0"	20'-0½"	19'-10"	20'-3½"



**STRUCTURE ERECTION DIAGRAM T-316**

733+50  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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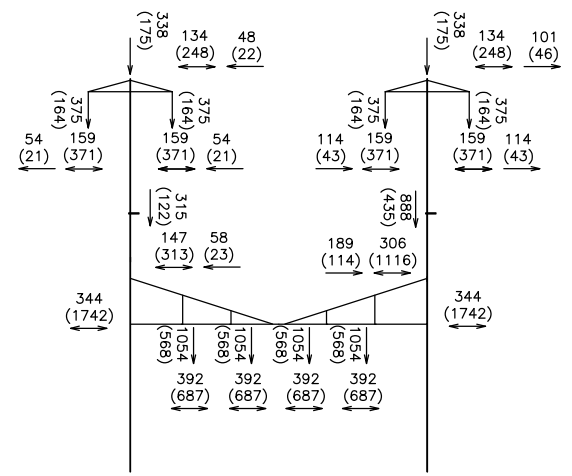
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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-316**  
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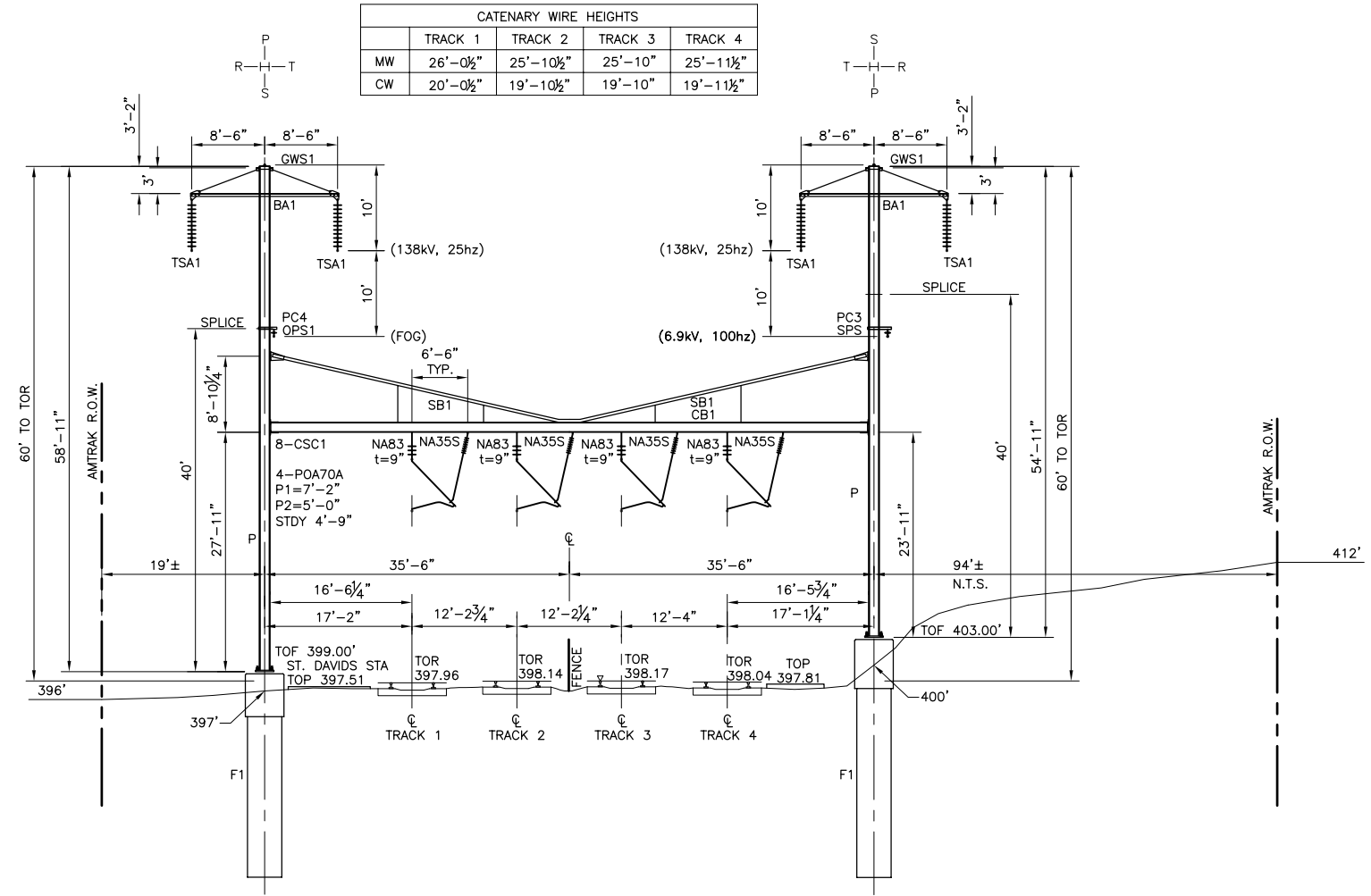
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Ref. No.:	2011-059
Sheet No.:	253 OF 565
<b>ET-1339</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY - INSUL.	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 250' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-0 1/2"	25'-10 1/2"	25'-10"	25'-11 1/2"
CW	20'-0 1/2"	19'-10 1/2"	19'-10"	19'-11 1/2"



**STRUCTURE ERECTION DIAGRAM T-315**  
 730+50  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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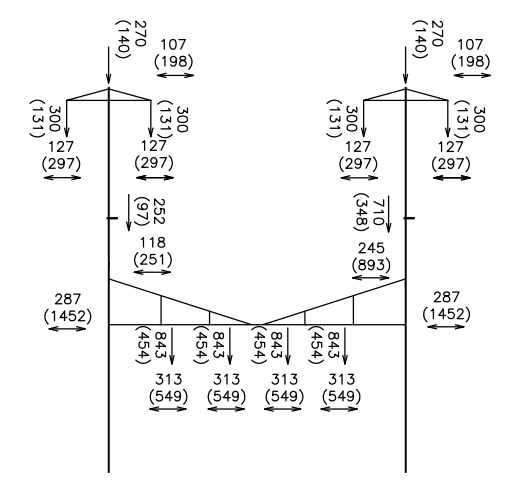


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-315**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

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Ref. No.:	2011-059
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<b>ET-1340</b>	

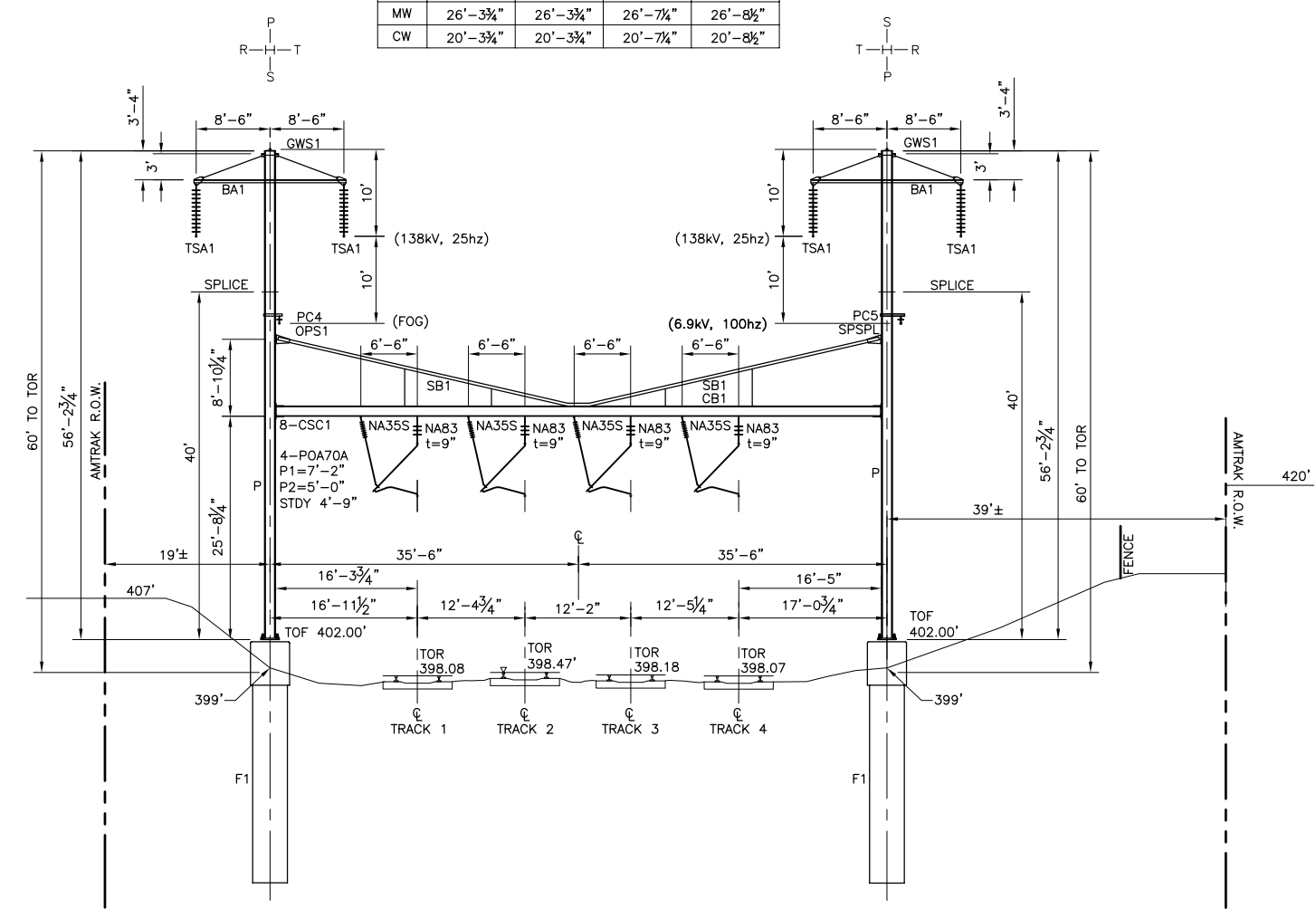


BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPSPL	SIGNAL POWER SPLICE	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC4	SLIDING CLAMP	S-5215	1
PC5	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
200' LOAD SPAN  
(NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-3 3/4"	26'-3 3/4"	26'-7 1/4"	26'-8 1/2"
CW	20'-3 3/4"	20'-3 3/4"	20'-7 1/4"	20'-8 1/2"



STRUCTURE ERECTION DIAGRAM T-314  
728+50  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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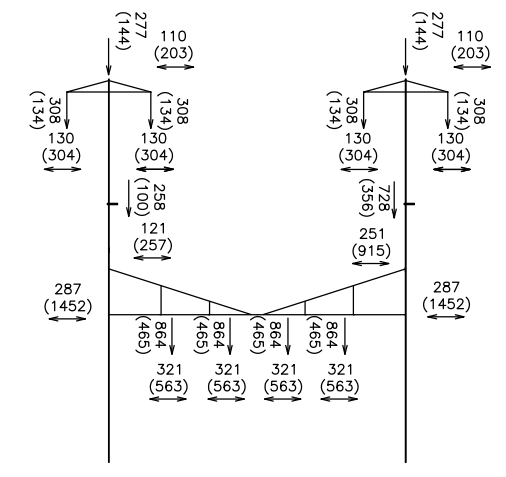
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-314  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

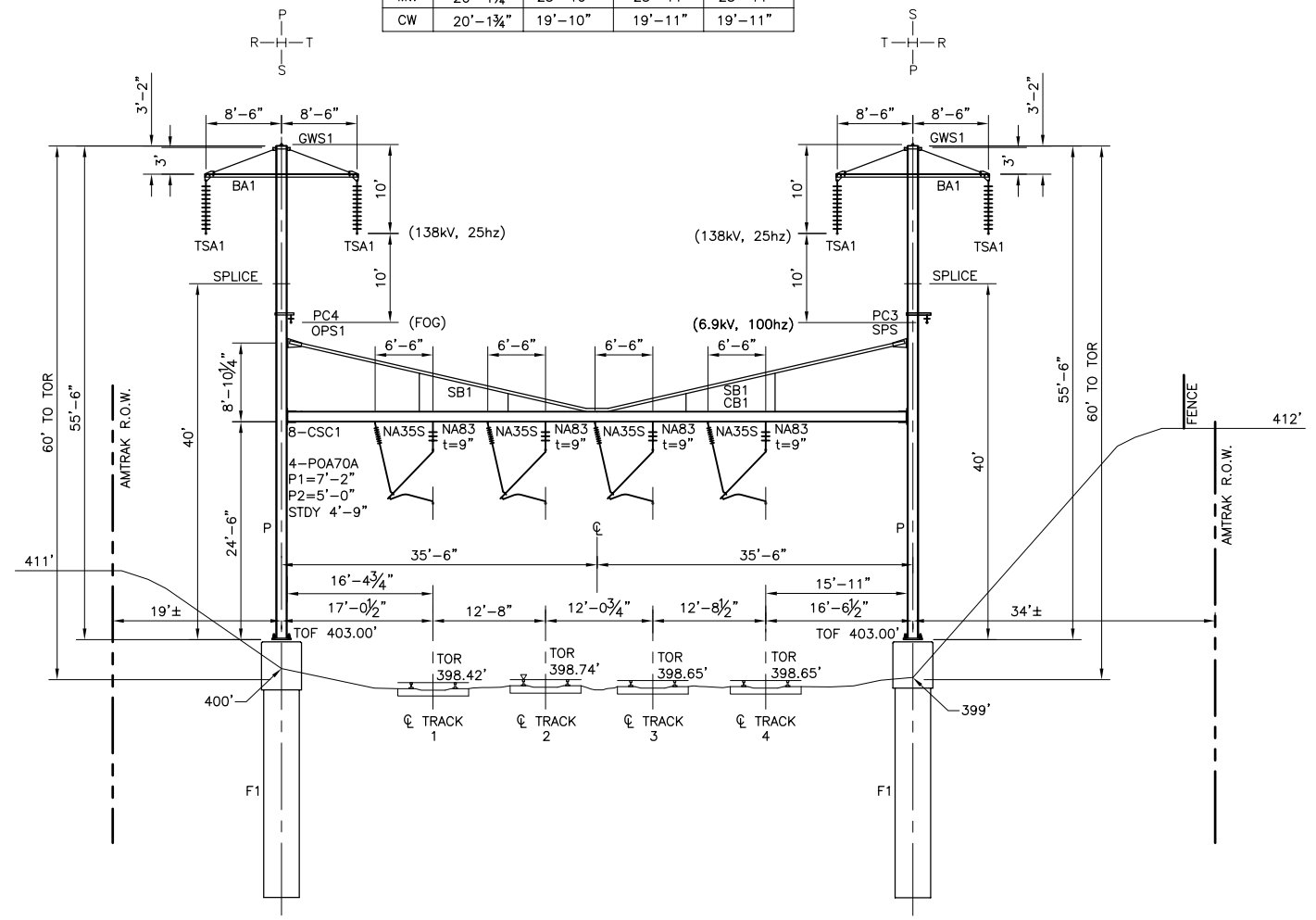
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Ref. No.: 2011-059  
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ET-1341

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 205' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-1 3/4"	25'-10"	25'-11"	25'-11"
CW	20'-1 3/4"	19'-10"	19'-11"	19'-11"



**STRUCTURE ERECTION DIAGRAM T-313**  
 726+50  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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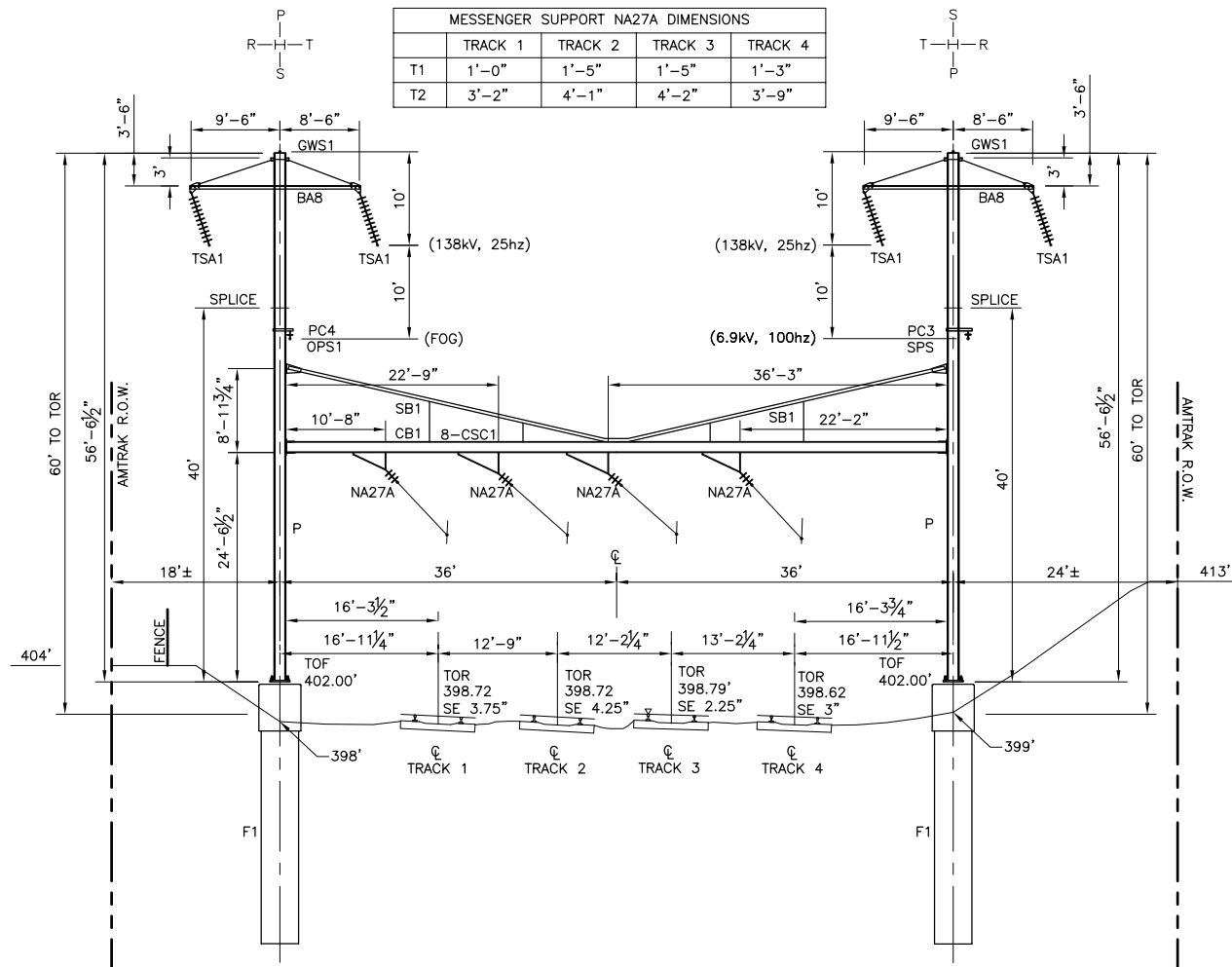
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-313**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

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Ref. No.:	2011-059
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<b>ET-1342</b>	

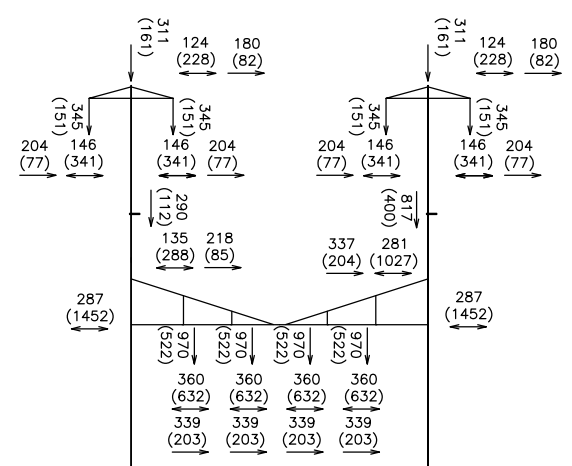
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-10 1/2"	24'-8"	24'-7"	24'-8 1/2"
CW	19'-3"	19'-4"	19'-3 1/4"	18'-11 1/2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-0"	1'-5"	1'-5"	1'-3"
T2	3'-2"	4'-1"	4'-2"	3'-9"



STRUCTURE ERECTION DIAGRAM T-312  
724+40  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
230' LOAD SPAN  
(NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.		
NA27A	MESSENGER SUPPORT	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA8	TRANSMISSION BRACKET - DOUBLE	S-5206	2	
CSC1	SLIDING BRACKET	S-5214	8	

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

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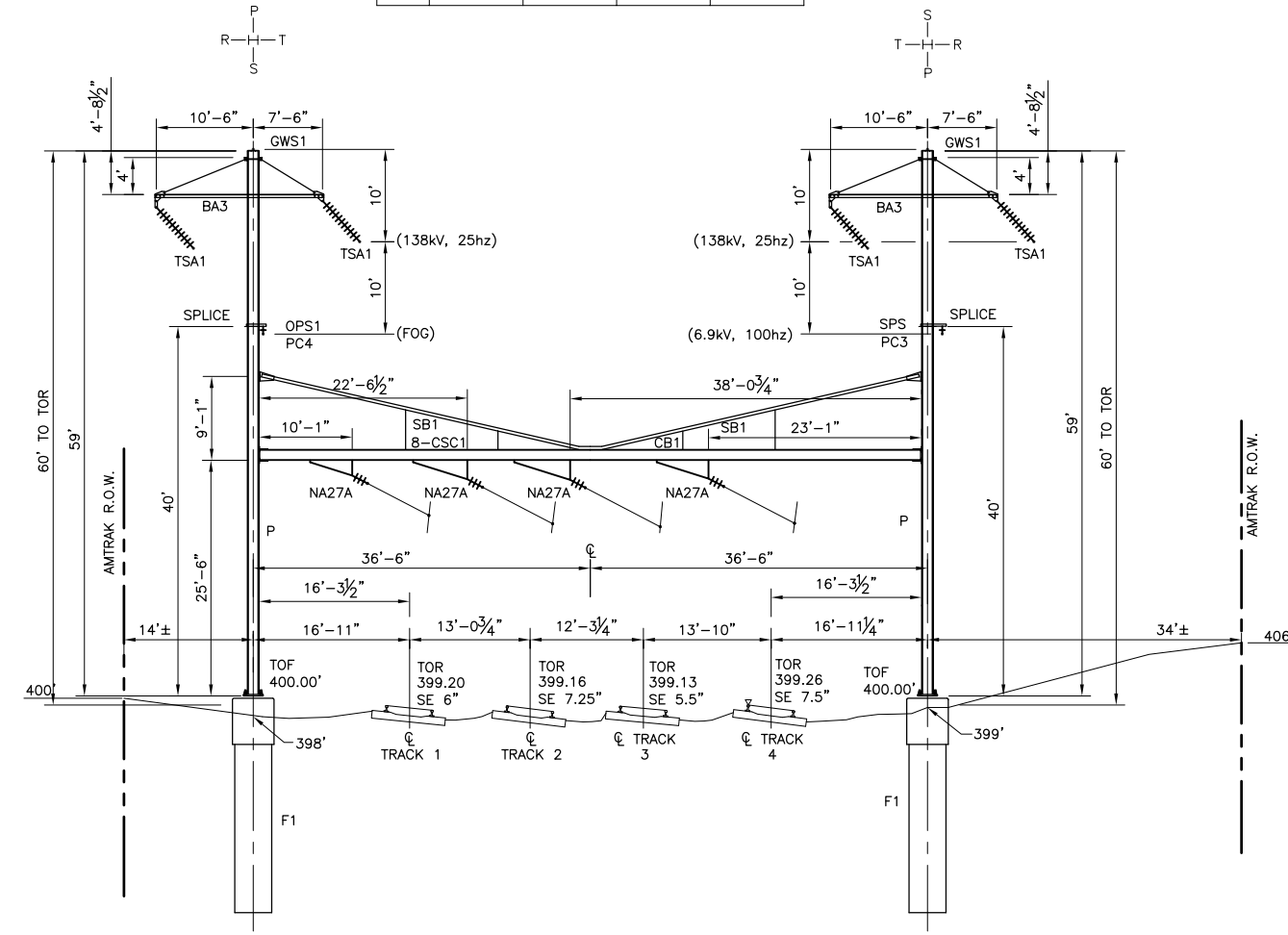
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-312**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1343.DWG
Ref. No.:	2011-059
Sheet No.:	257 OF 565
<b>ET-1343</b>	

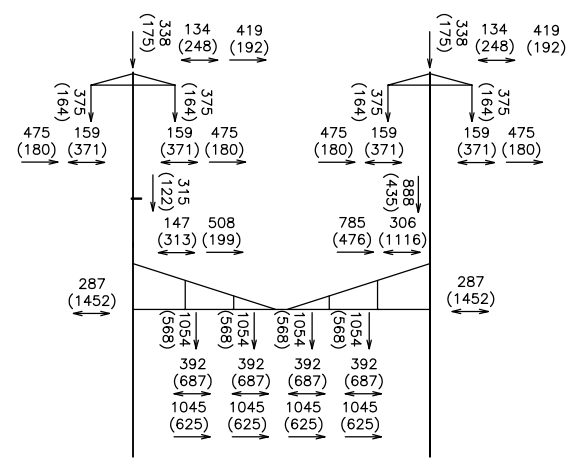
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-0 1/2"	23'-8 1/4"	23'-8"	23'-8 1/4"
CW	20'-7"	19'-8 3/4"	19'-5 1/4"	19'-8 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-10"	1'-3"	1'-3 1/2"	1'-2"
T2	4'-1"	5'-6"	5'-8"	5'-3"



**STRUCTURE ERECTION DIAGRAM T-311**  
 721+91  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 250' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	2
CSC1	SLIDING BRACKET	S-5214	8

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-311**

Recommended: DP    Drawn: WJC    Checked: MJM    Date: 03/17/16

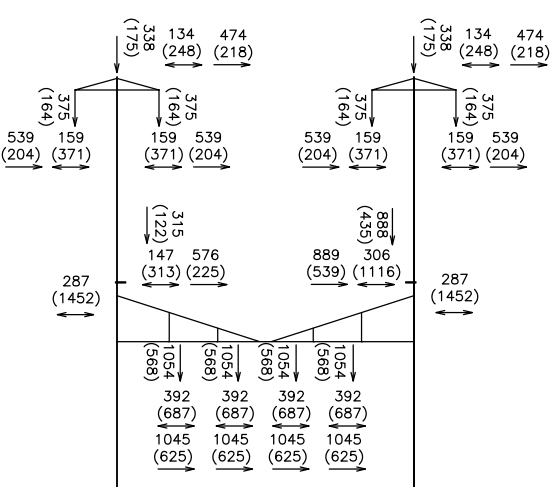
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 Sheet No.: 258 OF 565  
**ET-1344**

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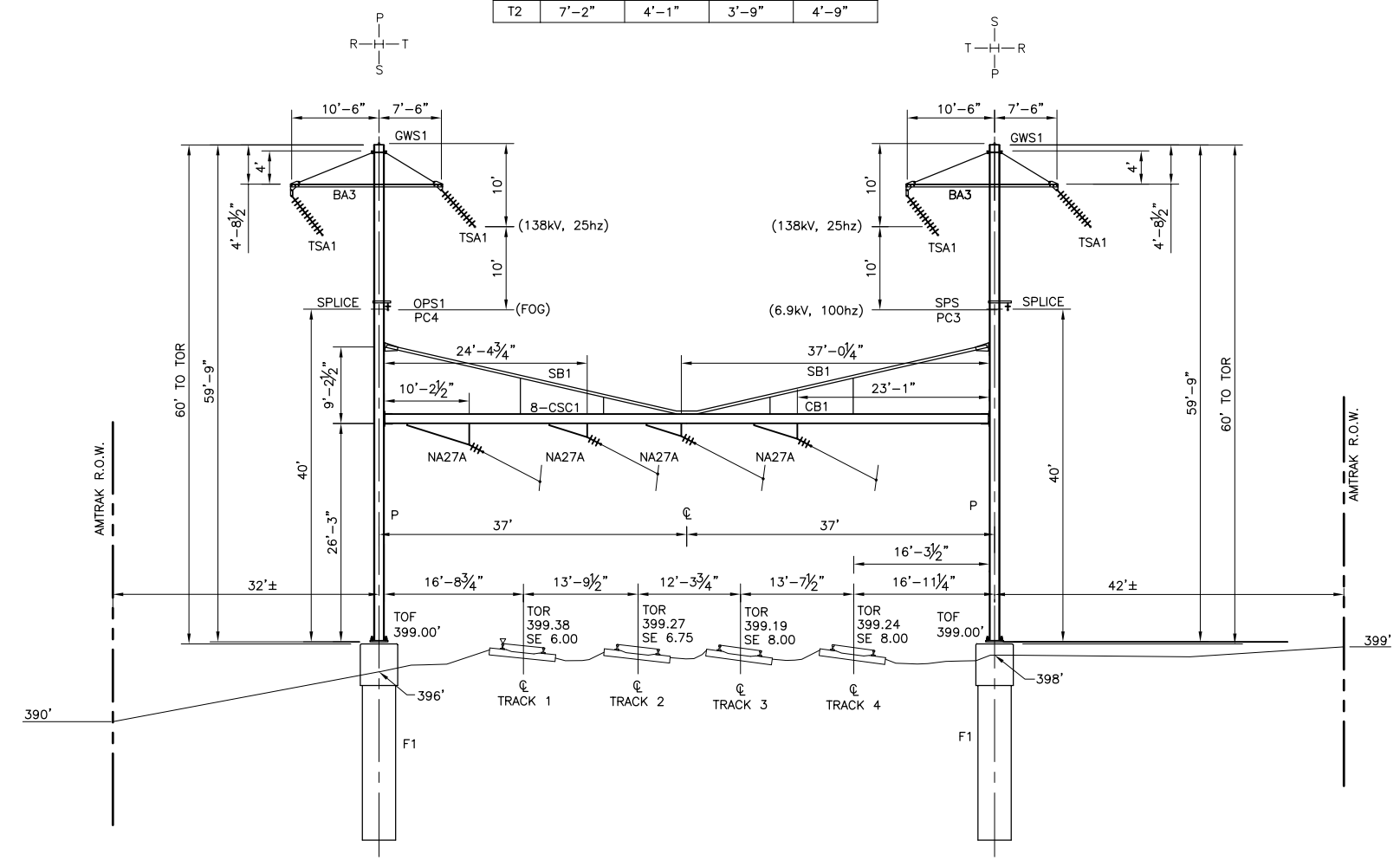
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
OPS1	OPTICAL WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-0 1/2"	24'-1"	24'-3 1/2"	23'-11"
CW	19'-5 1/4"	20'-6 1/4"	20'-0"	19'-9 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-9"	0'-10"	0'-8 1/2"	1'-0 1/2"
T2	7'-2"	4'-1"	3'-9"	4'-9"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
250' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE ERECTION DIAGRAM T-310  
719+52  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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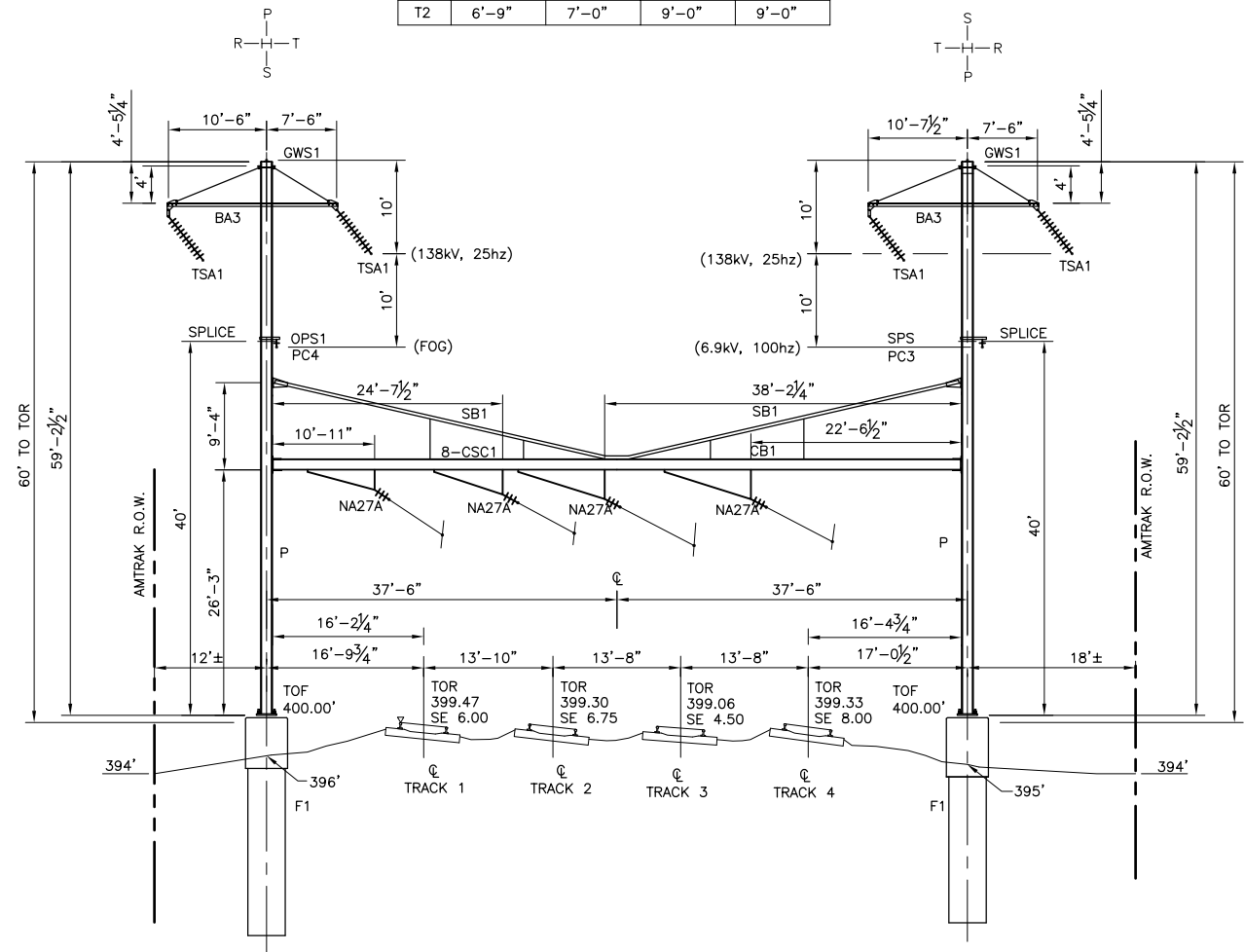
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-310  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1345.DWG  
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ET-1345

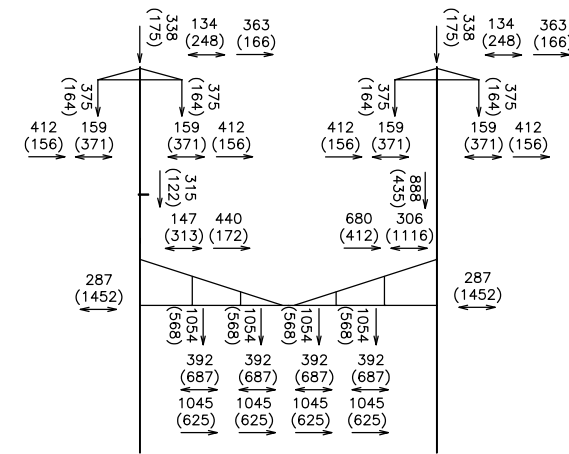
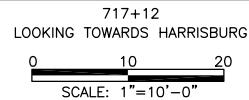
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-10 1/4"	24'-1 1/4"	24'-5 3/4"	23'-2 1/4"
CW	20'-0 3/4"	20'-5"	19'-4 1/4"	19'-6"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-3 1/2"	1'-9 1/2"	2'-3 1/2"	2'-3 1/2"
T2	6'-9"	7'-0"	9'-0"	9'-0"



STRUCTURE ERECTION DIAGRAM T-309



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
250' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	2
CSC1	SLIDING BRACKET	S-5214	8

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IN ASSOCIATION WITH



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-309

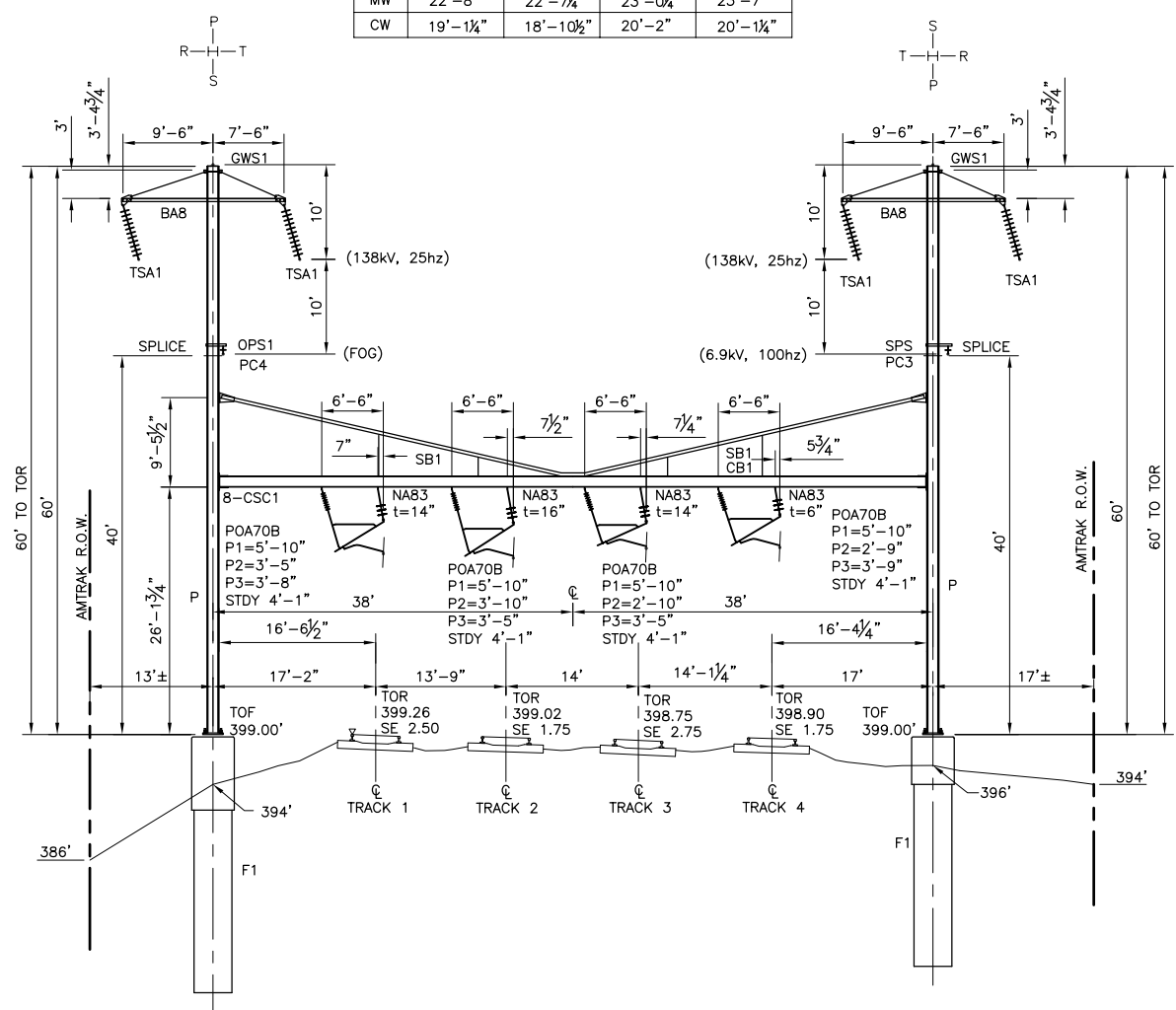
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Ref. No.:	2011-059
Sheet No.:	260 OF 565

ET-1346

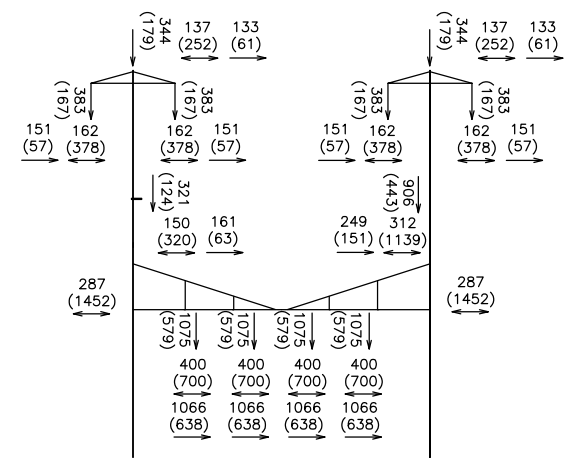
Recommended: DP    Drawn: WJC    Checked: MJM    Date: 03/17/16

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER TERMINATION	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA8	TRANSMISSION BRACKET -DOUBLE	S-5206	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	22'-8"	22'-7 1/4"	23'-0 1/4"	23'-7"
CW	19'-1 1/4"	18'-10 1/2"	20'-2"	20'-1 1/4"



STRUCTURE ERECTION DIAGRAM T-308  
714+73  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
255' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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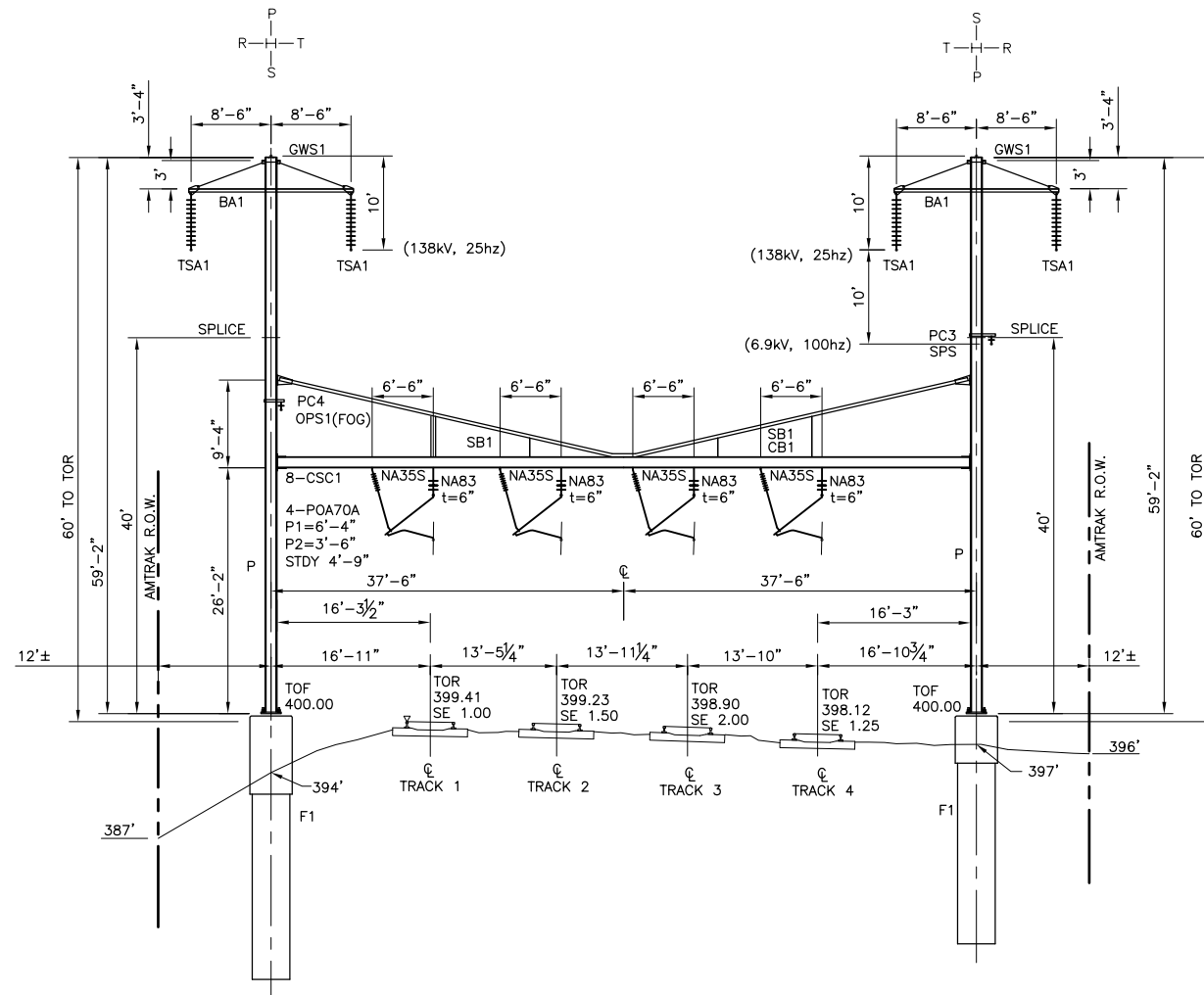
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-308  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1347.DWG  
Ref. No.: 2011-059  
Sheet No: 261 OF 565  
ET-1347

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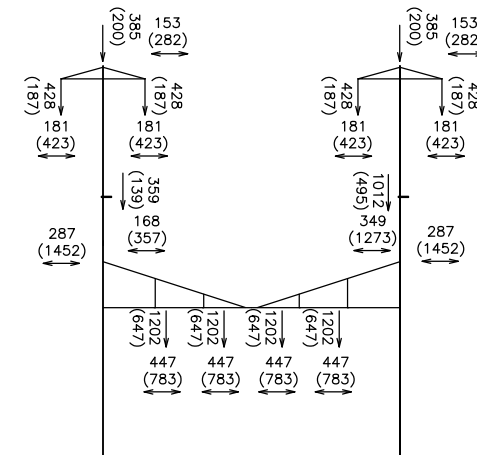
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NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER TERMINATION	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5214	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5102	2
F1	FOUNDATION	S-5103	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-1"	24'-3/4"	24'-7"	25'-4 1/2"
CW	19'-4"	19'-6 1/4"	19'-10"	20'-7 1/2"



STRUCTURE ERECTION DIAGRAM T-307

712+03  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
285' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-307  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

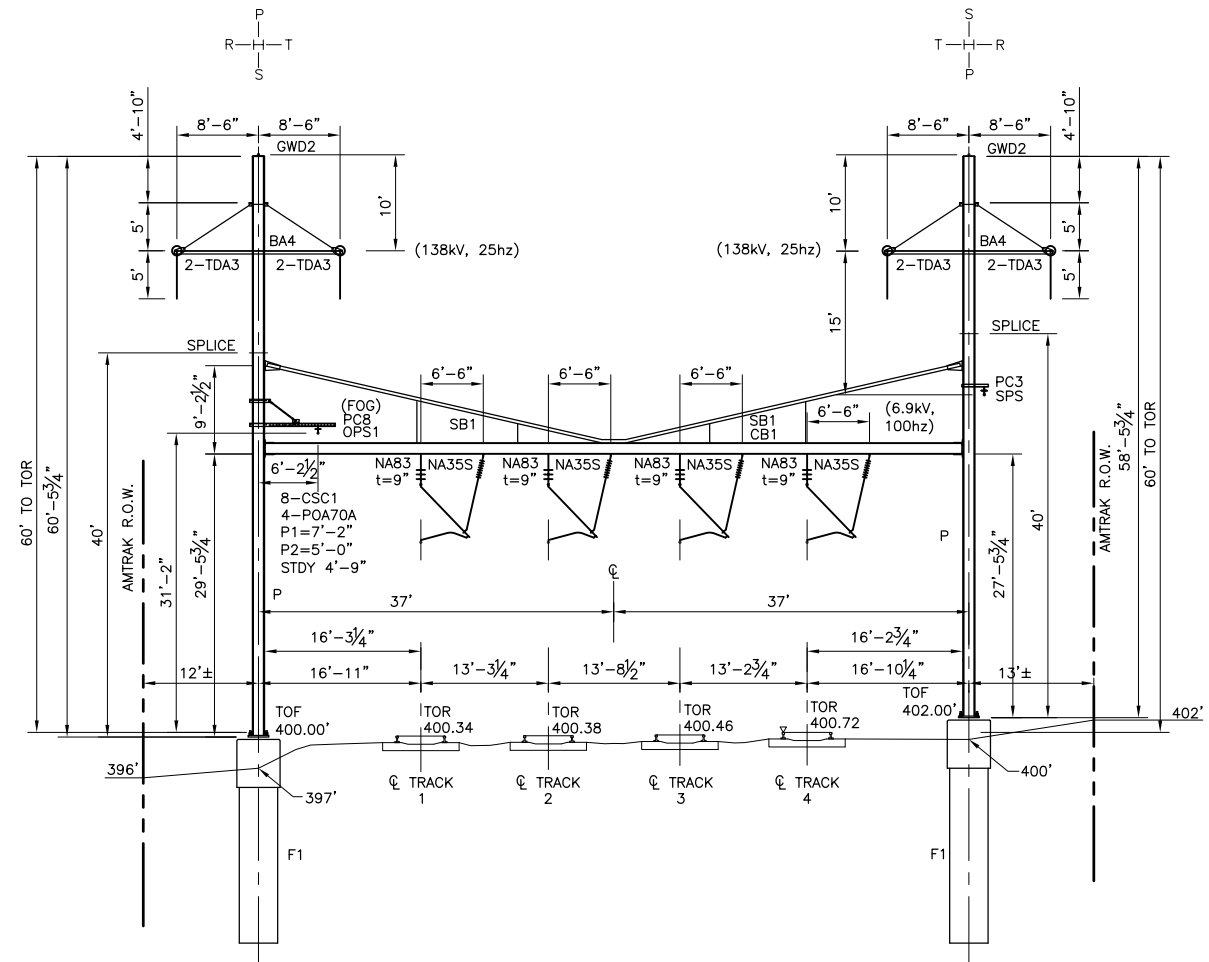
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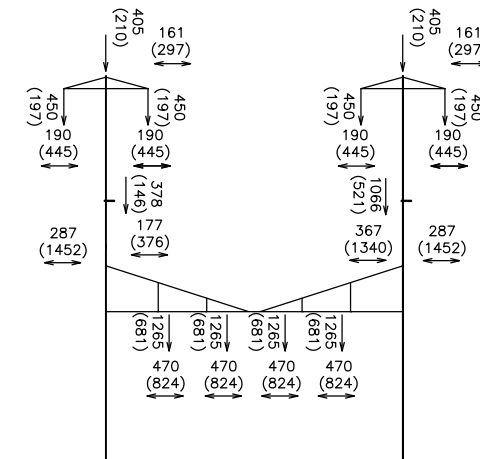
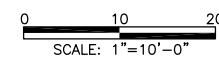
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE DEADEND	ET-1909	2
TDA3	TRANSMISSION DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PCB	SLIDING CLAMP	S-5240	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4	TRANSMISSION BRACKET	S-5203	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 1/4"	26'-1 3/4"	26'-0 3/4"	25'-9 3/4"
CW	20'-2 1/4"	20'-1 3/4"	20'-0 3/4"	19'-9 3/4"



STRUCTURE ERECTION DIAGRAM T-306

709+03  
LOOKING TOWARDS HARRISBURG



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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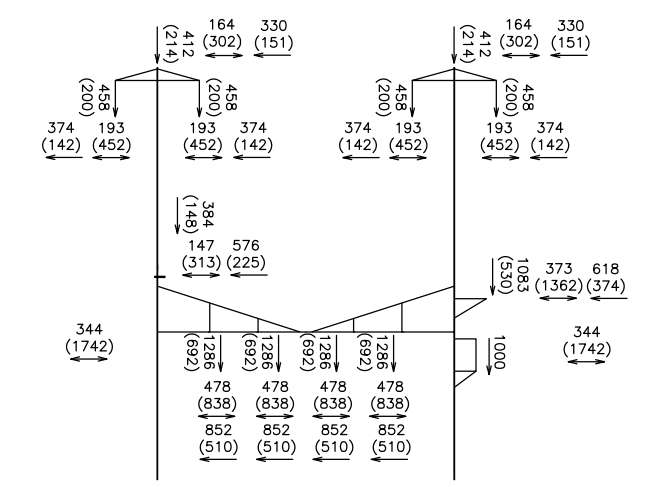
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-306  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1349.DWG  
Ref. No.: 2011-059  
Sheet No: 263 OF 565  
ET-1349

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPT	SIGNAL POWER TERMINATION	ET-1913	1	
SPCS1	SIGNAL POWER CUT SECTION	ET-1810	1	
PC1	SLIDING CLAMP	S-5214	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA3	TRANSMISSION BRACKET -DOUBLE	S-5202	2	
CSC1	SLIDING BRACKET	S-5214	8	

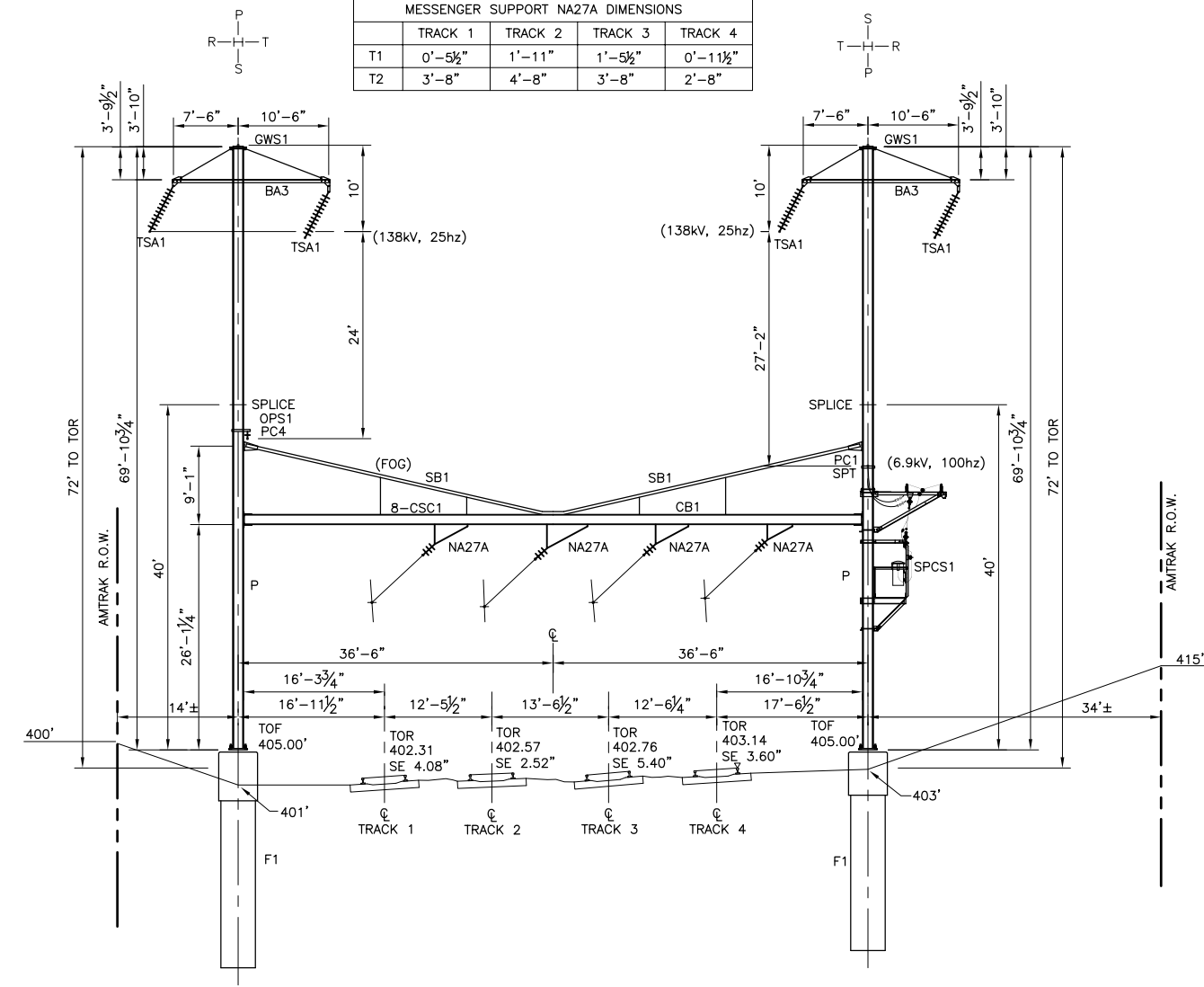


LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
305' LOAD SPAN  
(NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-6 1/4"	24'-9 1/2"	25'-0 3/4"	25'-2 1/4"
CW	20'-0 1/4"	19'-3 1/2"	19'-6 3/4"	19'-8 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-5 1/2"	1'-11"	1'-5 1/2"	0'-11 1/2"
T2	3'-8"	4'-8"	3'-8"	2'-8"



STRUCTURE ERECTION DIAGRAM T-305  
706+07  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

- WORK STATEMENT:
- INSTALL FOUNDATIONS.
  - INSTALL POLES, CROSS BEAM AND SAG BRACES.
  - INSTALL TRANSMISSION BRACKETS.
  - INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORMS.
  - INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  - TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  - INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  - TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  - ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  - DEMO OLD CAT POLES AND FOUNDATIONS.

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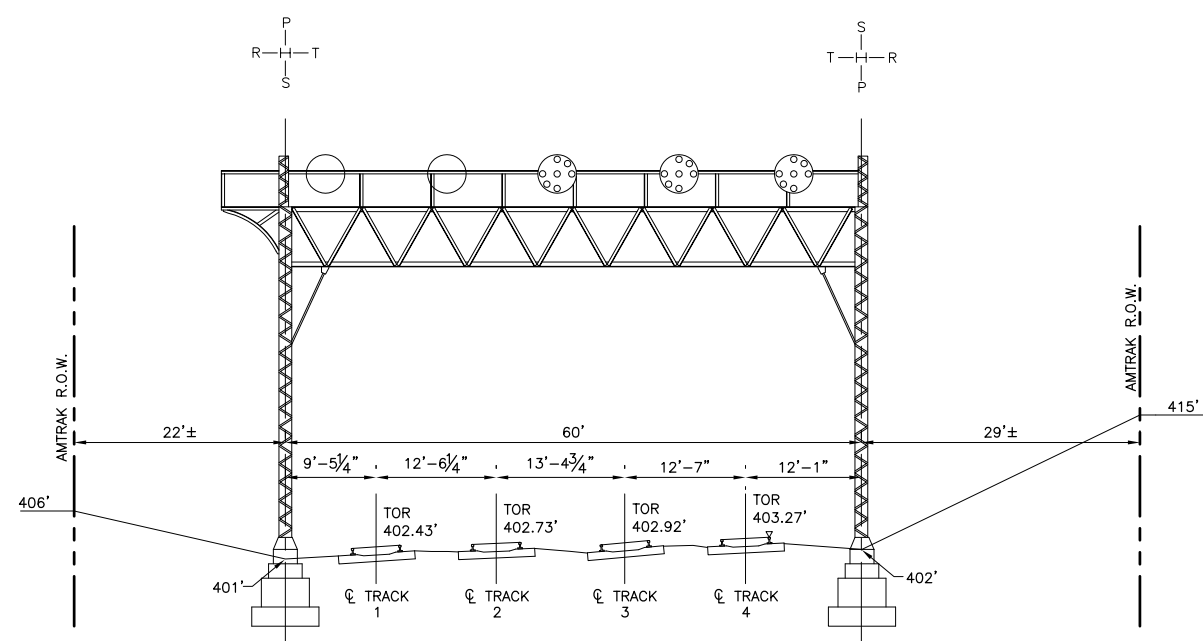
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-305  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1350.DWG
Ref. No.:	2011-059
Sheet No.:	264 OF 565
ET-1350	

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**WORK STATEMENT:**  
1. GROUND STRUCTURE.

STRUCTURE ERECTION DIAGRAM T-304 SB (EXISTING P-151 SB)

705+90  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"

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**AECOM**  
BURNS ENGINEERING, INC. | 215 879-7700  
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
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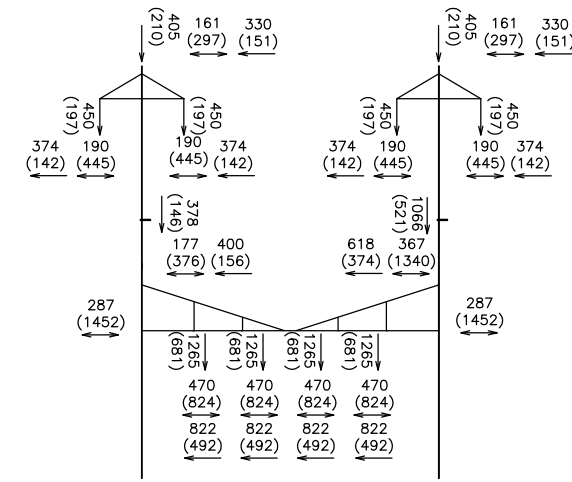
**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-304 SB (P-151 SB)**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1351.DWG  
Ref. No.: 2011-059  
Sheet No.: 265 OF 565  
**ET-1351**

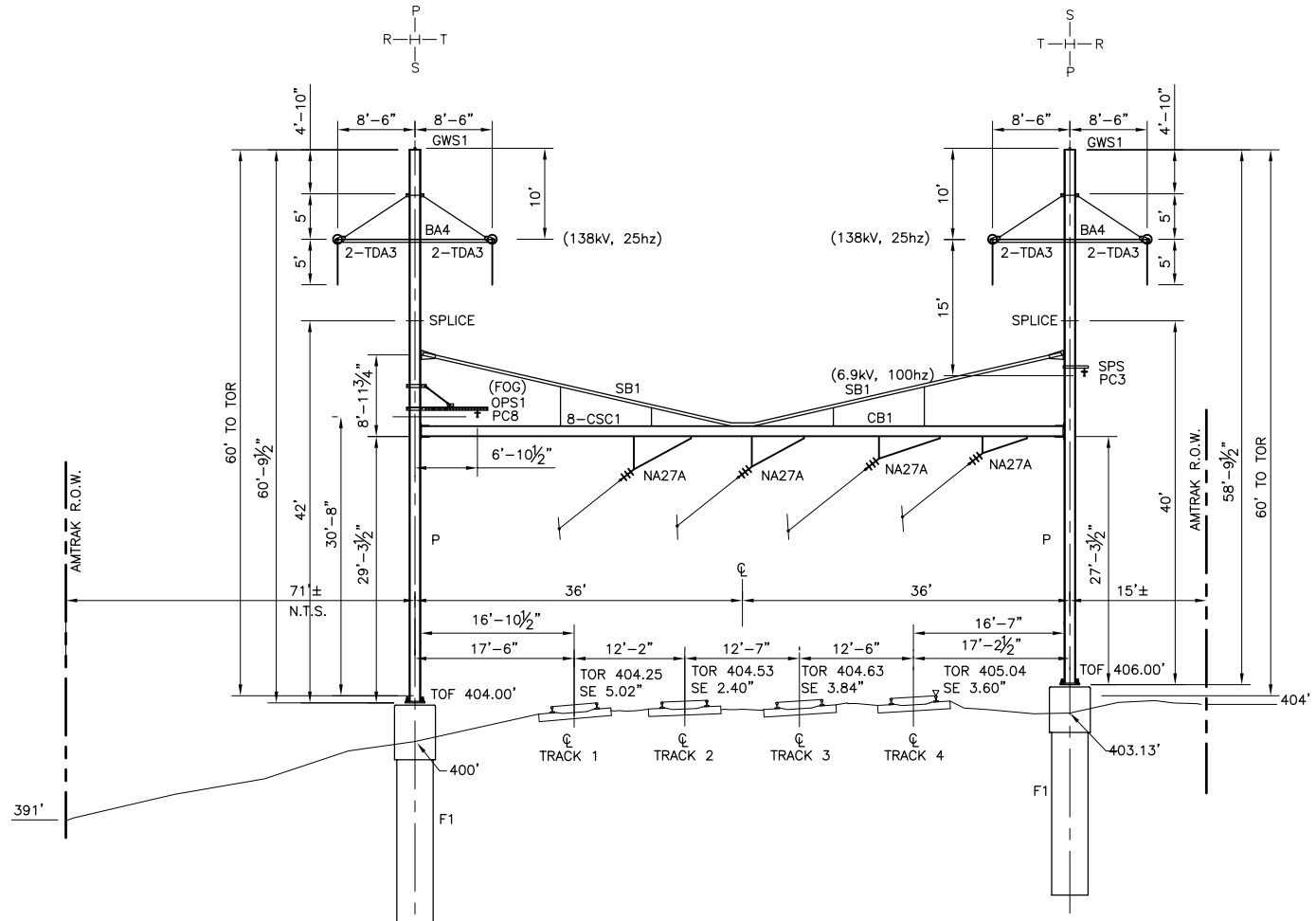
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-6 1/4"	24'-6 1/4"	25'-3 3/4"	25'-6"
CW	19'-1 3/4"	19'-2"	18'-6 1/2"	19'-7 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-9 1/2"	2'-6"	1'-7 1/2"	1'-0"
T2	6'-5"	5'-10"	6'-5"	4'-6"

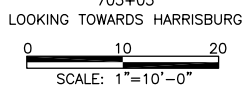


**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TDA3	TRANSMISSION DEADEND	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
PC3	SLIDING CLAMP	S-5215	1	
PC8	SLIDING CLAMP	S-5240	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA4	TRANSMISSION BRACKET	S-5203	2	
CSC1	SLIDING BRACKET	S-5214	8	



**STRUCTURE ERECTION DIAGRAM T-303**  
 703+03  
 LOOKING TOWARDS HARRISBURG



**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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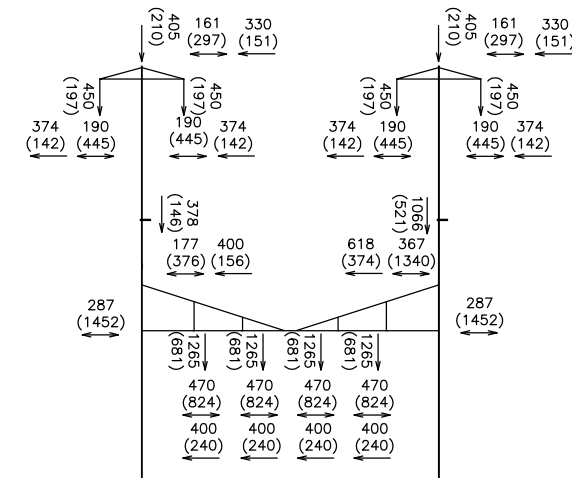


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-303**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1352.DWG
Ref. No.:	2011-059
Sheet No.:	266 OF 565
<b>ET-1352</b>	

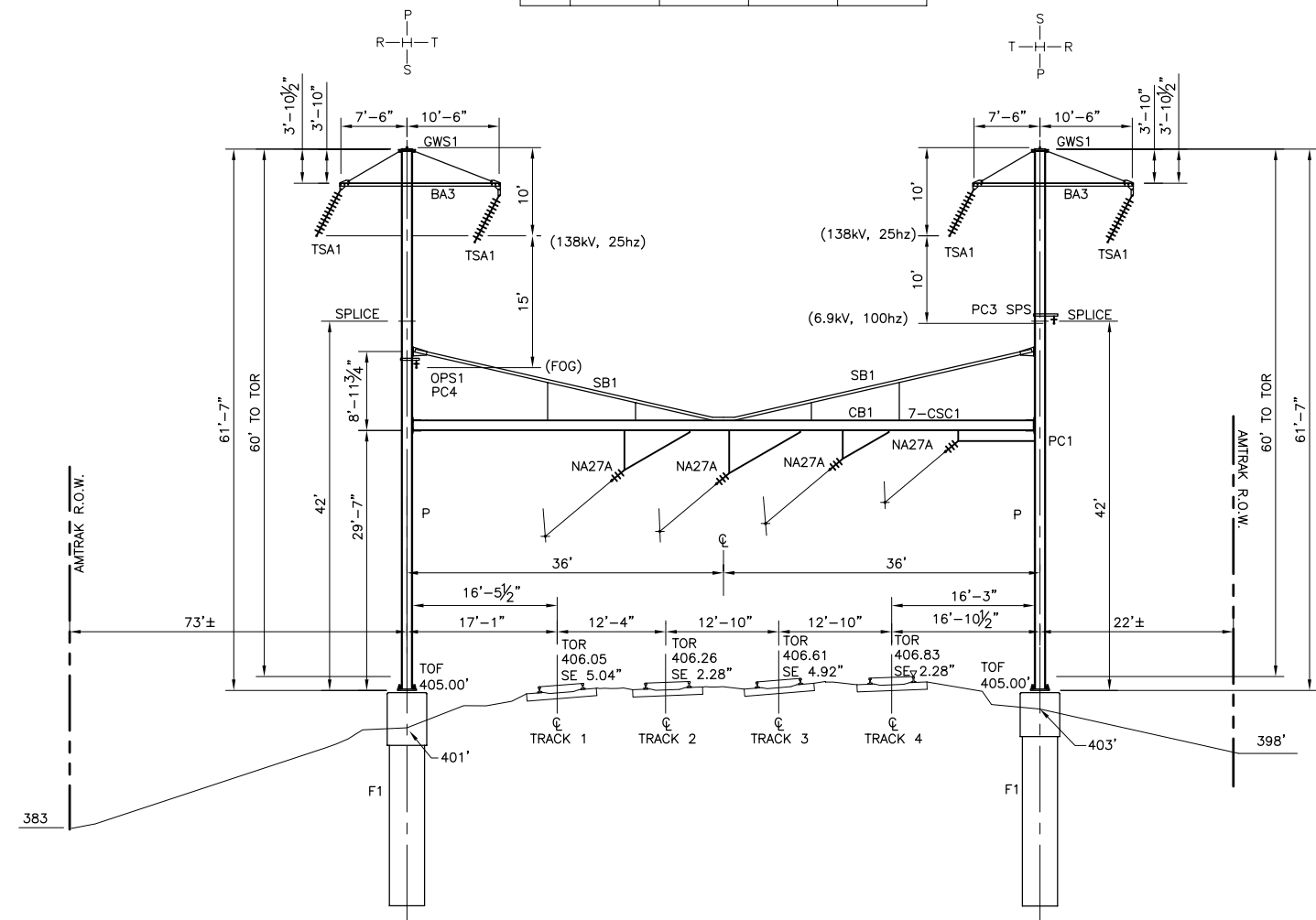
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	23'-1"	22'-6"	23'-9½"	25'-7¼"
CW	16'-8¾"	17'-1"	17'-7½"	19'-9¾"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	3'-8"	4'-0½"	2'-5"	0'-4½"
T2	7'-11"	8'-8"	5'-5"	---



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
PC1	SLIDING CLAMP	S-5214	1	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2	
CSC1	SLIDING BRACKET	S-5214	7	



**STRUCTURE ERECTION DIAGRAM T-302**  
 700+02  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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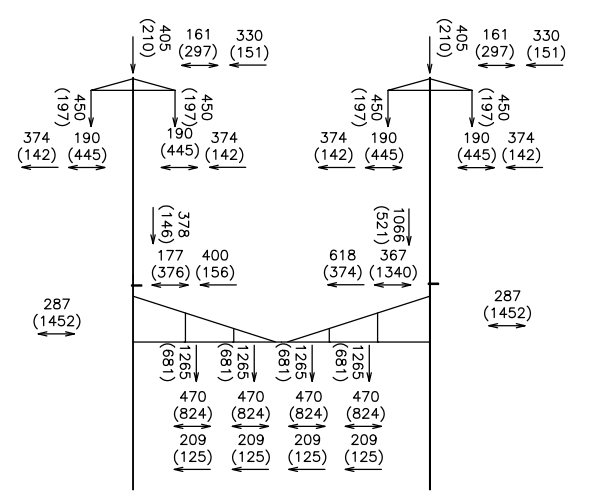
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-302**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1353.DWG
Ref. No.:	2011-059
Sheet No.:	267 OF 565
<b>ET-1353</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	2
CSC1	SLIDING BRACKET	S-5214	12

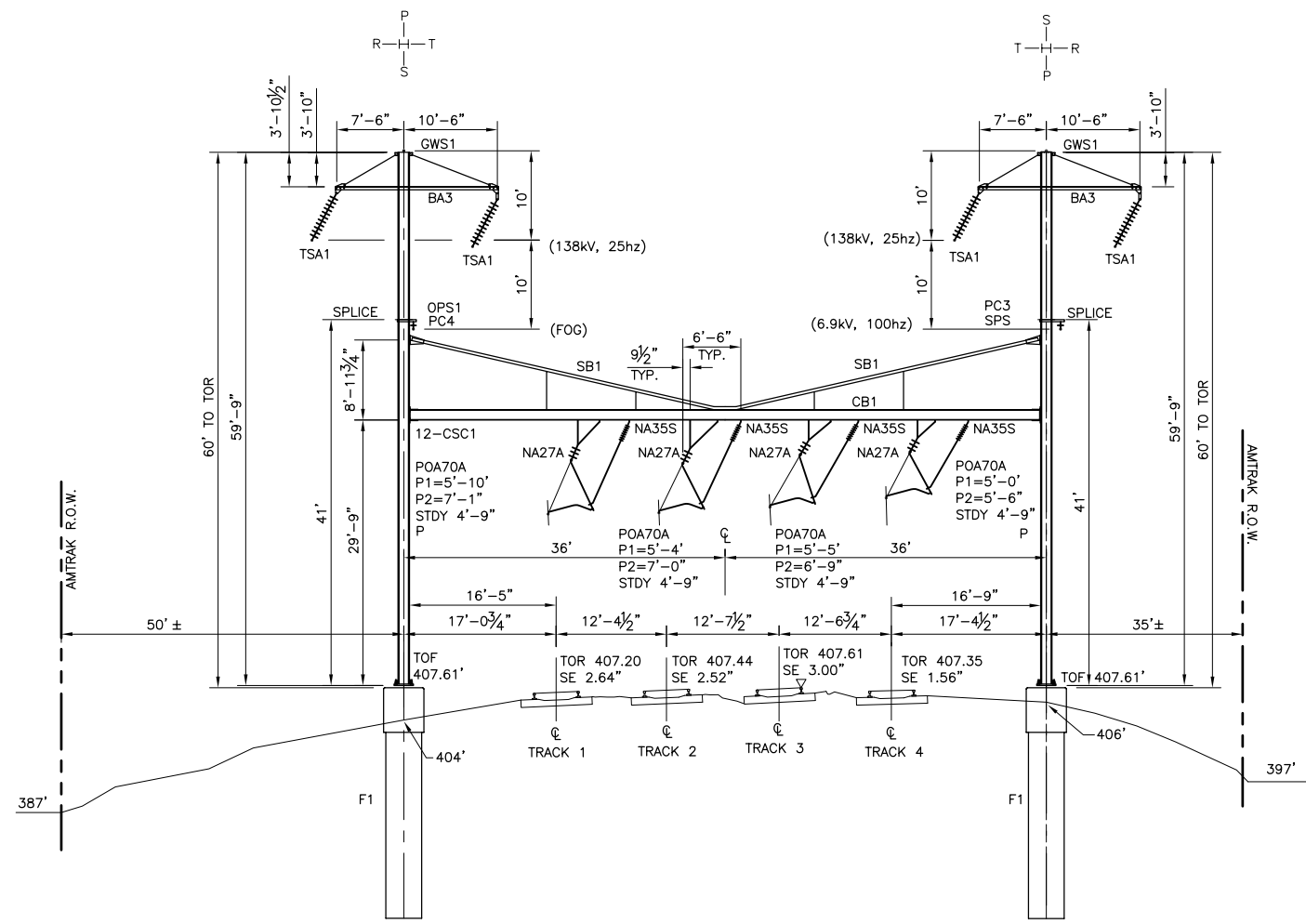
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-11"	25'-3 3/4"	26'-1 1/4"	26'-8 1/4"
CW	19'-10 1/2"	19'-9 1/4"	20'-2 3/4"	21'-6 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-11 1/2"	2'-4 1/2"	1'-5 1/2"	1'-2"
T2	2'-10"	3'-7"	2'-7"	2'-0"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.



**STRUCTURE ERECTION DIAGRAM T-301**  
 697+02  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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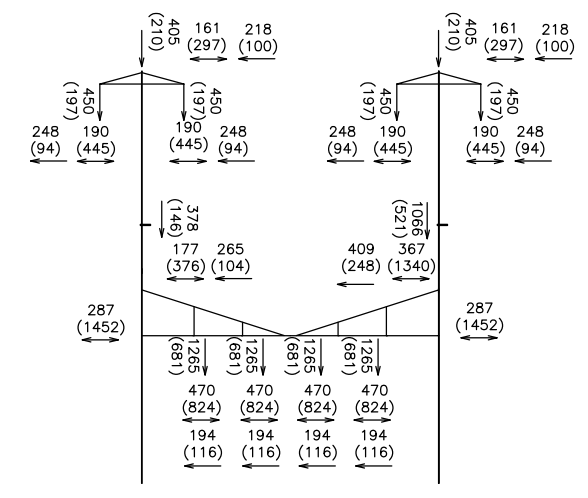
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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-301**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

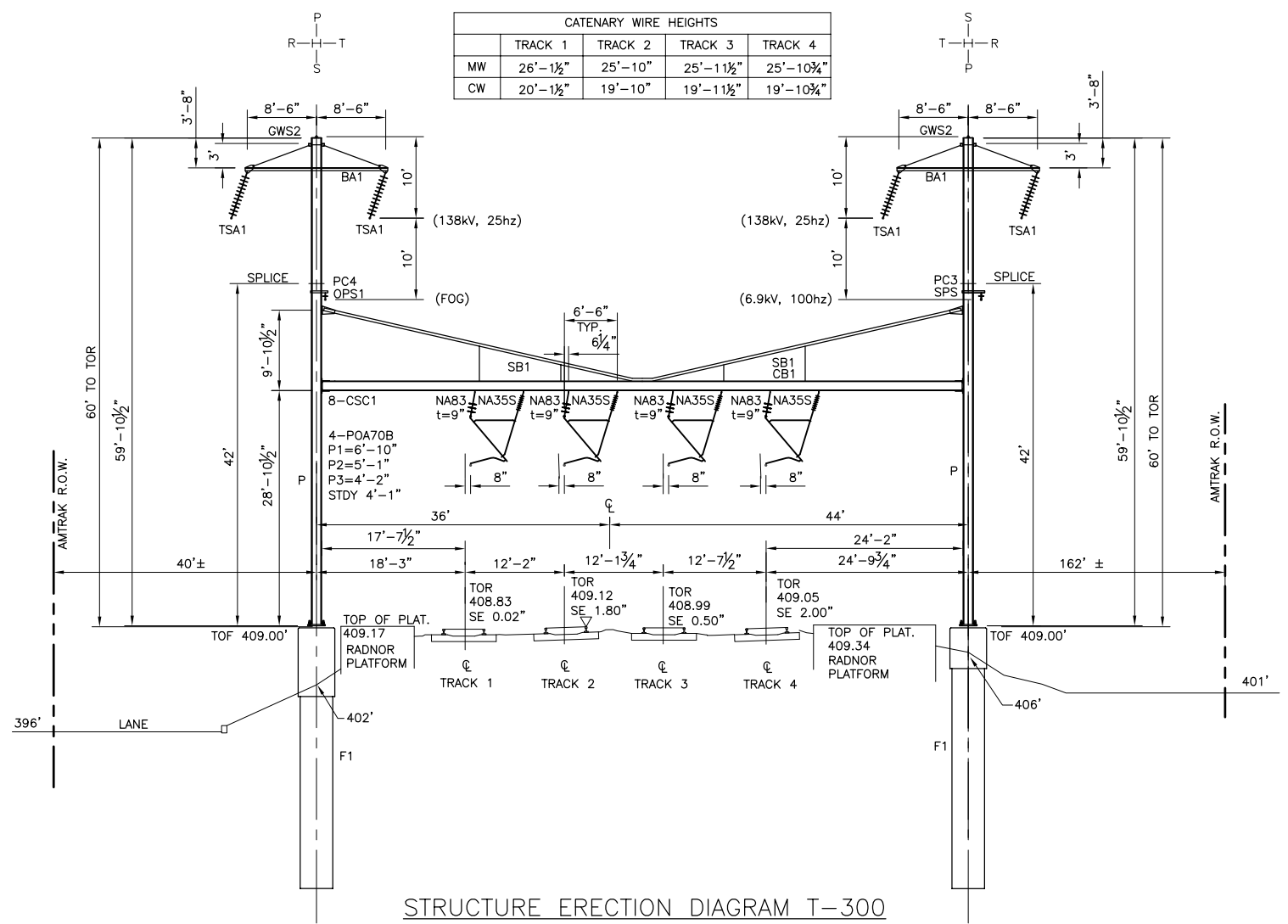
File No.: 2011-059-ET-1354.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 268 OF 565  
 ET-1354

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-1 1/2"	25'-10"	25'-1 1/2"	25'-10 3/4"
CW	20'-1 1/2"	19'-10"	19'-1 1/2"	19'-10 3/4"



STRUCTURE ERECTION DIAGRAM T-300  
 694+02  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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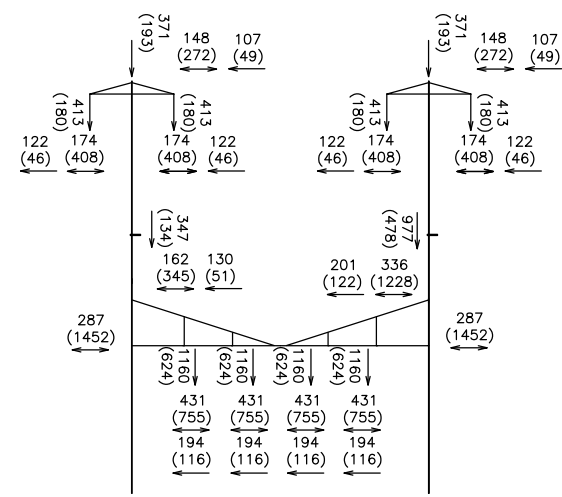
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PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-300  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1355.DWG  
 Ref. No.: 2011-059  
 Sheet No: 269 OF 565  
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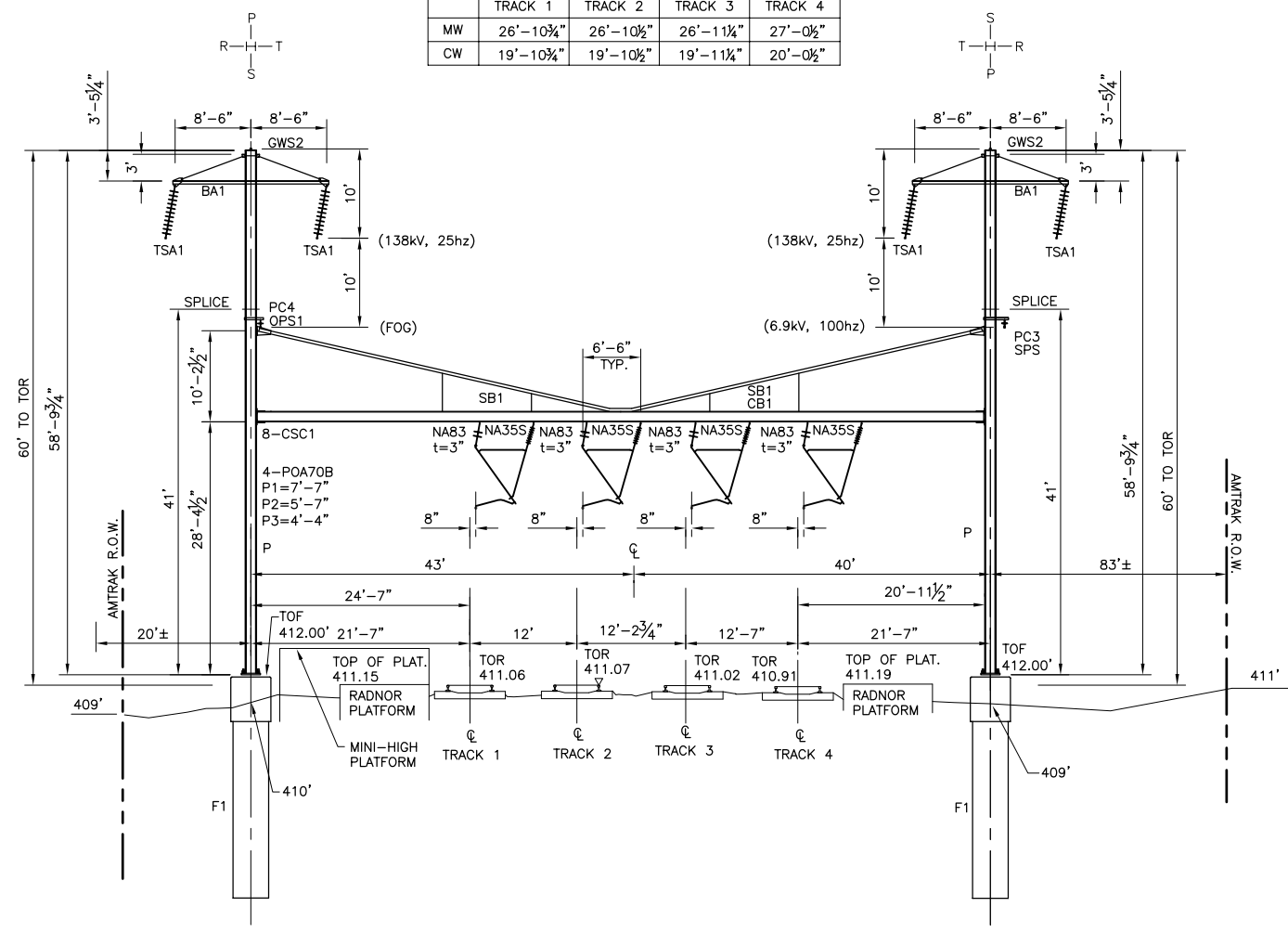
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**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 275' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-10 3/4"	26'-10 1/2"	26'-11 1/4"	27'-0 1/2"
CW	19'-10 3/4"	19'-10 1/2"	19'-11 1/4"	20'-0 1/2"



**STRUCTURE ERECTION DIAGRAM T-299**  
 691+02  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 National Railroad Passenger Corporation  
 30TH Street Station-Philadelphia, Pennsylvania 19104

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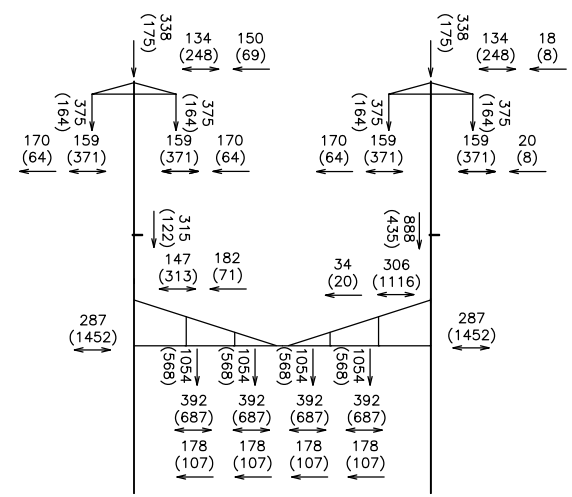


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-299**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1356.DWG
Ref. No.:	2011-059
Sheet No.:	270 OF 565
<b>ET-1356</b>	

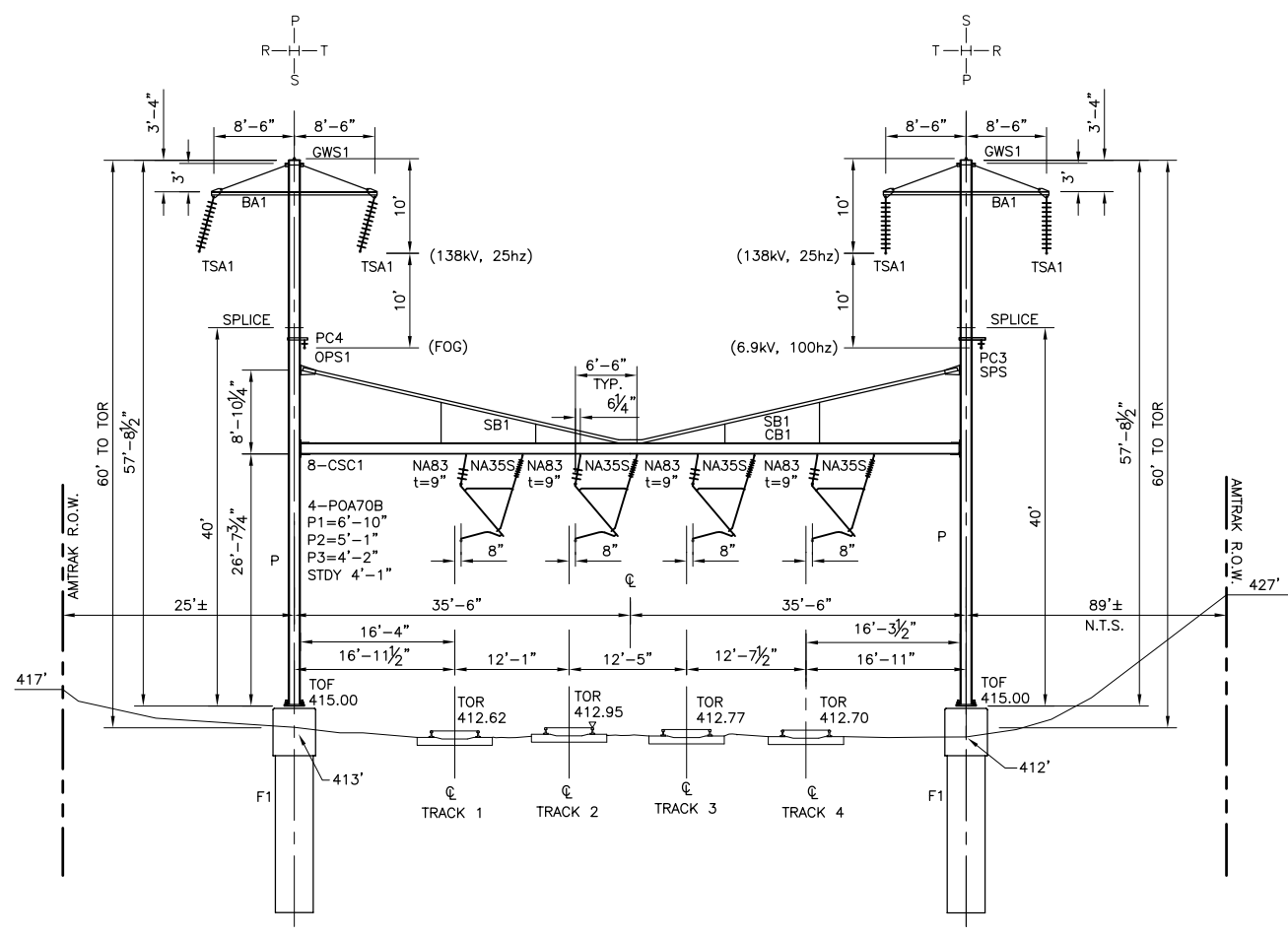


BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 250' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-1 1/4"	25'-9 1/2"	25'-11 1/2"	26'-0 1/2"
CW	20'-1 1/4"	19'-9 1/2"	19'-11 1/2"	20'-0 1/2"



STRUCTURE ERECTION DIAGRAM T-298  
 688+52  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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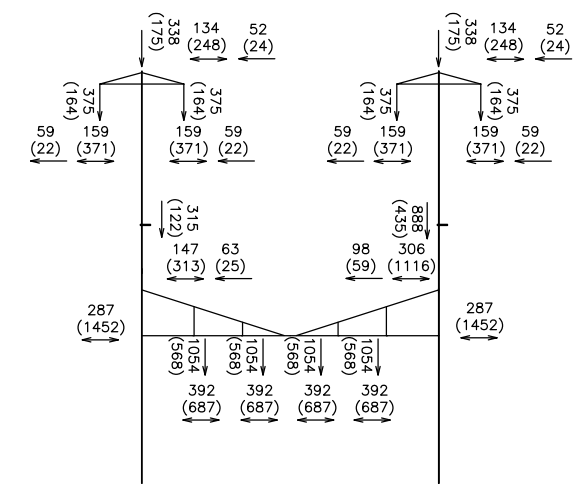


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-298  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1357.DWG  
 Ref. No.: 2011-059  
 Sheet No: 271 OF 565  
 ET-1357

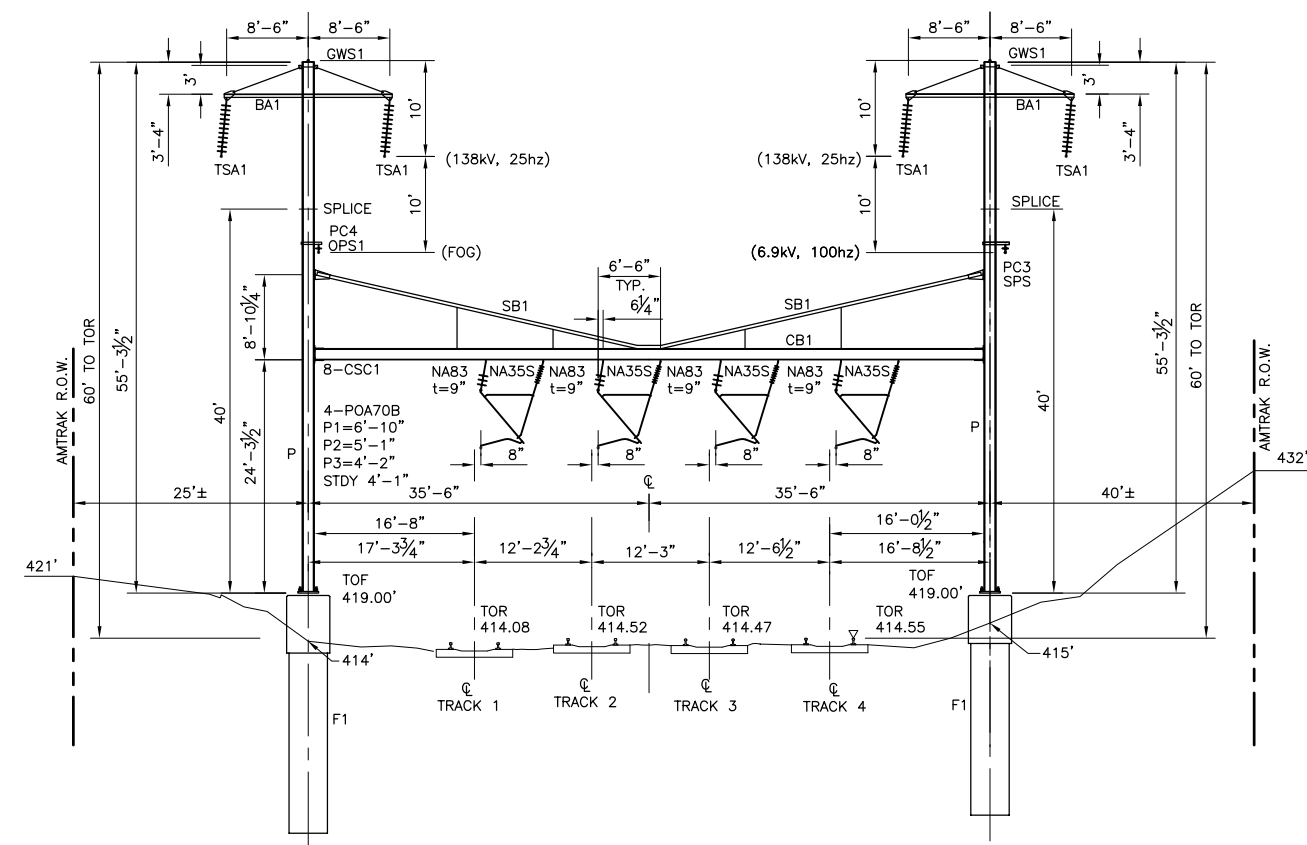
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BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5206	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 250' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-3 3/4"	25'-10 1/4"	25'-11"	25'-10"
CW	20'-3 3/4"	19'-10 1/4"	19'-11"	19'-10"



**STRUCTURE ERECTION DIAGRAM T-297**  
 686+02  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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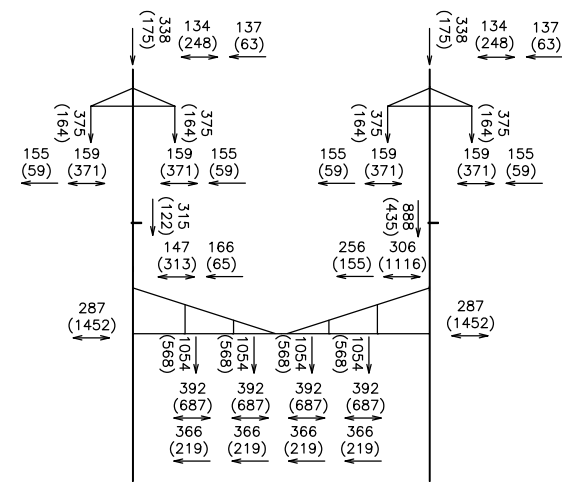


**PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-297**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

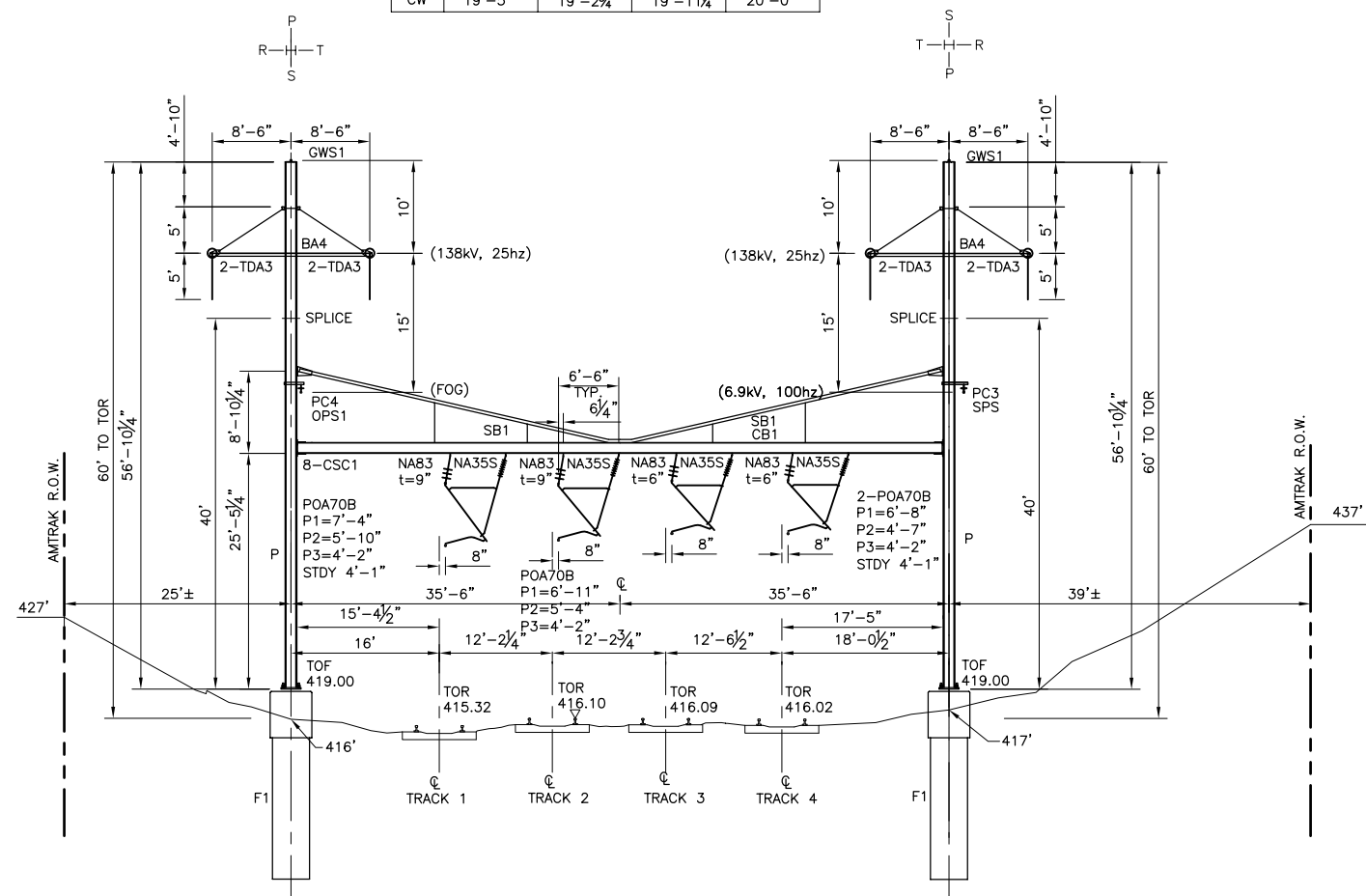
File No.:	2011-059-ET-1358.DWG
Ref. No.:	2011-059
Sheet No.:	272 OF 565
<b>ET-1358</b>	

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BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70B	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4	TRANSMISSION BRACKET	S-5203	2
CSC1	SLIDING BRACKET	S-5214	8

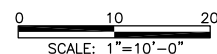


CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-1 1/2"	25'-3 1/2"	25'-7 1/2"	25'-9"
CW	19'-5"	19'-2 3/4"	19'-11 1/4"	20'-0"



**STRUCTURE ERECTION DIAGRAM T-296**

683+53  
LOOKING TOWARDS HARRISBURG



**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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IN ASSOCIATION WITH



**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-296**

File No.: 2011-059-ET-1359.DWG  
Ref. No.: 2011-059  
Sheet No: 273 OF 565

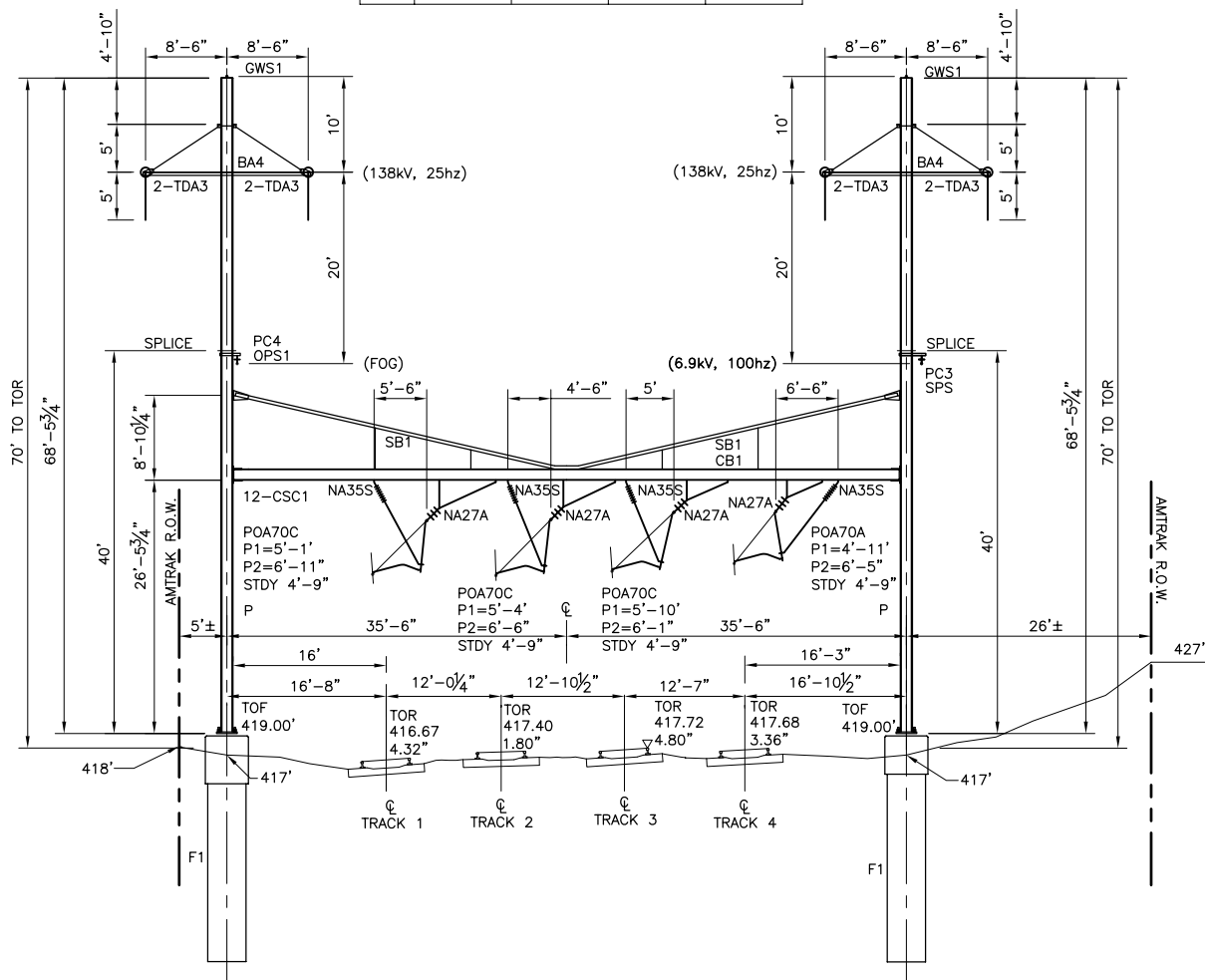
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Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

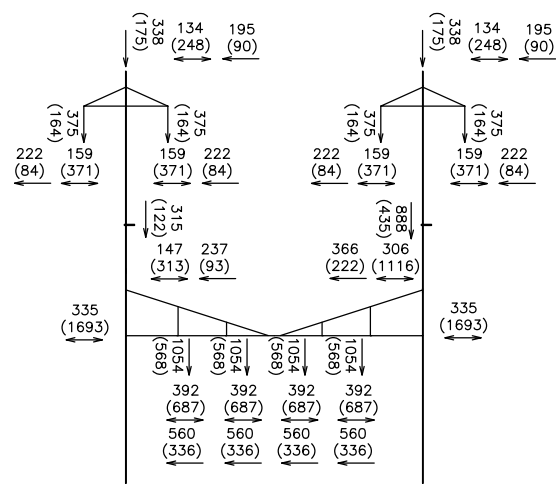
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-9 3/4"	24'-2 1/2"	24'-7 3/4"	24'-9 1/4"
CW	19'-2 1/2"	18'-4 1/4"	18'-5 3/4"	19'-4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-1"	1'-11 1/2"	1'-3"	1'-0"
T2	5'-10"	5'-4"	4'-0"	3'-4"



STRUCTURE ERECTION DIAGRAM T-295  
681+02  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
250' LOAD SPAN  
(NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TDA3	TRANSMISSION DEADEND	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	1	
POA70C	REGISTRATION ASSEMBLY	ET-1902	3	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA4	TRANSMISSION BRACKET	S-5203	2	
CSC1	SLIDING BRACKET	S-5214	12	

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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30TH Street Station-Philadelphia, Pennsylvania 19104

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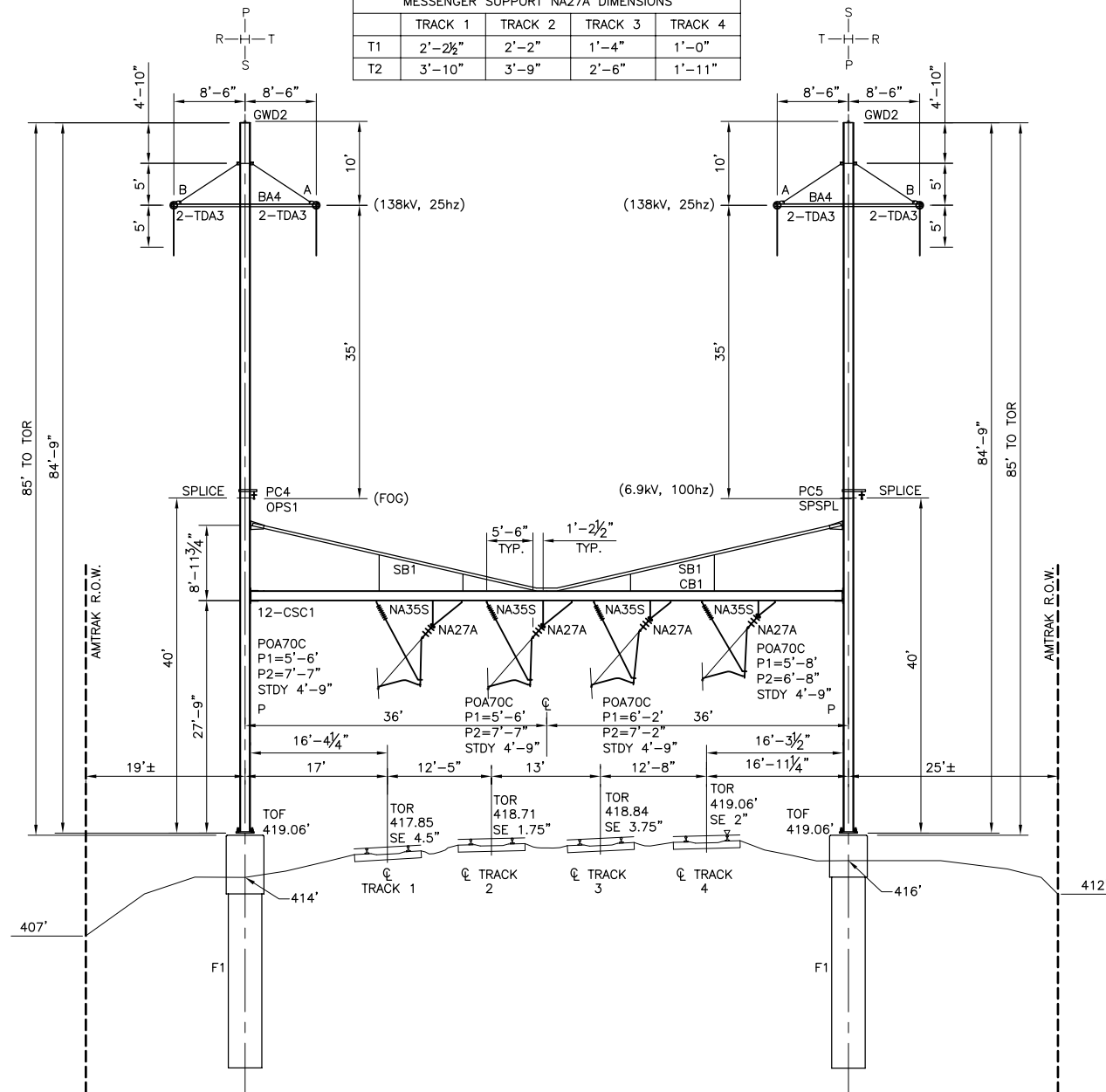


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-295**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1360  
Ref. No.: 2011-059  
Sheet No.: 274 OF 565  
**ET-1360**

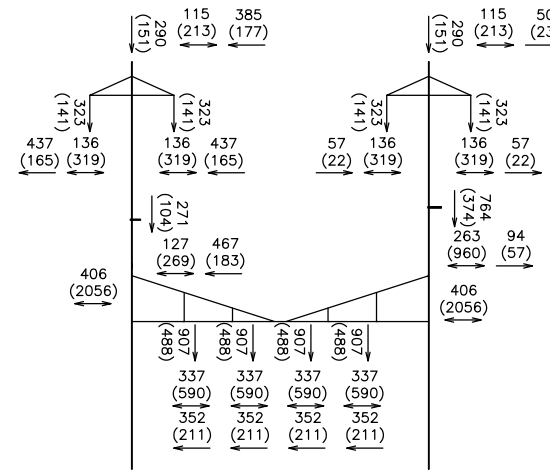
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-10 1/4"	23'-11 1/2"	24'-8 1/4"	24'-9 1/4"
CW	18'-9 1/4"	17'-9 3/4"	18'-0"	18'-6 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-2 1/2"	2'-2"	1'-4"	1'-0"
T2	3'-10"	3'-9"	2'-6"	1'-11"



STRUCTURE ERECTION DIAGRAM T-294

678+62  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
215' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWD2	GROUND WIRE DEADEND	ET-1909	2	
TDA3	TRANSMISSION DEADEND	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPSPL	SIGNAL POWER SPLICE	ET-1913	1	
POA70C	REGISTRATION ASSEMBLY	ET-1902	4	
PC4	SLIDING CLAMP	S-5215	1	
PC5	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA4	TRANSMISSION BRACKET	S-5203	2	
CSC1	SLIDING BRACKET	S-5214	12	

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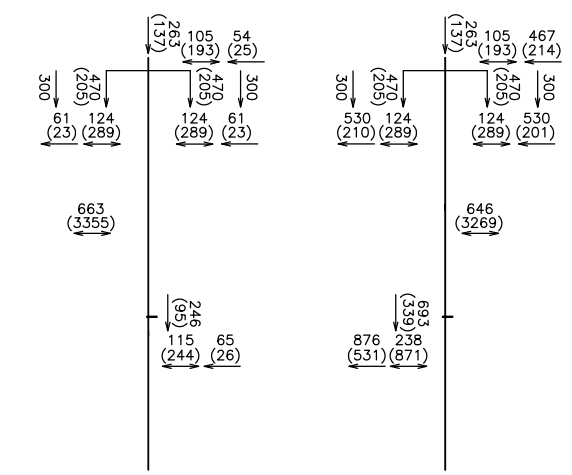
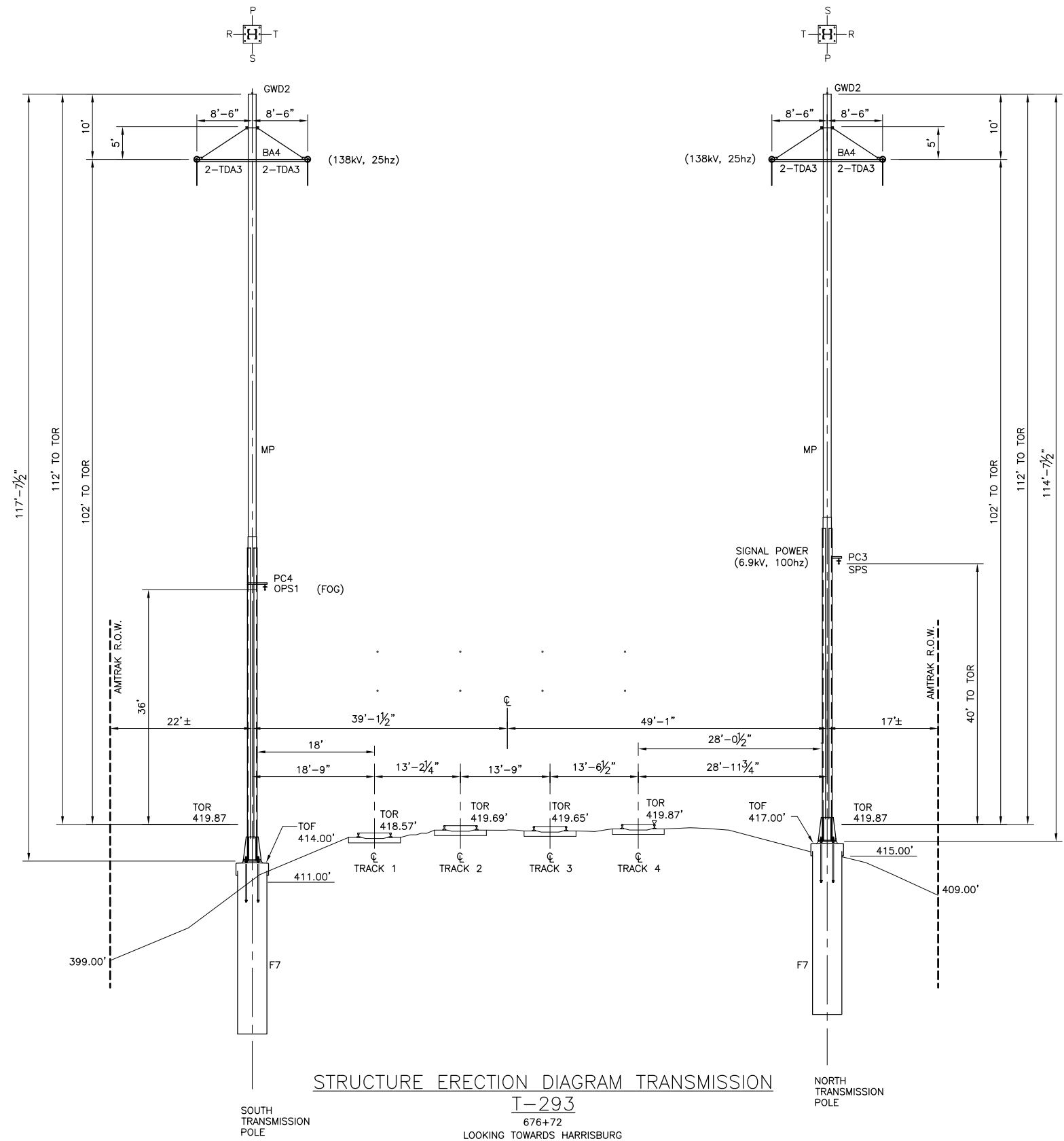
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-294  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1361.DWG  
Ref. No.: 2011-059  
Sheet No: 275 OF 565  
ET-1361

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION DEADEND ASSEMBLY	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
MP	POLE	S-5109	2
F7	FOUNDATION	S-5111	2
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
BA4	TRANSMISSION BRACKET	S-5203	2



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, 314' VERTICAL SPAN, 195' WIND SPAN  
 (60'F, 90 MPH WIND, 195' MAX SPAN)  
 NOT TO SCALE

- WORK STATEMENT:**
1. INSTALL FOUNDATION.
  2. INSTALL POLE.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.

**STRUCTURE ERECTION DIAGRAM TRANSMISSION**  
**T-293**  
 676+72  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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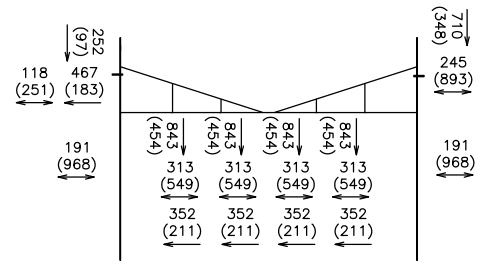
**PAOLI TO BRYN MAWR TRANSMISSION**  
**ELECTRIFICATION**  
**STRUCTURAL ERECTION DIAGRAM**  
**T-293**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1362.DWG
Ref. No.:	2011-059
Sheet No.:	276 OF 565
<b>ET-1362</b>	

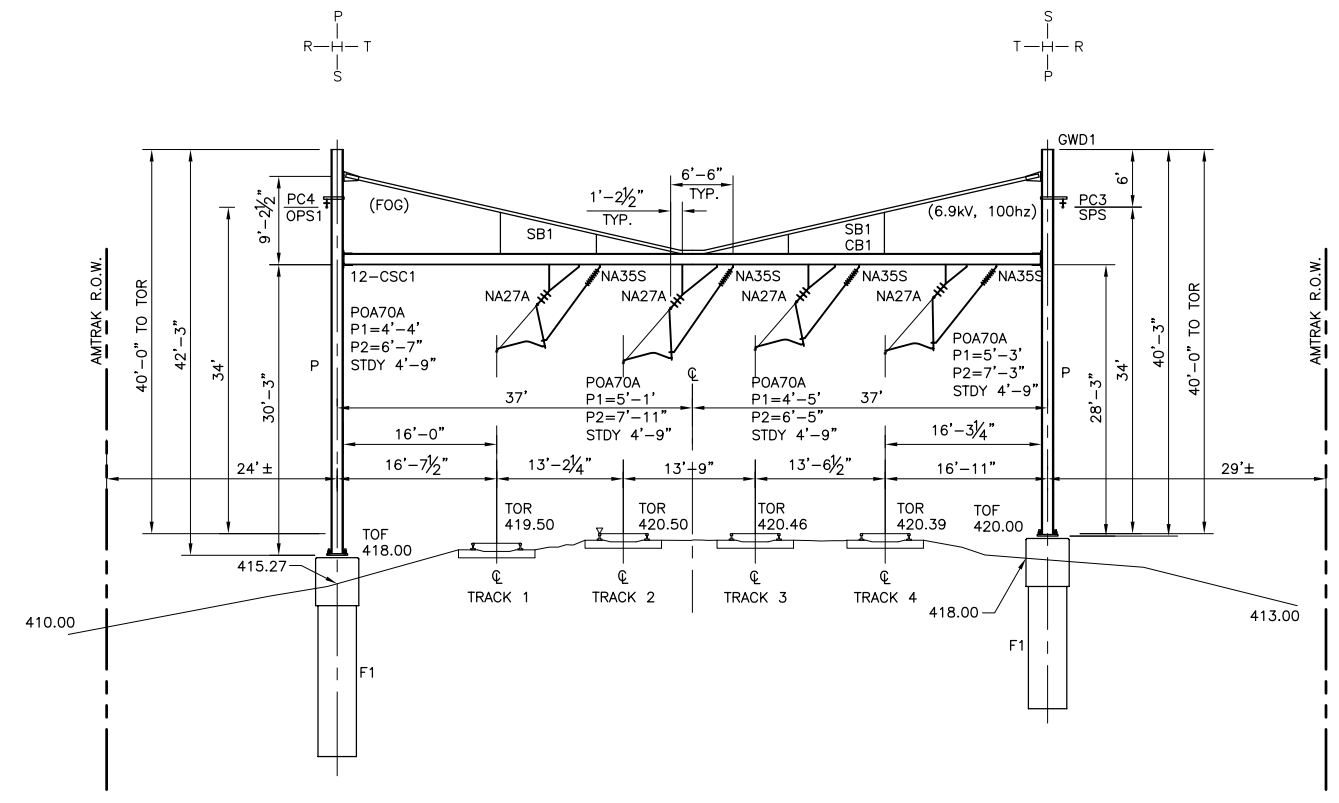
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD1	GROUND WIRE ASSEMBLY	ET-1909	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
CSC1	SLIDING BRACKET	S-5214	12

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-10 1/2"	23'-5 3/4"	24'-1 3/4"	24'-7 1/2"
CW	19'-11 3/4"	17'-9 1/2"	19'-2"	18'-9 1/2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-11"	2'-3 1/2"	1'-7 1/2"	1'-2"
T2	3'-4"	4'-0"	2'-11"	2'-2"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
200' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE ERECTION DIAGRAM T-292  
675+61  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
4. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
5. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
6. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
7. DEMO OLD CAT POLES AND FOUNDATIONS.

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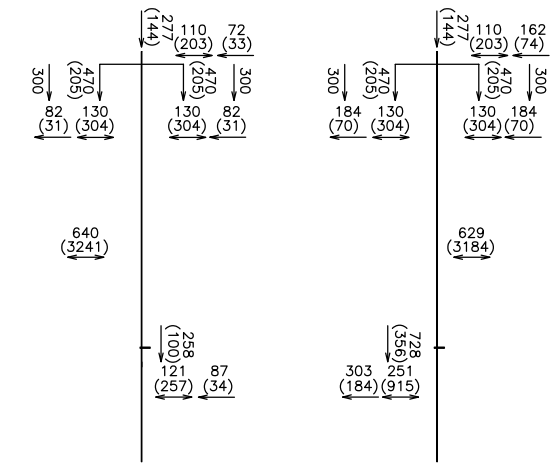
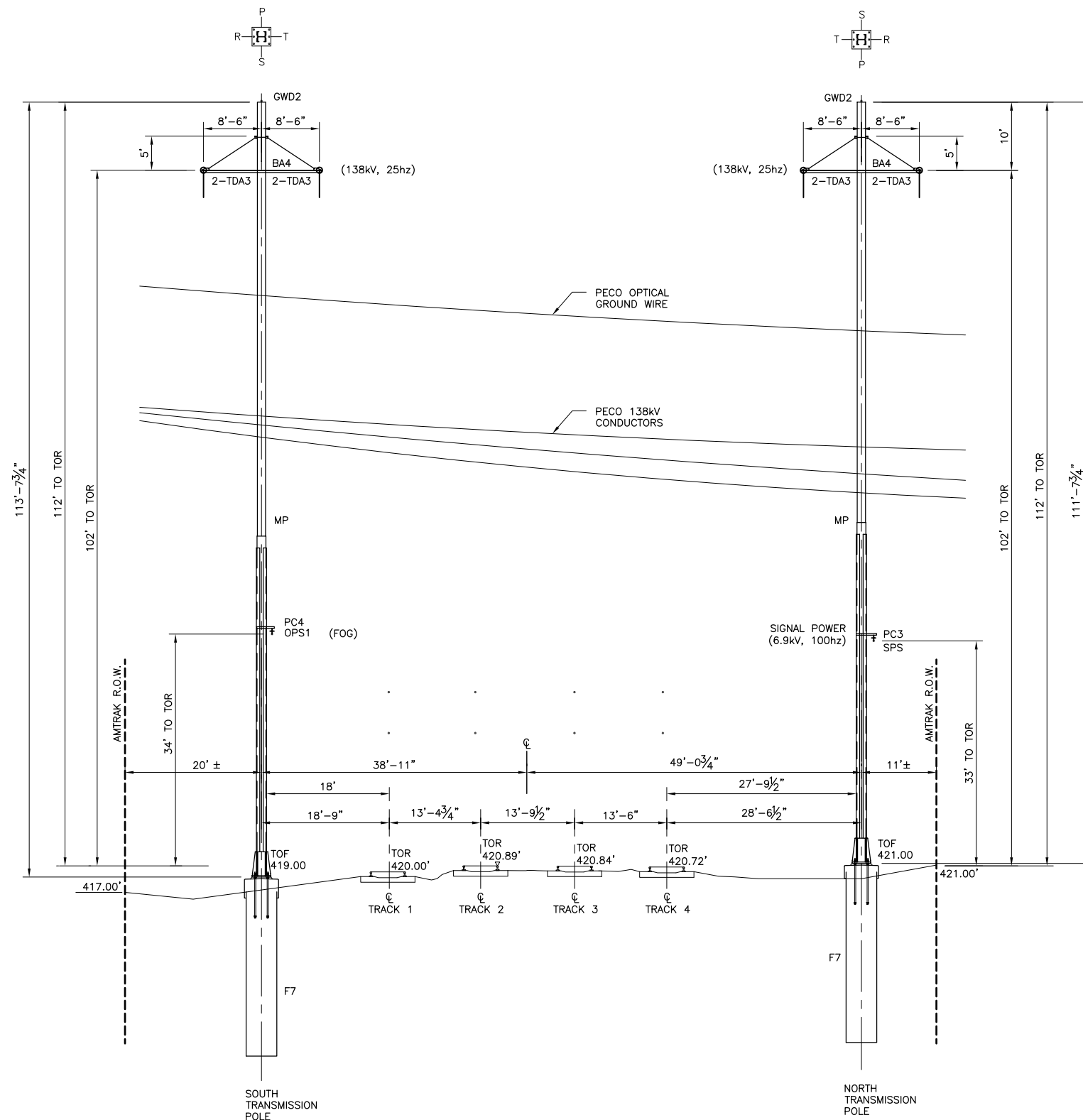
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-292  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1363.DWG  
Ref. No.: 2011-059  
Sheet No.: 277 OF 565  
ET-1363

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION DEADEND ASSEMBLY	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
MP	POLE	S-5109	2
F7	FOUNDATION	S-5111	2
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
BA4	TRANSMISSION BRACKET	S-5203	2



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, 314' VERTICAL SPAN, 205' WIND SPAN  
 (60°F, 90 MPH WIND, 205' MAX SPAN)  
 NOT TO SCALE

- WORK STATEMENT:**
1. INSTALL FOUNDATION.
  2. INSTALL POLE.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.

**STRUCTURE ERECTION DIAGRAM TRANSMISSION**  
**T-291**  
 674+75  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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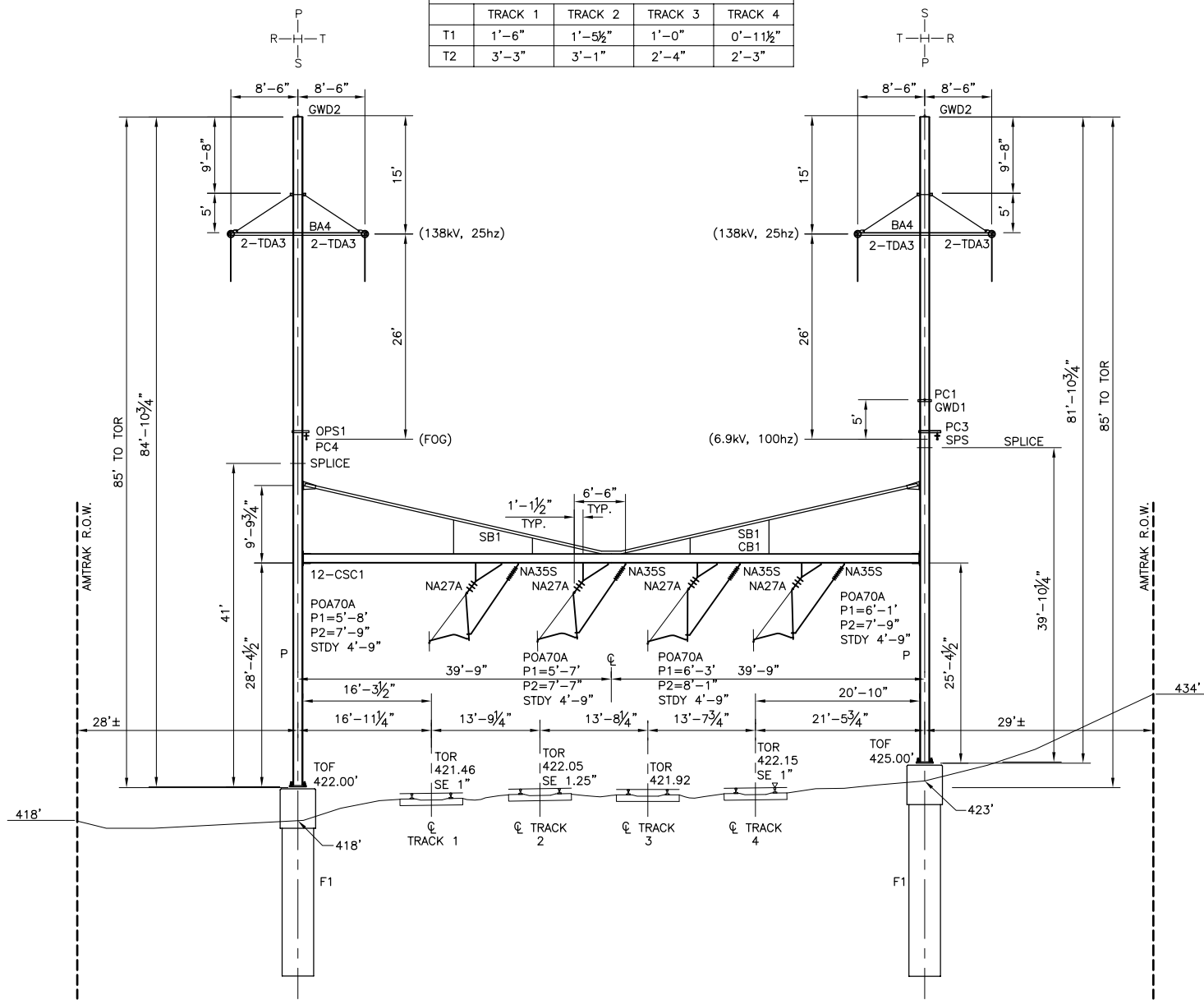
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-291**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1364.DWG
Ref. No.:	2011-059
Sheet No.:	278 OF 565
<b>ET-1364</b>	



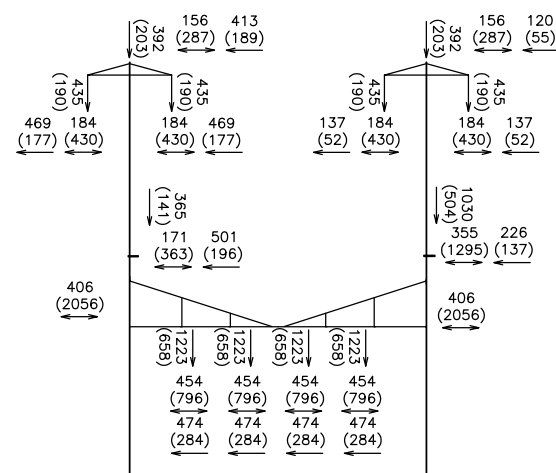
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-4 1/4"	24'-10"	25'-5"	25'-2 1/2"
CW	19'-0 1/2"	18'-7 1/2"	18'-6"	18'-6"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-6"	1'-5 1/2"	1'-0"	0'-11 1/2"
T2	3'-3"	3'-1"	2'-4"	2'-3"



STRUCTURE ERECTION DIAGRAM T-290

672+61  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
290' LOAD SPAN  
(NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWD2	GROUND WIRE DEADEND	ET-1909	2	
GWD1	GROUND WIRE ASSEMBLY	ET-1909	1	
TDA3	TRANSMISSION DEADEND	ET-1800	8	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC1	SLIDING CLAMP	S-5214	1	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA4	TRANSMISSION BRACKET	S-5203	2	
CSC1	SLIDING BRACKET	S-5214	12	

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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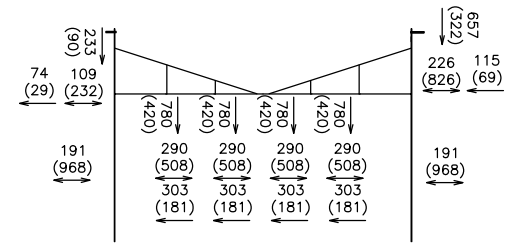


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-290  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1365.DWG  
Ref. No.: 2011-059  
Sheet No.: 279 OF 565  
ET-1365

BILL OF MATERIALS

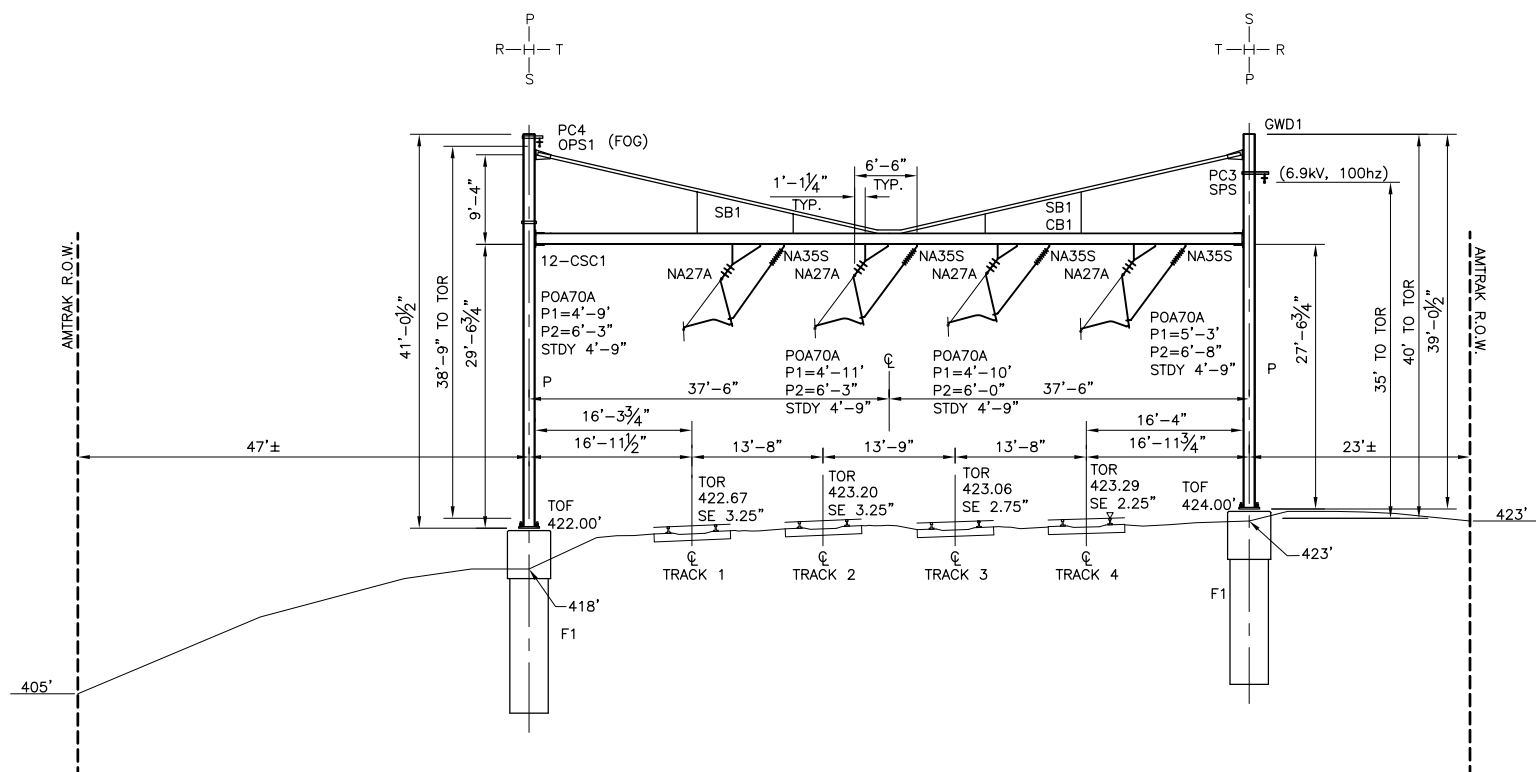
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD1	GROUND WIRE ASSEMBLY	ET-1909	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
CSC1	SLIDING BRACKET	S-5214	12



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
185' LOAD SPAN  
(NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-7 1/2"	25'-5 1/4"	25'-9 3/4"	25'-4 1/2"
CW	20'-4"	19'-11 1/4"	20'-4 3/4"	19'-5 1/2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-3 1/2"	0'-11"	0'-8 1/2"	0'-10"
T2	2'-10"	2'-2"	1'-9"	2'-0"



STRUCTURE ERECTION DIAGRAM T-289  
670+75  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
4. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
5. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
6. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
7. DEMO OLD CAT POLES AND FOUNDATIONS.

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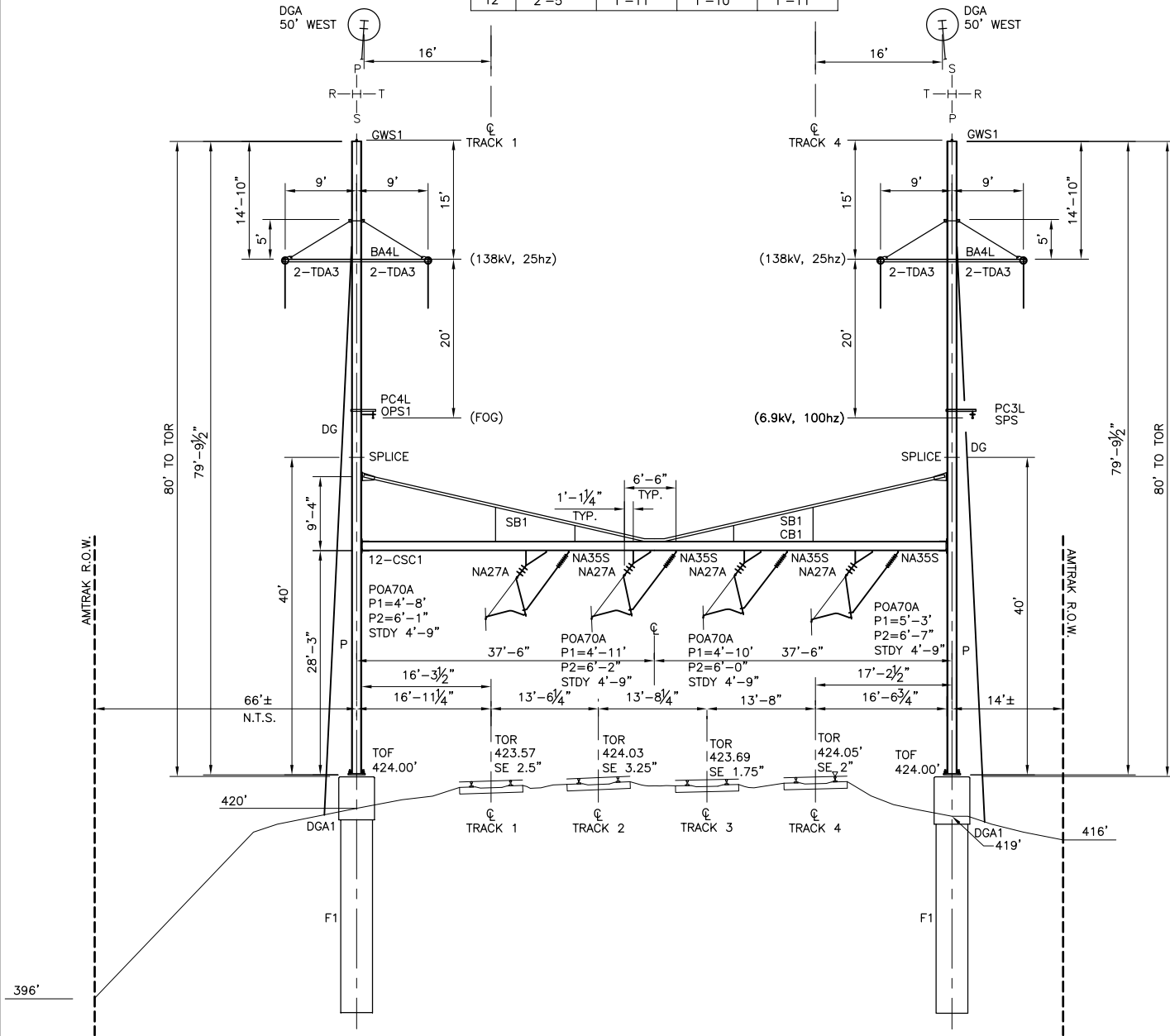
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-289  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1366.DWG  
Ref. No.: 2011-059  
Sheet No.: 280 OF 565  
ET-1366

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-7"	25'-4 3/4"	25'-9 1/4"	25'-4 1/2"
CW	20'-4"	19'-11"	20'-4 3/4"	19'-6"

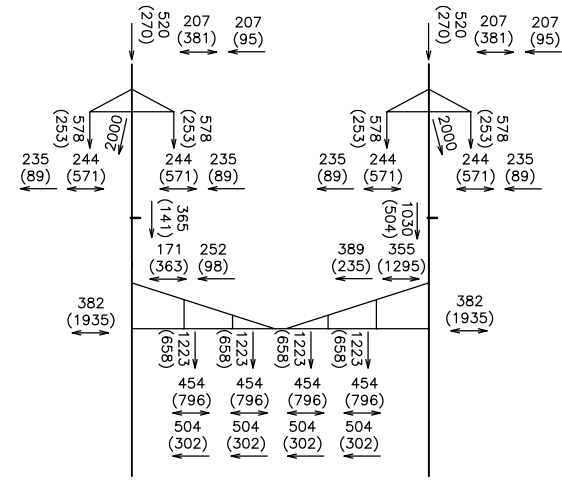
  

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-0 1/2"	0'-9 1/2"	0'-9"	0'-9 1/2"
T2	2'-5"	1'-11"	1'-10"	1'-11"



STRUCTURE ERECTION DIAGRAM T-288

668+96  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
385' TRANSMISSION SPAN  
290' CATENARY SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
DG	DOWNGUY	ET-1908	2
PC3L	SLIDING CLAMP	S-5215	1
PC4L	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4L	TRANSMISSION BRACKET -DOUBLE	S-5203	2
DGA	DOWNGUY FOUNDATION	S-5101	2
CSC1	SLIDING BRACKET	S-5214	12

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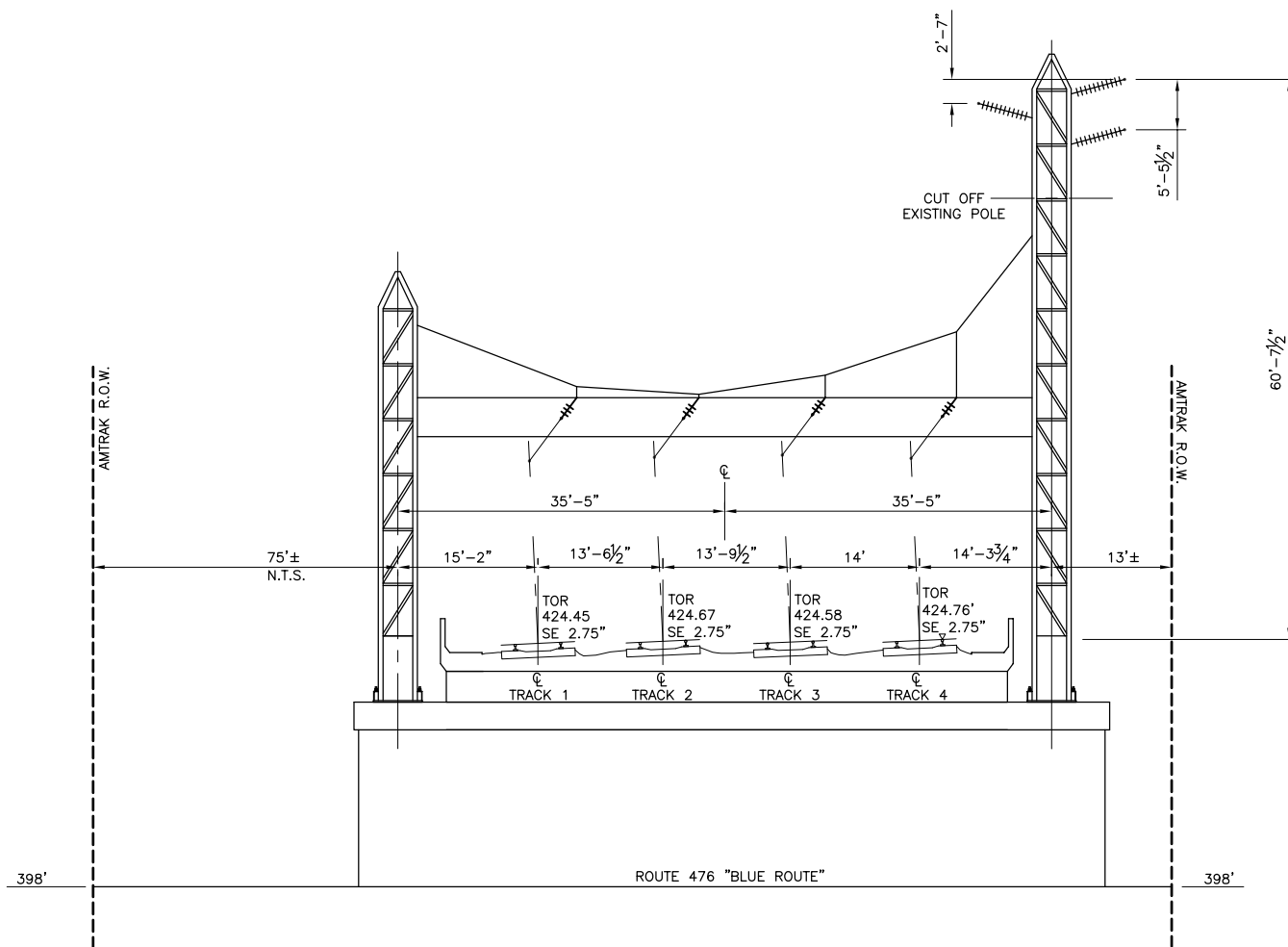
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-288  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1367.DWG  
Ref. No.: 2011-059  
Sheet No: 281 OF 565  
ET-1367

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-3"	24'-0½"	24'-6¼"	24'-2"
CW	19'-7½"	19'-9½"	20'-1½"	19'-7¼"



**WORK STATEMENT:**

1. REMOVE PECO WIRES.
2. CUT OFF EXISTING LATTICE POLE.

**STRUCTURE ERECTION DIAGRAM T-287 (EXISTING P-138A)**

667+17  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-287 (EXISTING)**

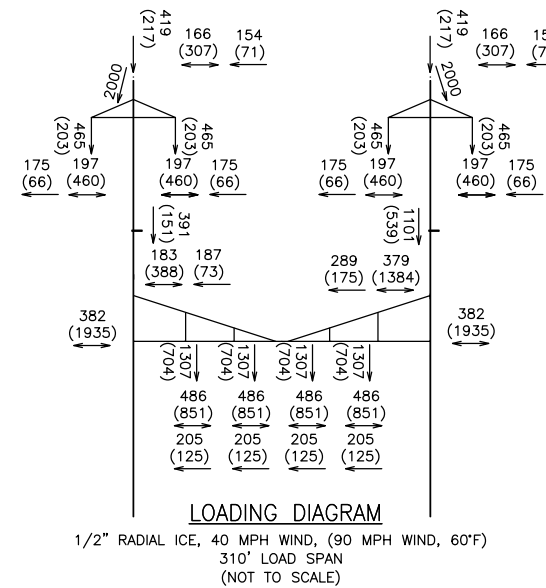
File No.:	2011-059-ET-1368.DWG
Ref. No.:	2011-059
Sheet No.:	282 OF 565

ET-1368

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	INSULATOR ASSEMBLY	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
DG	DOWNGUY	ET-1908	2
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4L	TRANSMISSION BRACKET -DOUBLE	S-5203	2
DGA	DOWNGUY FOUNDATION	S-5101	2
CSC1	SLIDING BRACKET	S-5214	12



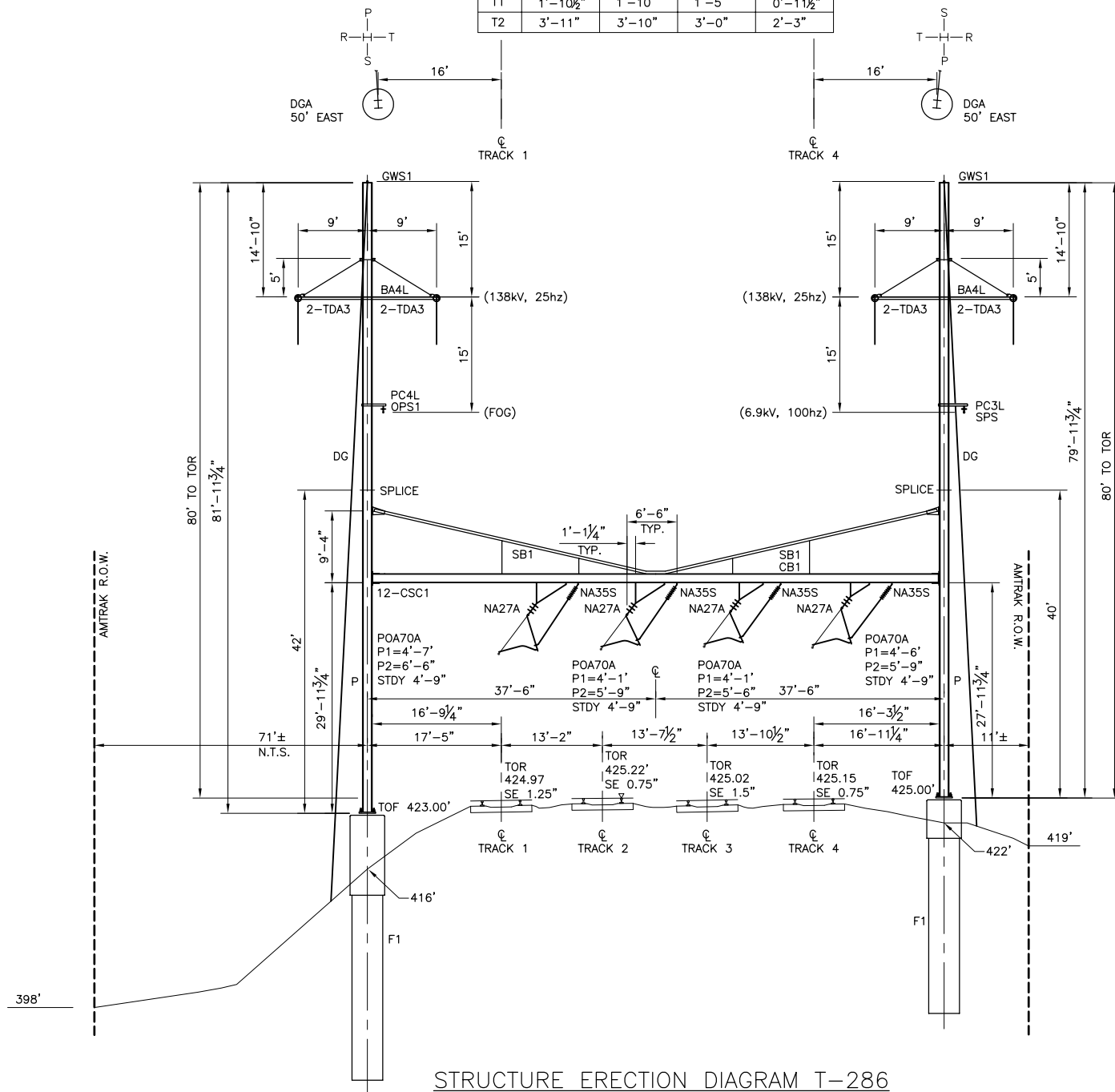
WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-4 1/4"	23'-10 1/4"	24'-6 1/4"	24'-9 1/2"
CW	19'-0 1/4"	19'-4 1/4"	19'-11 1/4"	19'-8"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-10 1/2"	1'-10"	1'-5"	0'-11 1/2"
T2	3'-11"	3'-10"	3'-0"	2'-3"



STRUCTURE ERECTION DIAGRAM T-286

665+45  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"

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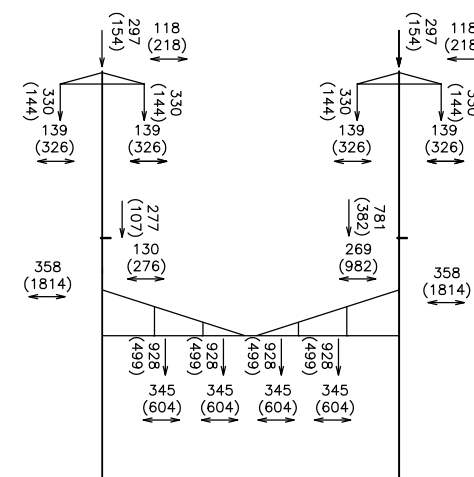
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-286

File No.: 2011-059-ET-1369.DWG  
Ref. No.: 2011-059  
Sheet No.: 283 OF 565

ET-1369

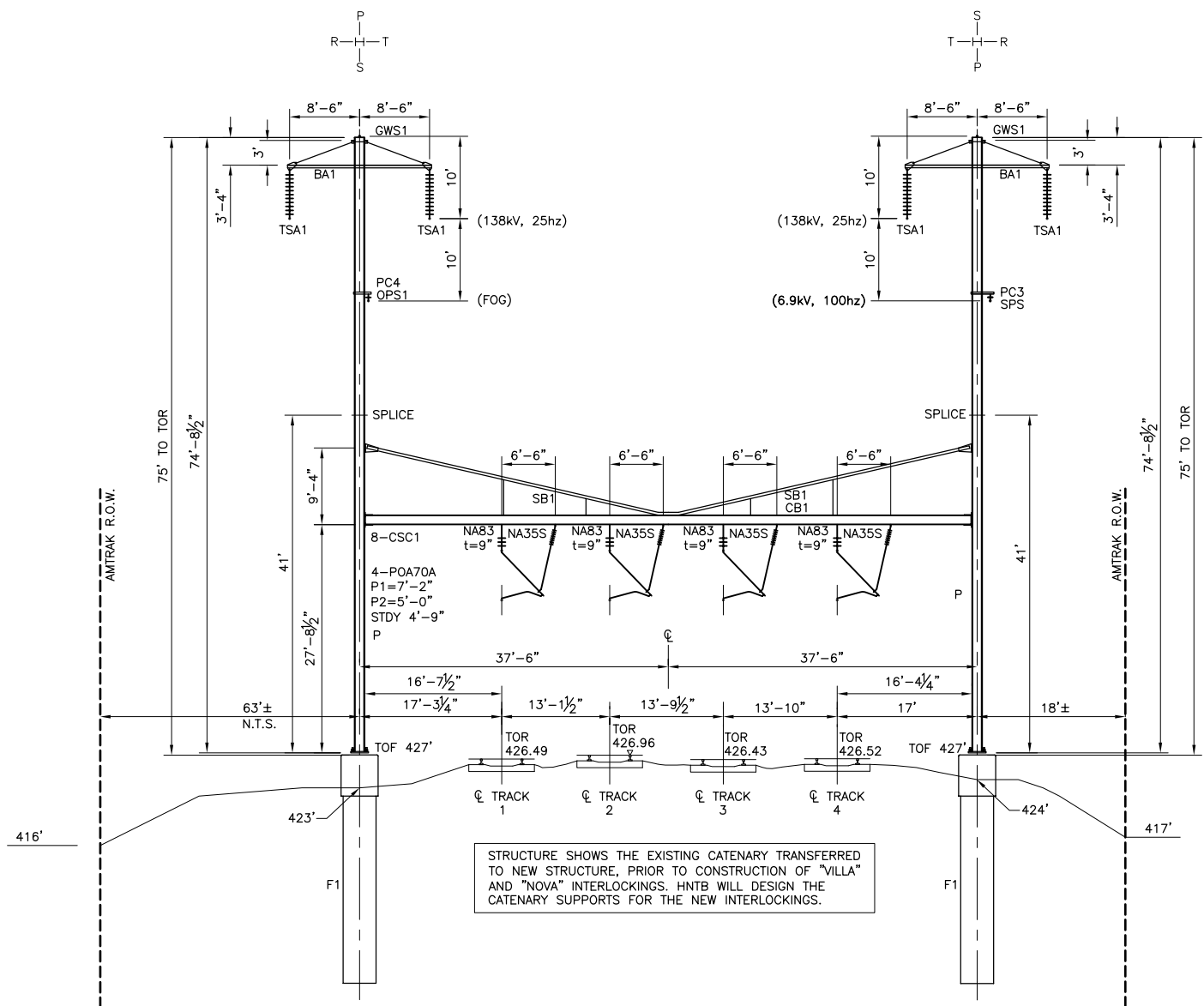
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 3/4"	25'-10"	26'-1 1/2"	26'-2 3/4"
CW	20'-2 3/4"	19'-10"	20'-1 1/2"	20'-2 3/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 220' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2	
CSC1	SLIDING BRACKET	S-5214	8	



STRUCTURE SHOWS THE EXISTING CATENARY TRANSFERRED TO NEW STRUCTURE, PRIOR TO CONSTRUCTION OF "VILLA" AND "NOVA" INTERLOCKINGS. HNTB WILL DESIGN THE CATENARY SUPPORTS FOR THE NEW INTERLOCKINGS.

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-285**  
 663+58  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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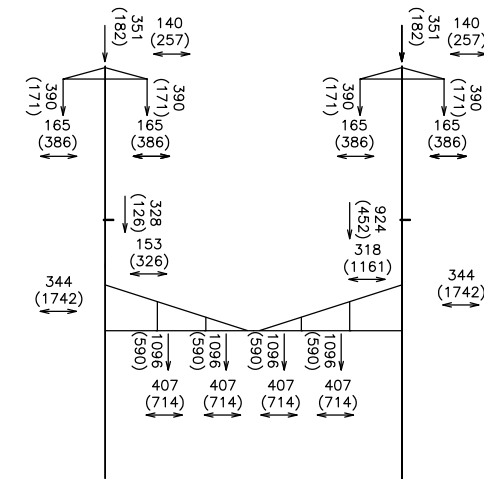
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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-285**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

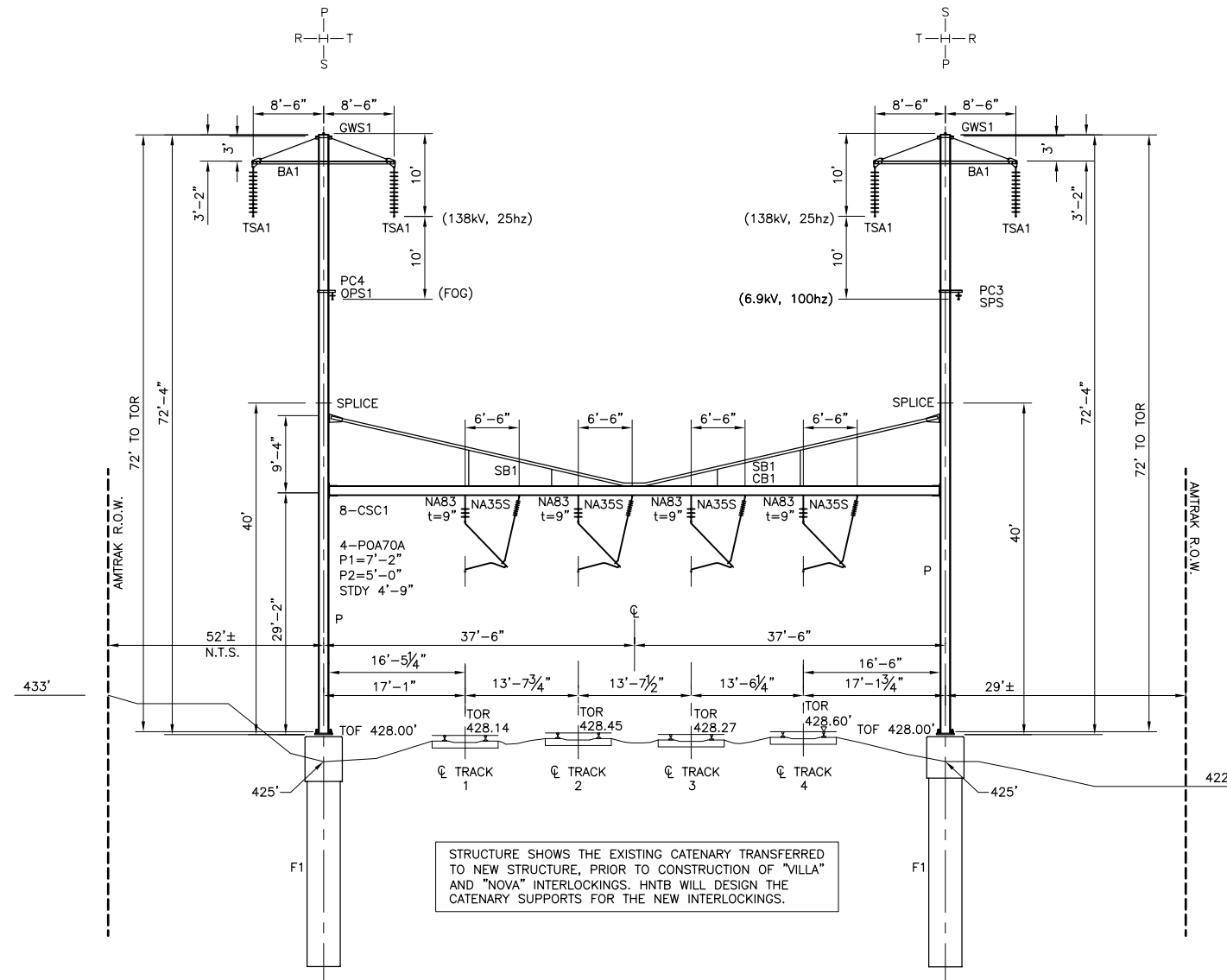
File No.: 2011-059-ET-1370-00  
 Ref. No.: 2011-059  
 Sheet No.: 284 OF 565  
 ET-1370

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-9 1/2"	25'-5 3/4"	25'-8"	25'-4"
CW	19'-9 1/2"	19'-5 3/4"	19'-8"	19'-4"



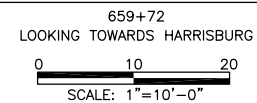
**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 260' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



STRUCTURE SHOWS THE EXISTING CATENARY TRANSFERRED TO NEW STRUCTURE, PRIOR TO CONSTRUCTION OF "VILLA" AND "NOVA" INTERLOCKINGS. HNTB WILL DESIGN THE CATENARY SUPPORTS FOR THE NEW INTERLOCKINGS.

**STRUCTURE ERECTION DIAGRAM T-284**



**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 National Railroad Passenger Corporation  
 30TH Street Station - Philadelphia, Pennsylvania 19104

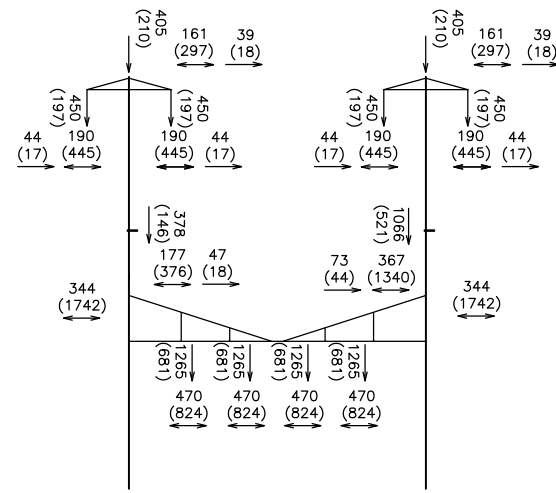
Approved	Date

**Burns Baker**  
 IN ASSOCIATION WITH  
**AECOM**

**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-284**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

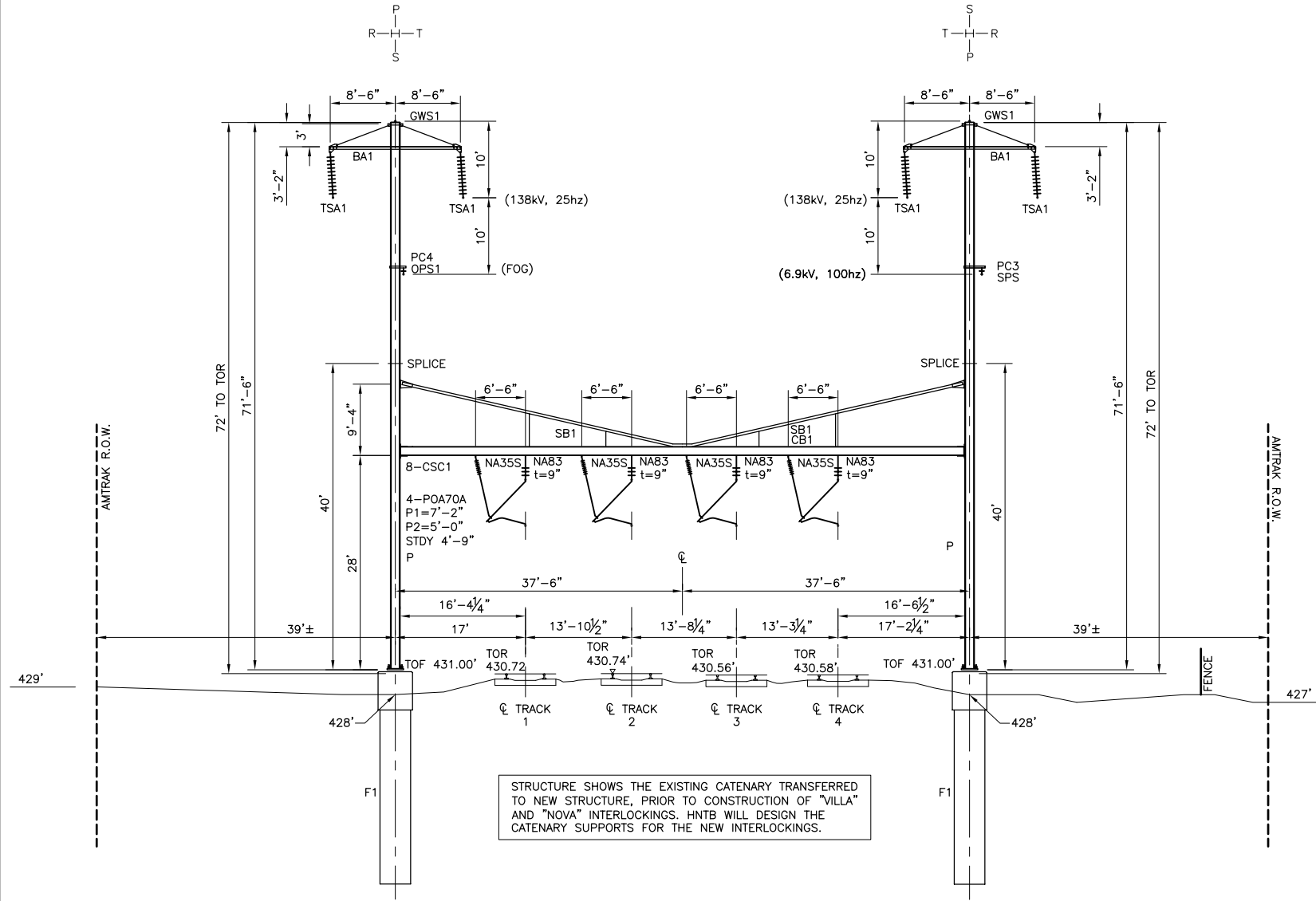
File No.:	2011-059-ET-1371.DWG
Ref. No.:	2011-059
Sheet No.:	285 OF 565
<b>ET-1371</b>	

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-4 1/4"	25'-4"	25'-6 1/4"	25'-6"
CW	19'-4 1/4"	19'-4"	19'-6 1/4"	19'-6"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2	
CSC1	SLIDING BRACKET	S-5214	8	



STRUCTURE SHOWS THE EXISTING CATENARY TRANSFERRED TO NEW STRUCTURE, PRIOR TO CONSTRUCTION OF "VILLA" AND "NOVA" INTERLOCKINGS. HNTB WILL DESIGN THE CATENARY SUPPORTS FOR THE NEW INTERLOCKINGS.

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-283**  
 656+84  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



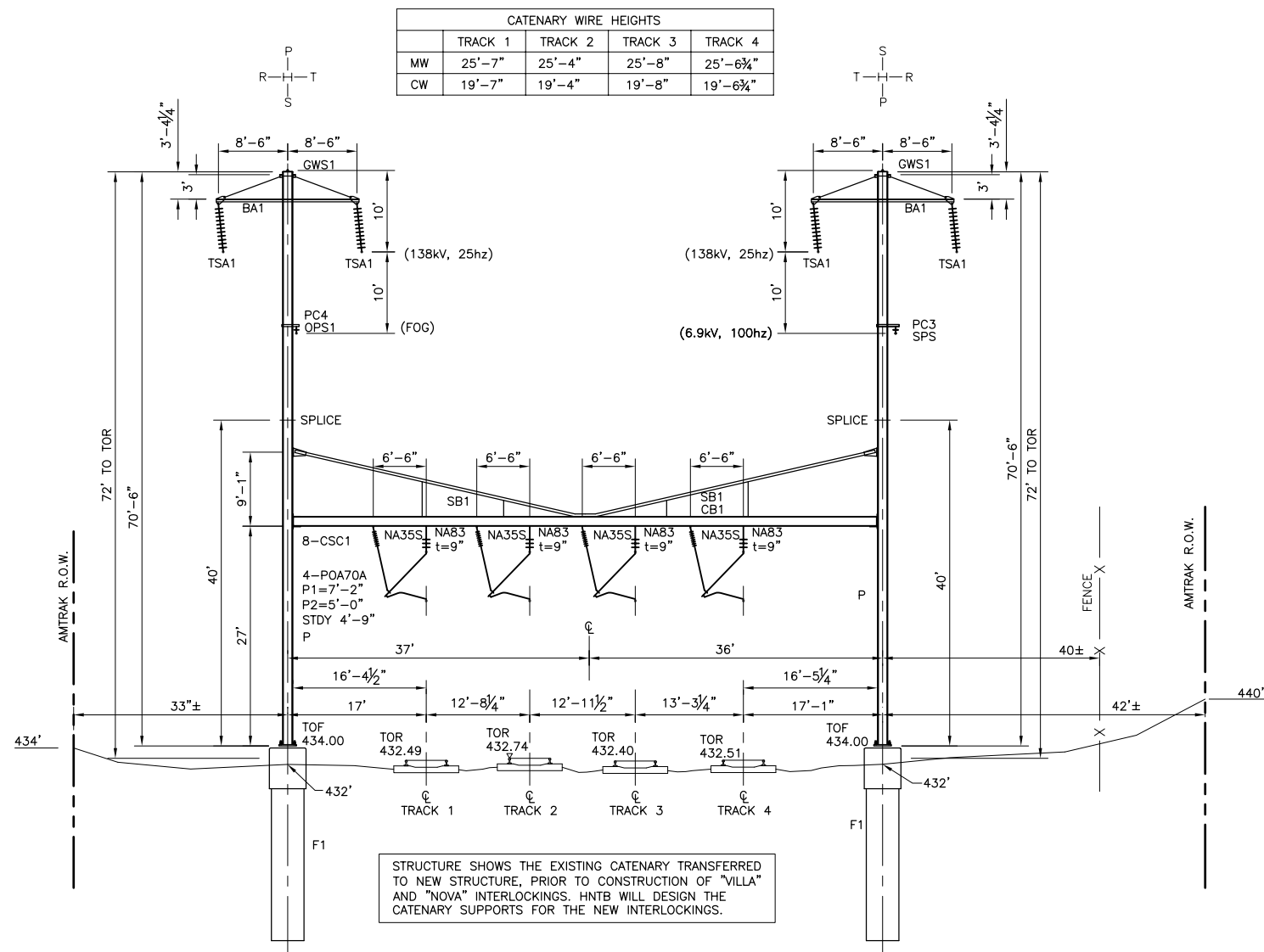
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-283**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1372.DWG
Ref. No.:	2011-059
Sheet No.:	286 OF 565
<b>ET-1372</b>	



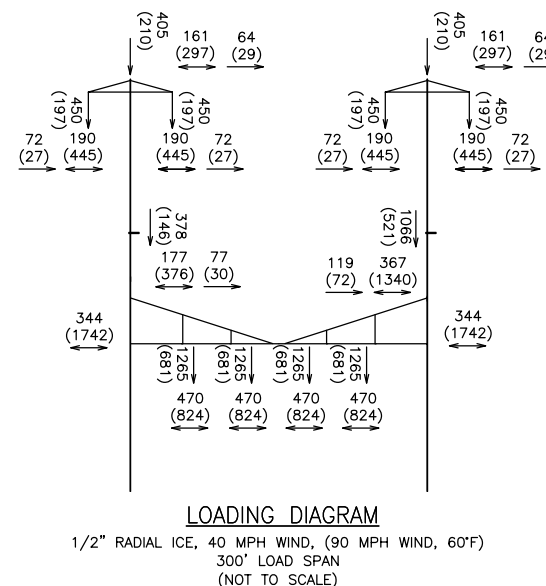
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8



STRUCTURE ERECTION DIAGRAM T-282

653+95  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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Approved	Date



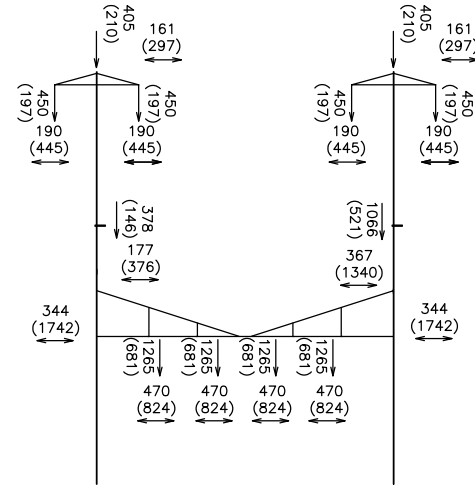
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-282  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1373.DWG  
Ref. No.: 2011-059  
Sheet No: 287 OF 565  
ET-1373

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

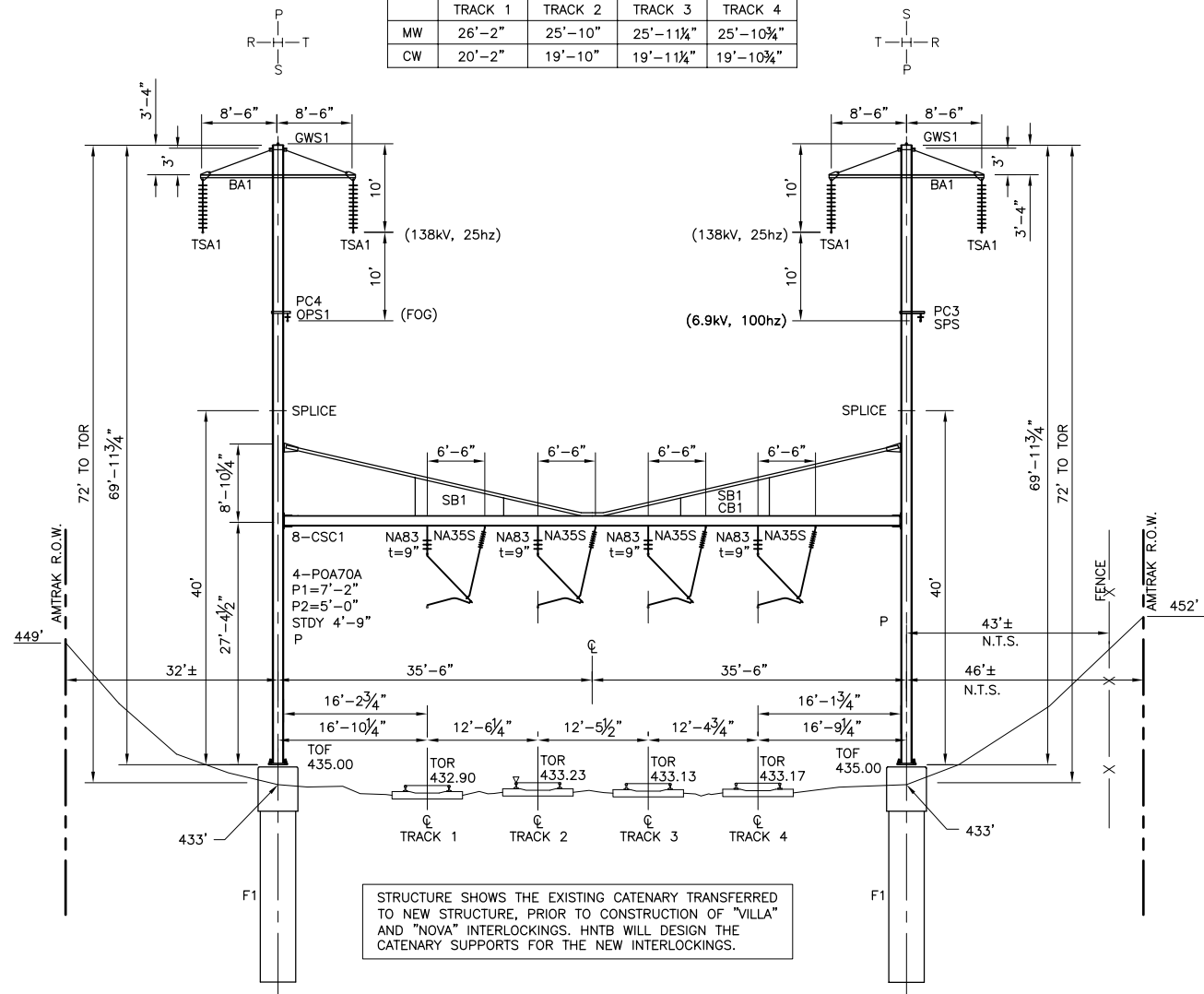
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2"	25'-10"	25'-11 1/4"	25'-10 3/4"
CW	20'-2"	19'-10"	19'-11 1/4"	19'-10 3/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.



**STRUCTURE ERECTION DIAGRAM T-281**

651+05  
 LOOKING TOWARDS HARRISBURG  
 0 10 20  
 SCALE: 1"=10'-0"

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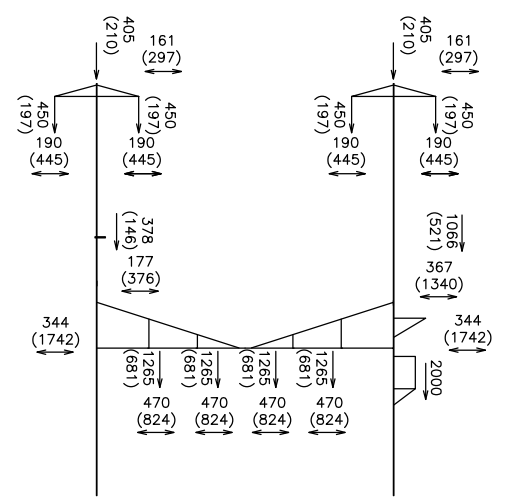
Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION**  
**ELECTRIFICATION**  
**STRUCTURAL ERECTION DIAGRAM**  
**T-281**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1374.DWG
Ref. No.:	2011-059
Sheet No.:	288 OF 565
<b>ET-1374</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
SPCS2	SIGNAL POWER CUT SECTION	ET-1811	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPT	SIGNAL POWER TERMINATION	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC1	SLIDING CLAMP	S-5214	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

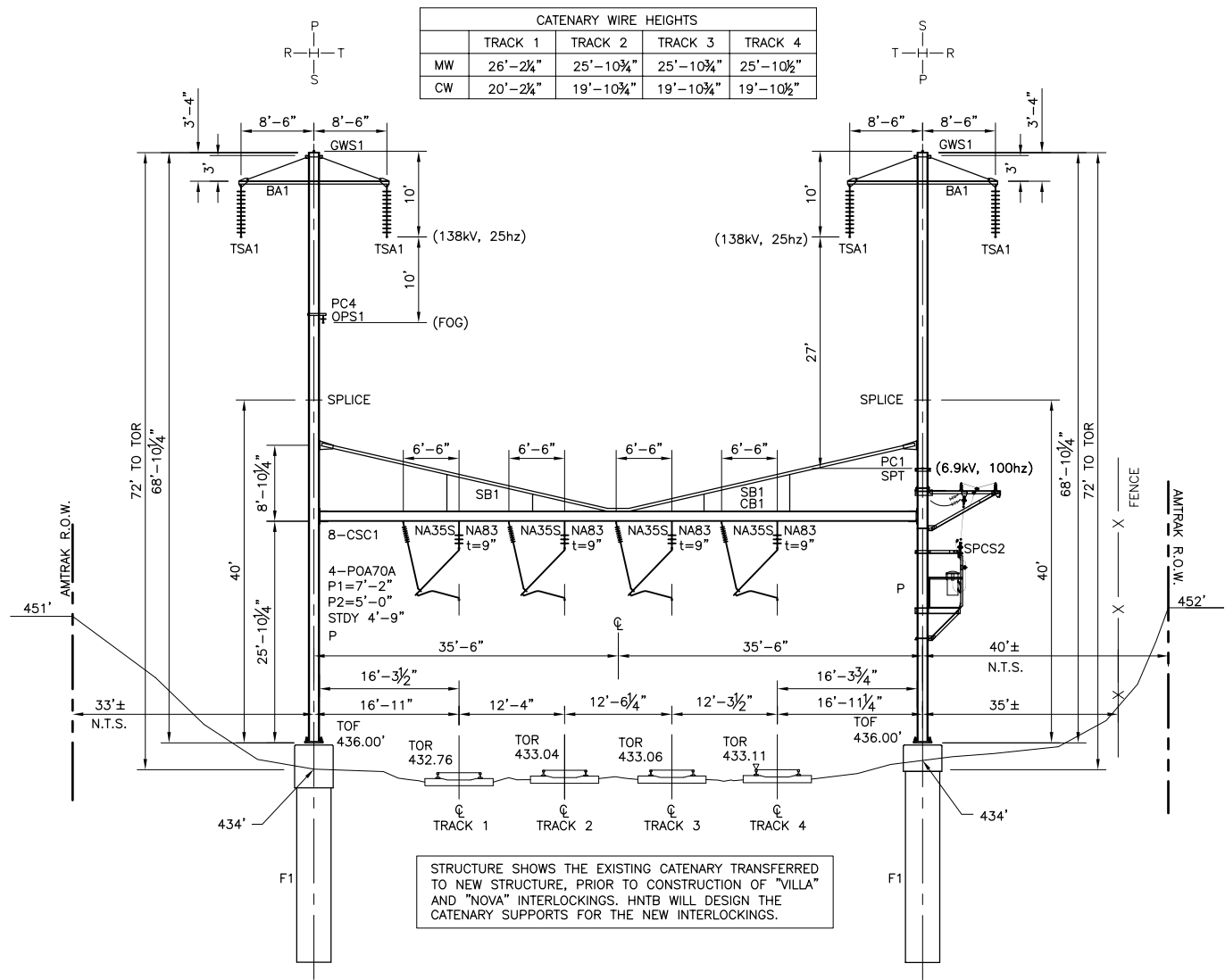


**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORM.
5. INSTALL STATIC, TRANSMISSION, AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 1/4"	25'-10 3/4"	25'-10 3/4"	25'-10 1/2"
CW	20'-2 1/4"	19'-10 3/4"	19'-10 3/4"	19'-10 1/2"



STRUCTURE SHOWS THE EXISTING CATENARY TRANSFERRED TO NEW STRUCTURE, PRIOR TO CONSTRUCTION OF "VILLA" AND "NOVA" INTERLOCKINGS. HNTB WILL DESIGN THE CATENARY SUPPORTS FOR THE NEW INTERLOCKINGS.

**STRUCTURE ERECTION DIAGRAM T-280**  
 648+76  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



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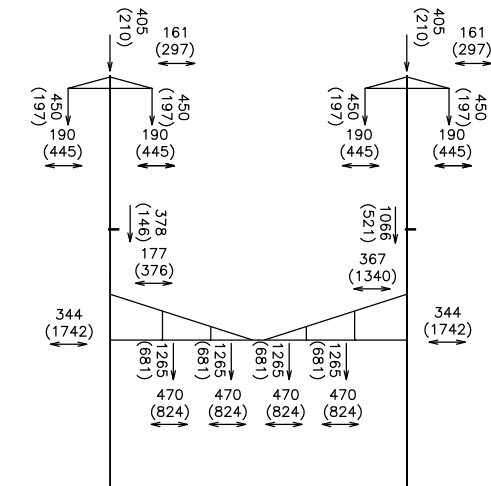
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-280**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1375.DWG  
 Ref. No.: 2011-059  
 Sheet No: 289 OF 565  
**ET-1375**

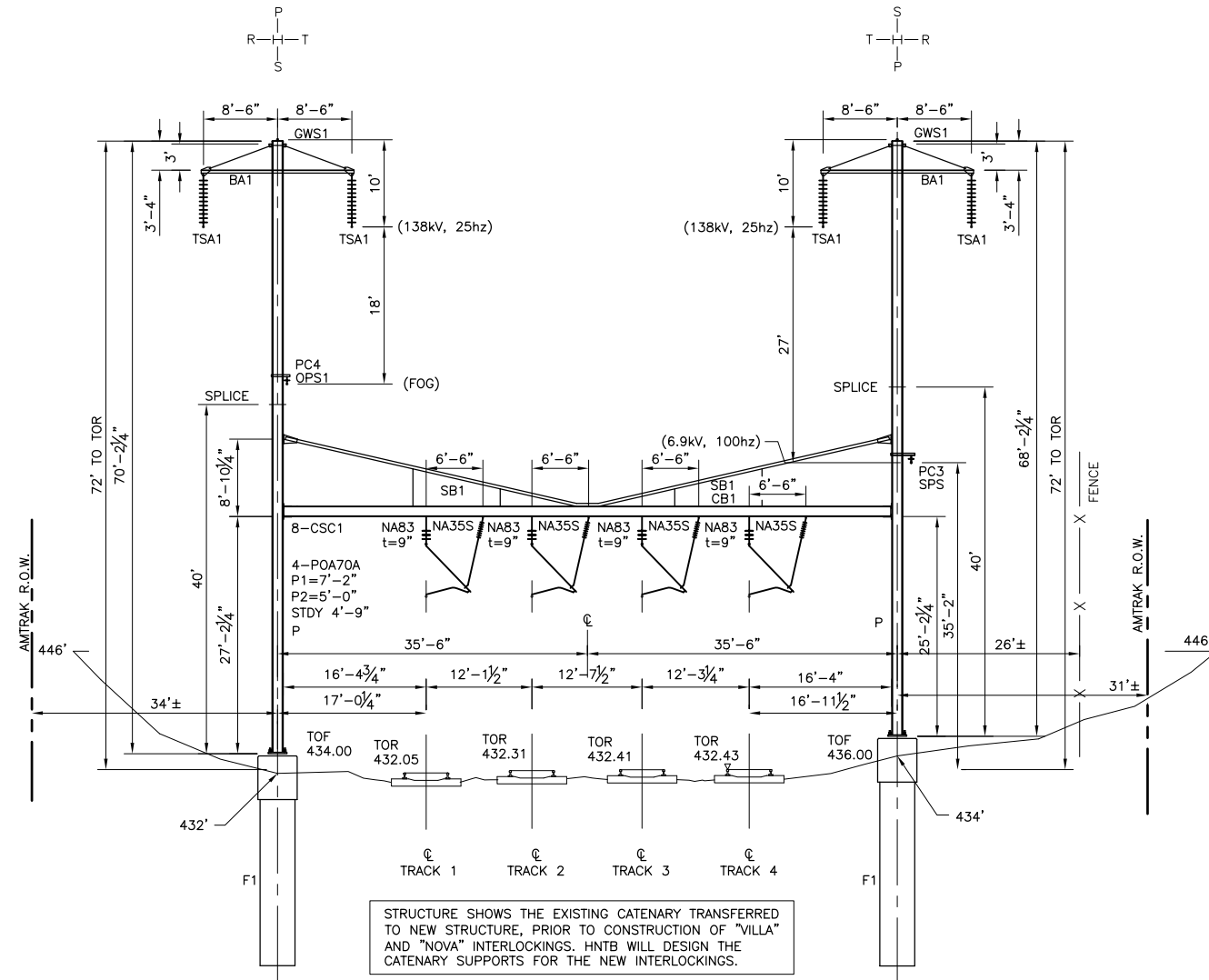
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	5
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 1/2"	25'-1 1/2"	25'-10 1/4"	25'-10"
CW	20'-2 1/2"	19'-1 1/2"	19'-10 1/4"	19'-10"



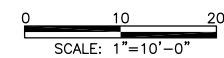
LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE SHOWS THE EXISTING CATENARY TRANSFERRED TO NEW STRUCTURE, PRIOR TO CONSTRUCTION OF "VILLA" AND "NOVA" INTERLOCKINGS. HNTB WILL DESIGN THE CATENARY SUPPORTS FOR THE NEW INTERLOCKINGS.

STRUCTURE ERECTION DIAGRAM T-279

646+02  
LOOKING TOWARDS HARRISBURG



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



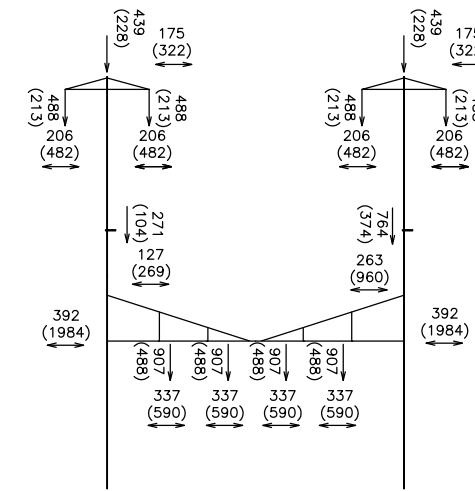
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-279  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1376.DWG  
Ref. No.: 2011-059  
Sheet No: 290 OF 565  
ET-1376

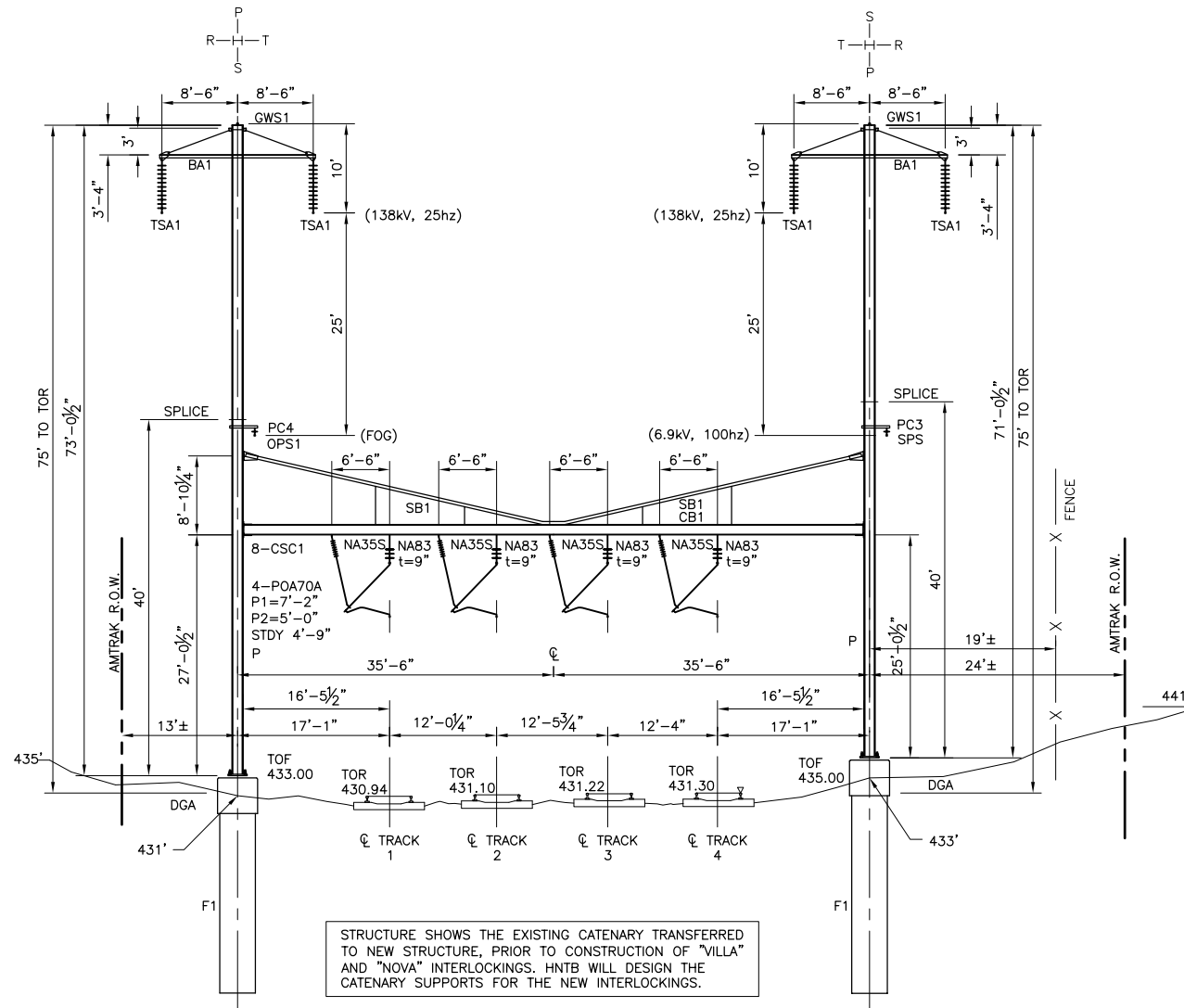
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 1/4"	26'-0 1/2"	25'-11"	25'-10"
CW	20'-2 1/4"	20'-0 1/2"	19'-11"	19'-10"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 325' TRANSMISSION SPAN  
 215' CATENARY SPAN  
 (NOT TO SCALE)



STRUCTURE SHOWS THE EXISTING CATENARY TRANSFERRED TO NEW STRUCTURE, PRIOR TO CONSTRUCTION OF "VILLA" AND "NOVA" INTERLOCKINGS. HNTB WILL DESIGN THE CATENARY SUPPORTS FOR THE NEW INTERLOCKINGS.

**STRUCTURE ERECTION DIAGRAM T-278**

643+82  
 LOOKING TOWARDS HARRISBURG  
 0 10 20  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

2:58:07 PM 3/14/2016 J:\2011\2011-059\Drawings\working drawings\paoli to bryn mawr\structural\2011-059-ET-1377.dwg

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No	Revisions	Date	By



**OFFICE OF Chief Engineer Engineering**  
 National Railroad Passenger Corporation  
 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



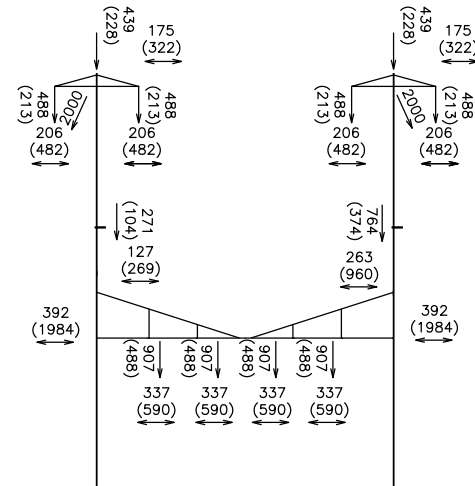
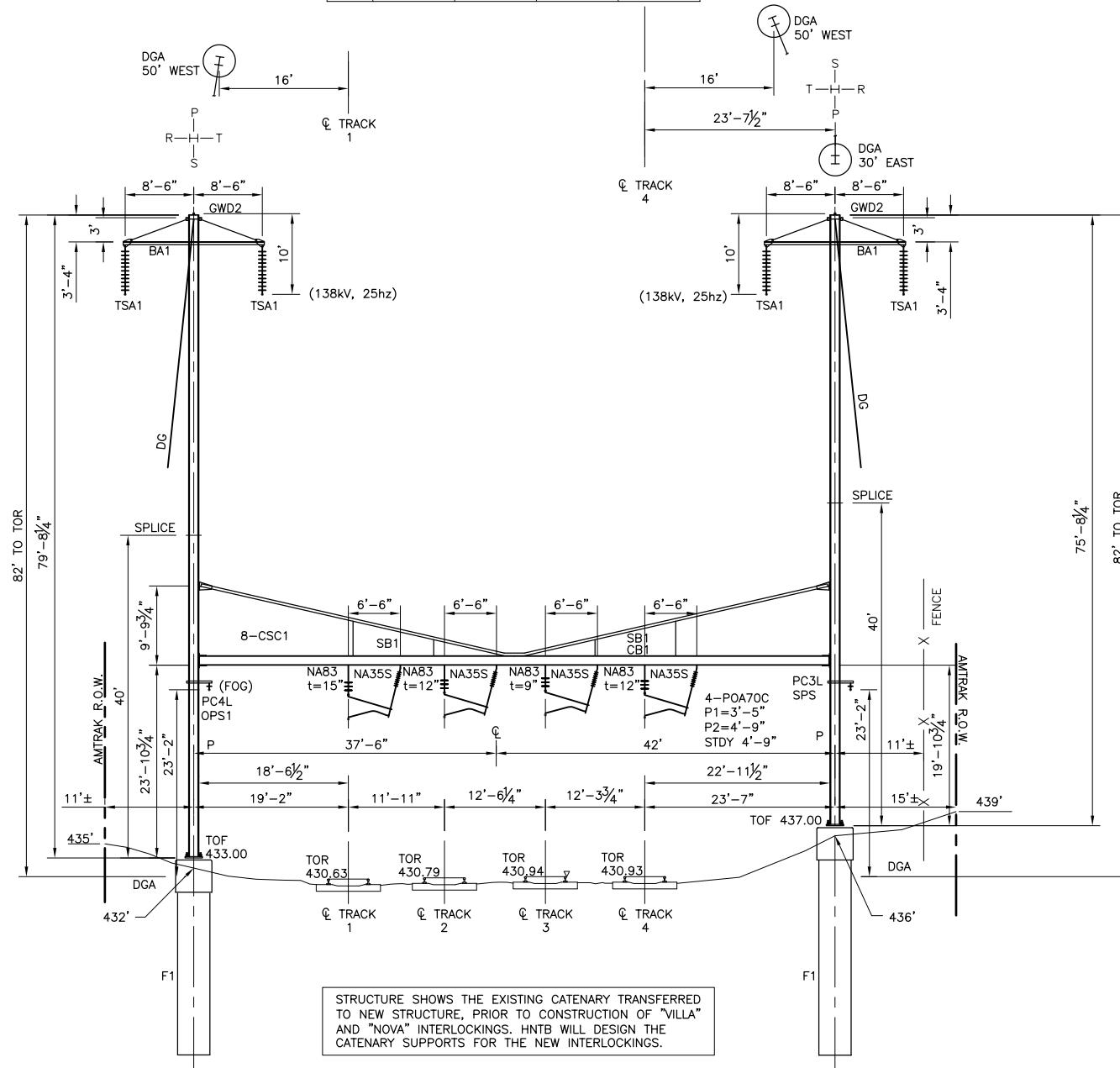
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-278**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1377.DWG  
 Ref. No.: 2011-059  
 Sheet No: 291 OF 565  
**ET-1377**

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE DEADEND	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70C	REGISTRATION ASSEMBLY	ET-1902	4
DG	DOWNGUY	ET-1908	2
PC3L	SLIDING CLAMP	S-5215	1
PC4L	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
CSC1	SLIDING BRACKET	S-5214	8
DGA	DOWNGUY ANCHOR	S-5101	2

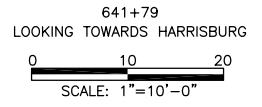
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	22'-10"	22'-11 1/4"	23'-0 1/2"	22'-8 3/4"
CW	19'-10"	19'-11 1/4"	20'-0 1/2"	19'-8 3/4"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 325' TRANSMISSION SPAN  
 215' CATENARY SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-277



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 30TH Street Station-Philadelphia, Pennsylvania 19104

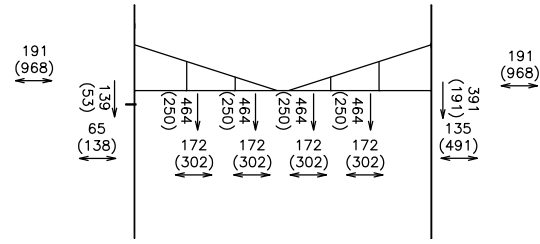
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-277  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

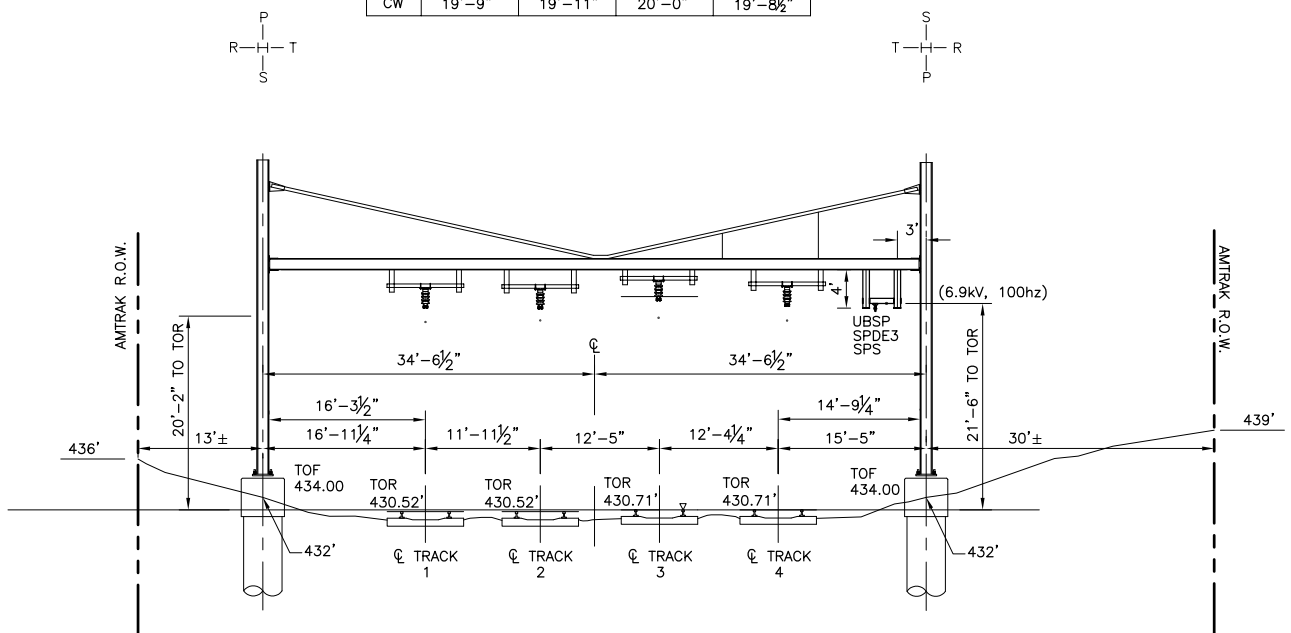
File No.: 2011-059-ET-1378-ENG  
 Ref. No.: 2011-059  
 Sheet No.: 292 OF 565  
 ET-1378

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
SPS	SIGNAL POWER SUPPORT	ET-1913	1
SPDE3	SIGNAL POWER DEADEND	ET-1913	1
UBSP	SIGNAL POWER BRACKET	S-5240	1

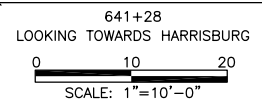


**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 110' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	21'-3 1/2"	21'-2 1/2"	22'-2 1/2"	21'-3 1/2"
CW	19'-9"	19'-11"	20'-0"	19'-8 1/2"



**STRUCTURE ERECTION DIAGRAM T-276B**  
 (EXISTING P-129B)



- WORK STATEMENT:**
1. INSTALL SIGNAL POWER BRACKET.
  2. INSTALL NEW SIGNAL POWER CABLE.
  3. TRANSFER EXISTING SIGNAL POWER CABLE TO NEW SUPPORT.
- NOTE:**
1. EXISTING PORTAL AT SPRING MILL ROAD WAS STRUCTURE P-129B.

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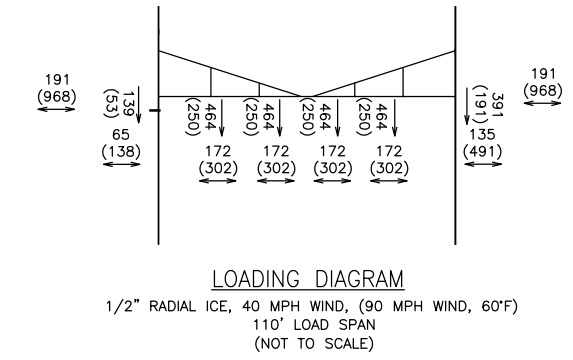
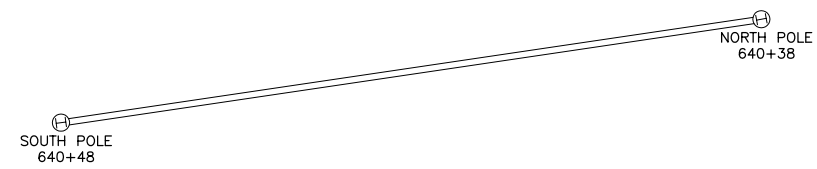


**PAOLI TO BRYN MAWR TRANSMISSION**  
**ELECTRIFICATION**  
**STRUCTURAL ERECTION DIAGRAM**  
**T-276B (EXISTING)**

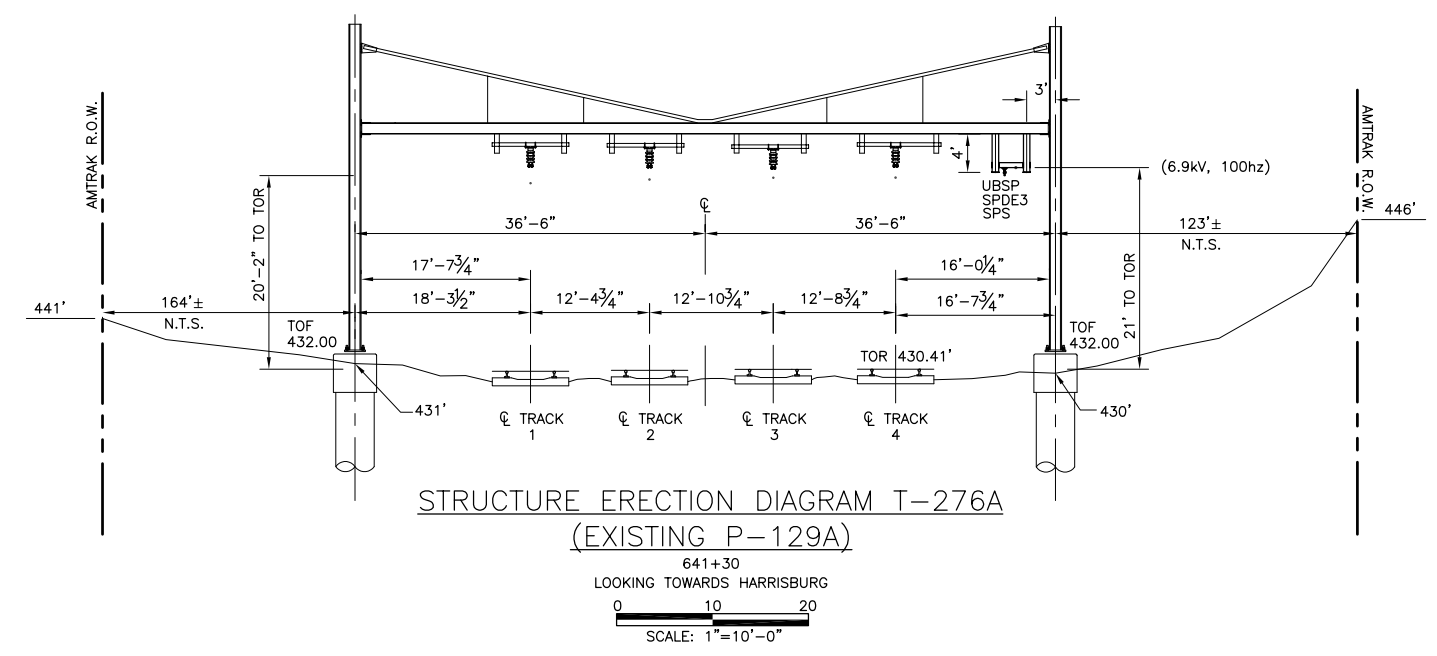
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1378A
Ref. No.:	2011-059
Sheet No.:	293 OF 565
<b>ET-1378A</b>	

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
SPS	SIGNAL POWER SUPPORT	ET-1913	1
SPDE3	SIGNAL POWER DEADEND	ET-1913	1
UBSP	SIGNAL POWER BRACKET	S-5240	1



CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	21'-4 1/2"	21'-2 1/2"	20'-11 1/2"	21'-2"
CW	19'-7"	19'-10 1/2"	19'-11 1/2"	19'-11 1/2"



- WORK STATEMENT:**
1. INSTALL SIGNAL POWER BRACKET.
  2. INSTALL NEW SIGNAL POWER CABLE.
  3. TRANSFER EXISTING SIGNAL POWER CABLE TO NEW SUPPORT.
- NOTE:**
1. EXISTING PORTAL AT SPRING MILL ROAD WAS STRUCTURE P-129A.

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-276 (EXISTING)**

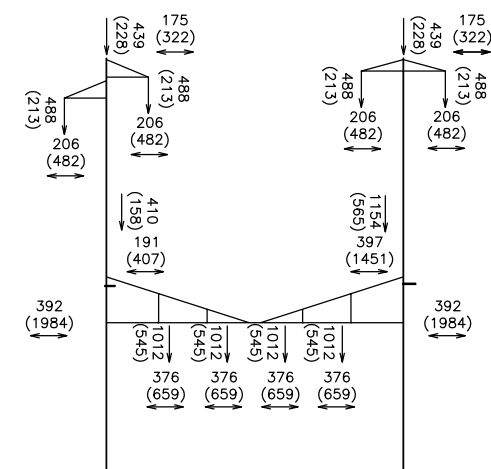
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1379.DWG
Ref. No.:	2011-059
Sheet No.:	294 OF 565
ET-1379	



BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE DEADEND	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3L	SLIDING CLAMP	S-5215	1
PC4L	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	4



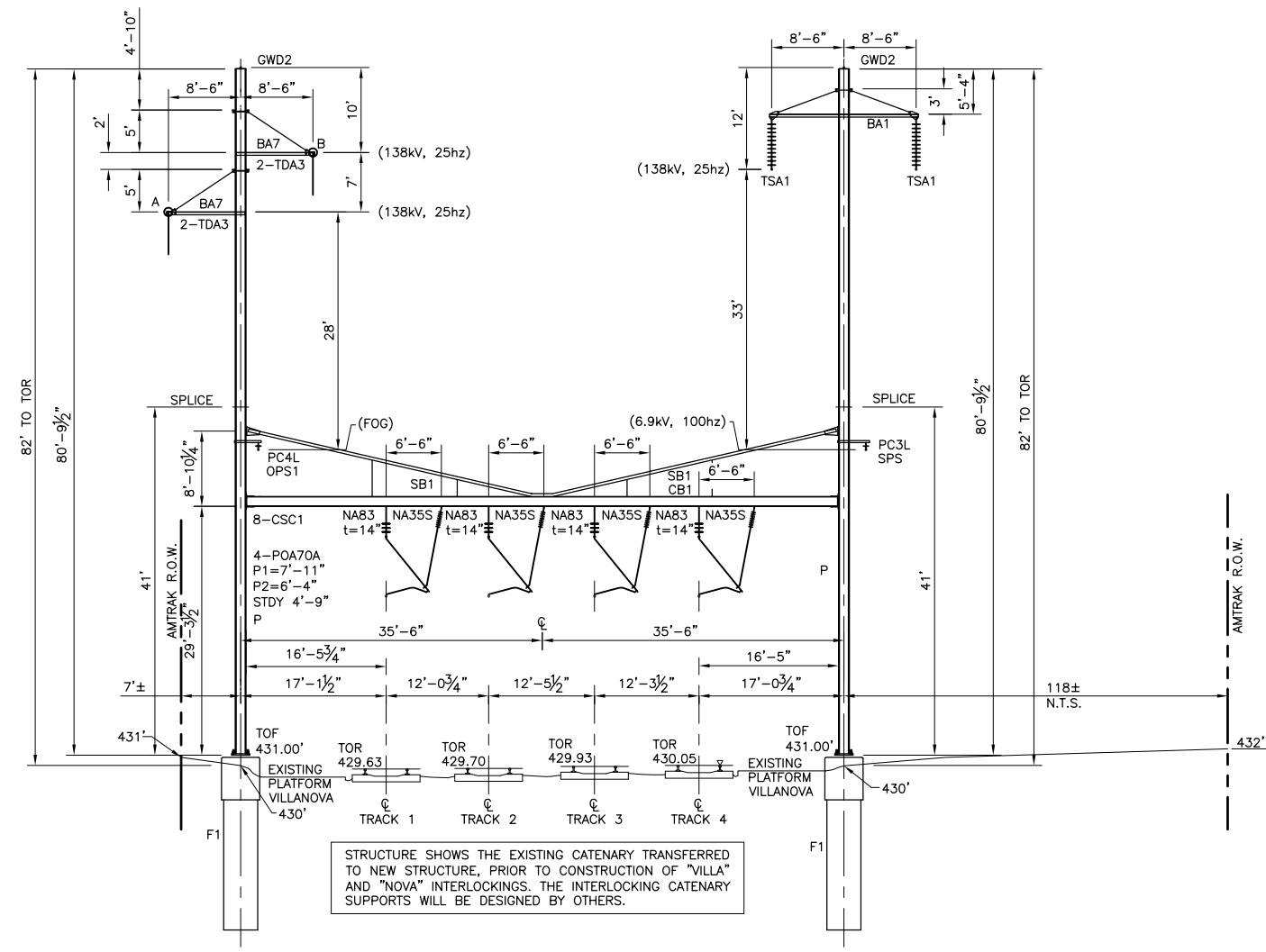
LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 325' TRANSMISSION LOAD SPAN  
 240' CATENARY LOAD SPAN  
 (NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-4"	27'-3 1/4"	27'-0 1/2"	26'-11"
CW	20'-4"	20'-3 1/4"	20'-0 1/2"	19'-11"



STRUCTURE ERECTION DIAGRAM T-275

639+13  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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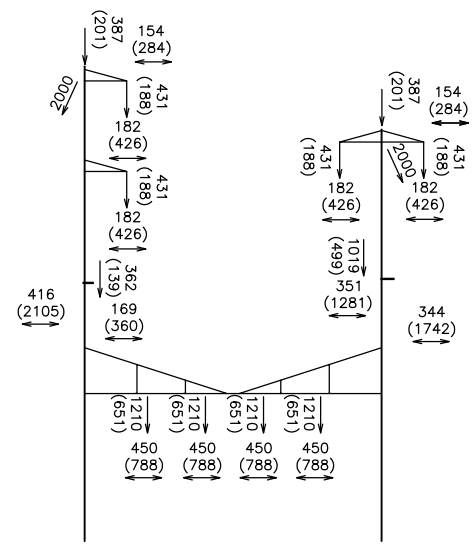
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PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-275

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

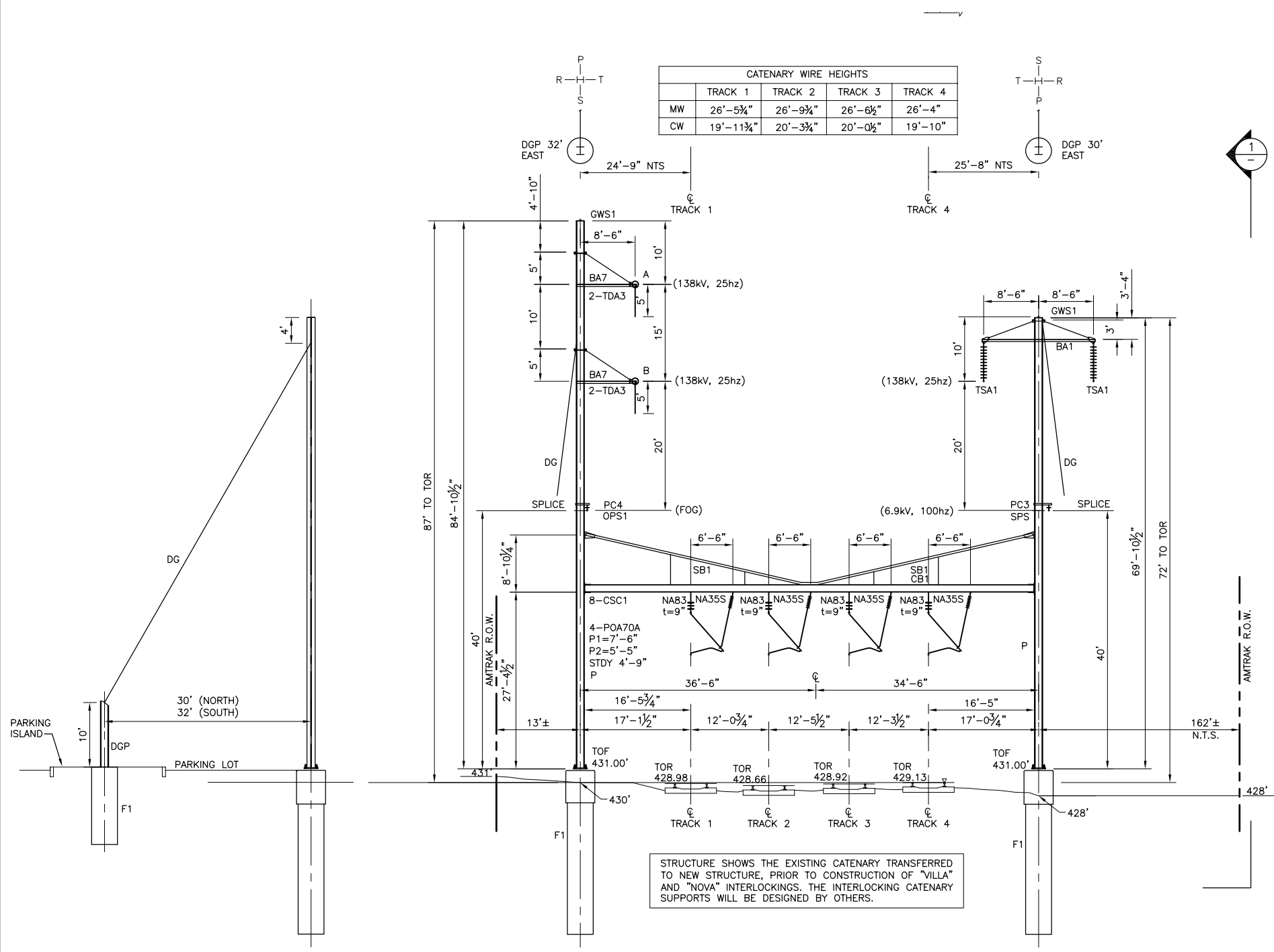
File No.: 2011-059-ET-1380.DWG  
 Ref. No.: 2011-059  
 Sheet No: 295 OF 565  
 ET-1380

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE DEADEND	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
DG	DOWN GUY	ET-1908	2
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	4
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA7	TRANSMISSION BRACKET	S-5203	2
CSC1	SLIDING BRACKET	S-5214	8
DGP	DOWNGUY STUB POLE	S-5123	2



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 290' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-5 3/4"	26'-9 3/4"	26'-6 1/2"	26'-4"
CW	19'-1 1/4"	20'-3 3/4"	20'-0 1/2"	19'-10"



**STRUCTURE ERECTION DIAGRAM T-274**

**SECTION 1**  
 SCALE: 1"=10'-0"

636+14  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 30TH Street Station-Philadelphia, Pennsylvania 19104

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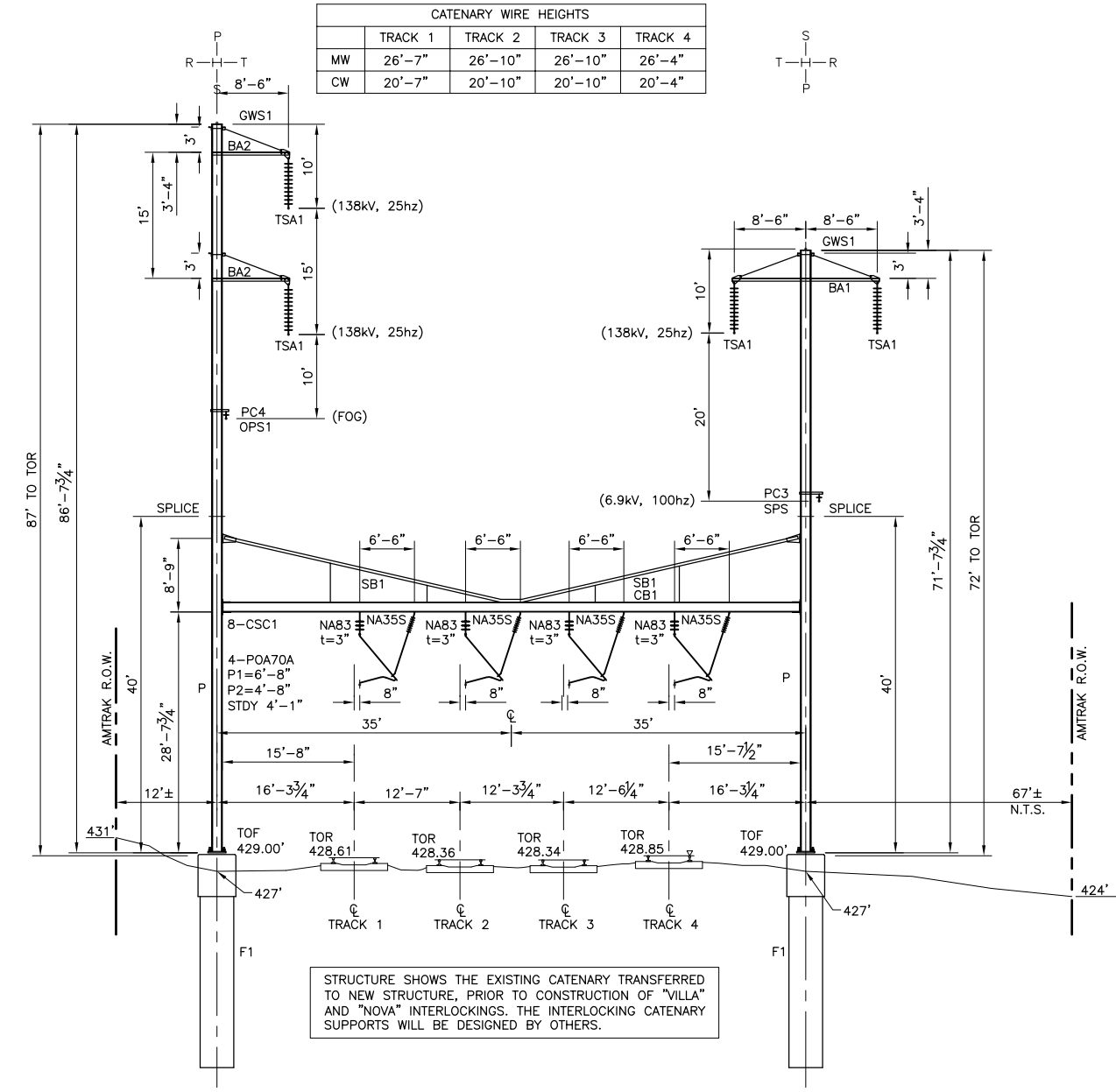


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-274**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

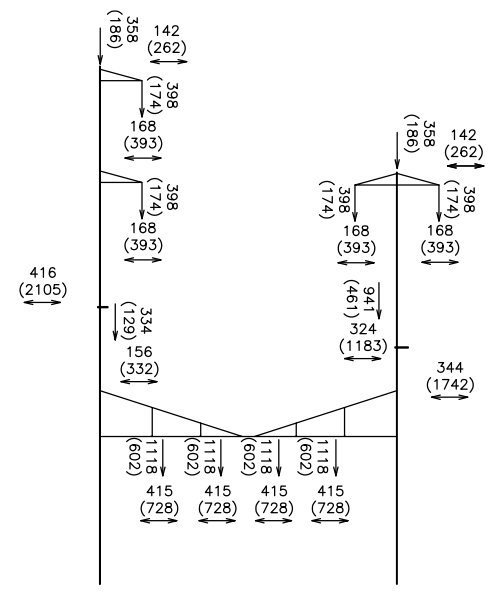
File No.: 2011-059-ET-1381.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 296 OF 565  
**ET-1381**

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	1
BA2	TRANSMISSION BRACKET	S-5201	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-7"	26'-10"	26'-10"	26'-4"
CW	20'-7"	20'-10"	20'-10"	20'-4"



STRUCTURE ERECTION DIAGRAM T-273  
 633+18  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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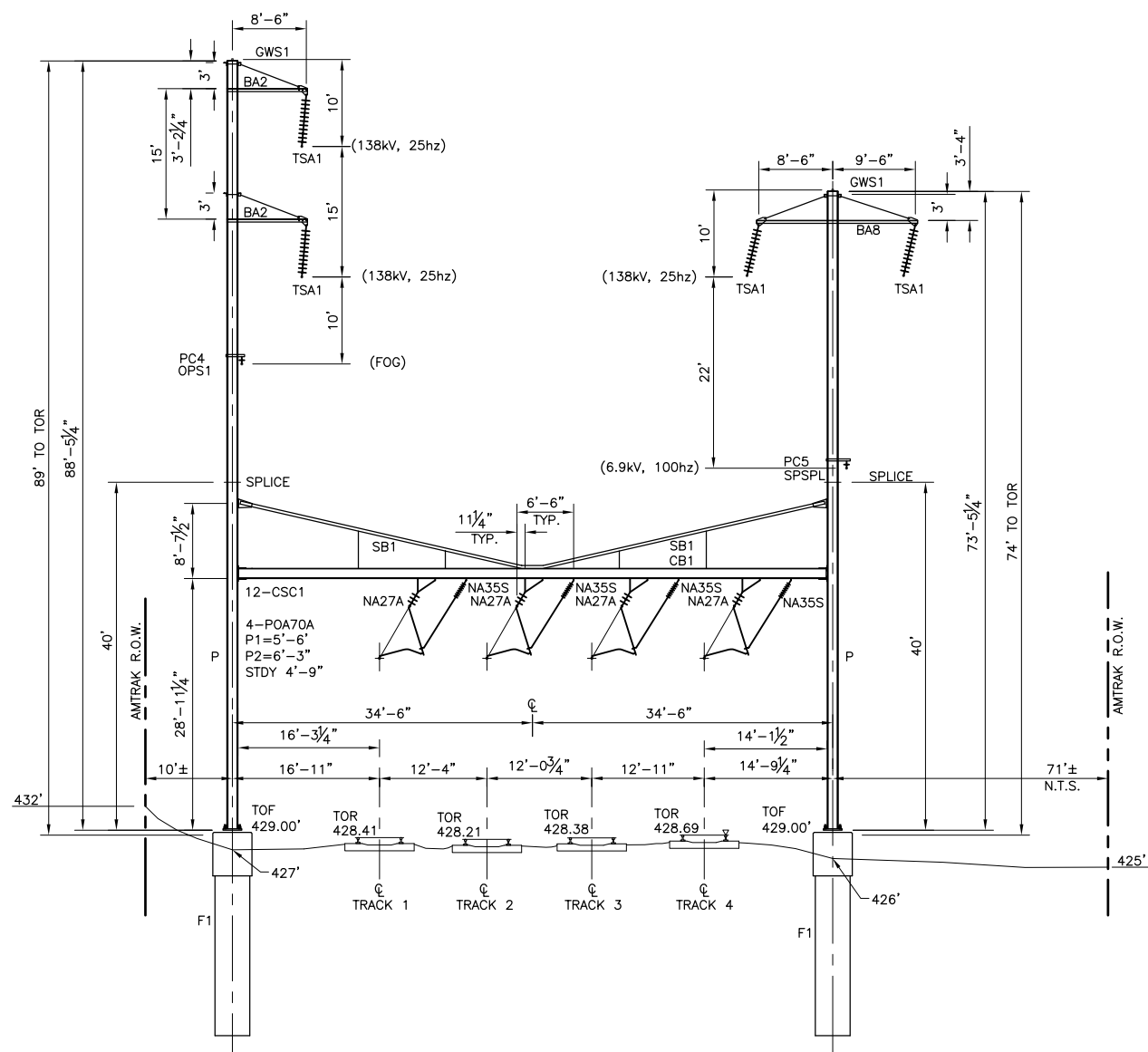


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-273  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1382.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 297 OF 565  
 ET-1382

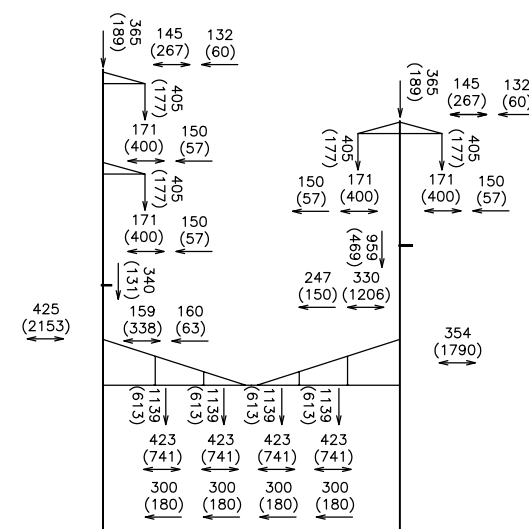
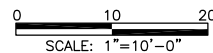
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MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-9"	0'-9"	0'-9"	0'-9"
T2	1'-9"	1'-9"	1'-9"	1'-9"



**STRUCTURE ERECTION DIAGRAM T-272**

630+76  
LOOKING TOWARDS HARRISBURG



**LOADING DIAGRAM**

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
265' LOAD SPAN  
(NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPSPL	SIGNAL POWER SPLICE	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC4	SLIDING CLAMP	S-5215	1	
PC5	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA2	TRANSMISSION BRACKET	S-5201	2	
BA8	TRANSMISSION BRACKET	S-5206	1	
CSC1	SLIDING BRACKET	S-5214	12	

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**Burns** IN ASSOCIATION WITH **Baker** **AECOM**

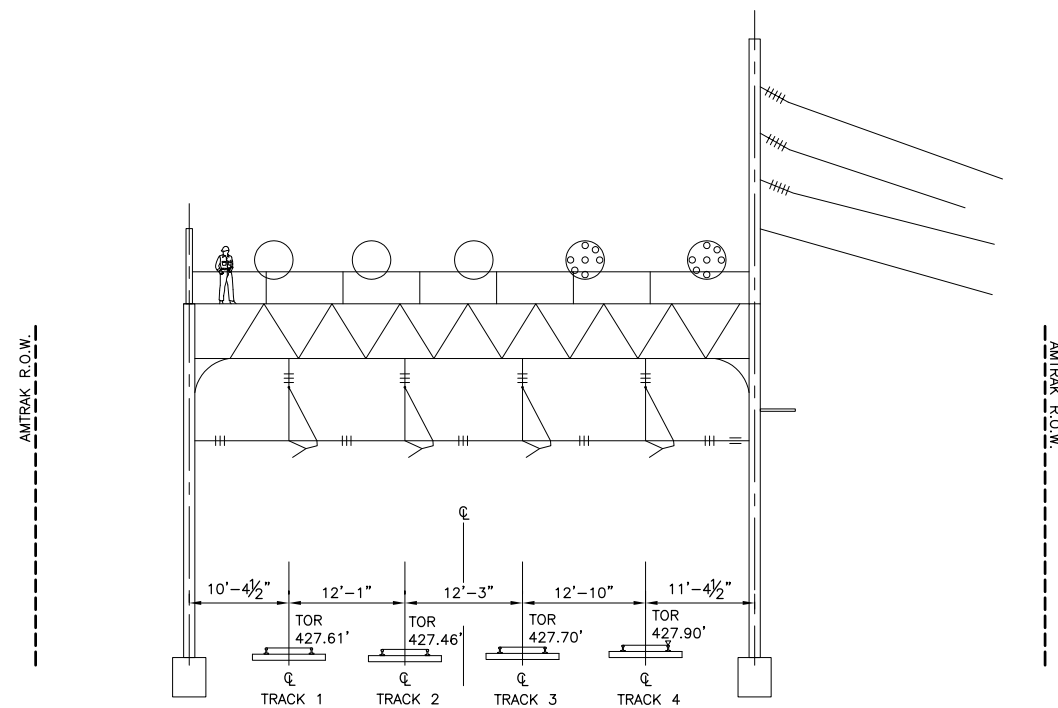
BURNS ENGINEERING, INC. | 215 879-7700  
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
PHILADELPHIA, PA 19103

**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-272**

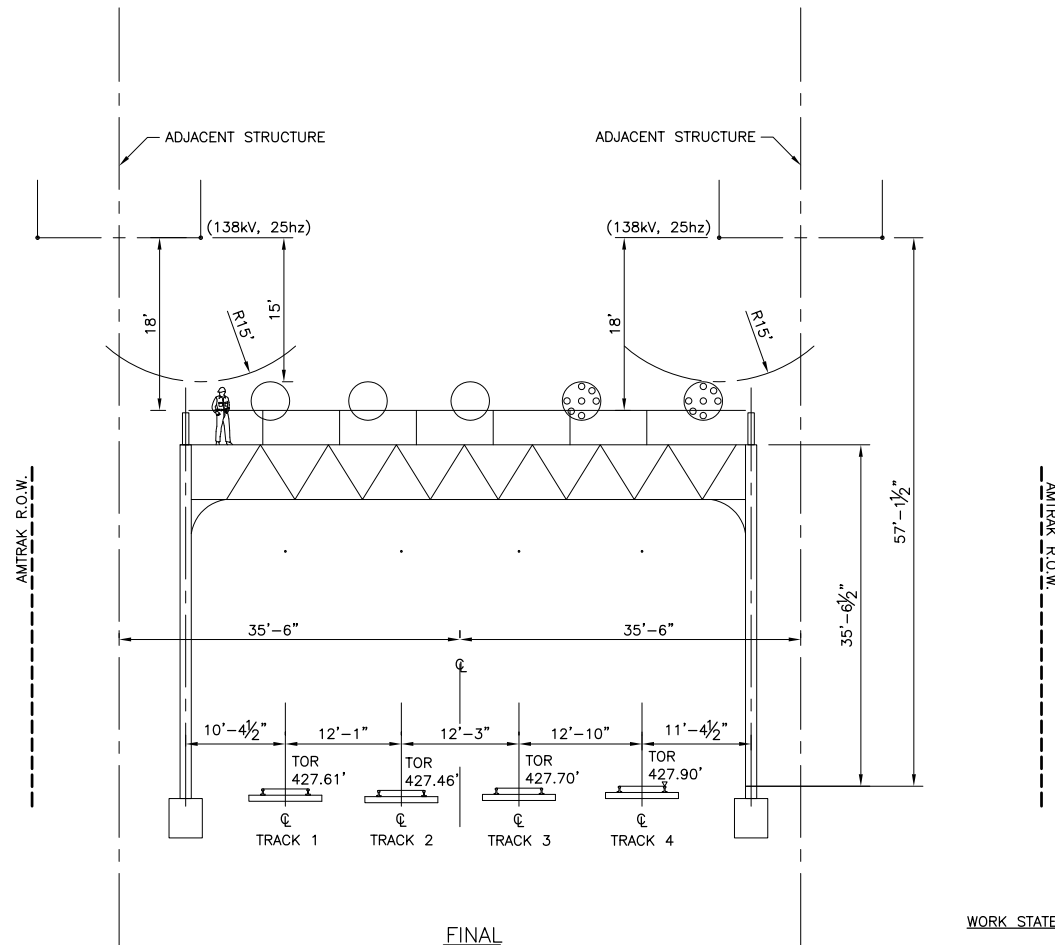
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1383.DWG  
Ref. No.: 2011-059  
Sheet No.: 298 OF 565  
**ET-1383**

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EXISTING



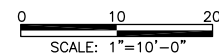
FINAL

STRUCTURE ERECTION DIAGRAM T-271A SB (EXISTING P-125 SB)

STATION 629+45  
LOOKING TOWARDS HARRISBURG

WORK STATEMENT:

1. REMOVE PECO DISTRIBUTION WIRES.
2. GROUND STRUCTURE.
3. CUT OFF POLE.
4. REMOVE CATENARY SUPPORTS.



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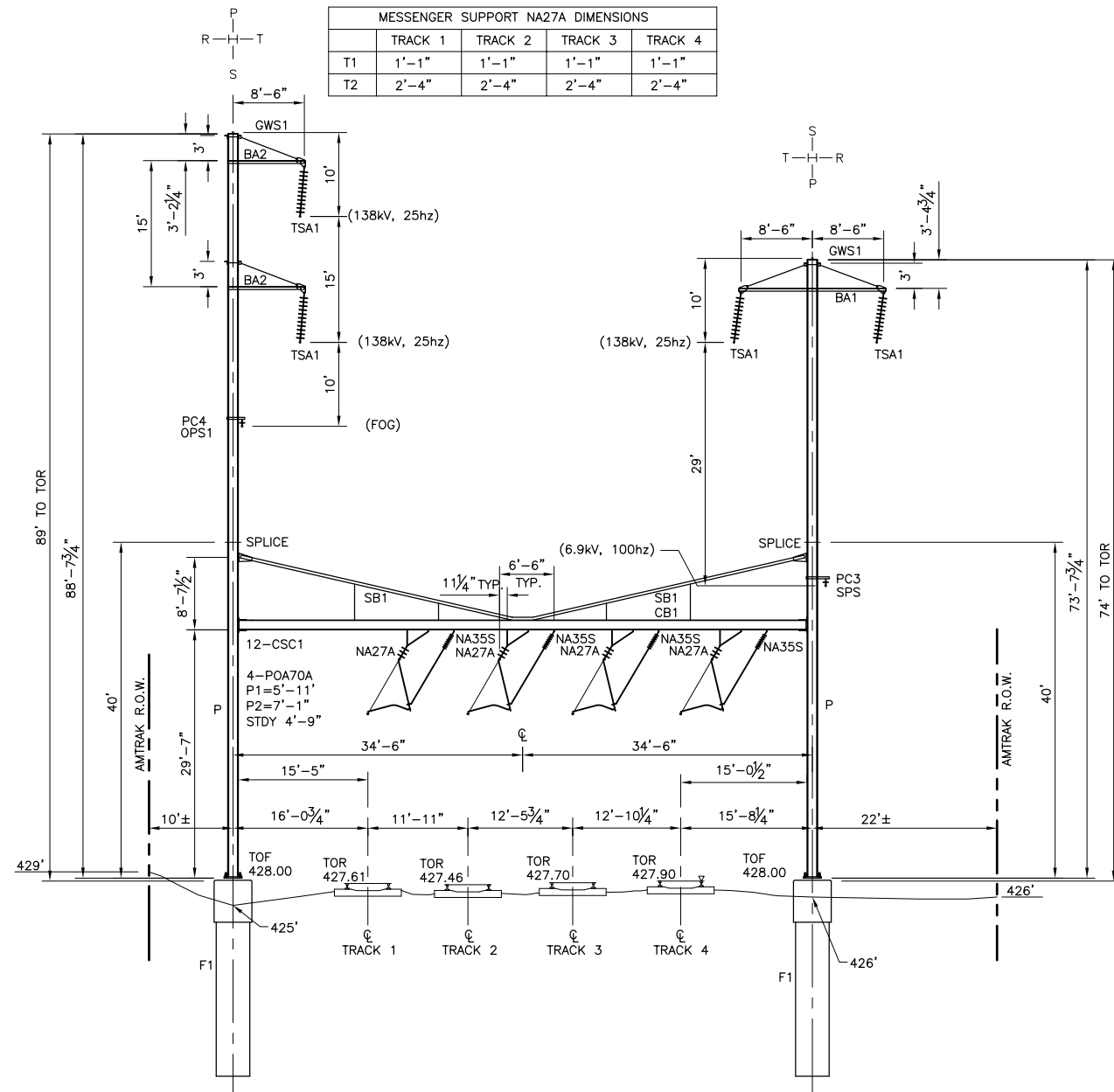


**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-271A SB (P-125 SB)**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1384.DWG
Ref. No.:	2011-059
Sheet No.:	299 OF 565
ET-1384	

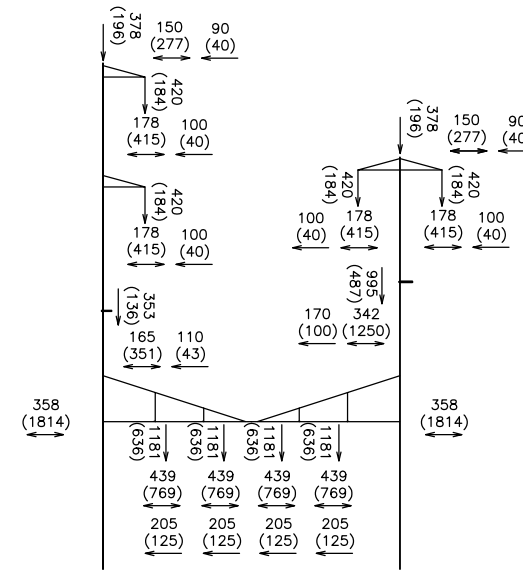
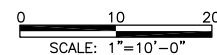
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2½"	26'-4"	26'-1½"	25'-11"
CW	20'-2½"	20'-4"	20'-1½"	19'-11"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-1"	1'-1"	1'-1"	1'-1"
T2	2'-4"	2'-4"	2'-4"	2'-4"



STRUCTURE ERECTION DIAGRAM T-271

628+37  
LOOKING TOWARDS HARRISBURG



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
280' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET	S-5200	1	
BA2	TRANSMISSION BRACKET	S-5201	2	
CSC1	SLIDING BRACKET	S-5214	12	

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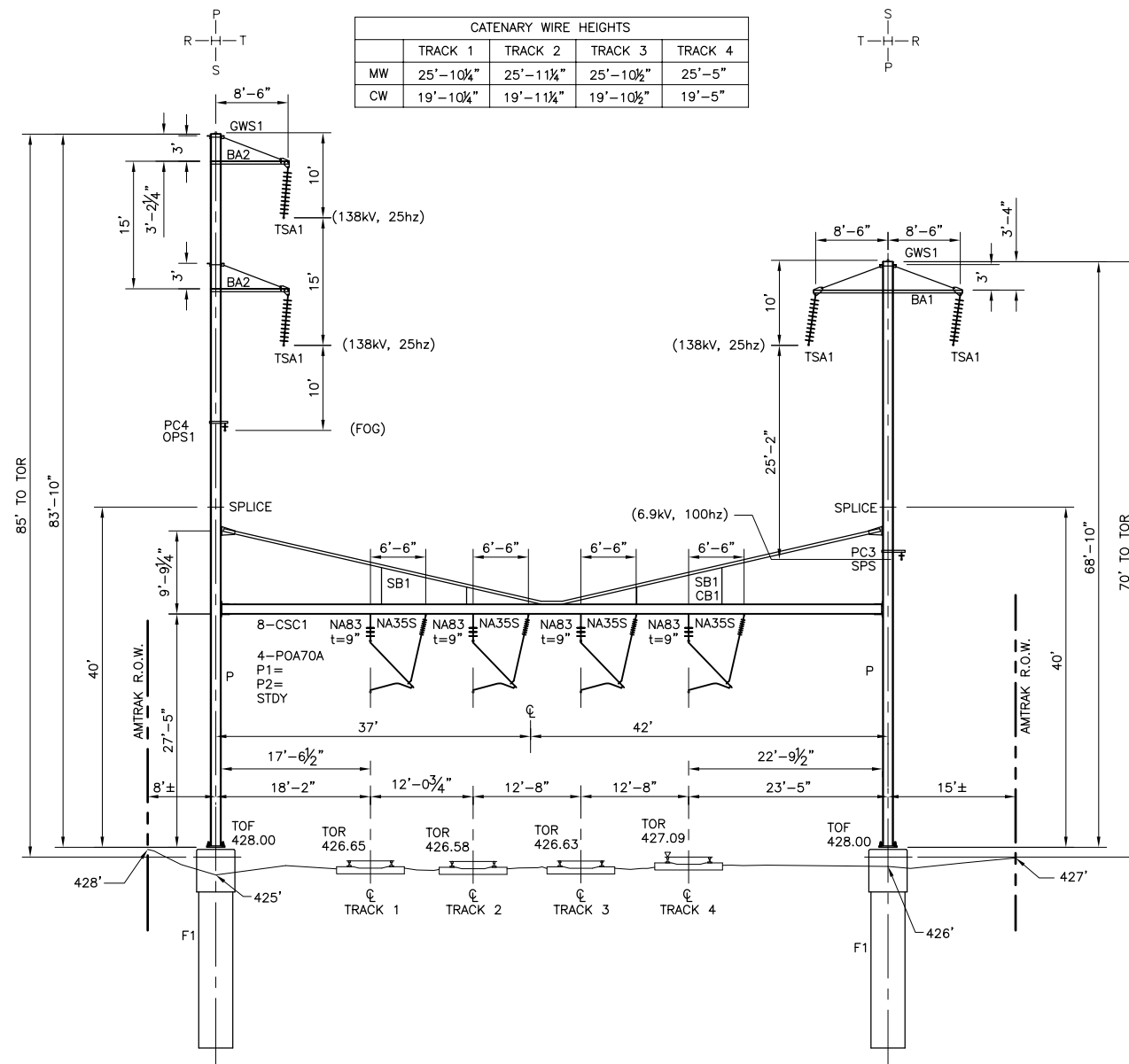
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-271  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1385.DWG  
Ref. No.: 2011-059  
Sheet No: 300 OF 565  
ET-1385

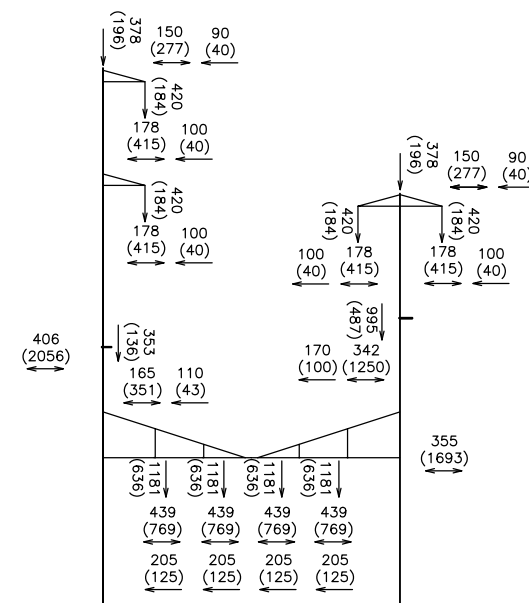
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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-10 1/4"	25'-11 1/4"	25'-10 1/2"	25'-5"
CW	19'-10 1/4"	19'-11 1/4"	19'-10 1/2"	19'-5"

**STRUCTURE ERECTION DIAGRAM T-270A**

626+34  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



**LOADING DIAGRAM**

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
280' LOAD SPAN  
(NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	INSULATOR ASSEMBLY	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA2	TRANSMISSION BRACKET	S-5201	2
CSC1	SLIDING BRACKET	S-5214	8

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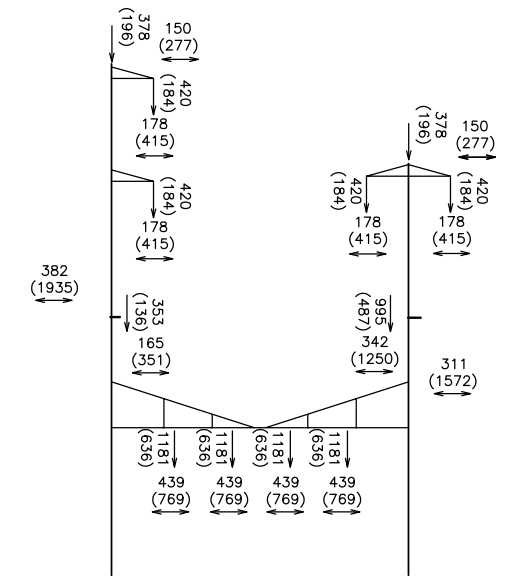
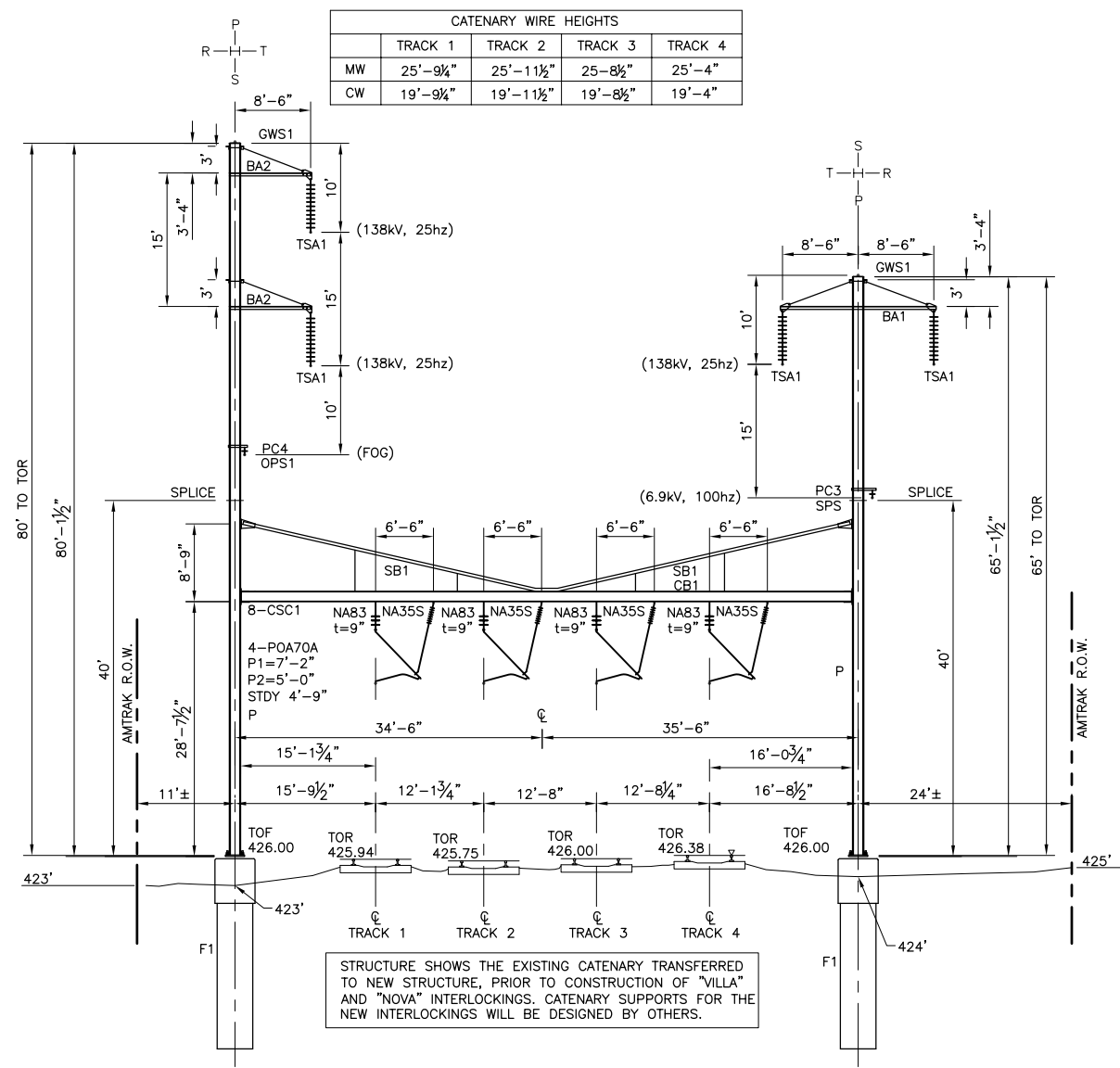


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-270A**

File No.: 2011-059-ET-1385A  
Ref. No.: 2011-059  
Sheet No.: 301 OF 565  
**ET-1385A**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA2	TRANSMISSION BRACKET	S-5201	2
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 280' LOAD SPAN  
 (NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-270  
 624+10  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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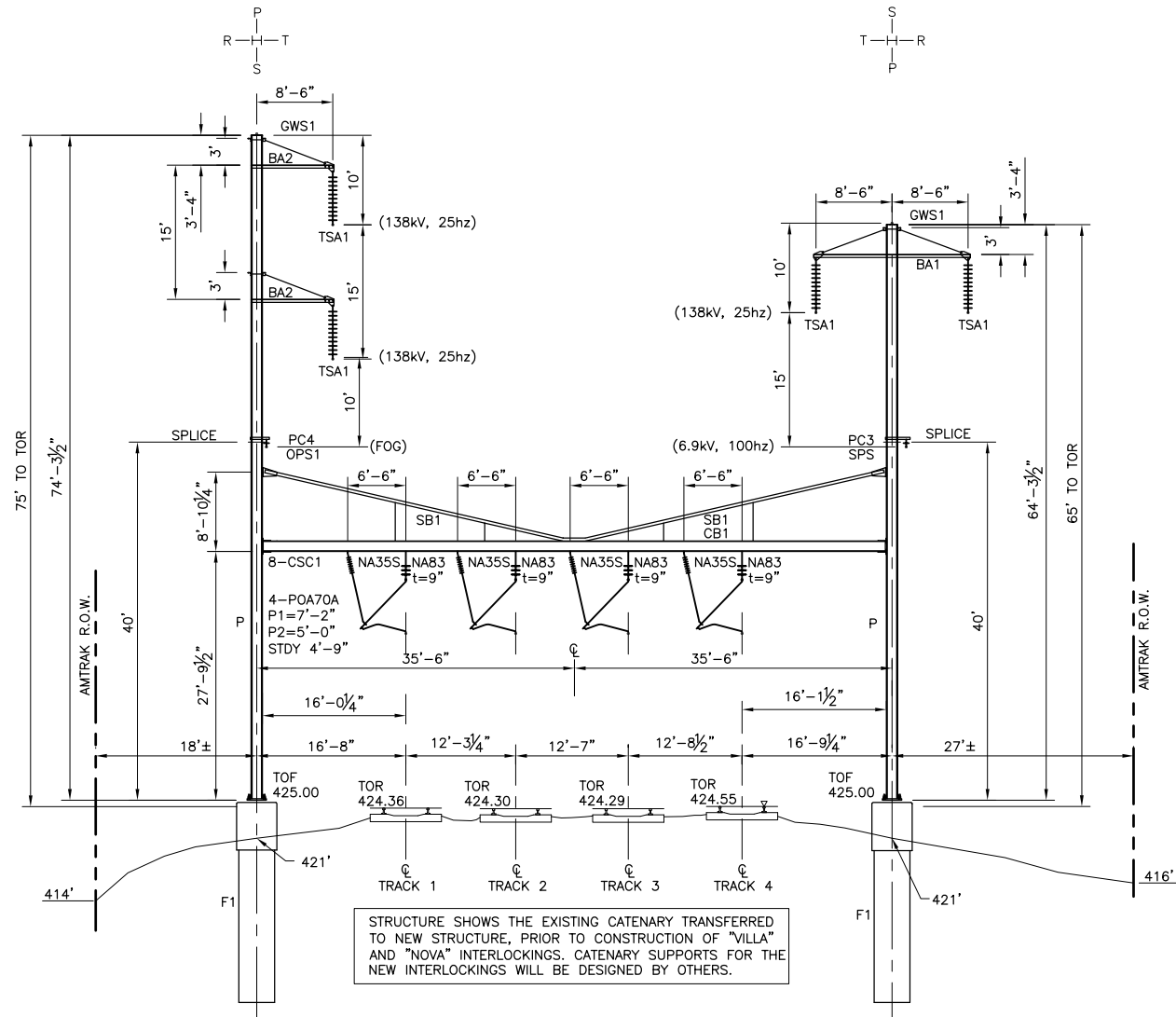
PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-270

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

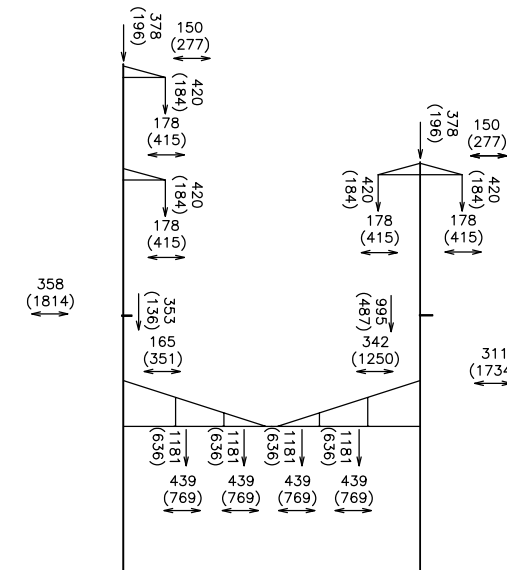
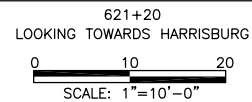
File No.: 2011-059-ET-1386.DWG  
 Ref. No.: 2011-059  
 Sheet No: 302 OF 565  
 ET-1386



CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-6 1/4"	25'-7"	25'-7"	25'-4"
CW	19'-6 1/4"	19'-7"	19'-7"	19'-4"



STRUCTURE ERECTION DIAGRAM T-269



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
280' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET	S-5200	1	
BA2	TRANSMISSION BRACKET	S-5201	2	
CSC1	SLIDING BRACKET	S-5214	8	

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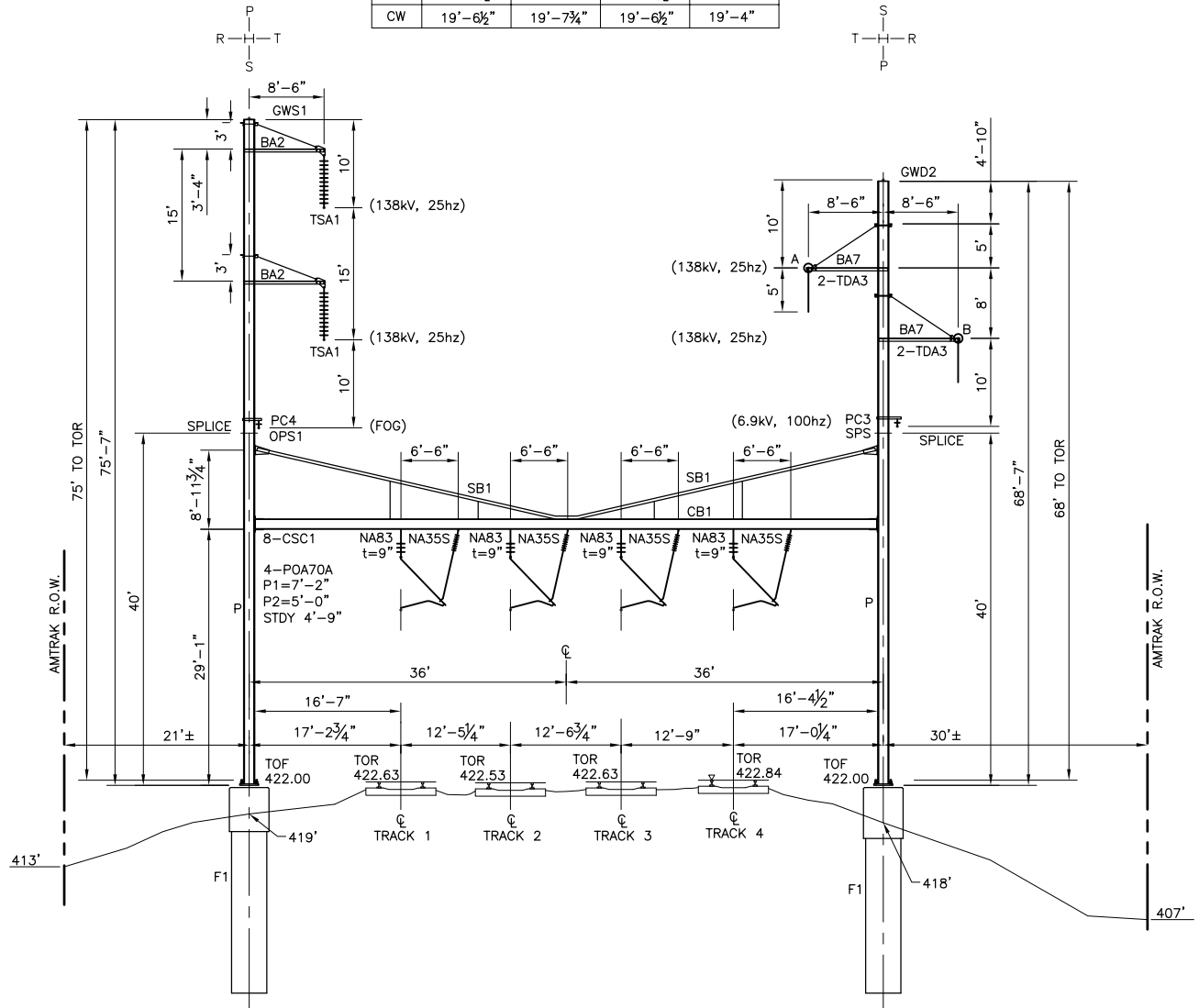


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-269  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

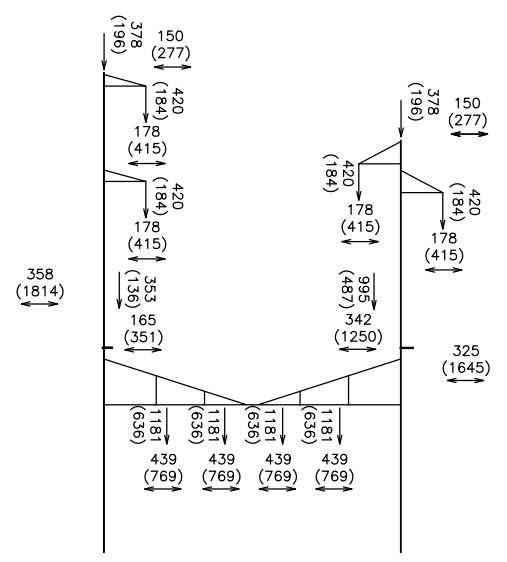
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Ref. No.: 2011-059  
Sheet No.: 303 OF 565  
ET-1387

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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-6½"	26'-10"	25'-6½"	25'-4"
CW	19'-6½"	19'-7¾"	19'-6½"	19'-4"



**STRUCTURE ERECTION DIAGRAM T-268**  
 618+00  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 280' LOAD SPAN  
 (NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
GWD2	GROUND WIRE DEADEND	ET-1909	4
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	2
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

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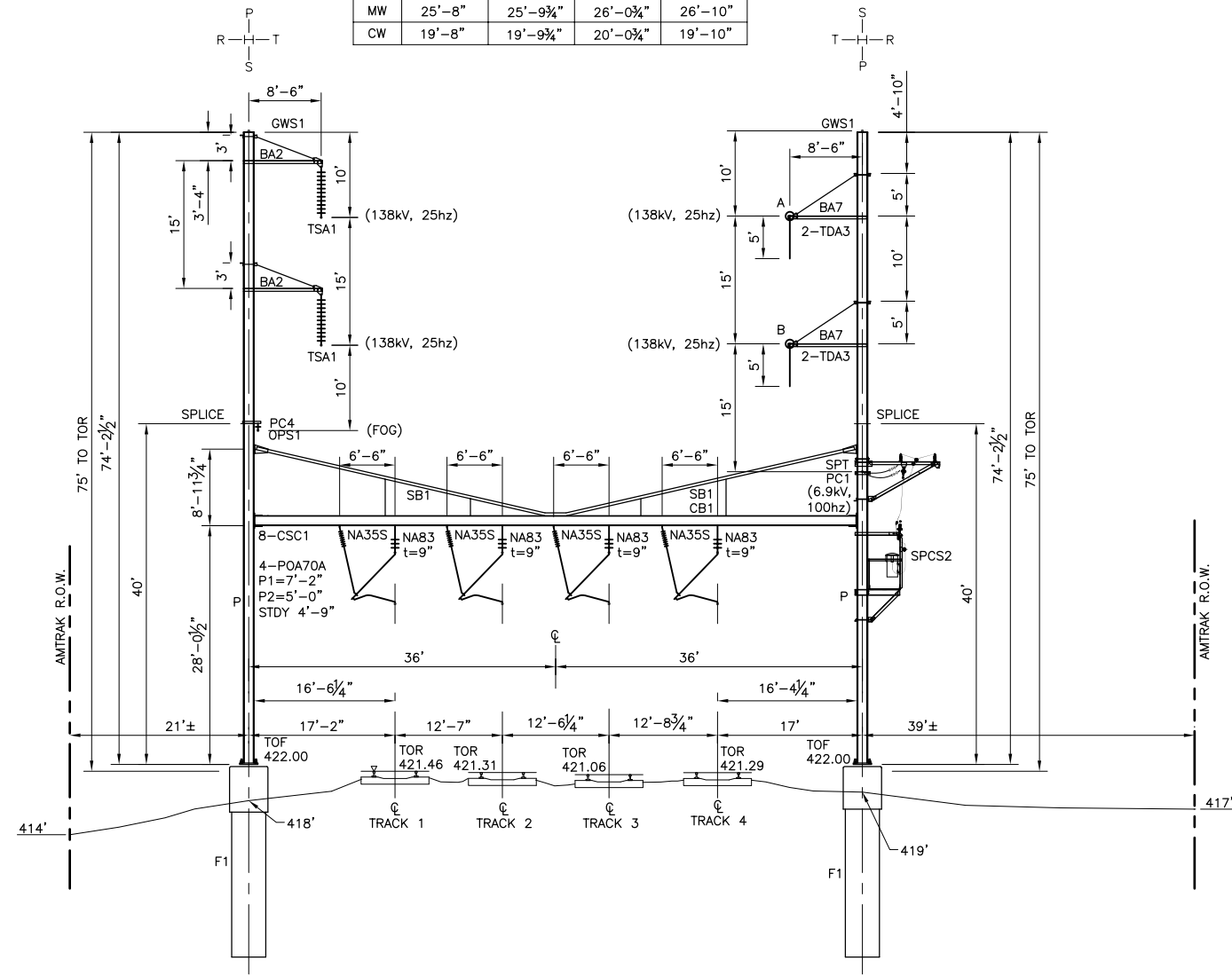


**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-268**

Recommended: DP    Drawn: WJC    Checked: MJM    Date: 03/17/16

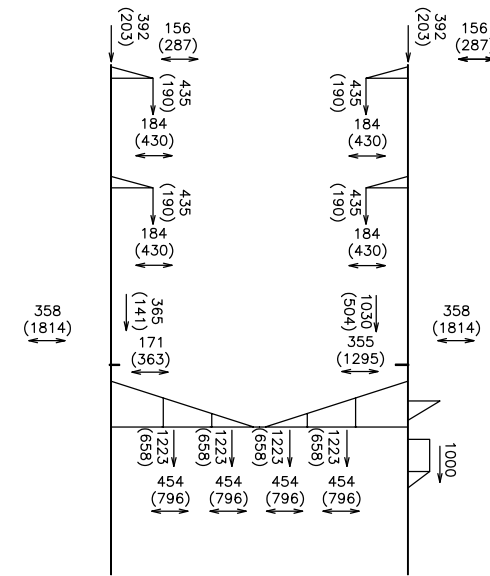
File No.: 2011-059-ET-1388.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 304 OF 565  
**ET-1388**

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-8"	25'-9 3/4"	26'-0 3/4"	26'-10"
CW	19'-8"	19'-9 3/4"	20'-0 3/4"	19'-10"



STRUCTURE ERECTION DIAGRAM T-267

615+36  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
290' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORMS.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4	
SPCS2	SIGNAL POWER CUT SECTION	ET-1811	1	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPT	SIGNAL POWER TERMINATION	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC1	SLIDING CLAMP	S-5214	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA2	TRANSMISSION BRACKET	S-5201	2	
BA7	TRANSMISSION BRACKET	S-5205	2	
CSC1	SLIDING BRACKET	S-5214	8	

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30TH Street Station-Philadelphia, Pennsylvania 19104

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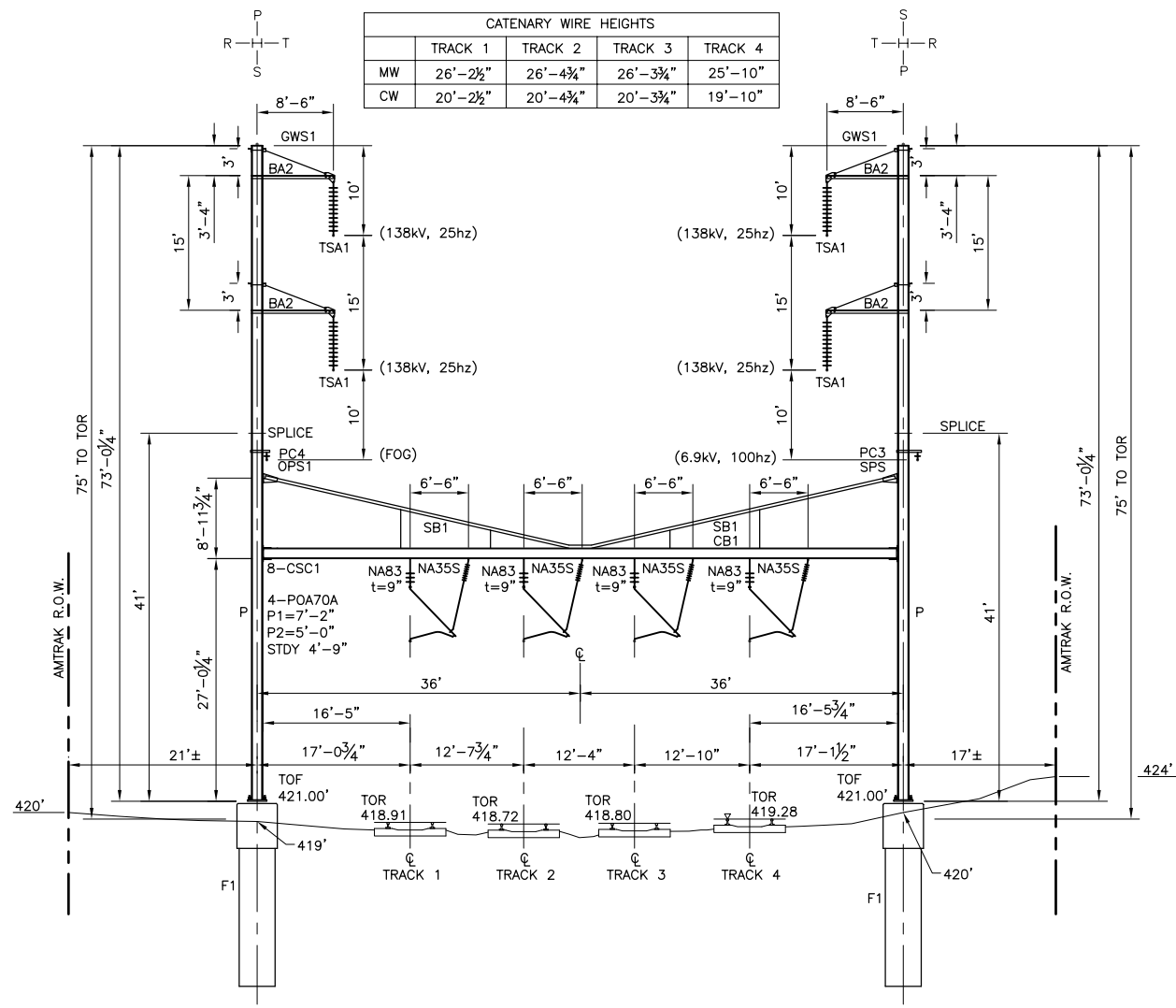
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-267

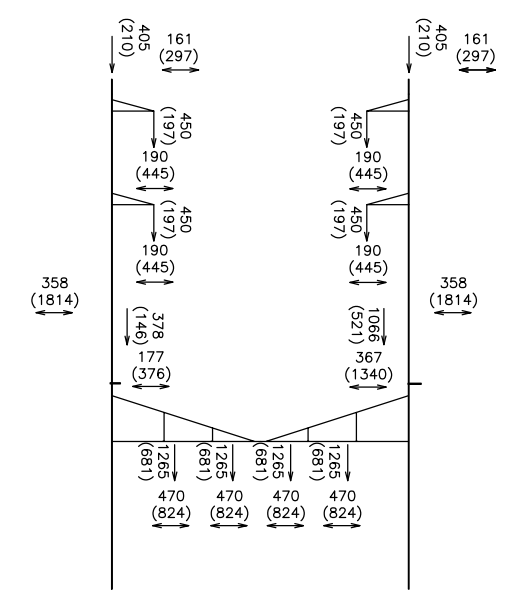
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1389.DWG  
Ref. No.: 2011-059  
Sheet No.: 305 OF 565  
ET-1389

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**STRUCTURE ERECTION DIAGRAM T-266**  
 612+46  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA2	TRANSMISSION BRACKET	S-5201	4	
CSC1	SLIDING BRACKET	S-5214	8	

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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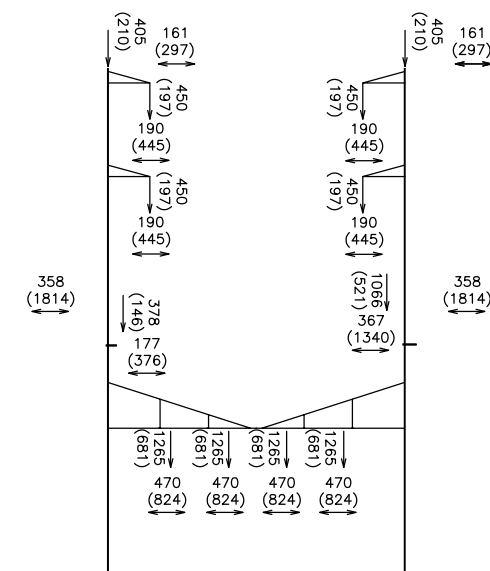
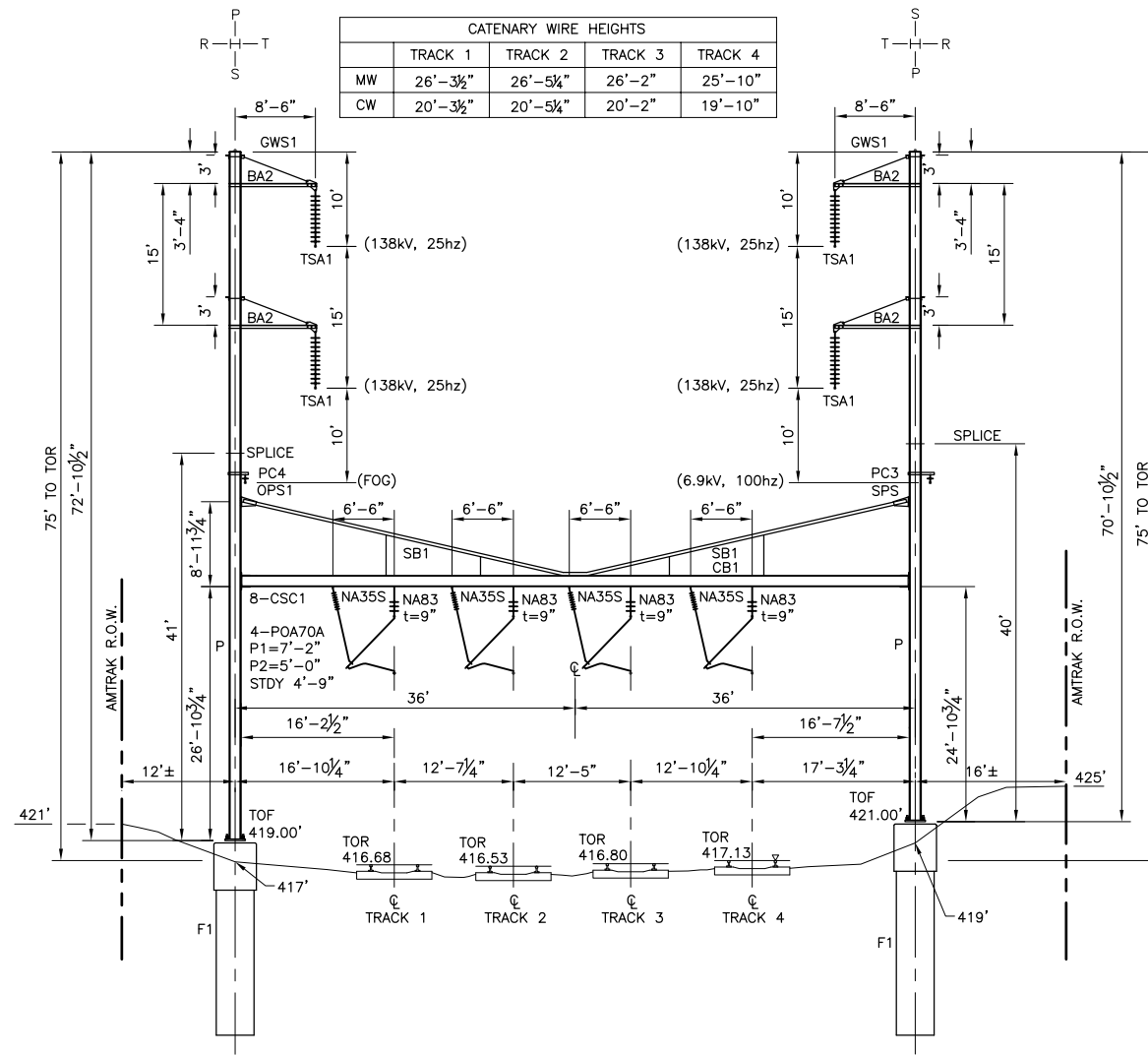
**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-266**

Recommended: DP    Drawn: WJC    Checked: MJM    Date: 03/17/16

File No.:	2011-059-ET-1390.DWG
Ref. No.:	2011-059
Sheet No.:	306 OF 565
<b>ET-1390</b>	

BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	4
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-265  
609+56  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

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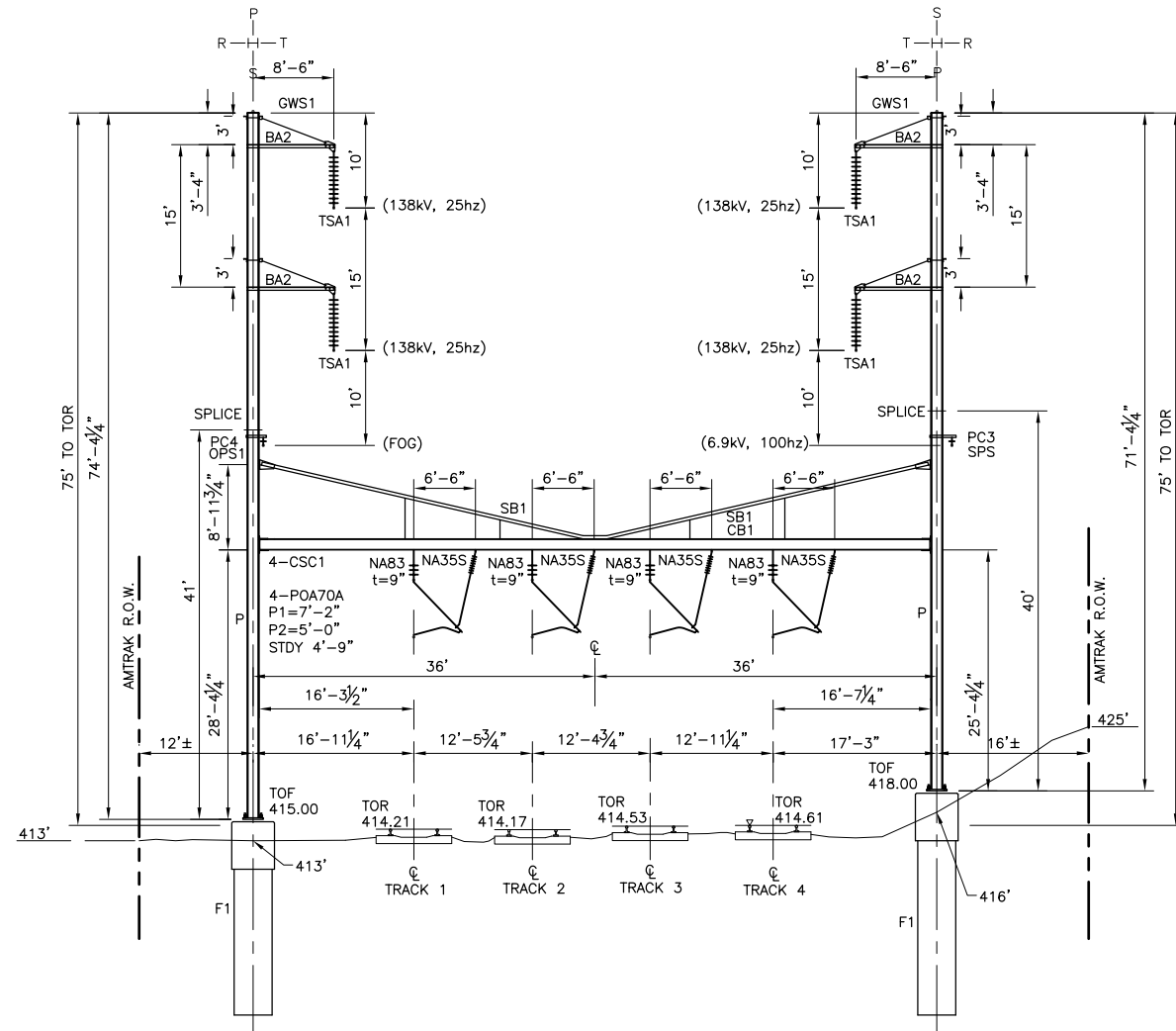
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-265  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

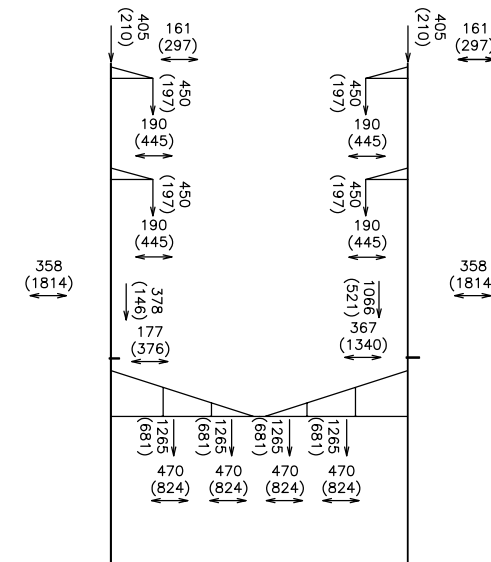
File No.:	2011-059-ET-1391.DWG
Ref. No.:	2011-059
Sheet No.:	307 OF 565
ET-1391	

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-2 3/4"	26'-3 3/4"	25'-11"	25'-10"
CW	20'-2 3/4"	20'-3 3/4"	19'-11"	19'-10"



STRUCTURE ERECTION DIAGRAM T-264

606+88  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NAB3	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA2	TRANSMISSION BRACKET	S-5201	4	
CSC1	SLIDING BRACKET	S-5214	8	

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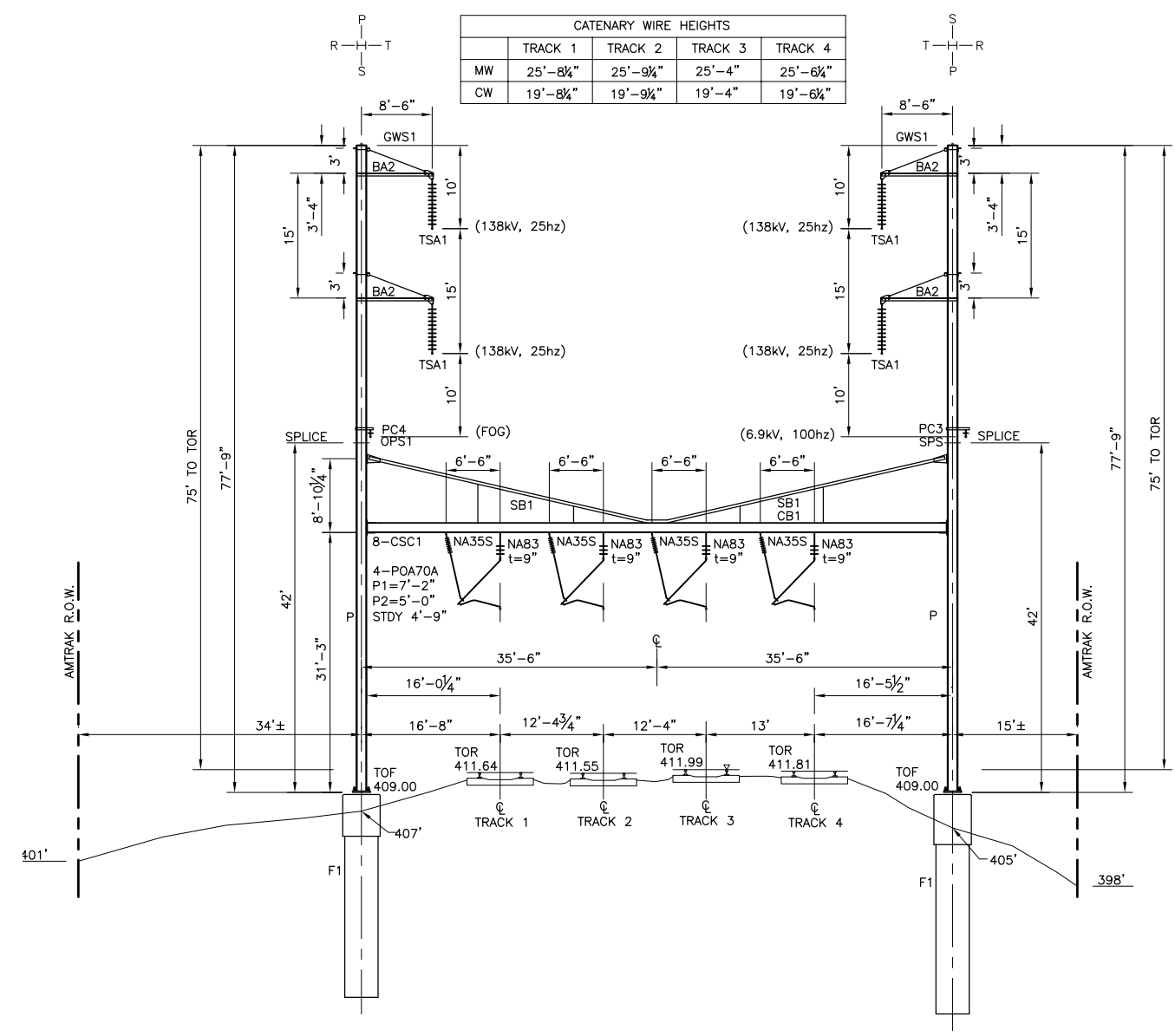


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-264  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

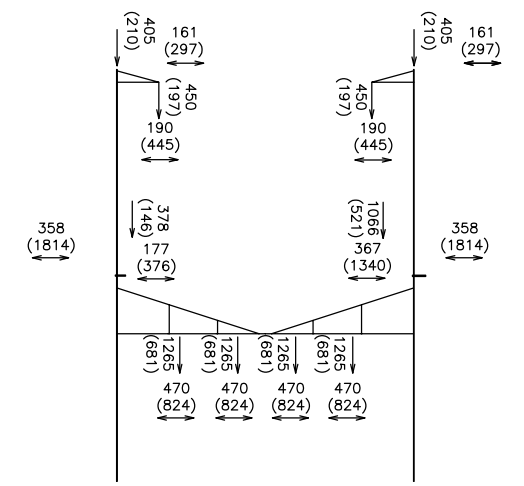
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Ref. No.: 2011-059  
Sheet No.: 308 OF 565  
ET-1392

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	4
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-8 1/4"	25'-9 1/4"	25'-4"	25'-6 1/4"
CW	19'-8 1/4"	19'-9 1/4"	19'-4"	19'-6 1/4"



STRUCTURE ERECTION DIAGRAM T-263  
 604+33  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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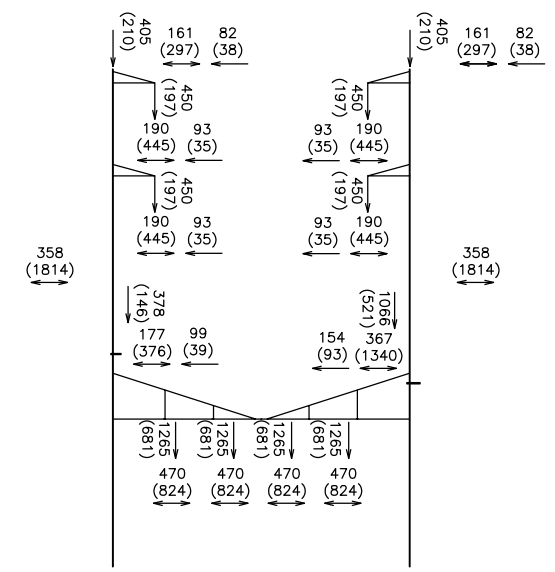
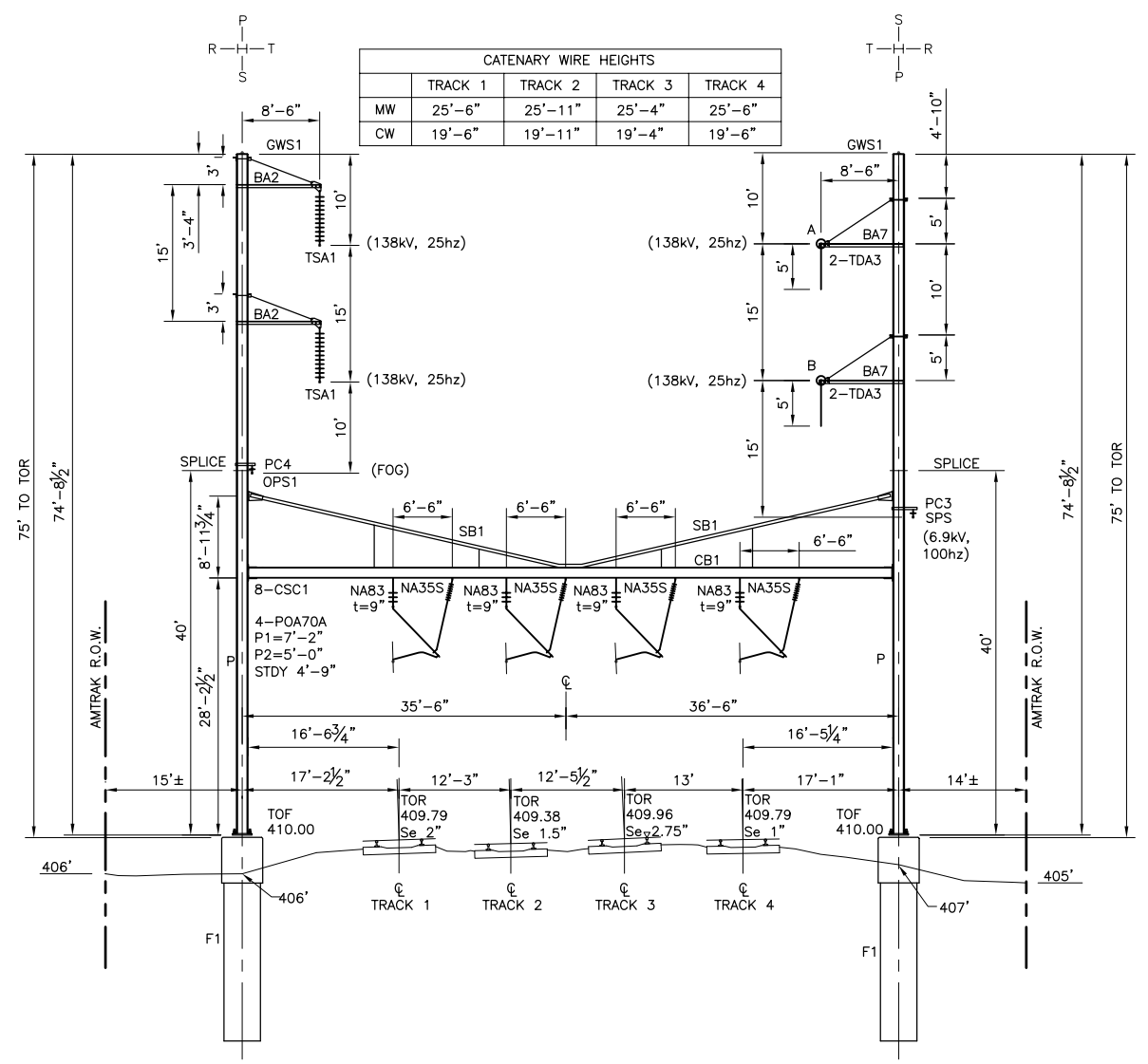
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-263  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1393.DWG  
 Ref. No.: 2011-059  
 Sheet No: 309 OF 565  
 ET-1393

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	2
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-262  
 601+53  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-262

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1394.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 310 OF 565  
 ET-1394

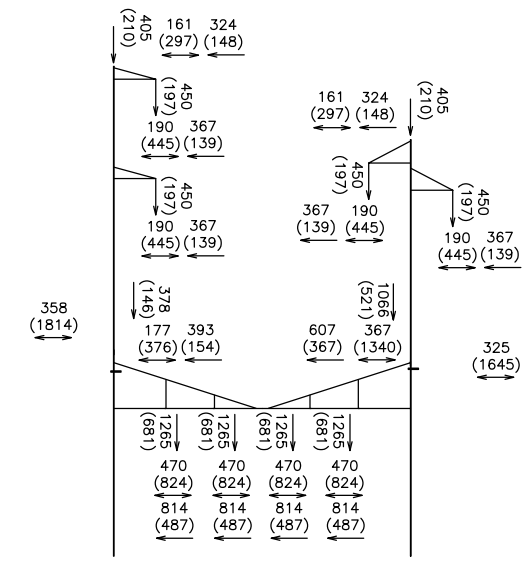


BILL OF MATERIALS

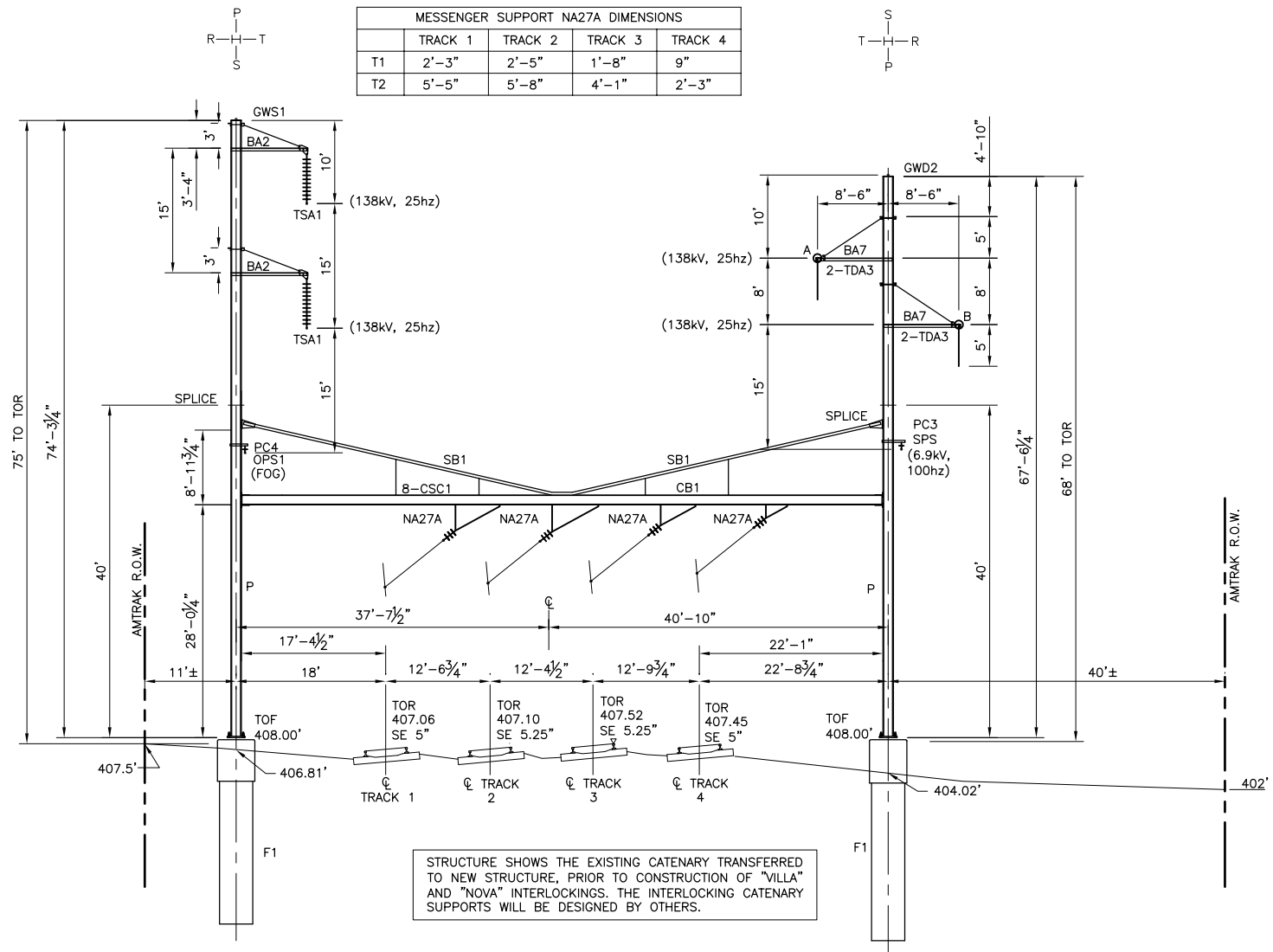
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	1
GWD2	GROUND WIRE DEADEND	ET-1909	1
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA2	TRANSMISSION BRACKET	S-5201	2
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	27'-1 3/4"	26'-10"	25'-8"	26'-9"
CW	21'-7 1/4"	21'-5"	20'-4"	21'-3 1/2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	2'-3"	2'-5"	1'-8"	9"
T2	5'-5"	5'-8"	4'-1"	2'-3"

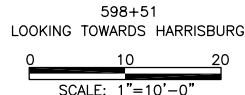


LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)



STRUCTURE SHOWS THE EXISTING CATENARY TRANSFERRED TO NEW STRUCTURE, PRIOR TO CONSTRUCTION OF "VILLA" AND "NOVA" INTERLOCKINGS. THE INTERLOCKING CATENARY SUPPORTS WILL BE DESIGNED BY OTHERS.

STRUCTURE ERECTION DIAGRAM T-261



WORK STATEMENT:

1. INSTALL TRANSMISSION BRACKETS.
2. INSTALL SIGNAL POWER SUPPORT BRACKET.
3. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
4. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
5. DEMO OLD CAT POLES AND FOUNDATIONS.

NOTES:

1. BASE OF STRUCTURE WILL BE INSTALLED UNDER A SEPARATE CONTRACT.

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30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-261  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1395.DWG  
Ref. No.: 2011-059  
Sheet No.: 311 OF 565  
ET-1395

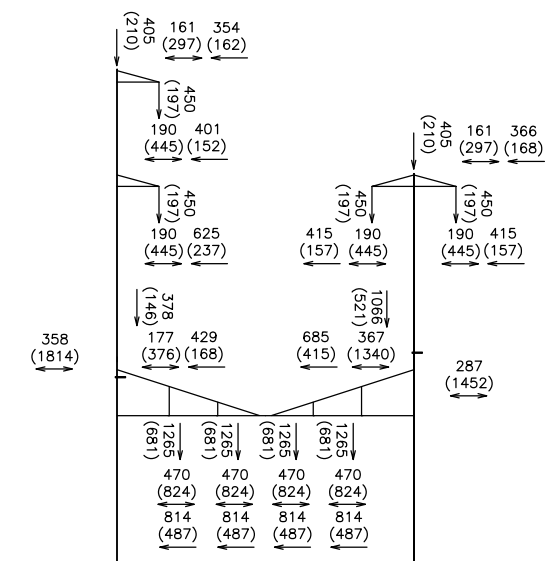
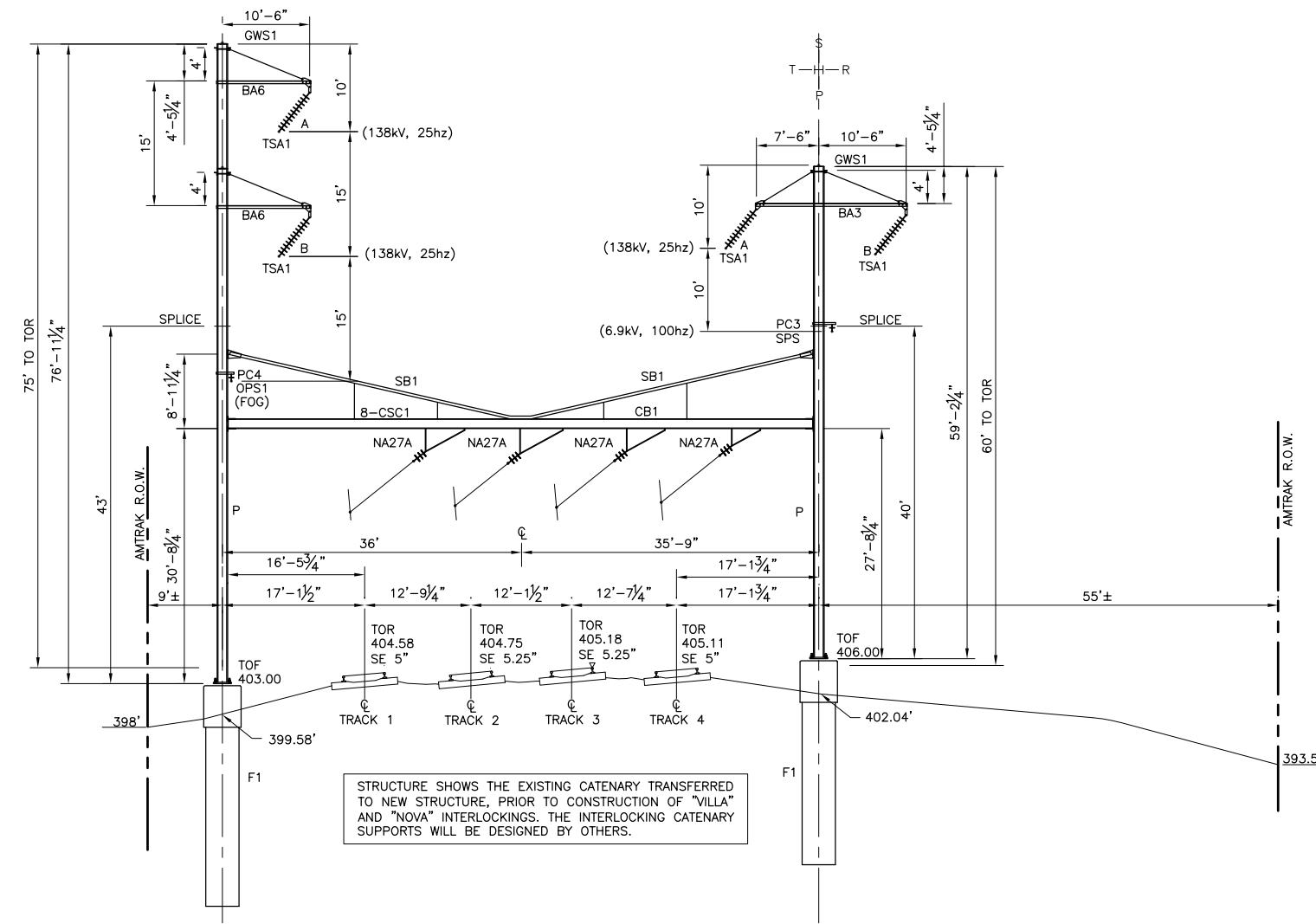
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BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	1
BA6	TRANSMISSION BRACKET	S-5204	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-1 1/2"	24'-8"	24'-7 1/2"	25'-4 1/2"
CW	19'-0 1/4"	19'-7"	19'-0 1/4"	19'-8 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-11"	2'-2"	1'-10 1/2"	1'-3"
T2	4'-8"	5'-2"	4'-6 1/2"	3'-3"



- WORK STATEMENT:
1. INSTALL TRANSMISSION BRACKETS.
  2. INSTALL SIGNAL POWER SUPPORT BRACKET.
  3. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  4. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  5. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-260  
 595+47  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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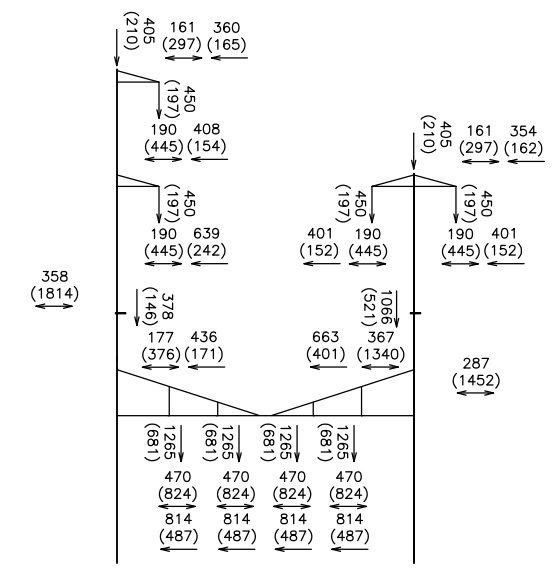
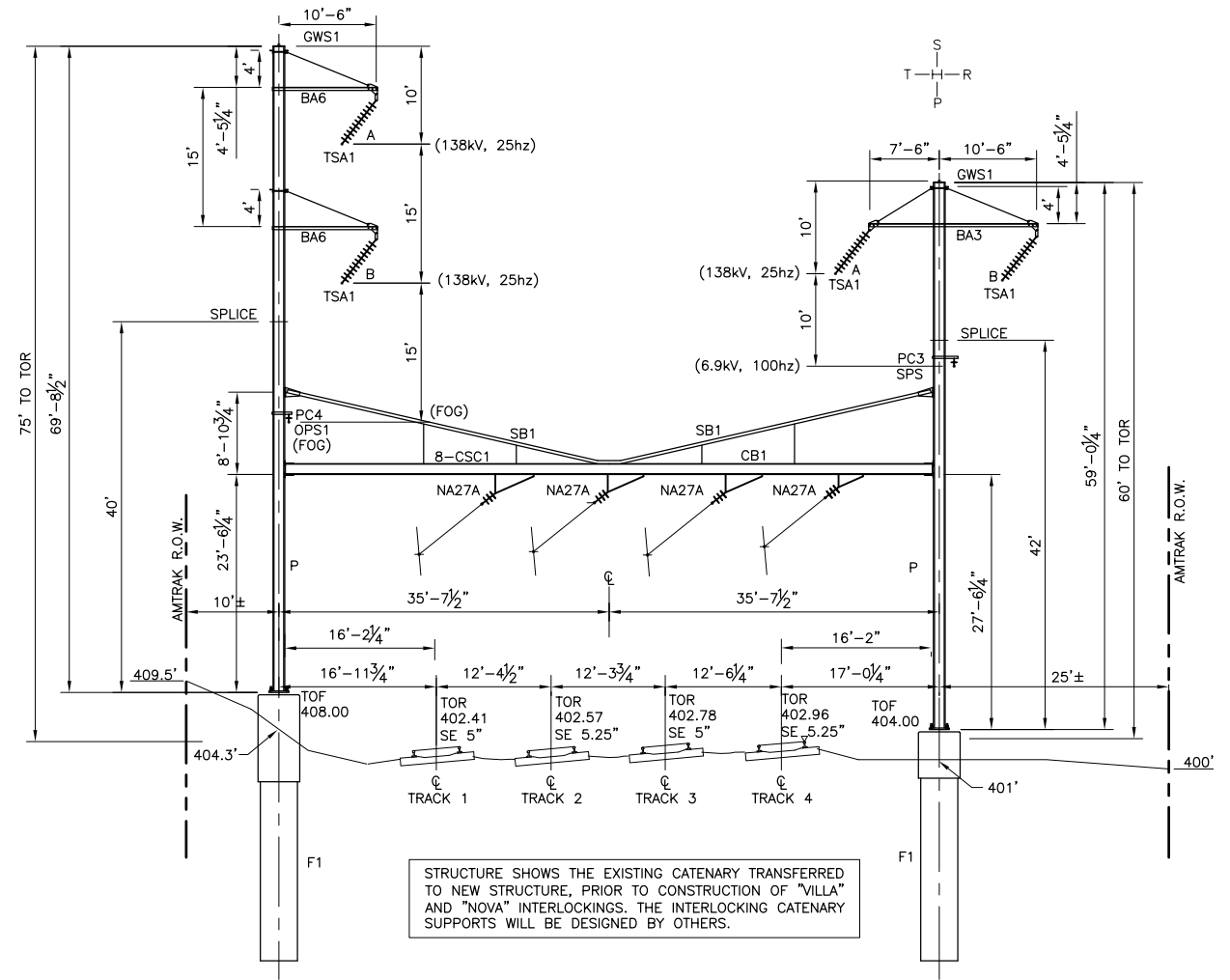
PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-260  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1396.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 312 OF 565  
 ET-1396

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BRACE	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	1
BA6	TRANSMISSION BRACKET	S-5204	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-10 3/4"	25'-9 3/4"	25'-6"	25'-11 3/4"
CW	20'-5 3/4"	20'-6 1/2"	19'-10 3/4"	20'-8 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-2"	1'-1"	1'-1"	6 1/2"
T2	3'-10"	3'-6"	3'-6"	2'-2"



- WORK STATEMENT:
1. INSTALL TRANSMISSION BRACKETS.
  2. INSTALL SIGNAL POWER SUPPORT BRACKET.
  3. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  4. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  5. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-259  
592+43  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-259  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1397.DWG  
Ref. No.: 2011-059  
Sheet No.: 313 OF 565  
ET-1397

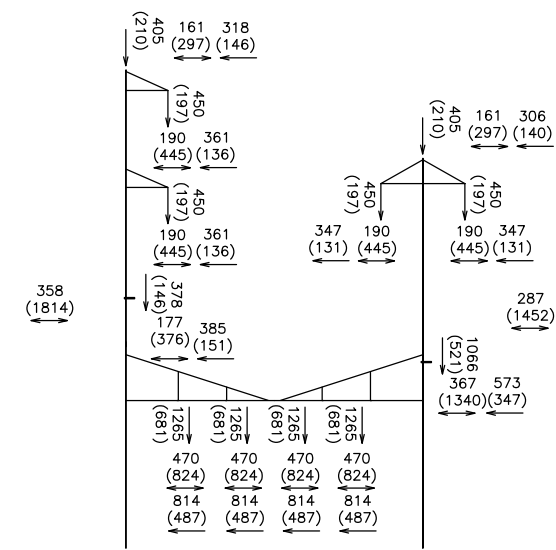
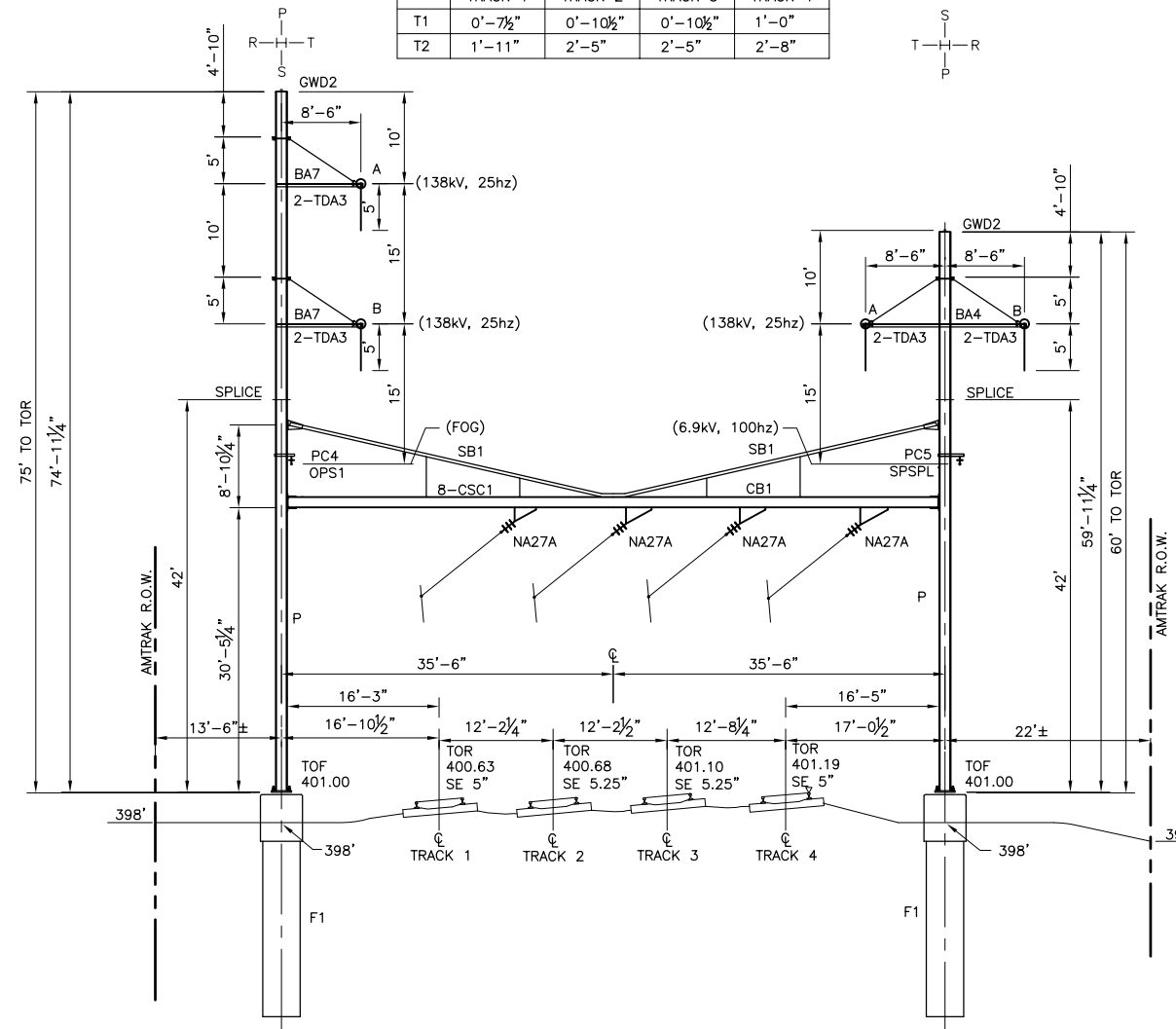
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BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWD2	GROUND WIRE DEADEND	ET-1909	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPSPL	SIGNAL POWER SPLICE	ET-1913	1
PC4	SLIDING CLAMP	S-5215	1
PC5	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4	TRANSMISSION BRACKET	S-5203	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	28'-5 1/4"	28'-1 3/4"	27'-8 3/4"	27'-6 1/4"
CW	21'-7 1/4"	21'-5 1/4"	21'-0 3/4"	20'-9 3/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-7 1/2"	0'-10 1/2"	0'-10 1/2"	1'-0"
T2	1'-11"	2'-5"	2'-5"	2'-8"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-258

589+87  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

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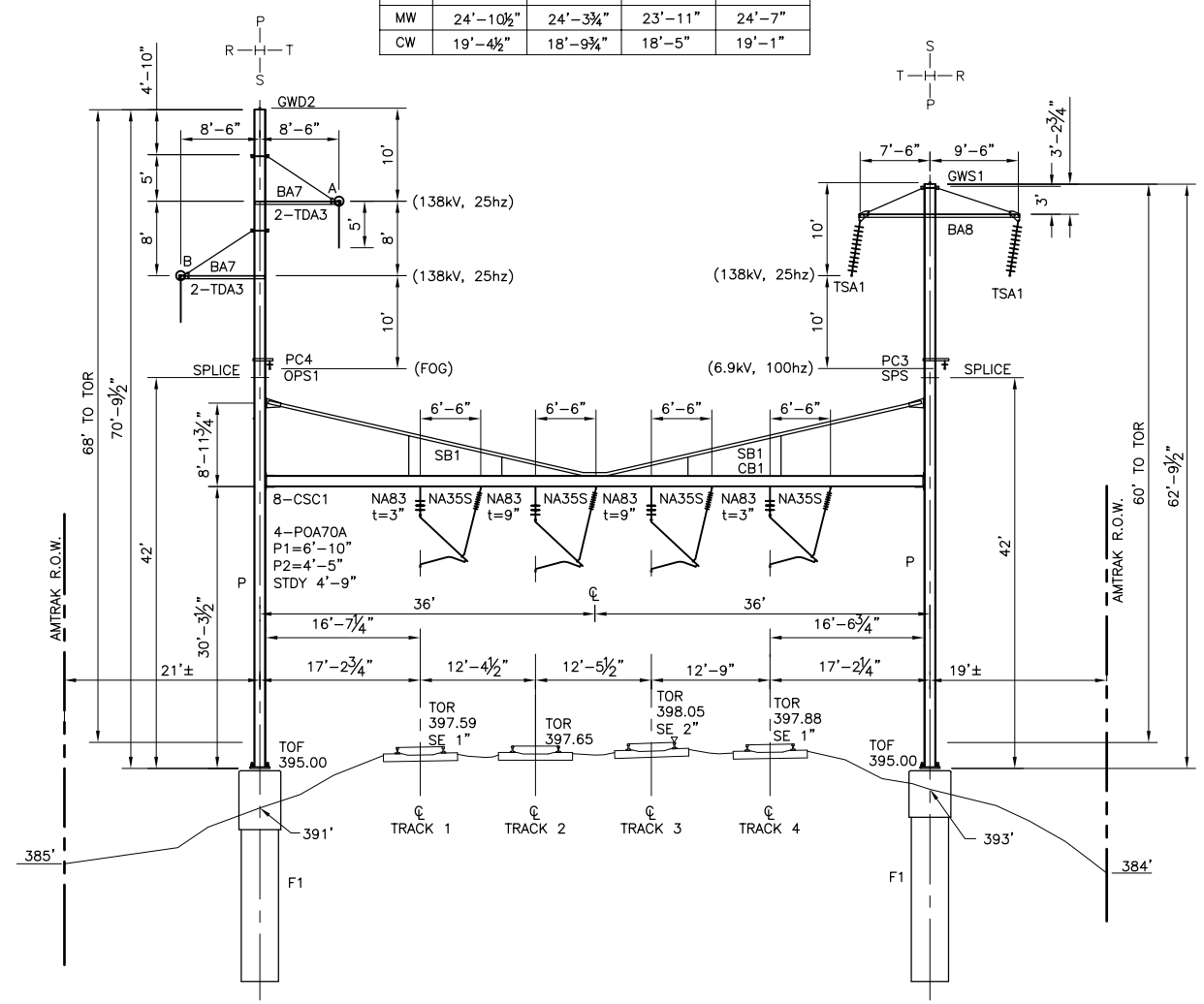


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-258  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

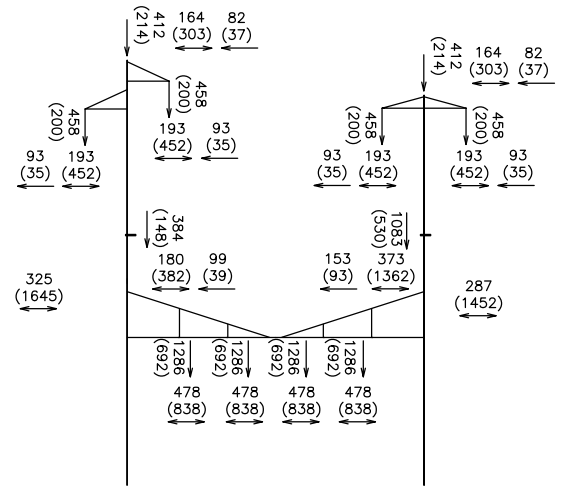
File No.: 2011-059-ET-1398.DWG  
Ref. No.: 2011-059  
Sheet No.: 314 OF 565  
ET-1398

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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-10 1/2"	24'-3 3/4"	23'-11"	24'-7"
CW	19'-4 1/2"	18'-9 3/4"	18'-5"	19'-1"



**STRUCTURE ERECTION DIAGRAM T-257**  
 586+86  
 LOOKING TOWARDS HARRISBURG  
 0 10 20  
 SCALE: 1"=10'-0"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' LOAD SPAN  
 (NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	1
GWD2	GROUND WIRE DEADEND	ET-1909	1
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA7	TRANSMISSION BRACKET	S-5203	2
BA8	TRANSMISSION BRACKET	S-5206	1
CSC1	SLIDING BRACKET	S-5214	8

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-257**

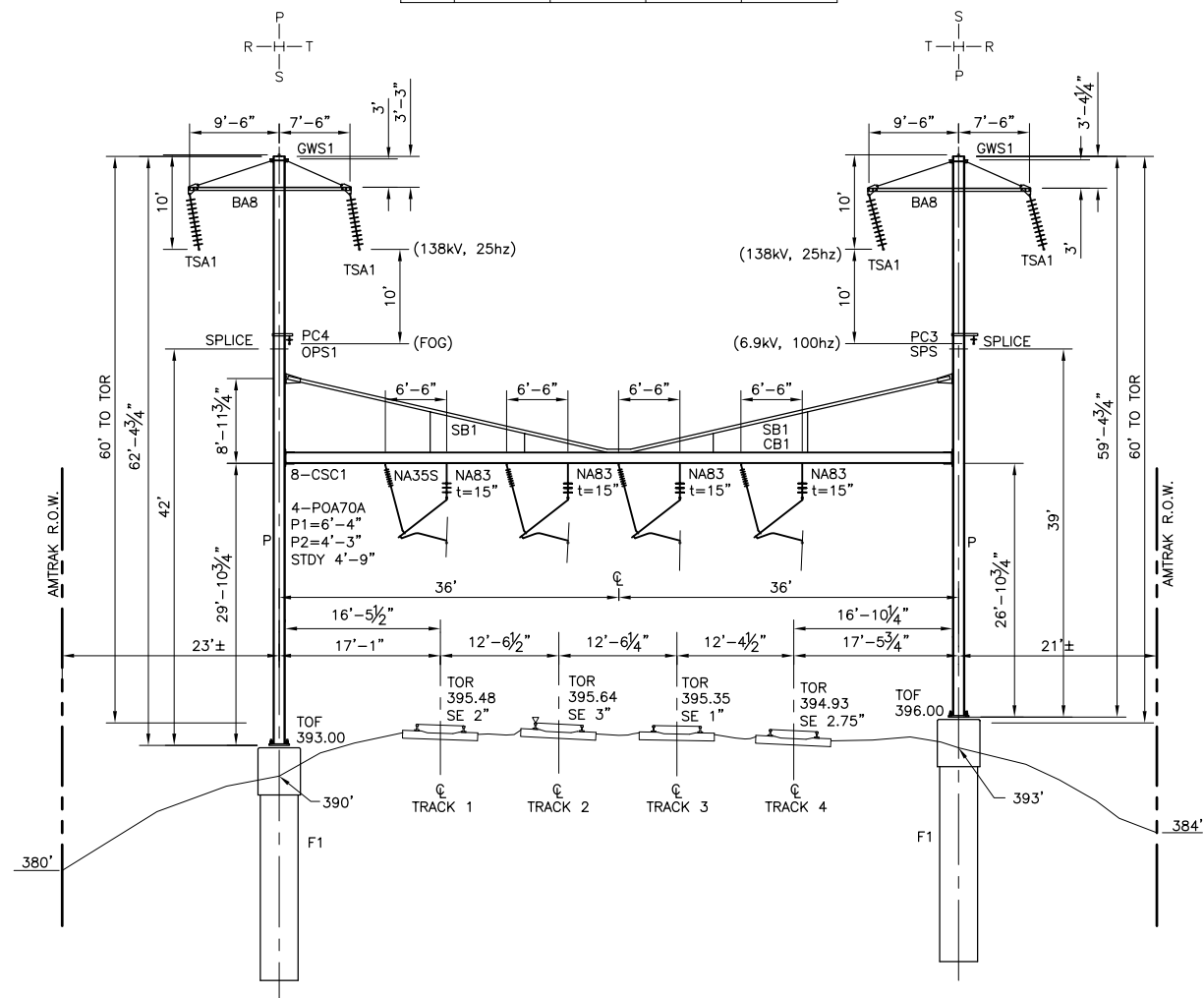
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File No.: 2011-059-ET-1399.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 315 OF 565  
**ET-1399**

BILL OF MATERIALS

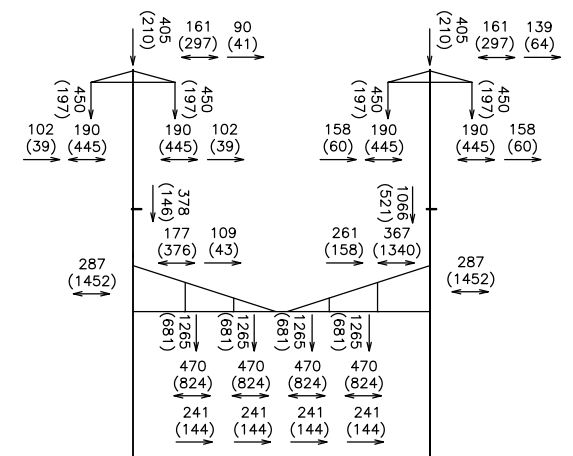
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA8	TRANSMISSION BRACKET	S-5206	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-0"	23'-10"	24'-1 1/2"	24'-6 1/2"
CW	19'-3"	19'-1"	19'-4 1/2"	19'-9 1/2"



STRUCTURE ERECTION DIAGRAM T-256

583+86  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-256

File No.: 2011-059-ET-1400  
Ref. No.: 2011-059  
Sheet No.: 316 OF 565

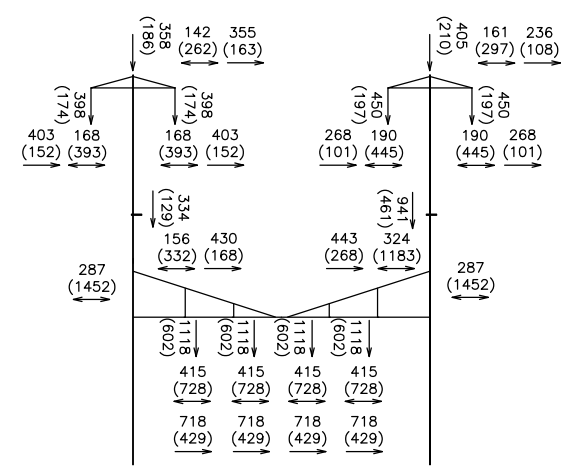
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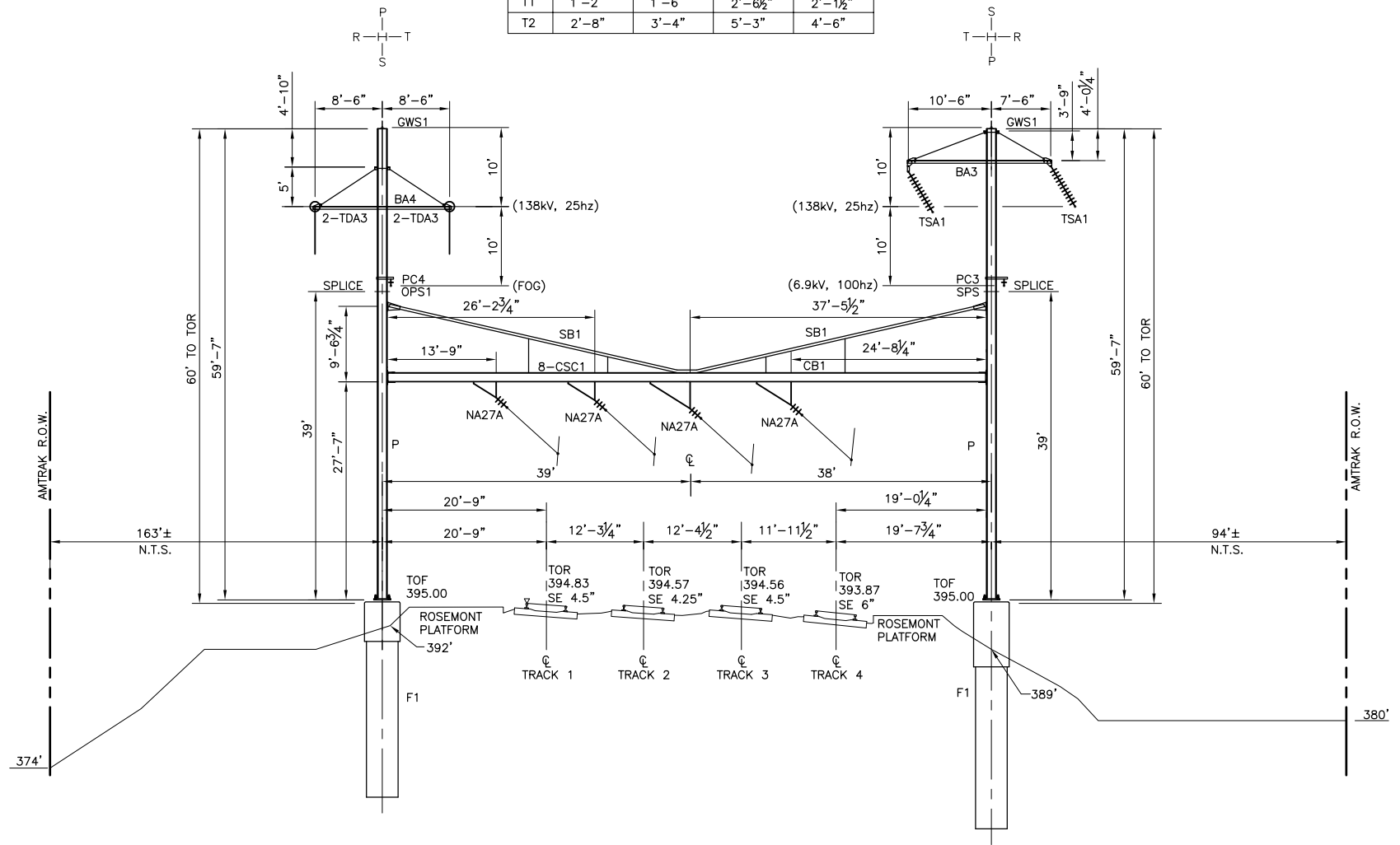
BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA3	TRANSMISSION BRACKET	S-5202	1	
BA4	TRANSMISSION BRACKET	S-5203	1	
CSC1	SLIDING BRACKET	S-5214	8	

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-3"	25'-1 3/4"	23'-7 3/4"	24'-9 1/4"
CW	18'-1 1/4"	19'-1 1/4"	17'-9 1/2"	19'-1 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	1'-2"	1'-6"	2'-6 1/2"	2'-1 1/2"
T2	2'-8"	3'-4"	5'-3"	4'-6"



- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.



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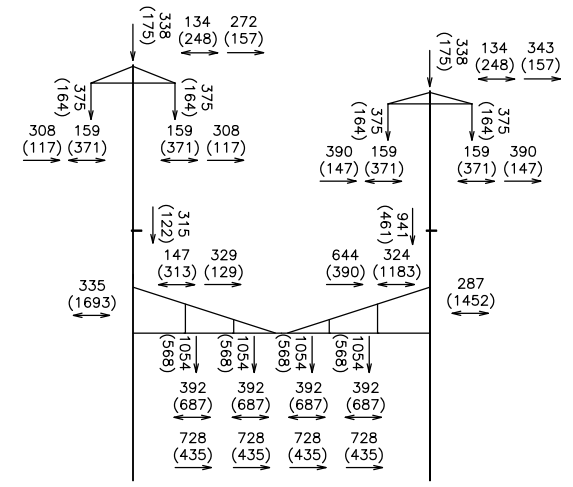
**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-255**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1401.DWG  
Ref. No.: 2011-059  
Sheet No.: 317 OF 565  
**ET-1401**

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	1
BA4	TRANSMISSION BRACKET	S-5203	1
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-1 1/4"	25'-5 1/4"	25'-4 1/4"	25'-10 1/4"
CW	19'-7"	20'-5"	19'-4 1/4"	20'-5 1/4"

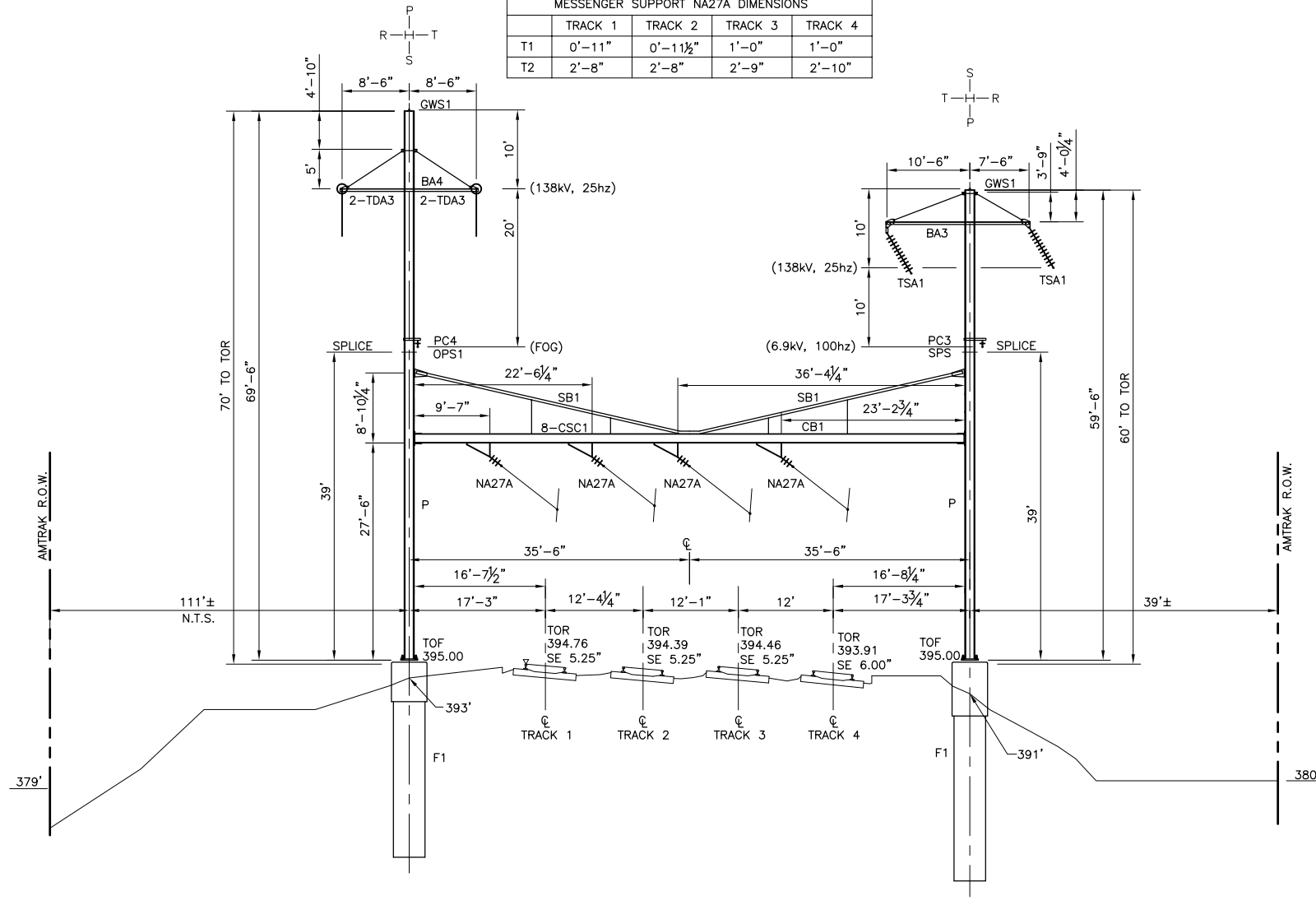
MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-11"	0'-11 1/2"	1'-0"	1'-0"
T2	2'-8"	2'-8"	2'-9"	2'-10"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 265' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
- INSTALL FOUNDATIONS.
  - INSTALL POLES, CROSS BEAM AND SAG BRACES.
  - INSTALL TRANSMISSION BRACKETS.
  - INSTALL SIGNAL POWER SUPPORT BRACKET.
  - INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  - TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  - INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  - TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  - ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  - DEMO OLD CAT POLES AND FOUNDATIONS.

**STRUCTURE ERECTION DIAGRAM T-254**  
 578+56  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



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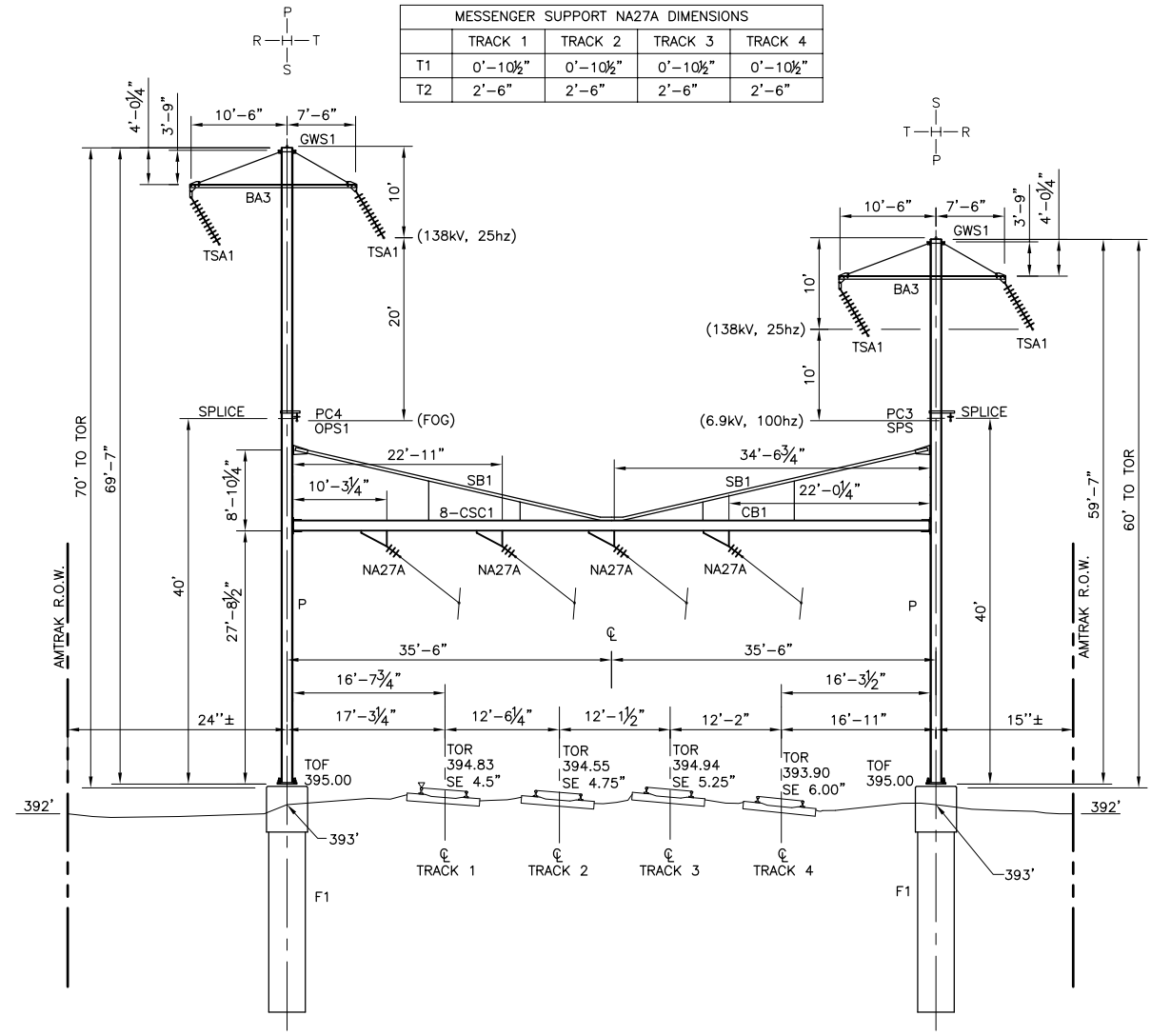
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<b>PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-254</b>			
Recommended: DP	Drawn: WJC	Checked: MJM	Date: 03/17/16
File No.: 2011-059-ET-1402			Ref. No.: 2011-059
Sheet No.: 318 OF 565			ET-1402



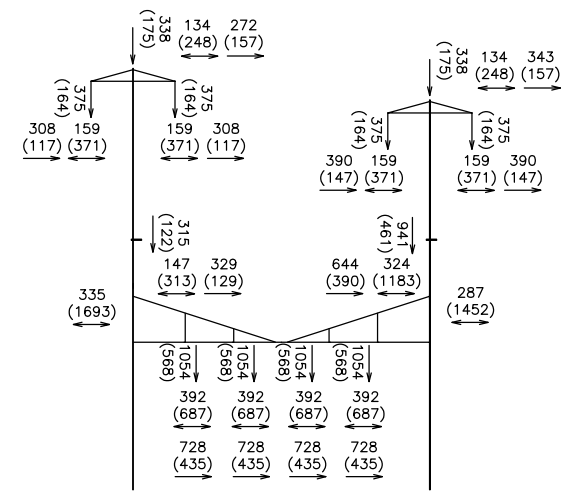
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-3 3/4"	25'-6 3/4"	25'-2 1/2"	26'-2 1/2"
CW	20'-2 3/4"	20'-6 1/4"	20'-2"	21'-2"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"
T2	2'-6"	2'-6"	2'-6"	2'-6"



STRUCTURE ERECTION DIAGRAM T-253  
 575+96  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 265' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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No	Revisions	Date	By



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 30TH Street Station-Philadelphia, Pennsylvania 19104

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PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-253

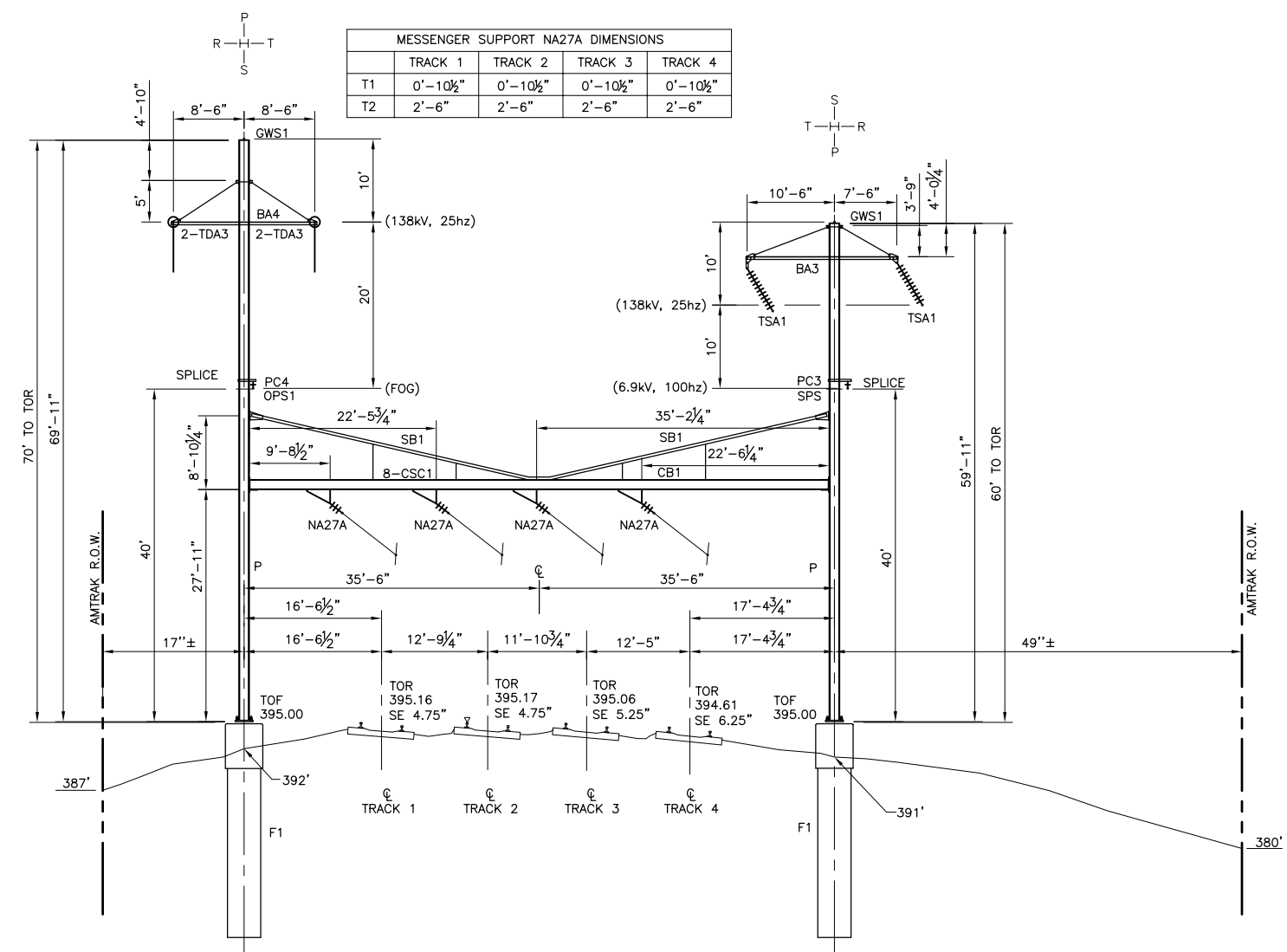
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1403.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 319 OF 565  
 ET-1403

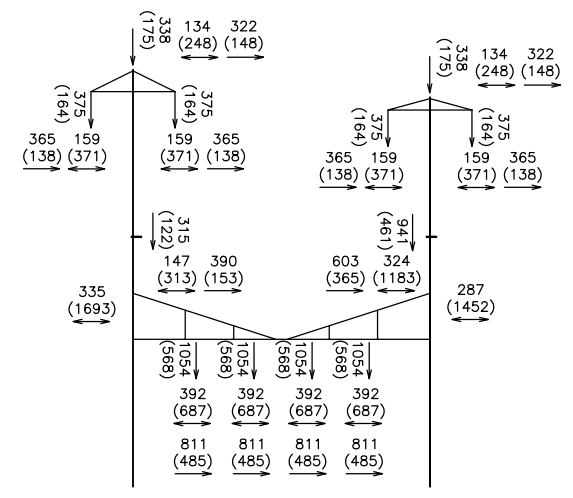
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	1
BA4	TRANSMISSION BRACKET	S-5203	1
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-2"	25'-2"	25'-3 1/4"	25'-8 1/4"
CW	20'-1 3/4"	20'-1 1/2"	20'-2 3/4"	20'-8 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"
T2	2'-6"	2'-6"	2'-6"	2'-6"



STRUCTURE ERECTION DIAGRAM T-252  
 573+38  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 265" LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-252

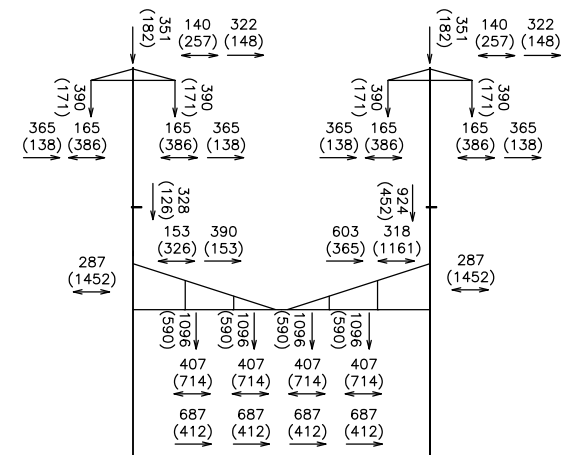
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File No.: 2011-059-ET-1404  
 Ref. No.: 2011-059  
 Sheet No: 320 OF 565  
 ET-1404

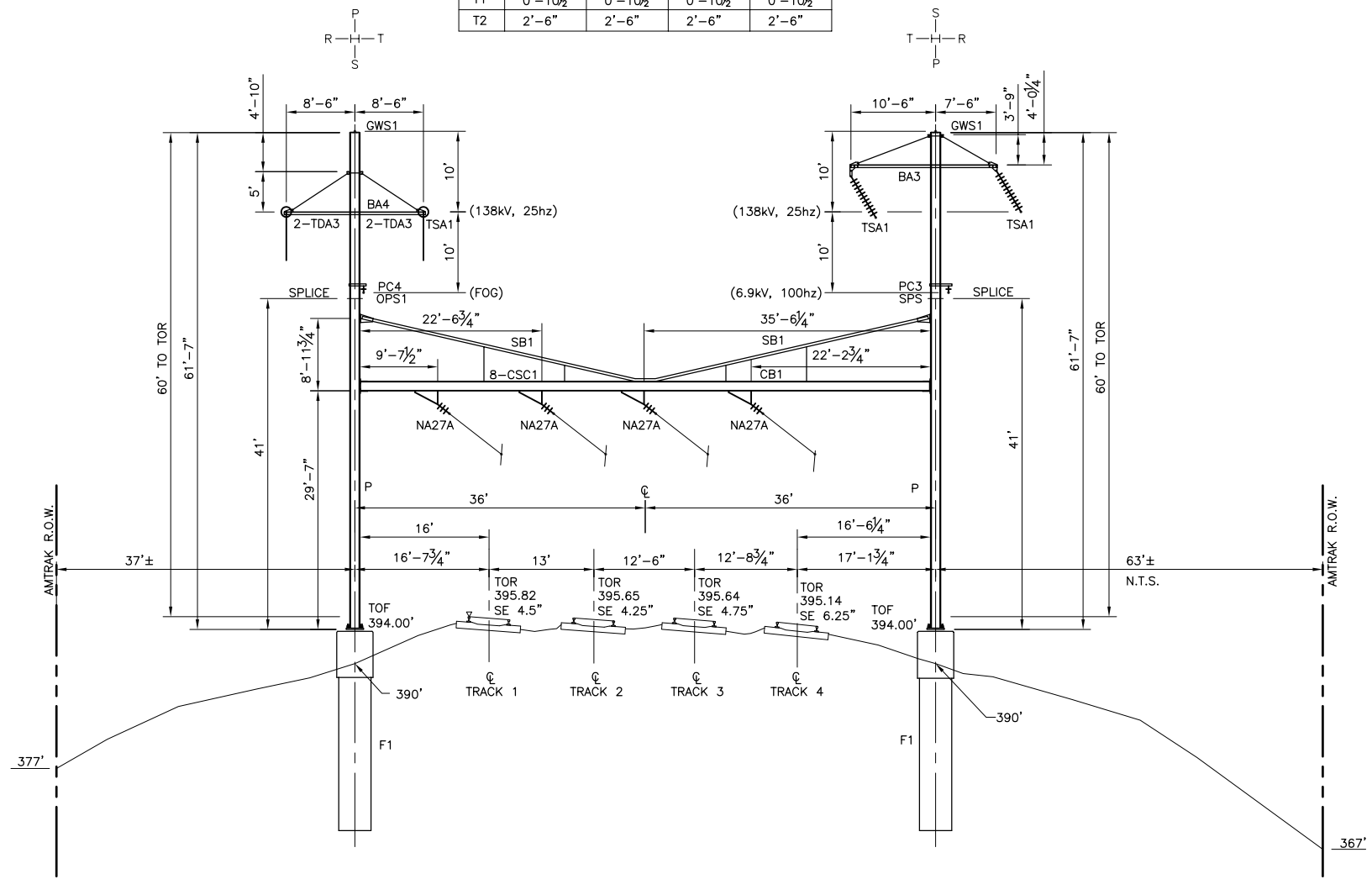
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA27A	MESSENGER SUPPORT	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA3	TRANSMISSION BRACKET	S-5202	1
BA4	TRANSMISSION BRACKET	S-5203	1
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-2"	25'-4"	25'-4 1/4"	25'-10 1/4"
CW	20'-1 1/2"	20'-3 1/2"	20'-3 3/4"	20'-9 1/4"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"
T2	2'-6"	2'-6"	2'-6"	2'-6"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 265' LOAD SPAN  
 (NOT TO SCALE)



**STRUCTURE ERECTION DIAGRAM T-251**  
 570+77  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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 National Railroad Passenger Corporation  
 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date

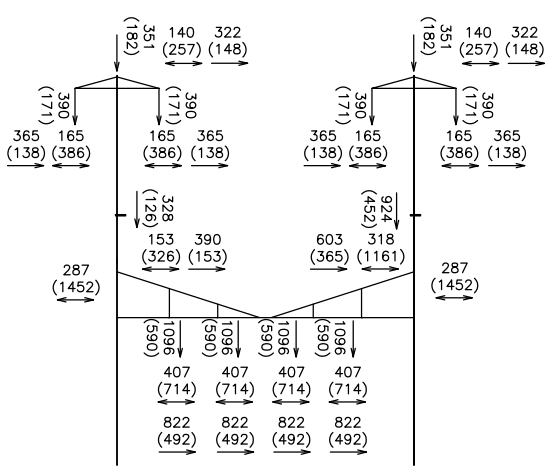


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-251**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1405.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 321 OF 565  
**ET-1405**

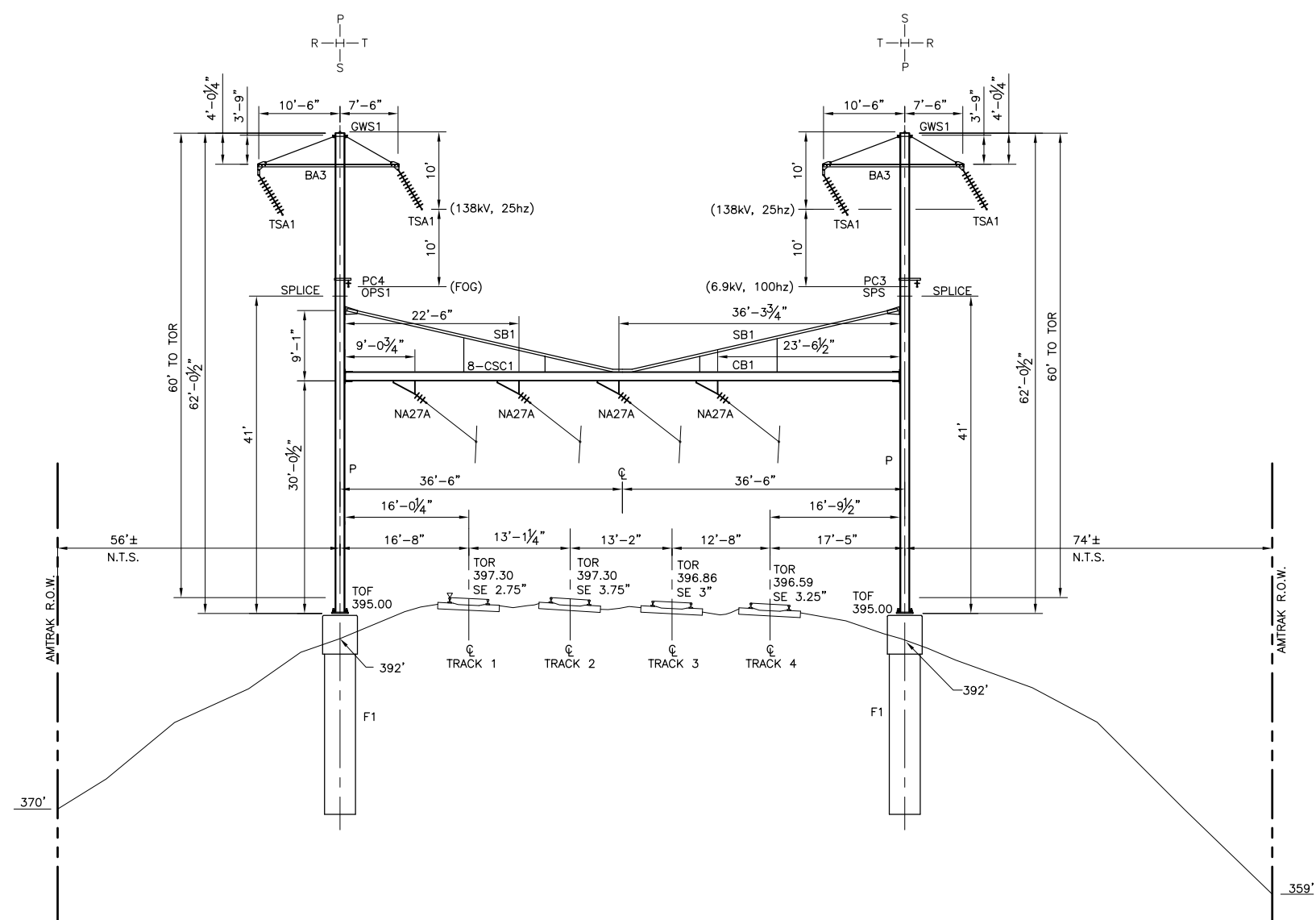
CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-2"	25'-2"	25'-7 1/4"	25'-10 1/2"
CW	20'-1 1/2"	20'-1 1/2"	20'-6 3/4"	20'-10"

MESSENGER SUPPORT NA27A DIMENSIONS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
T1	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"	0'-10 1/2"
T2	2'-6"	2'-6"	2'-6"	2'-6"



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 260' LOAD SPAN  
 (NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA27A	MESSENGER SUPPORT	ET-1904	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA3	TRANSMISSION BRACKET	S-5202	2	
CSC1	SLIDING BRACKET	S-5214	8	



**STRUCTURE ERECTION DIAGRAM T-250**  
 568+17  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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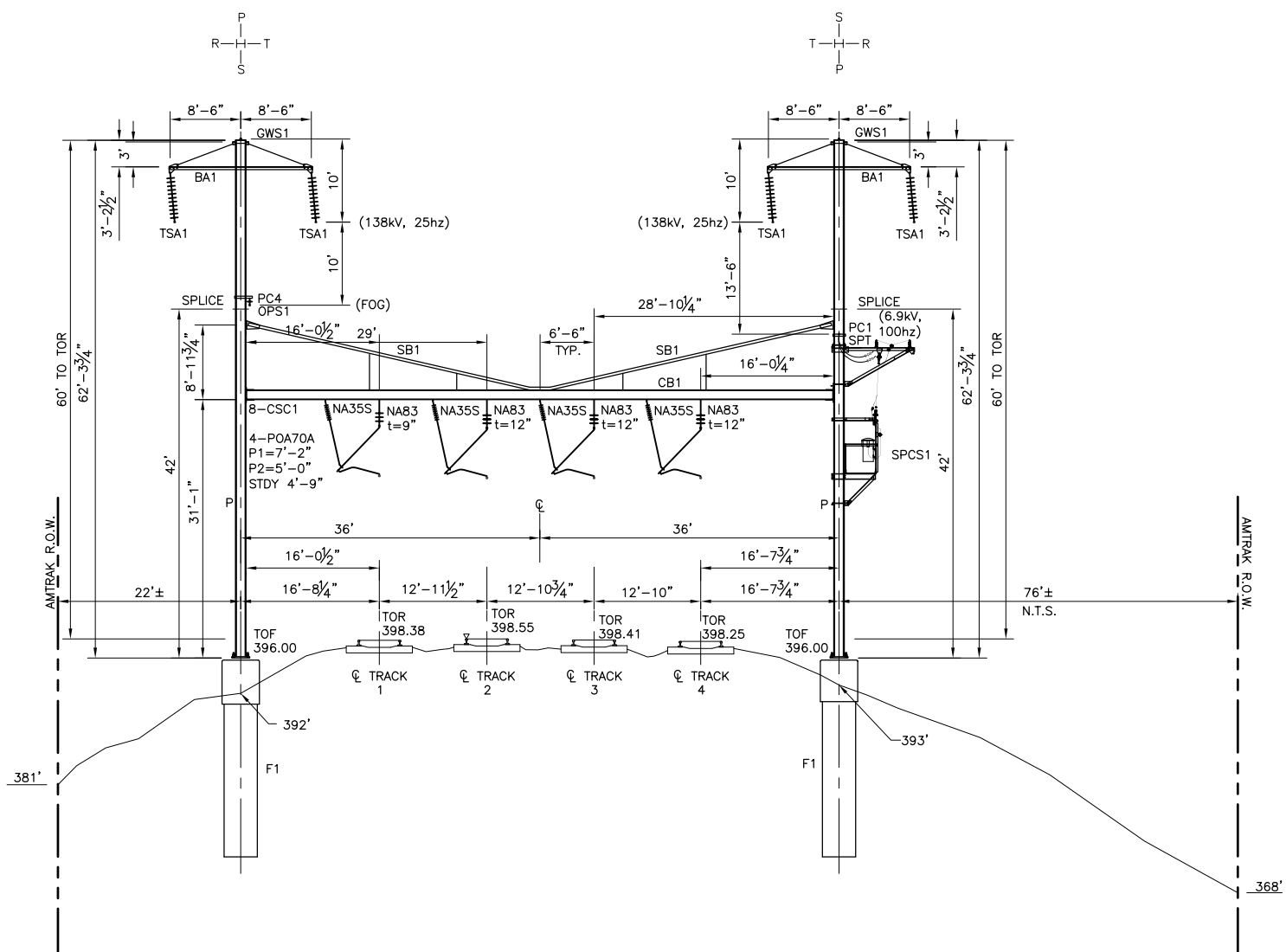


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-250**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

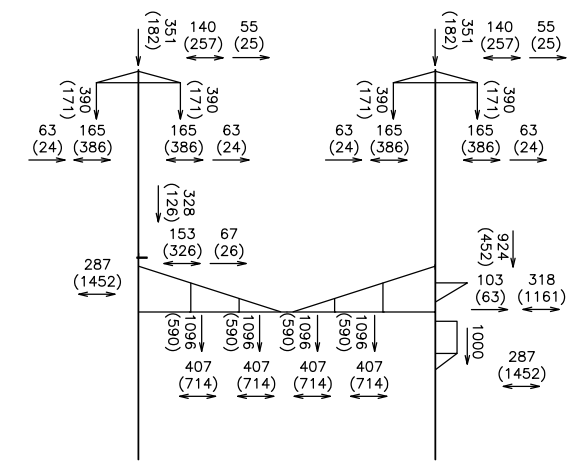
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Ref. No.:	2011-059
Sheet No.:	322 OF 565
<b>ET-1406</b>	

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CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-9 1/2"	25'-4 1/2"	25'-6 1/4"	25'-8"
CW	19'-9 1/2"	19'-4 1/2"	19'-6 1/4"	19'-8"



STRUCTURE ERECTION DIAGRAM T-249  
 565+56  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 280' LOAD SPAN  
 (NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORMS.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
SPCS1	SIGNAL POWER CUT SECTION	ET-1810	1
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPT	SIGNAL POWER TERMINATION	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
PC1	SLIDING CLAMP	S-5214	1
PC4	SLIDING CLAMP	S-5215	1
CSC1	SLIDING BRACKET	S-5214	4

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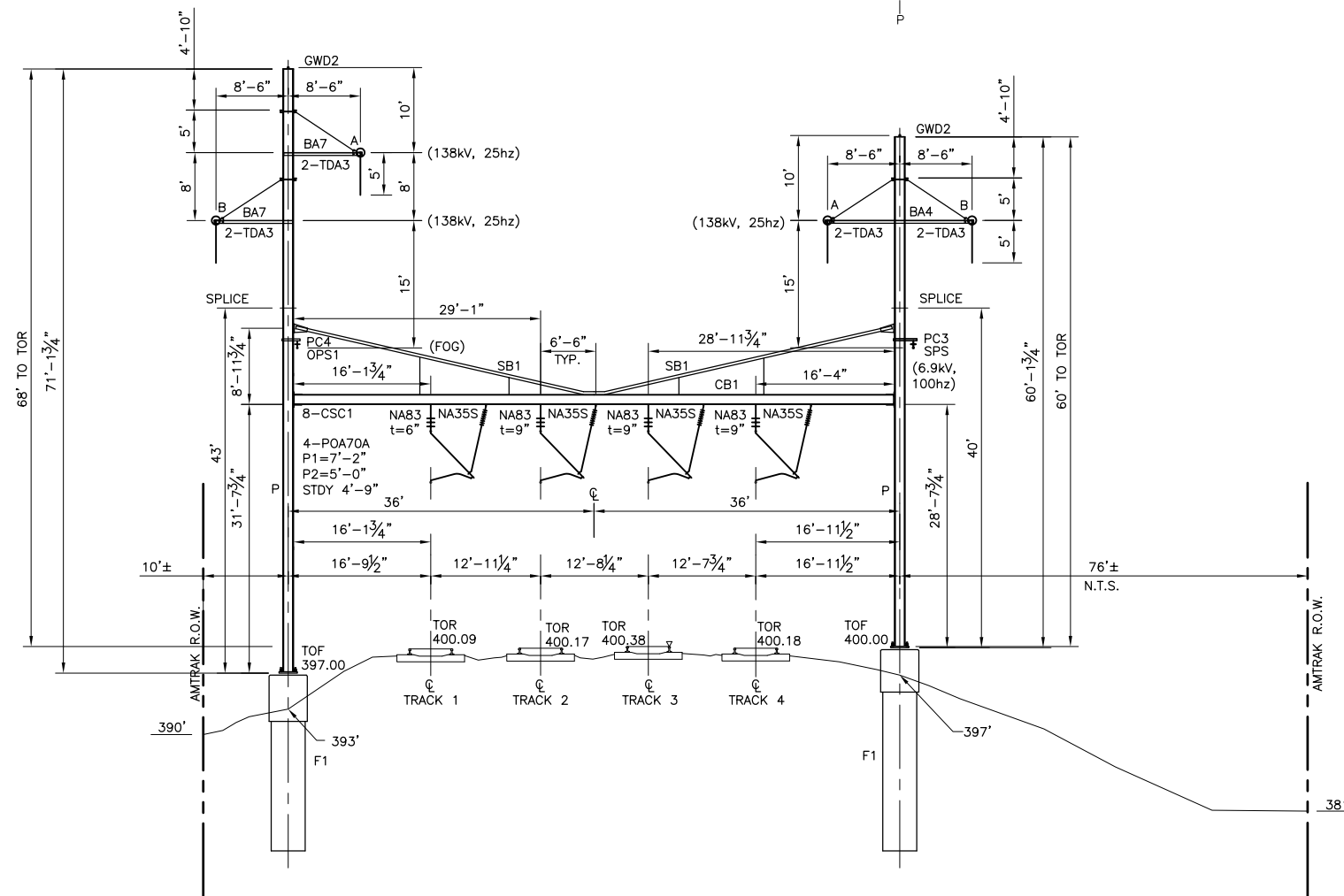
PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-249  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1407.DWG  
 Ref. No.: 2011-059  
 Sheet No: 323 OF 565  
 ET-1407

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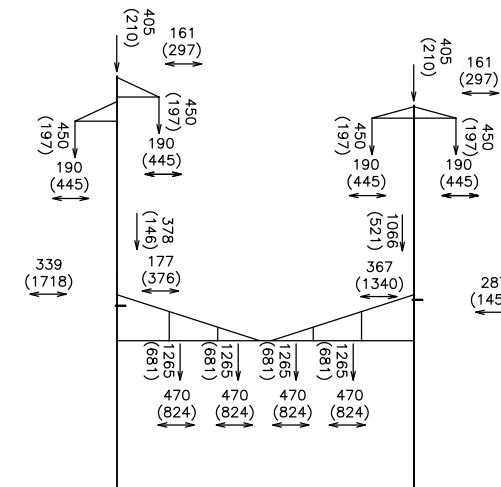
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE DEADEND	ET-1909	2
TDA3	TRANSMISSION WIRE SUPPORT	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4	TRANSMISSION BRACKET - DOUBLE	S-5203	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	25'-7½"	25'-6½"	25'-4"	25'-6½"
CW	19'-7½"	19'-6½"	19'-4"	19'-6½"



STRUCTURE ERECTION DIAGRAM T-248

562+66  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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IN ASSOCIATION WITH



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-248

File No.: 2011-059-ET-1408  
Ref. No.: 2011-059  
Sheet No.: 324 OF 565

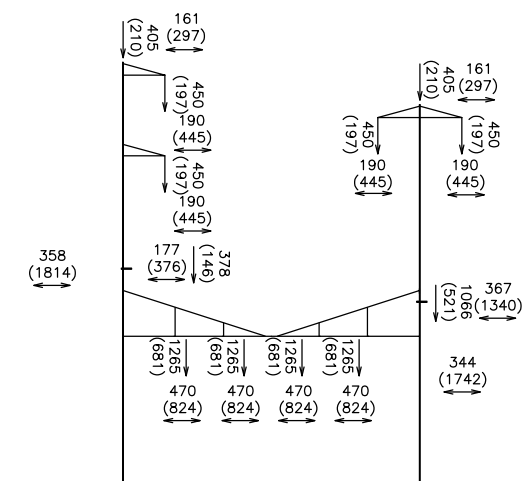
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Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

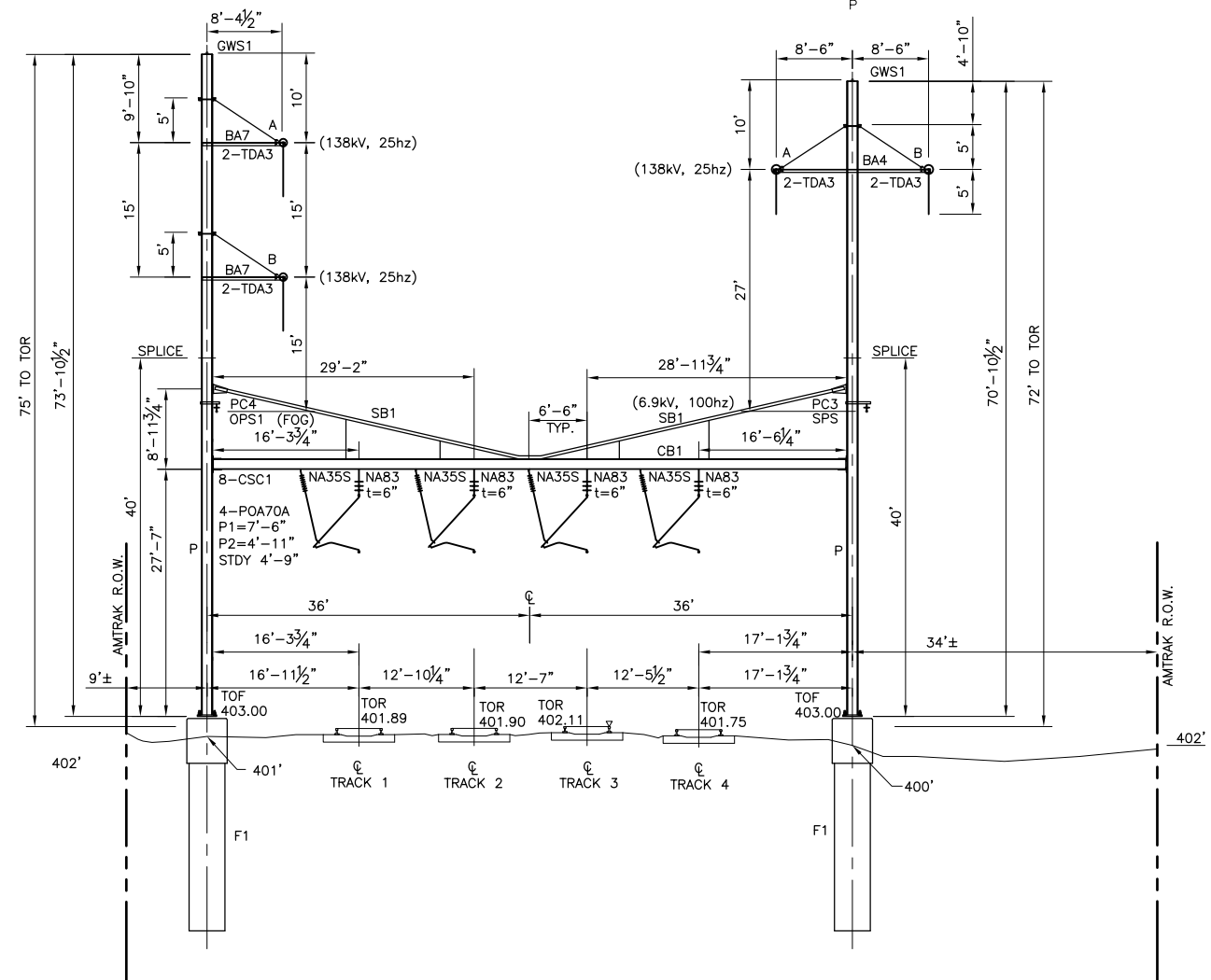
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MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4	TRANSMISSION BRACKET	S-5203	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	8

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	26'-0 1/4"	26'-0"	25'-9 1/2"	26'-1 1/4"
CW	19'-8 3/4"	19'-8 1/2"	19'-6"	19'-10 1/4"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
300' LOAD SPAN  
(NOT TO SCALE)



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

STRUCTURE ERECTION DIAGRAM T-247

559+65  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"

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Engineering  
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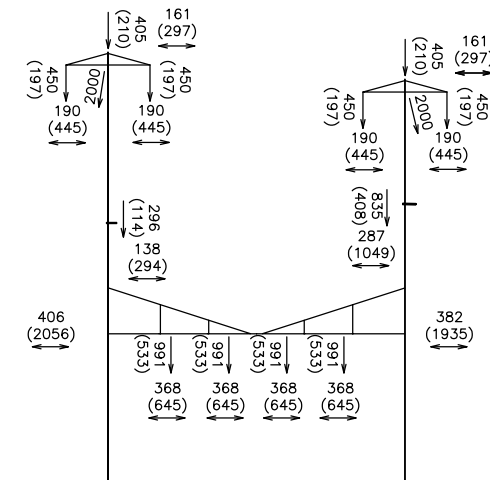


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-247  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1409.DWG
Ref. No.:	2011-059
Sheet No.:	325 OF 565
ET-1409	

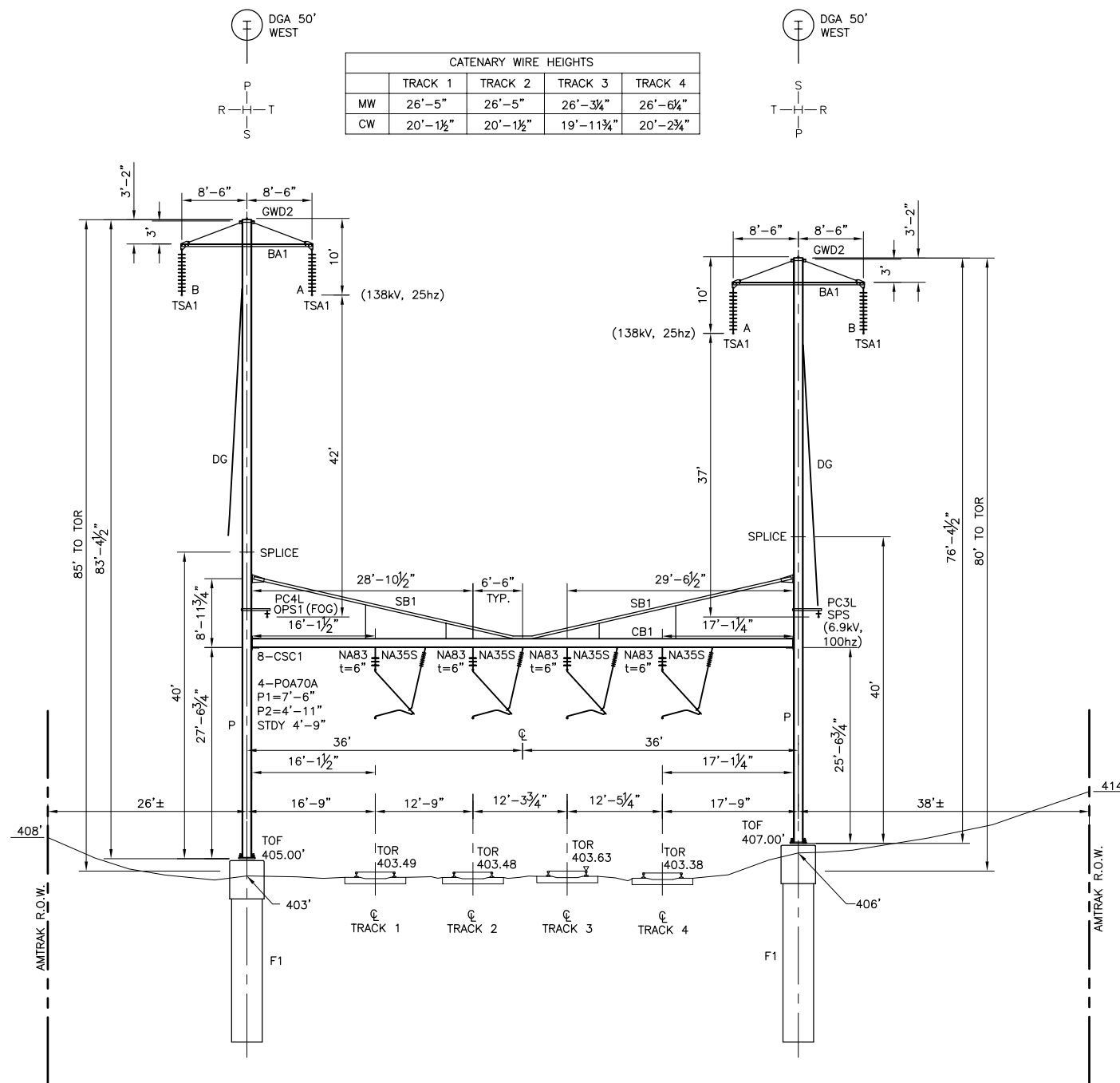
BILL OF MATERIALS

MARK	DESCRIPTION	REF. DWG.	QUANTITY
NAB3	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4
DG	DOWNGUY	ET-1908	2
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
PC3L	SLIDING CLAMP	S-5215	1
PC4L	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	2
DGA	DOWNGUY FOUNDATION	S-5101	2
CSC1	SLIDING BRACKET	S-5214	8



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 300' TRANSMISSION LOAD SPAN  
 235' CATENARY LOAD SPAN  
 (NOT TO SCALE)



STRUCTURE ERECTION DIAGRAM T-246

556+66  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

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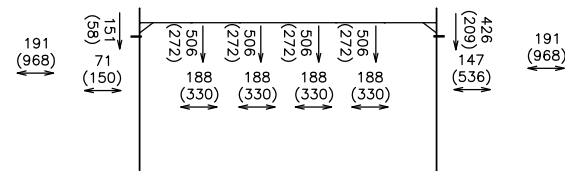


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-246  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1410  
 Ref. No.: 2011-059  
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 ET-1410

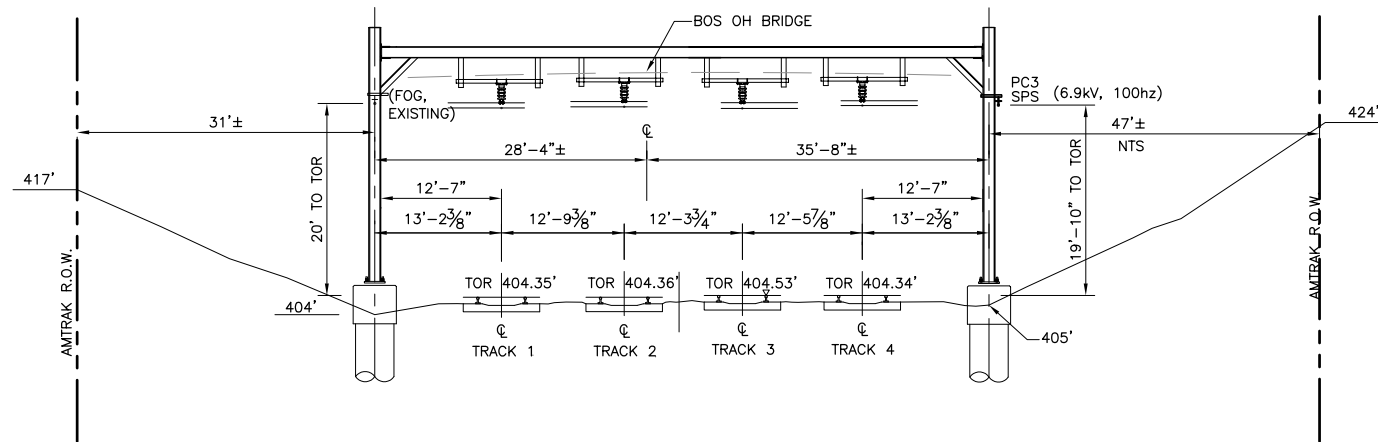


BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC3	SLIDING CLAMP	S-5215	1



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 120' LOAD SPAN  
 (NOT TO SCALE)

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	20'-3"	20'-4½"	20'-1½"	20'-3½"
CW	19'-5½"	19'-10"	19'-6½"	19'-9½"



**STRUCTURE ERECTION DIAGRAM T-245 (EXISTING P101A)**

554+98  
 LOOKING TOWARDS HARRISBURG  
 0 10 20  
 SCALE: 1"=10'-0"

**WORK STATEMENT:**

1. INSTALL SLIDING BRACKET AND SIGNAL POWER ON EXISTING STRUCTURE.

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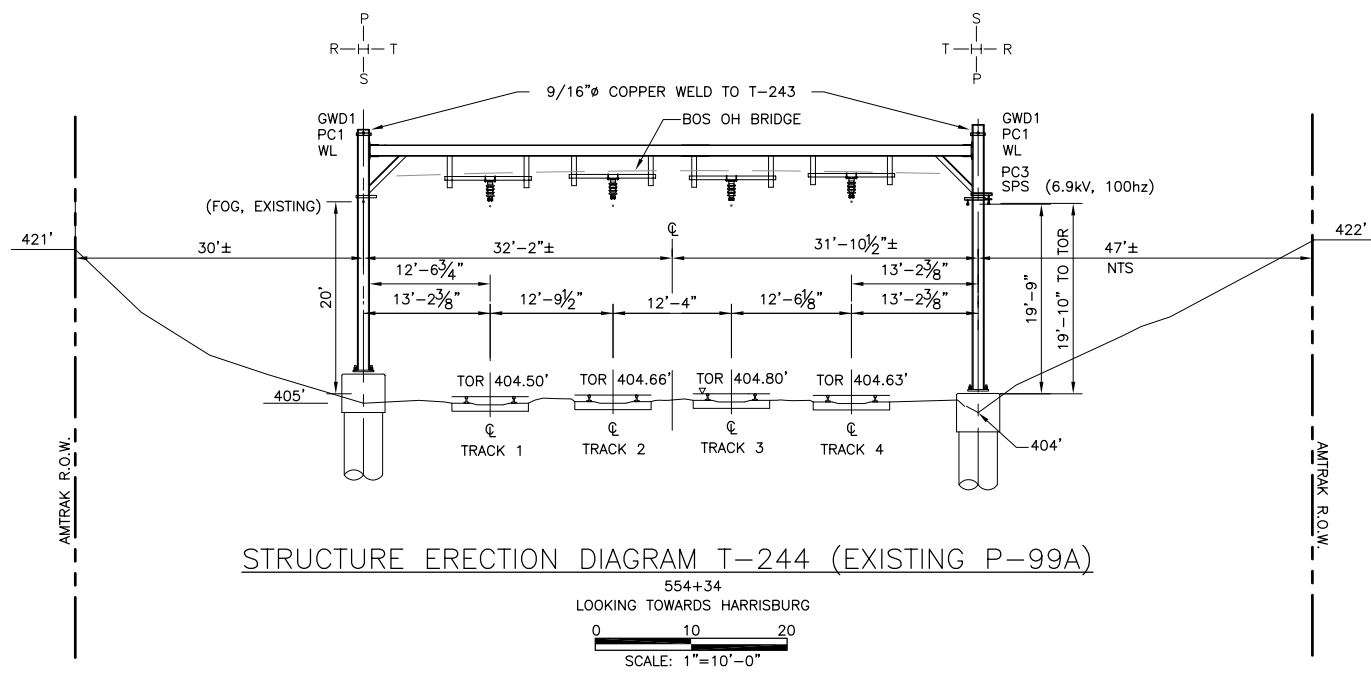


**PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-245 (EXISTING)**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1411  
 Ref. No.: 2011-059  
 Sheet No.: 327 OF 565  
**ET-1411**

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
GWD1	GROUND WIRE ASSEMBLY	ET-1909	2
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC1	SLIDING CLAMP	S-5214	2
PC3	SLIDING CLAMP	S-5215	1
WL	5/8" WIRE LOCK	ET-1915	2
-	9/16"Ø CU-CLAD STEEL	ET-0093	140'

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	20'-6"	20'-5"	20'-3"	20'-6"
CW	19'-10"	19'-7"	19'-7"	20'-0"



STRUCTURE ERECTION DIAGRAM T-244 (EXISTING P-99A)  
 554+34  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

WORK STATEMENT:  
 1. INSTALL SLIDING BRACKET AND SIGNAL POWER ON EXISTING STRUCTURE.

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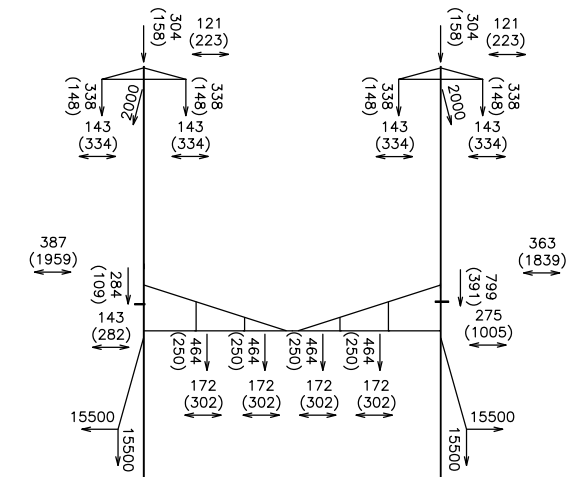
	<b>OFFICE OF Chief Engineer Engineering</b> <small>National Railroad Passenger Corporation 30TH Street Station-Philadelphia, Pennsylvania 19104</small>	<table border="1"> <thead> <tr> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Approved	Date						
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<b>PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-244 (EXISTING)</b>	<table border="1"> <tr> <td>File No.:</td> <td>2011-059-ET-1412.DWG</td> </tr> <tr> <td>Ref. No.:</td> <td>2011-059</td> </tr> <tr> <td>Sheet No.:</td> <td>328 OF 565</td> </tr> </table>	File No.:	2011-059-ET-1412.DWG	Ref. No.:	2011-059	Sheet No.:	328 OF 565
File No.:	2011-059-ET-1412.DWG						
Ref. No.:	2011-059						
Sheet No.:	328 OF 565						
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Recommended: DP	Drawn: WJC	Checked: MJM	Date: 03/17/16				

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-1 3/4"	23'-10 3/4"	23'-10"	24'-0 1/4"
CW	20'-1 3/4"	19'-10 3/4"	19'-10"	20'-0 1/4"

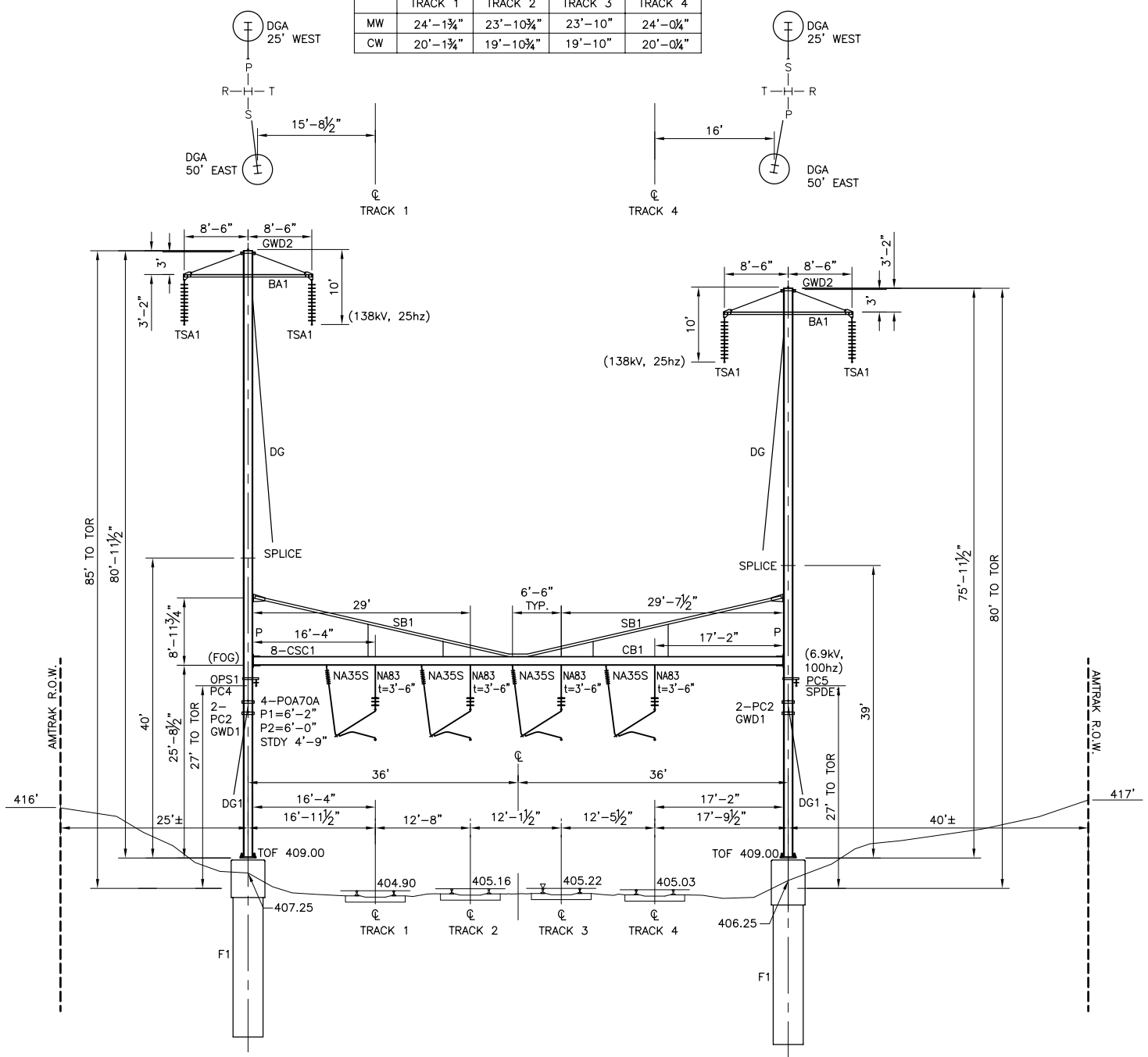
BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	4	
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4	
GWD1	GROUND WIRE ASSEMBLY	ET-1909	2	
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPDE1	SIGNAL POWER DEADEND	ET-1913	1	
POA70A	REGISTRATION ASSEMBLY	ET-1902	4	
DG	DOWN GUY	ET-1908	2	
DG1	DOWN GUY	ET-1908	2	
PC2	SLIDING CLAMP	S-5214	4	
PC4	SLIDING CLAMP	S-5215	1	
PC5	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET -DOUBLE	S-5200	2	
DGA	DOWN GUY FOUNDATION	S-5101	4	
CSC1	SLIDING BRACKET	S-5214	8	



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 225' LOAD SPAN  
 110' CATENARY SPAN  
 (NOT TO SCALE)

**WORK STATEMENT:**

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.



**STRUCTURE ERECTION DIAGRAM T-243**  
 553+66  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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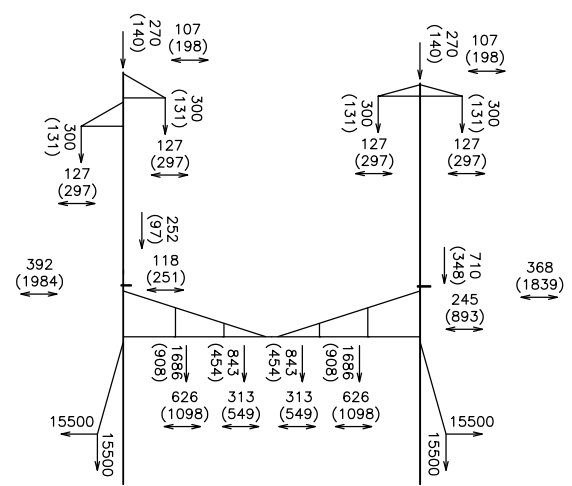
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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-243**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

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<b>ET-1413</b>	

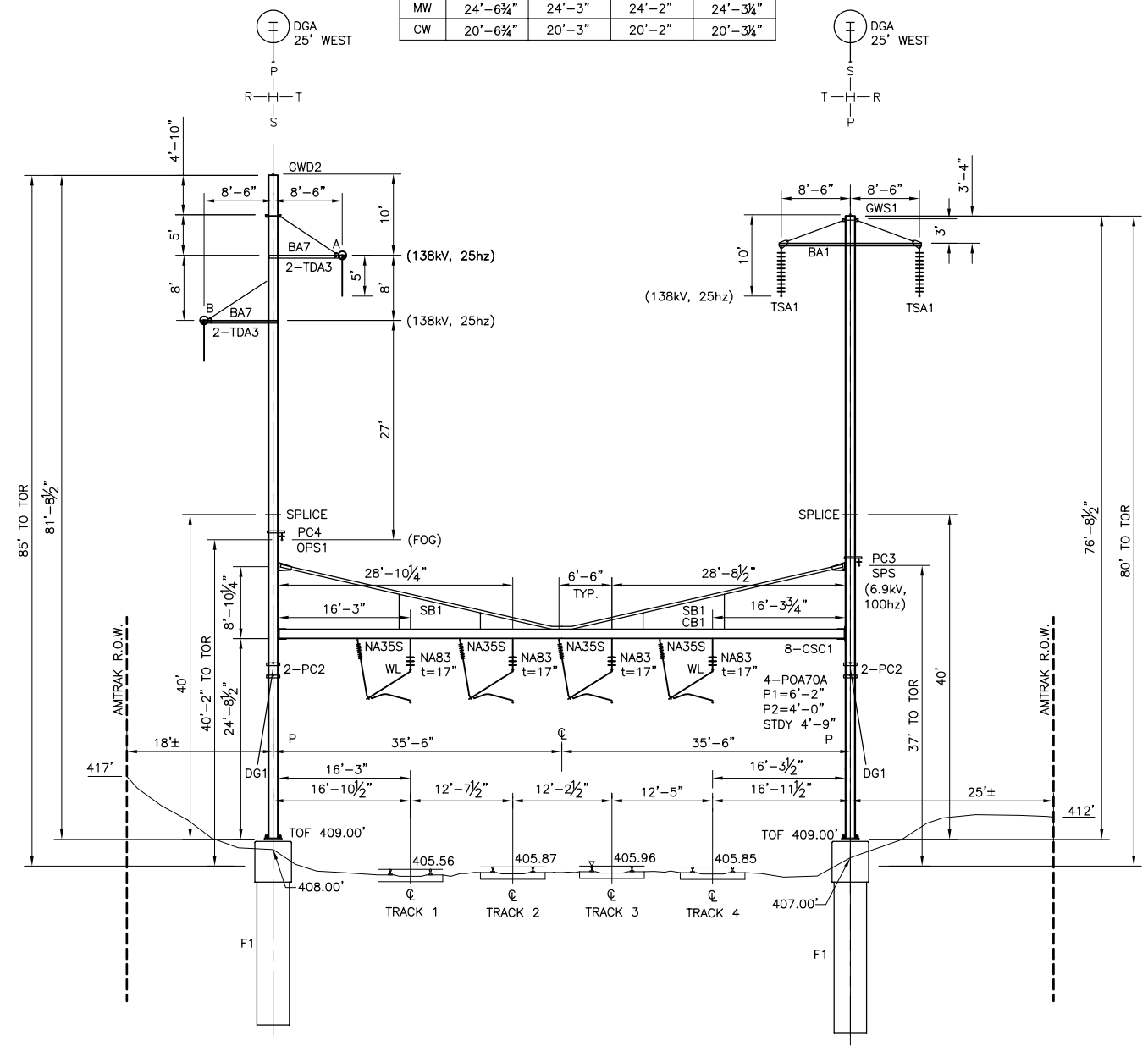
BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	4
NA35S	SYNTHETIC PIPE INSULATOR	ET-1904	4
GWD2	GROUND WIRE ASSEMBLY	ET-1909	1
GWD1	GROUND WIRE DEADEND	ET-1909	1
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
POA70A	REGISTRATION ASSEMBLY	ET-1902	4
DG1	DOWN GUY	ET-1908	2
WL	WIRE LOCK	ET-1915	8
PC2	SLIDING CLAMP	S-5214	4
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA7	TRANSMISSION BRACKET	S-5205	2
DGA	DOWN GUY FOUNDATION	S-5101	2
CSC1	SLIDING BRACKET	S-5214	8



**LOADING DIAGRAM**  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 200' LOAD SPAN  
 (NOT TO SCALE)

- WORK STATEMENT:**
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER CUT SECTION BRACKETS, SWITCHES AND PLATFORMS.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

CATENARY WIRE HEIGHTS				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
MW	24'-6 3/4"	24'-3"	24'-2"	24'-3 1/4"
CW	20'-6 3/4"	20'-3"	20'-2"	20'-3 1/4"



**STRUCTURE ERECTION DIAGRAM T-242**  
 552+16  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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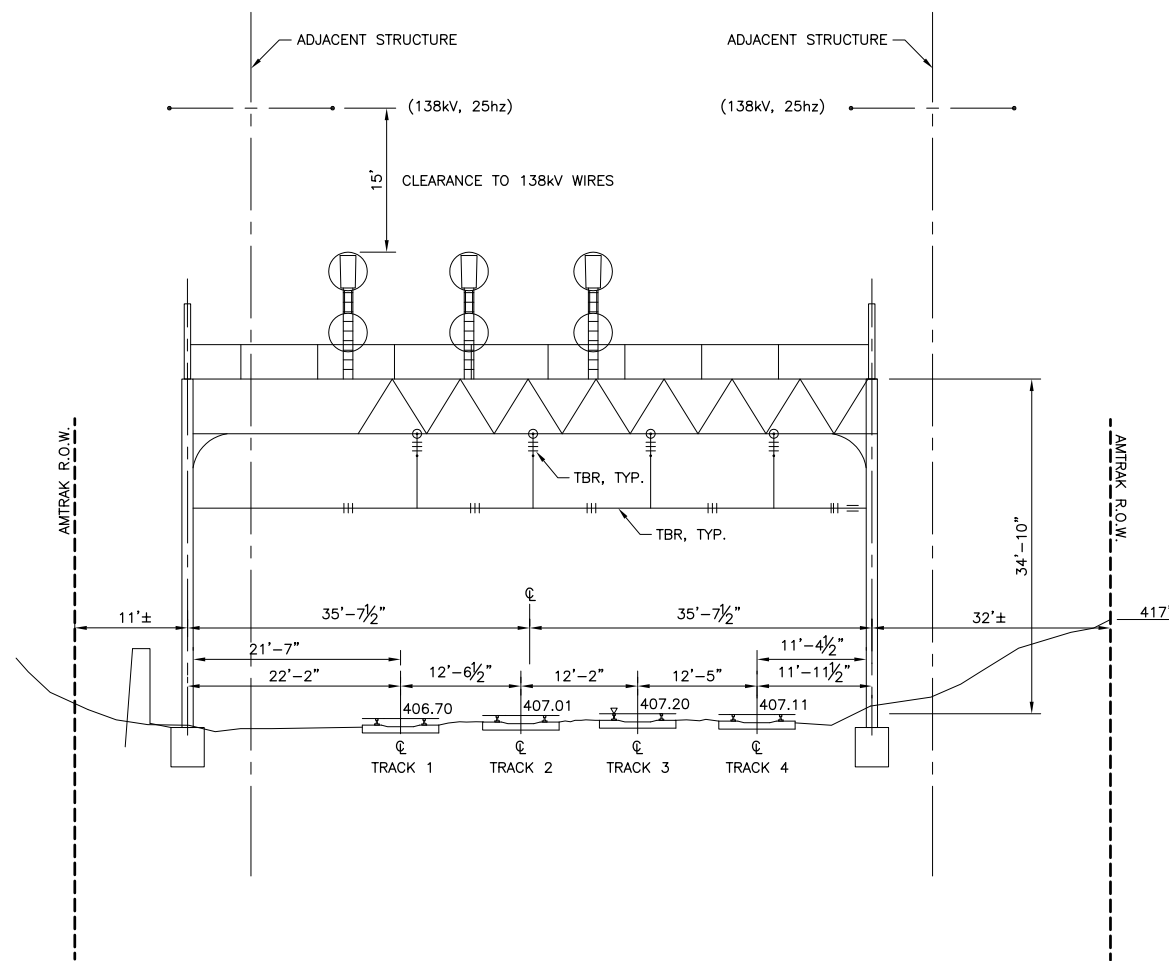
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**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION STRUCTURAL ERECTION DIAGRAM T-242**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1414  
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**WORK STATEMENT:**

1. GROUND STRUCTURE.
2. REMOVE CATENARY SUPPORTS.

STRUCTURE ERECTION DIAGRAM T-241SB (EXISTING P-98SB)

550+07  
LOOKING TOWARDS HARRISBURG  
0 10 20  
SCALE: 1"=10'-0"

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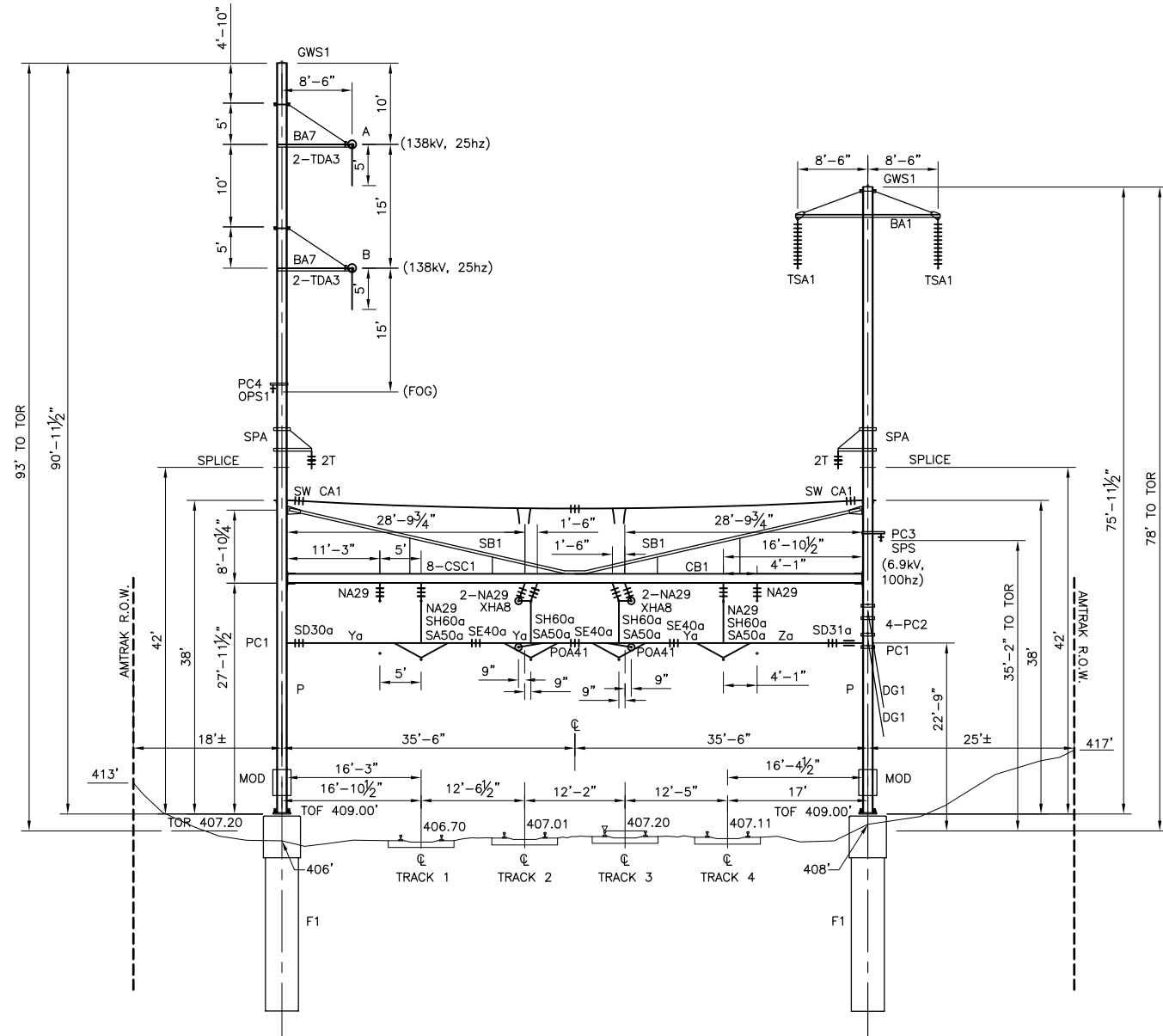
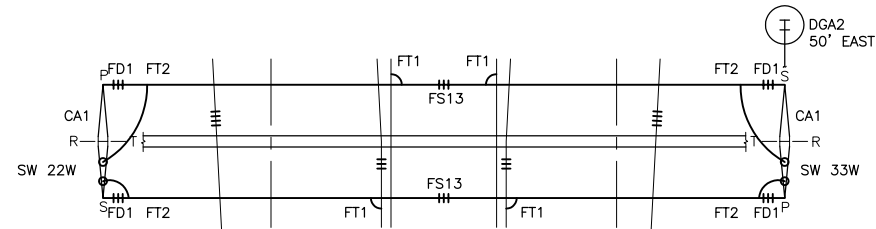
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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-241 SB (P-98 SB)**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

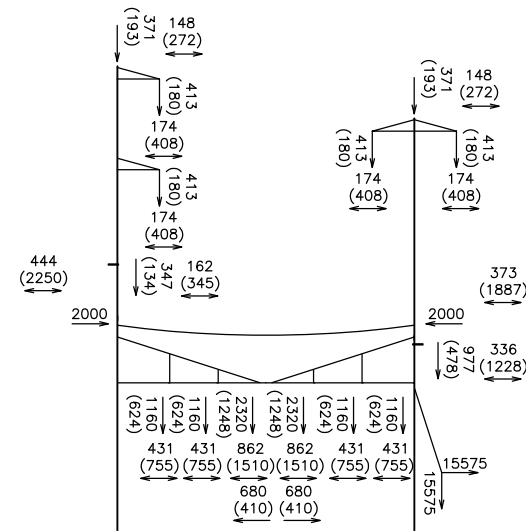
File No.:	2011-059-ET-1415.DWG
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CATENARY WIRE HEIGHTS								
	W/R A OOR	TRACK 1	TRACK 2 OOR	TRACK 2	TRACK 3	TRACK 3 OOR	TRACK 4	W/R B OOR
MW	28'-4 1/4"	28'-4 1/4"	28'-0 1/2"	28'-0 1/2"	27'-10"	27'-10"	27'-11 1/4"	27'-11 1/4"
CW	22'-0"	21'-3 1/4"	22'-5 1/4"	20'-11 1/4"	20'-9"	22'-3"	20'-10"	21'-7"



STRUCTURE ERECTION DIAGRAM T-240

549+86  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
275' LOAD SPAN  
(NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2	
TDA3	TRANSMISSION WIRE SUPPORT	ET-1800	4	
XHA8	SPREADER ASSEMBLY	ET-1901	2	
NA29	MESSENGER SUPPORT	ET-1904	8	
SD30a	STEADY SPAN ASSEMBLY	ET-1914	1	
SD31a	STEADY SPAN ASSEMBLY	ET-1914	1	
SE40a	STEADY SPAN ASSEMBLY	ET-1914	3	
Ya	STEADY SPAN ASSEMBLY	ET-1914	3	
Za	STEADY SPAN ASSEMBLY	ET-1914	1	
SH60a	STEADY SPAN HANGER	ET-1914	4	
SA50a	REGISTRATION ASSEMBLY	ET-1914	4	
POA41	PULL OFF ASSEMBLY	ET-1914	2	
OP51	FOG WIRE SUPPORT	ET-1906	1	
DG1	DOWN GUY	ET-1908	2	
2T	FEEDER SUPPORT	ET-1908	4	
FD1	FEEDER DEADEND	ET-1908	4	
FS13	FEEDER INSULATOR	ET-1908	2	
FT1	FEEDER TAP	ET-1908	4	
FT2	FEEDER TAP	ET-1908	4	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
SW	DISCONNECT SWITCH	ET-1910	2	
MOD	MOTOR OPERATOR	ET-1910	2	
PC1	SLIDING CLAMP	S-5214	2	
PC2	SLIDING CLAMP	S-5214	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET	S-5200	1	
BA7	TRANSMISSION BRACKET	S-5205	1	
DGA2	DOWN GUY FOUNDATION	S-5101	1	
CSC1	SLIDING BRACKET	S-5214	8	
SPA	SPIDER ARM	S-5213	2	
CA1	FEEDER CROSS ARM	S-5212	2	

WORK STATEMENT:

- INSTALL FOUNDATIONS.
- INSTALL POLES, CROSS BEAM AND SAG BRACES.
- INSTALL TRANSMISSION BRACKETS.
- INSTALL SIGNAL POWER SUPPORT BRACKET.
- INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
- TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
- INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
- TRANSFER CATENARY WIRES TO NEW STRUCTURE.
- ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
- DEMO OLD CAT POLES AND FOUNDATIONS.

NOTE:

- BRYN MAWR INTERLOCKING WILL BE RETIRED ONCE VILLA AND NOVA INTERLOCKINGS ARE BUILT.

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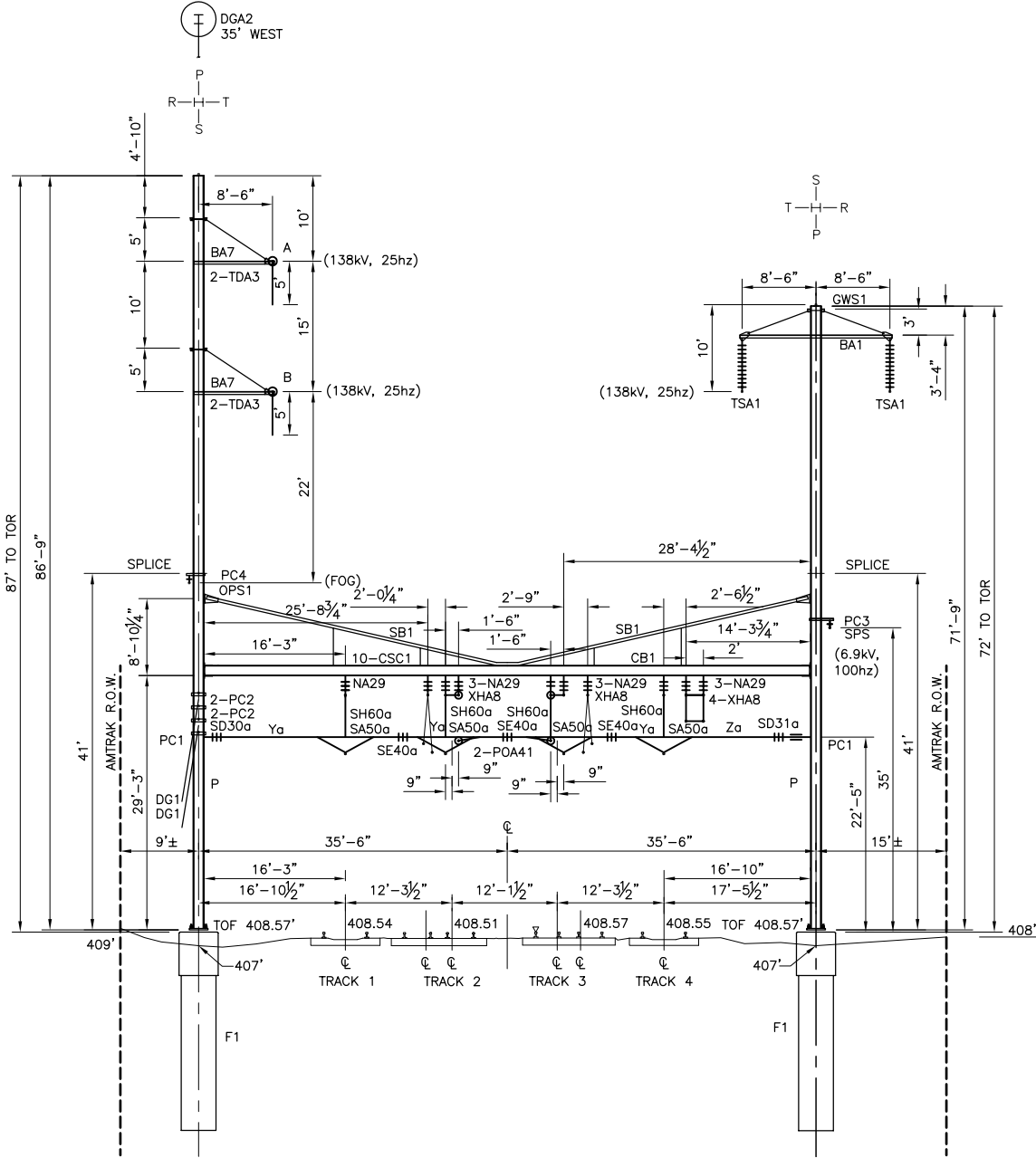


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-240  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

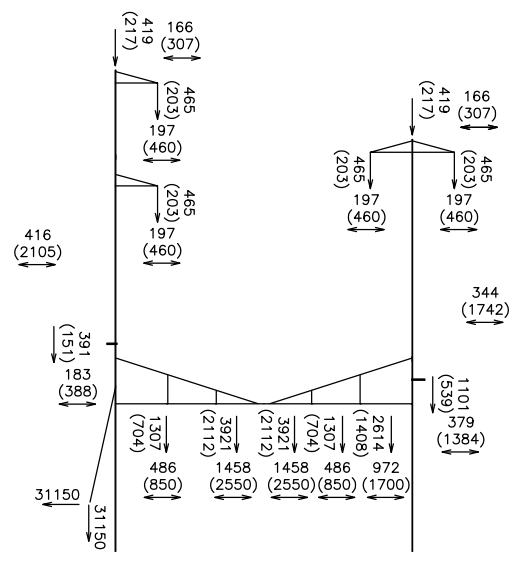
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CATENARY WIRE HEIGHTS										
	TRACK 1	X/O W/R A	TRACK 2	TRACK 2 OOR	TRACK 3	TRACK 3 OOR	X/O W/R B	TRACK 4	W/R C OOR	W/R 4B OOR
MW	27'-3 1/4"	27'-3 1/4"	27'-3 1/4"	27'-3 1/4"	27'-3"	27'-3"	27'-3"	27'-3 1/4"	27'-3 1/4"	27'-3 1/4"
CW	20'-6 1/4"	20'-8 3/4"	20'-6 3/4"	22'-0 3/4"	22'-0"	20'-6"	20'-8"	20'-6 1/4"	24'-3 1/4"	24'-3 1/4"



STRUCTURE ERECTION DIAGRAM T-239  
546+86  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM  
1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
310' LOAD SPAN  
(NOT TO SCALE)

BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA29	MESSENGER SUPPORT	ET-1904	10	
SD30a	STEADY SPAN ASSEMBLY	ET-1914	1	
SD31a	STEADY SPAN ASSEMBLY	ET-1914	1	
SE40a	STEADY SPAN ASSEMBLY	ET-1914	3	
Ya	STEADY SPAN ASSEMBLY	ET-1914	3	
Za	STEADY SPAN ASSEMBLY	ET-1914	1	
SH60a	STEADY SPAN HANGER	ET-1914	4	
SA50a	REGISTRATION ASSEMBLY	ET-1914	4	
POA41	PULL OFF ASSEMBLY	ET-1914	2	
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2	
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2	
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4	
OPS1	FOG WIRE SUPPORT	ET-1906	1	
SPS	SIGNAL POWER SUPPORT	ET-1913	1	
XHAB	SPREADER ASSEMBLY	ET-1901	6	
DG1	DOWN GUY	ET-1908	2	
PC1	SLIDING CLAMP	S-5214	2	
PC2	SLIDING CLAMP	S-5214	4	
PC3	SLIDING CLAMP	S-5215	1	
PC4	SLIDING CLAMP	S-5215	1	
P	POLE	S-5103	2	
F1	FOUNDATION	S-5102	2	
SB1	SAG BRACE	S-5105	2	
CB1	CROSS BEAM	S-5104	1	
BA1	TRANSMISSION BRACKET	S-5200	1	
BA7	TRANSMISSION BRACKET	S-5205	1	
DGA2	DOWN GUY FOUNDATION -DOUBLE	S-5101	1	
CSC1	SLIDING BRACKET	S-5214	10	

NOTE:  
1. BRYN MAWR INTERLOCKING WILL BE RETIRED ONCE VILLA AND NOVA INTERLOCKINGS ARE BUILT.

- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL TRANSMISSION BRACKETS.
  4. INSTALL SIGNAL POWER SUPPORT BRACKET.
  5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
  6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
  7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

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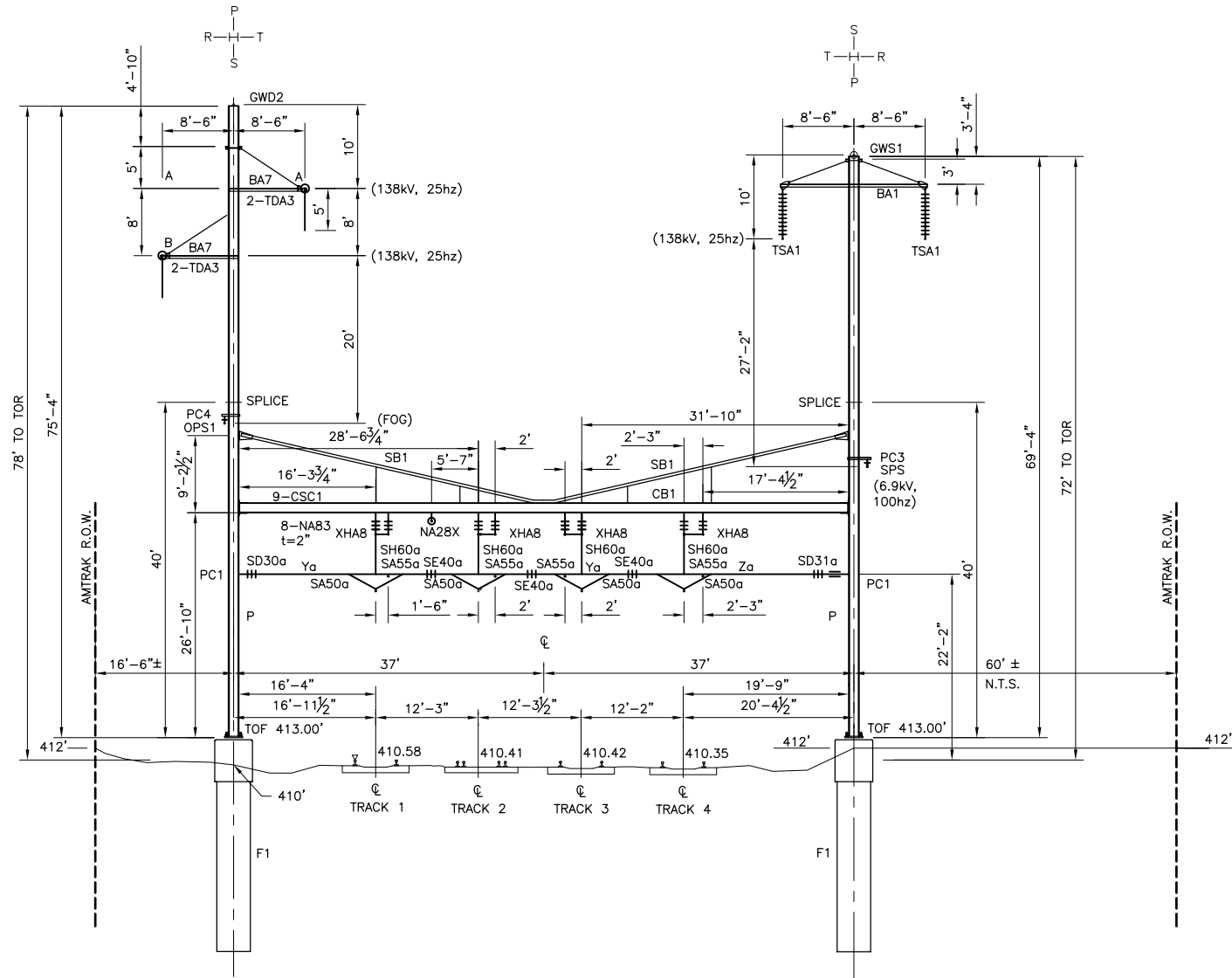
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-239  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

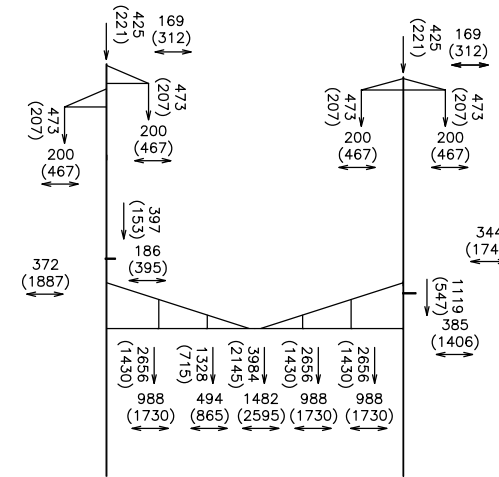
File No.: 2011-059-ET-1417.DWG  
Ref. No.: 2011-059  
Sheet No.: 333 OF 565  
ET-1417

CATENARY WIRE HEIGHTS										
	TRACK 1	TRACK 1 OOR	W/R D OOR	TRACK 2	X/O W/R C	W/R A OOR	W/R B OOR	TRACK 3	TRACK 4	W/R 4B OOR
MW	26'-11"	26'-11"	28'-6"	27'-1"	27'-1"	27'-1"	27'-1"	27'-1"	27'-1 3/4"	27'-1 3/4"
CW	20'-2"	21'-11"	-	20'-4"	20'-5"	22'-1"	22'-1"	20'-4"	20'-4 3/4"	22'-1 3/4"



STRUCTURE ERECTION DIAGRAM T-238

543+76  
LOOKING TOWARDS HARRISBURG  
SCALE: 1"=10'-0"



LOADING DIAGRAM

1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
315' LOAD SPAN  
(NOT TO SCALE)

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	8
NA28X	MESSENGER SUPPORT	ET-1918	1
SD30a	STEADY SPAN ASSEMBLY	ET-1914	1
SD31a	STEADY SPAN ASSEMBLY	ET-1914	1
SE40a	STEADY SPAN ASSEMBLY	ET-1914	3
Ya	STEADY SPAN ASSEMBLY	ET-1914	3
Za	STEADY SPAN ASSEMBLY	ET-1914	1
SH60a	STEADY SPAN HANGER	ET-1914	4
SA50a	REGISTRATION ASSEMBLY	ET-1914	4
SA55a	REGISTRATION CLAMP	ET-1903	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	1
GWD2	GROUND WIRE ASSEMBLY	ET-1909	1
TSA1	TRANSMISSION WIRE SUPPORT	ET-1800	2
TDA3	TRANSMISSION WIRE DEADEND	ET-1800	4
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
XHA8	SPREADER ASSEMBLY	ET-1901	4
PC1	SLIDING CLAMP	S-5214	2
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA1	TRANSMISSION BRACKET	S-5200	1
BA7	TRANSMISSION BRACKET	S-5205	2
CSC1	SLIDING BRACKET	S-5214	9

WORK STATEMENT:

- INSTALL FOUNDATIONS.
- INSTALL POLES, CROSS BEAM AND SAG BRACES.
- INSTALL TRANSMISSION BRACKETS.
- INSTALL SIGNAL POWER SUPPORT BRACKET.
- INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
- TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
- INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
- TRANSFER CATENARY WIRES TO NEW STRUCTURE.
- ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
- DEMO OLD CAT POLES AND FOUNDATIONS.

NOTE:

- BRYN MAWR INTERLOCKING WILL BE RETIRED ONCE VILLA AND NOVA INTERLOCKINGS ARE BUILT.

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30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



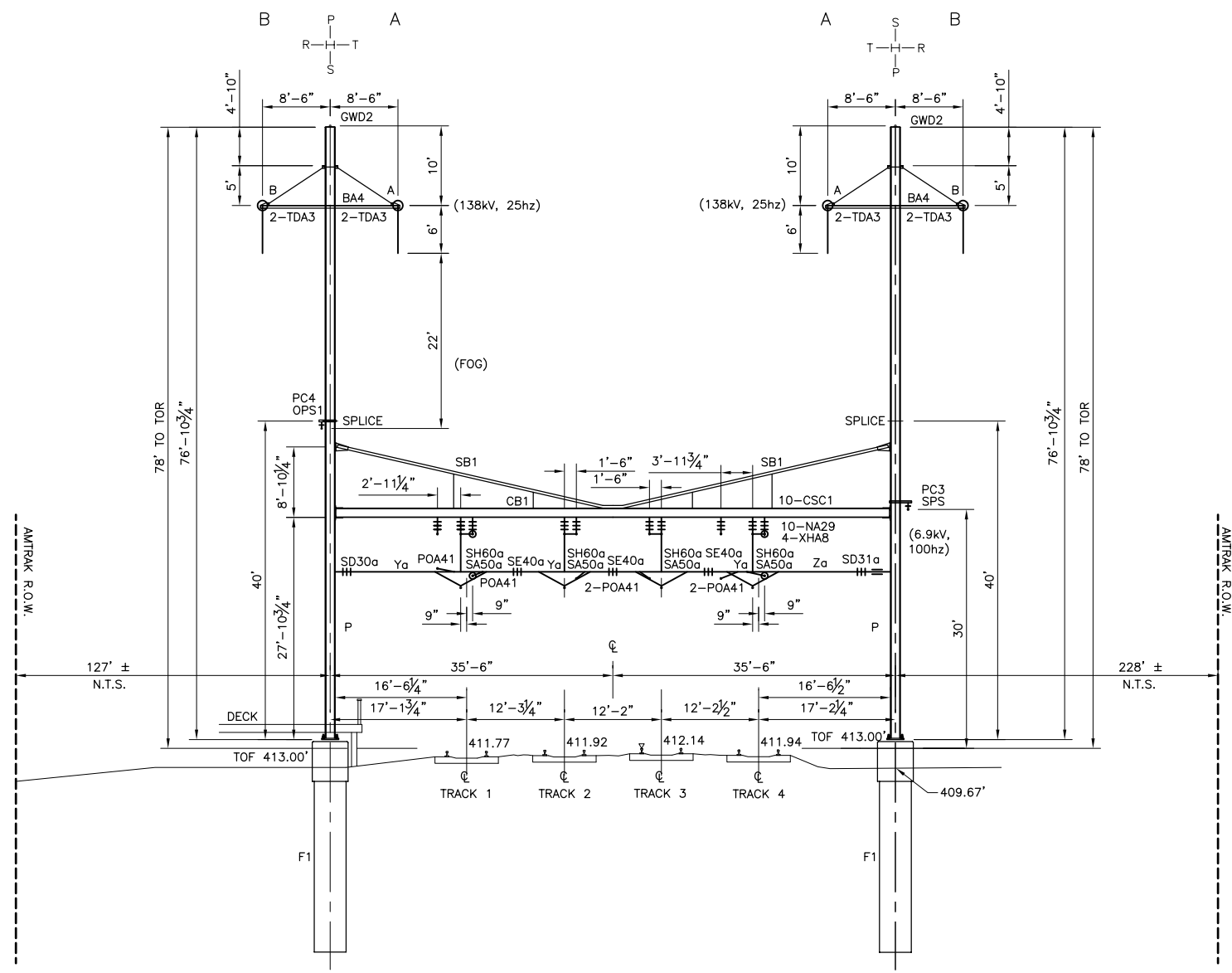
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
STRUCTURAL ERECTION DIAGRAM  
T-238  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1418
Ref. No.:	2011-059
Sheet No.:	334 OF 565
ET-1418	

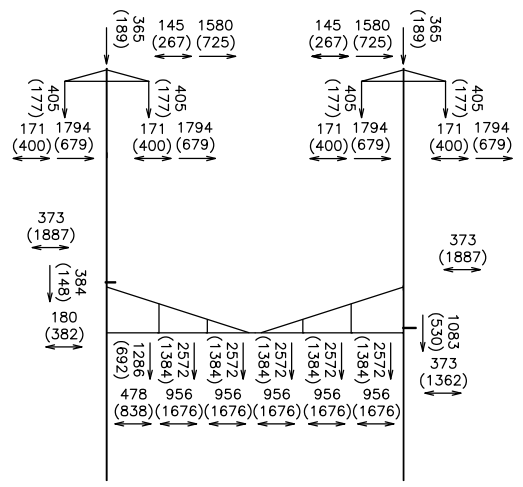
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CATENARY WIRE HEIGHTS										
	W/R C OOR	TRACK 1	TRACK 1 OOR	TRACK 2	W/R A OOR	W/R B OOR	TRACK 3	W/R D OOR	TRACK 4	TRACK 4 OOR
MW	27'-3 1/2"	27'-3 1/2"	27'-3 1/2"	27'-1 3/4"	27'-1 3/4"	26'-11"	26'-11"	26'-11"	27'-1 1/2"	27'-1 1/2"
CW	22'-1 1/2"	20'-6 1/2"	22'-0 1/2"	20'-4 3/4"	21'-6 3/4"	21'-4"	20'-2"	21'-4"	20'-4 1/2"	21'-10 1/2"



STRUCTURE ERECTION DIAGRAM T-237  
 540+56  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 270' LOAD SPAN TRANSMISSION AND STATIC  
 305' LOAD SPAN SIGNAL POWER, FOG AND CATENARY  
 (NOT TO SCALE)

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA29	MESSENGER SUPPORT	ET-1904	10
SD30a	STEADY SPAN ASSEMBLY	ET-1914	1
SD31a	STEADY SPAN ASSEMBLY	ET-1914	1
SE40a	STEADY SPAN ASSEMBLY	ET-1914	3
Ya	STEADY SPAN ASSEMBLY	ET-1914	3
Za	STEADY SPAN ASSEMBLY	ET-1914	1
SH60a	STEADY SPAN HANGER	ET-1914	4
SA50a	REGISTRATION ASSEMBLY	ET-1914	4
POA41	PULL OFF ASSEMBLY	ET-1914	6
GWD2	GROUND WIRE ASSEMBLY	ET-1909	2
TDA3	TRANSMISSION WIRE SUPPORT	ET-1800	8
OPS1	FOG WIRE SUPPORT	ET-1906	1
SPS	SIGNAL POWER SUPPORT	ET-1913	1
PC1	SLIDING CLAMP	S-5214	2
PC3	SLIDING CLAMP	S-5215	1
PC4	SLIDING CLAMP	S-5215	1
P	POLE	S-5103	2
F1	FOUNDATION	S-5102	2
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
BA4	TRANSMISSION BRACKET -DOUBLE	S-5203	2
CSC1	SLIDING BRACKET	S-5214	10

WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL TRANSMISSION BRACKETS.
4. INSTALL SIGNAL POWER SUPPORT BRACKET.
5. INSTALL STATIC, TRANSMISSION AND INSULATED SIGNAL POWER WIRES.
6. TRANSFER FOG AND EXISTING INSULATED SIGNAL POWER WIRES TO NEW STRUCTURE.
7. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
8. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

NOTE:

1. BRYN MAWR INTERLOCKING WILL BE RETIRED ONCE VILLA AND NOVA INTERLOCKINGS ARE BUILT.

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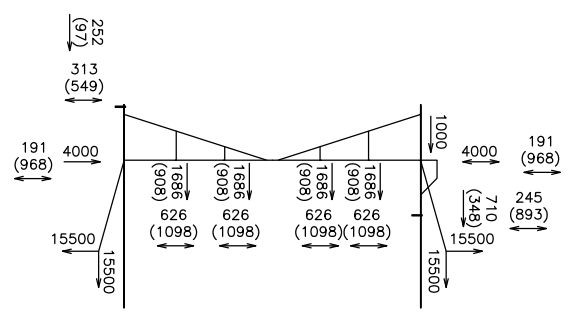


PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-237  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

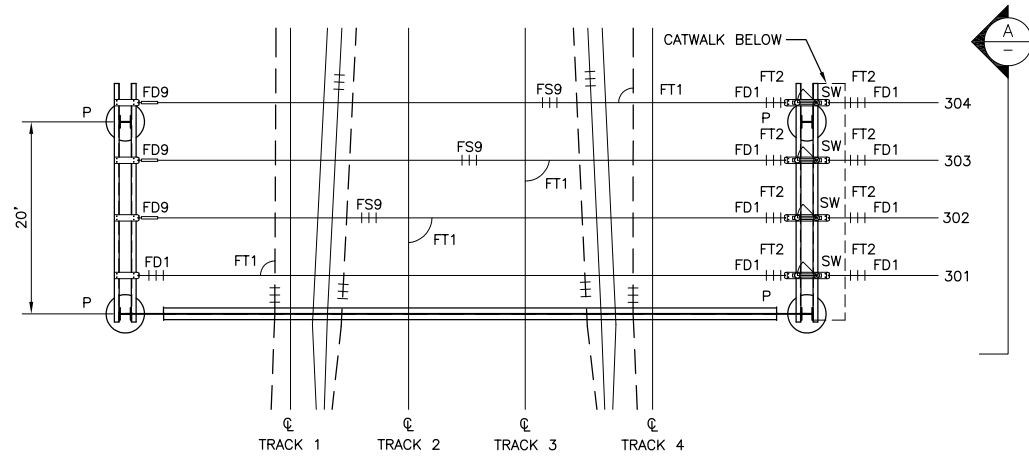
File No.:	2011-059-ET-1419.DWG
Ref. No.:	2011-059
Sheet No.:	335 OF 565
ET-1419	

STRUCTURE IS INCLUDED IN BRYN MAWR CONTRACT

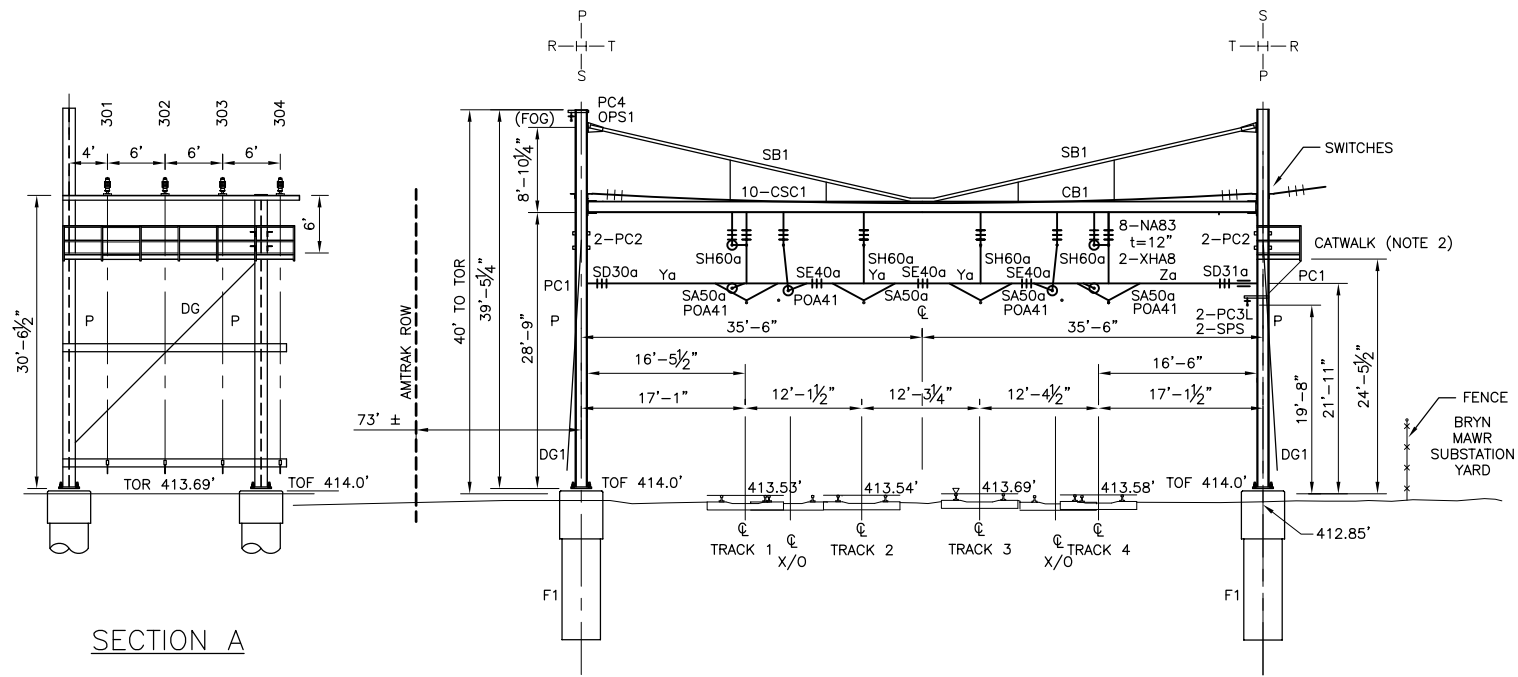
CATENARY WIRE HEIGHTS										
	TRACK 1	TRACK 1A	X/O A	X/O B	TRACK 2	TRACK 3	X/O C	X/O D	TRACK 4	TRACK 4A
MW	26'-1"	26'-1"	26'-1"	26'-1"	26'-0 3/4"	25'-11"	26'-1 1/4"	26'-1 1/4"	26'-0 1/4"	26'-0 1/4"
CW	21'-7"	20'-1"	20'-4"	21'-4"	20'-0 3/4"	19'-11"	21'-4 1/4"	21'-0 1/4"	21'-6 1/4"	20'-0 1/4"



LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 200' LOAD SPAN  
 (NOT TO SCALE)



BILL OF MATERIALS				
MARK	DESCRIPTION	REF. DWG.	QUANTITY	
NA83	MESSENGER SUPPORT	ET-1904	ET	8
SD30a	STEADY SPAN ASSEMBLY	ET-1914	ET	1
SD31a	STEADY SPAN ASSEMBLY	ET-1914	ET	1
SE40a	STEADY SPAN ASSEMBLY	ET-1914	ET	3
Ya	STEADY SPAN ASSEMBLY	ET-1914	ET	3
Za	STEADY SPAN ASSEMBLY	ET-1914	ET	1
SH60a	STEADY SPAN HANGER	ET-1914	ET	4
SA50a	REGISTRATION ASSEMBLY	ET-1914	ET	4
POA41	PULL OFF ASSEMBLY	ET-1914	ET	4
GWS1	GROUND WIRE ASSEMBLY	ET-1909	ET	2
SPS	SIGNAL POWER SUPPORT	ET-1915	ET	2
OPS1	FOG WIRE SUPPORT	ET-1906	ET	1
FD1	FEEDER DEADEND	ET-1907	ET	9
FD9	FEEDER DEADEND	ET-1907	ET	3
FS9	FEEDER DEADEND	ET-1907	ET	3
FT1	FEEDER TAP	ET-1907	ET	4
FT2	FEEDER TAP	ET-1907	ET	8
SW	DISCONNECT SWITCH	ET-1910	ET	4
MOD	MOTOR OPERATOR	ET-1910	ET	4
HAN	HAND OPERATOR	ET-1910	ET	4
DG1	DOWN GUY	ET-1908	ET	2
P	POLE	S-5103	S	4
F1	FOUNDATION	S-5102	S	4
SB1	SAG BRACE	S-5105	S	2
CB1	CROSS BEAM	S-5104	S	1
PC1	SLIDING CLAMP	S-5214	S	2
PC3L	SLIDING CLAMP	S-5215	S	2
PC4	SLIDING CLAMP	S-5215	S	1
CSC1	SLIDING BRACKETS	S-5214	S	8
DGA	DOWNGUY ANCHOR	S-5101	S	2



- WORK STATEMENT:
1. INSTALL FOUNDATIONS.
  2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
  3. INSTALL SWITCH STRUCTURE, CATWALK AND DISCONNECT SWITCHES.
  4. TRANSFER FOG WIRE TO NEW STRUCTURE.
  5. INSTALL SIGNAL POWER WIRE.
  6. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
  7. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
  8. INSTALL CROSS TRACK FEEDERS AND TAPS TO CATENARY.
  9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
  10. DEMO OLD CAT POLES AND FOUNDATIONS.

- NOTES:
1. BRYN MAWR INTERLOCKING WILL BE RETIRED ONCE VILLA AND NOVA INTERLOCKINGS ARE BUILT.
  2. SEE DRAWING S-5107 FOR CATWALK STEEL DETAILS.
  3. SEE DRAWING S-5238 FOR DEADEND PLATES AND SWITCH MOUNTING DETAILS.

STRUCTURE ERECTION DIAGRAM T-236

537+66  
 LOOKING TOWARDS HARRISBURG  
 SCALE: 1"=10'-0"

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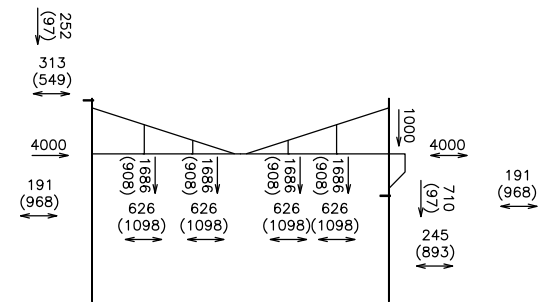
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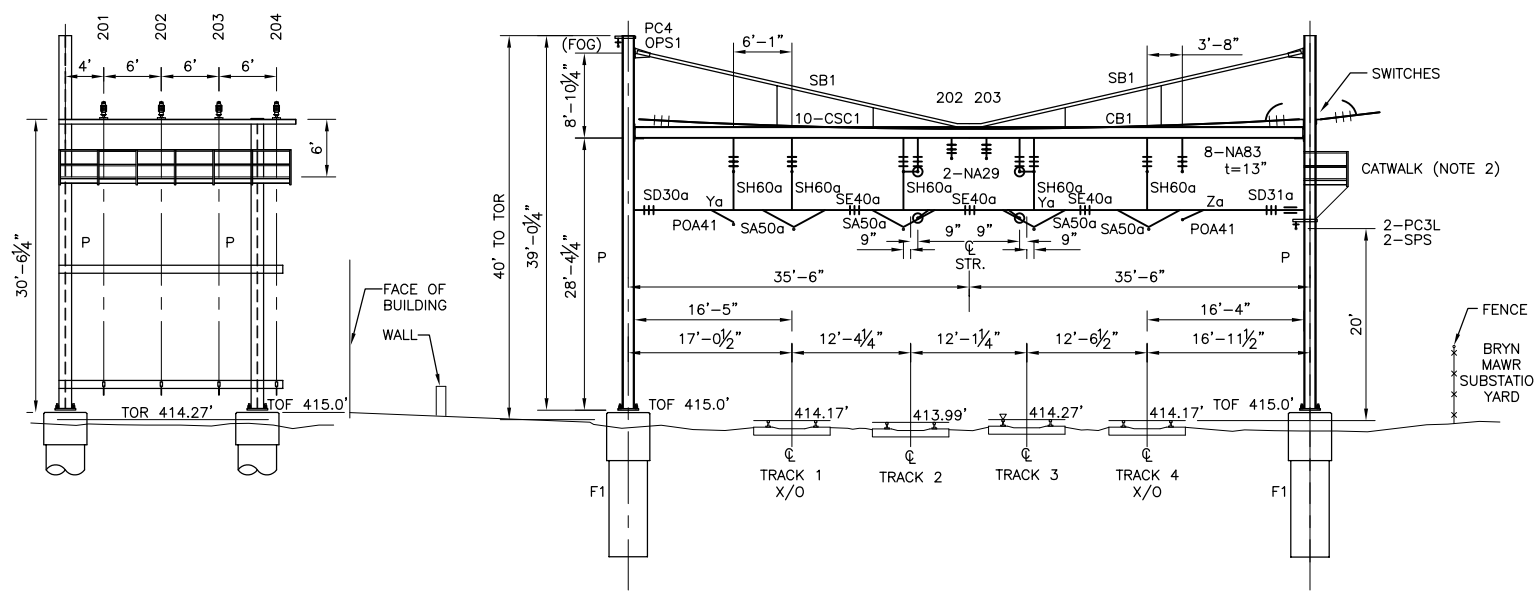
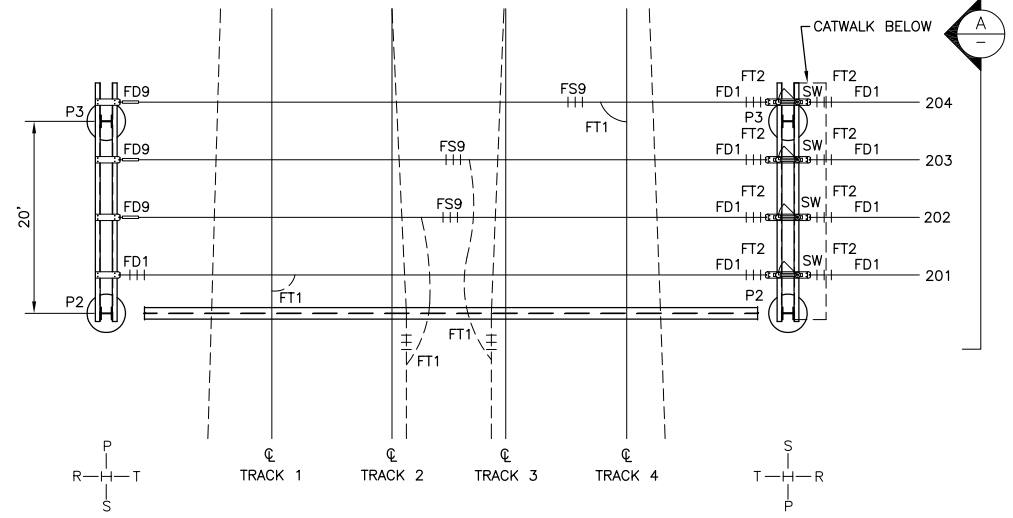
PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-236  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1420  
 Ref. No.: 2011-059  
 Sheet No: 336 OF 565  
 ET-1420

STRUCTURE IS INCLUDED IN BRYN MAWR CONTRACT



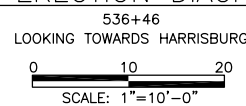
LOADING DIAGRAM  
 1/2" RADIAL ICE, 40 MPH WIND, (90 MPH WIND, 60°F)  
 200' LOAD SPAN  
 (NOT TO SCALE)



SECTION A

CATENARY WIRE HEIGHTS								
	TRACK 1A	TRACK 1	TRACK 2	TRACK 2A	TRACK 3A	TRACK 3	TRACK 4	TRACK 4A
MW	25'-11 1/4"	25'-11 1/4"	26'-1 1/4"	26'-1 1/4"	25'-10"	25'-10"	25'-11 1/4"	25'-11 1/4"
CW	20'-5 1/4"	19'-11 1/4"	20'-1 1/4"	21'-3 1/4"	21'-0"	19'-10"	19'-11 1/4"	20'-11 1/4"

STRUCTURE ERECTION DIAGRAM T-235



WORK STATEMENT:

1. INSTALL FOUNDATIONS.
2. INSTALL POLES, CROSS BEAM AND SAG BRACES.
3. INSTALL SWITCH STRUCTURE, CATWALK AND DISCONNECT SWITCHES.
4. TRANSFER FOG WIRE TO NEW STRUCTURE.
5. INSTALL SIGNAL POWER WIRE.
6. INSTALL SLIDING BEAM CLAMPS AND MESSENGER SUPPORTS.
7. TRANSFER CATENARY WIRES TO NEW STRUCTURE.
8. INSTALL CROSS TRACK FEEDERS AND TAPS TO CATENARY.
9. ADJUST HANGERS IN CATENARY SPANS AND REPROFILE CATENARY.
10. DEMO OLD CAT POLES AND FOUNDATIONS.

NOTES:

1. BRYN MAWR INTERLOCKING WILL BE RETIRED ONCE VILLA AND NOVA INTERLOCKINGS ARE BUILT.
2. SEE DRAWING S-5107 FOR CATWALK STEEL DETAILS.
3. SEE DRAWING S-5238 FOR DEADEND PLATES AND SWITCHING MOUNTING DETAILS.

BILL OF MATERIALS			
MARK	DESCRIPTION	REF. DWG.	QUANTITY
NA83	MESSENGER SUPPORT	ET-1904	8
NA28	MESSENGER SUPPORT		2
SD30a	STEADY SPAN ASSEMBLY	ET-1914	1
SD31a	STEADY SPAN ASSEMBLY	ET-1914	1
SE40a	STEADY SPAN ASSEMBLY	ET-1914	3
Ya	STEADY SPAN ASSEMBLY	ET-1914	3
Za	STEADY SPAN ASSEMBLY	ET-1914	1
SH60a	STEADY SPAN HANGER	ET-1914	4
SA50a	REGISTRATION ASSEMBLY	ET-1914	4
POA41	PULLOFF ASSEMBLY	ET-1914	4
SPS	SIGNAL POWER SUPPORT	ET-1913	2
OPS1	FOG SUPPORT	ET-1906	1
GWS1	GROUND WIRE ASSEMBLY	ET-1909	2
FD1	FEEDER DEADEND	ET-1907	9
FD9	FEEDER DEADEND	ET-1907	3
FS9	FEEDER DEADEND	ET-1907	3
FT1	FEEDER TAP	ET-1907	4
FT2	FEEDER TAP	ET-1907	8
SW	DISCONNECT SWITCH	ET-1910	4
MOD	MOTOR OPERATOR	ET-1910	4
HAN	HAND OPERATOR	ET-1910	4
P	POLE	S-5103	4
F1	FOUNDATION	S-5102	4
SB1	SAG BRACE	S-5105	2
CB1	CROSS BEAM	S-5104	1
PC1	SLIDING CLAMP	S-5214	2
PC3L	SLIDING CLAMP	S-5215	2
PC4	SLIDING CLAMP	S-5215	1
CSC1	SLIDING CLAMP	S-5214	13

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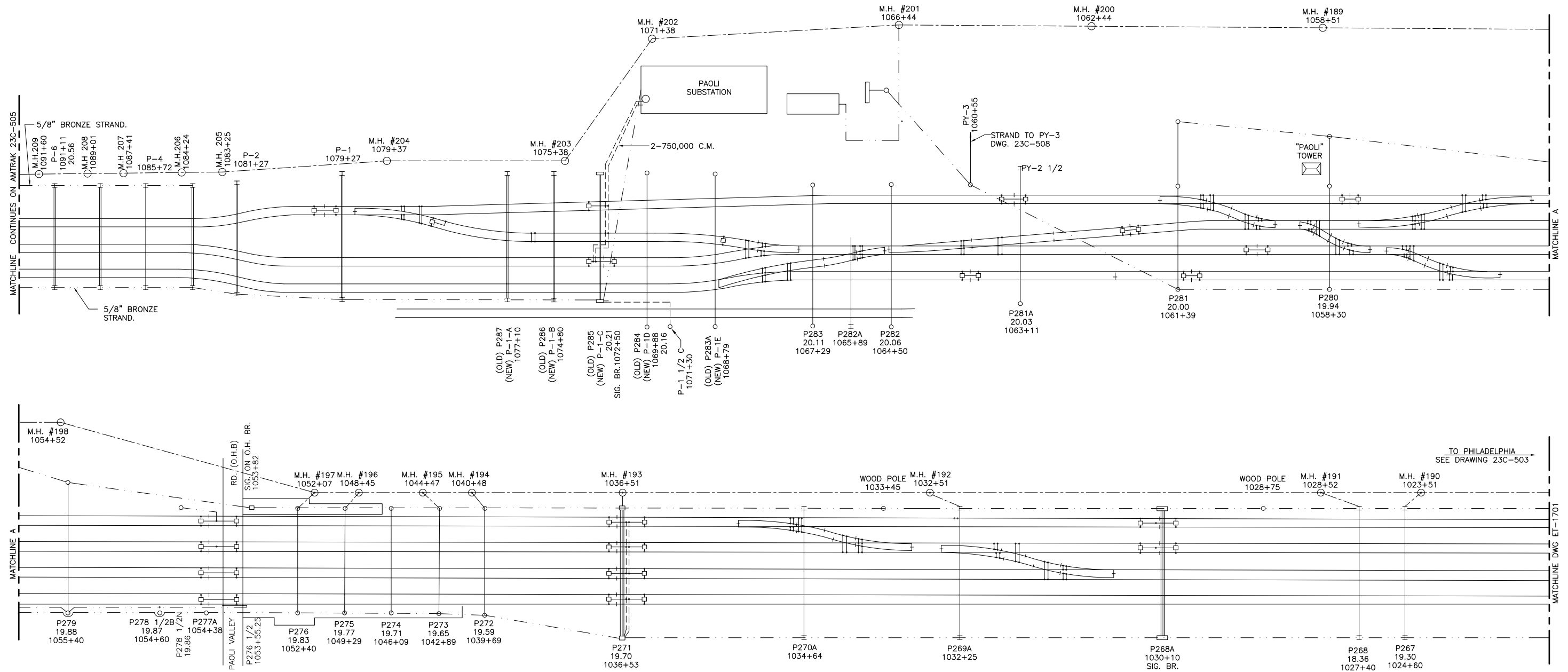
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PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 STRUCTURAL ERECTION DIAGRAM  
 T-235  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1421.DWG  
 Ref. No.: 2011-059  
 Sheet No.: 337 OF 565  
 ET-1421

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REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-504-16

KEY:

- GROUND WIRE (% COPPER UNLESS NOTED) - - - - -
- NEUTRALIZING WIRE IN DUCT LINE (% COPPER, BARE) - - - - -
- RAIL NOT BONDED FOR PROPULSION - - - - -
- RAIL BONDED FOR PROPULSION - - - - -

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2:04:46 PM 3/14/2016 J:\2011\2011-059\Drawings\working drawings paoli to bryn mawr\electrical\catenary\2011-059-et-1700.dwg

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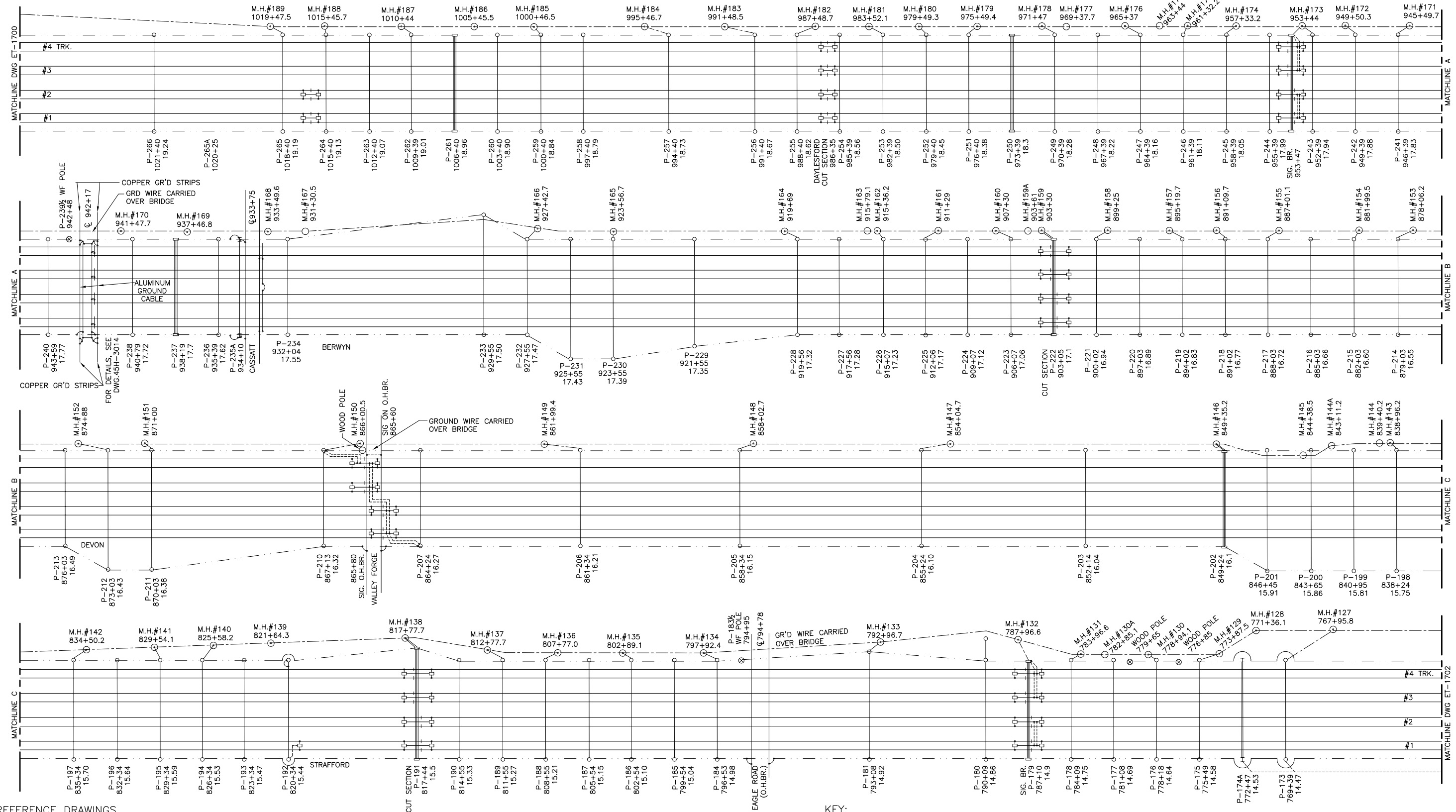
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
EXISTING, SHEET 1 OF 6

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1700
Ref. No.:	2011-059
Sheet No.:	338 OF 565
ET-1700	

TO HARRISBURG

TO PHILADELPHIA



REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-503-11

KEY:

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- NEUTRALIZING WIRE IN DUCT LINE (% COPPER, BARE) - - - - -
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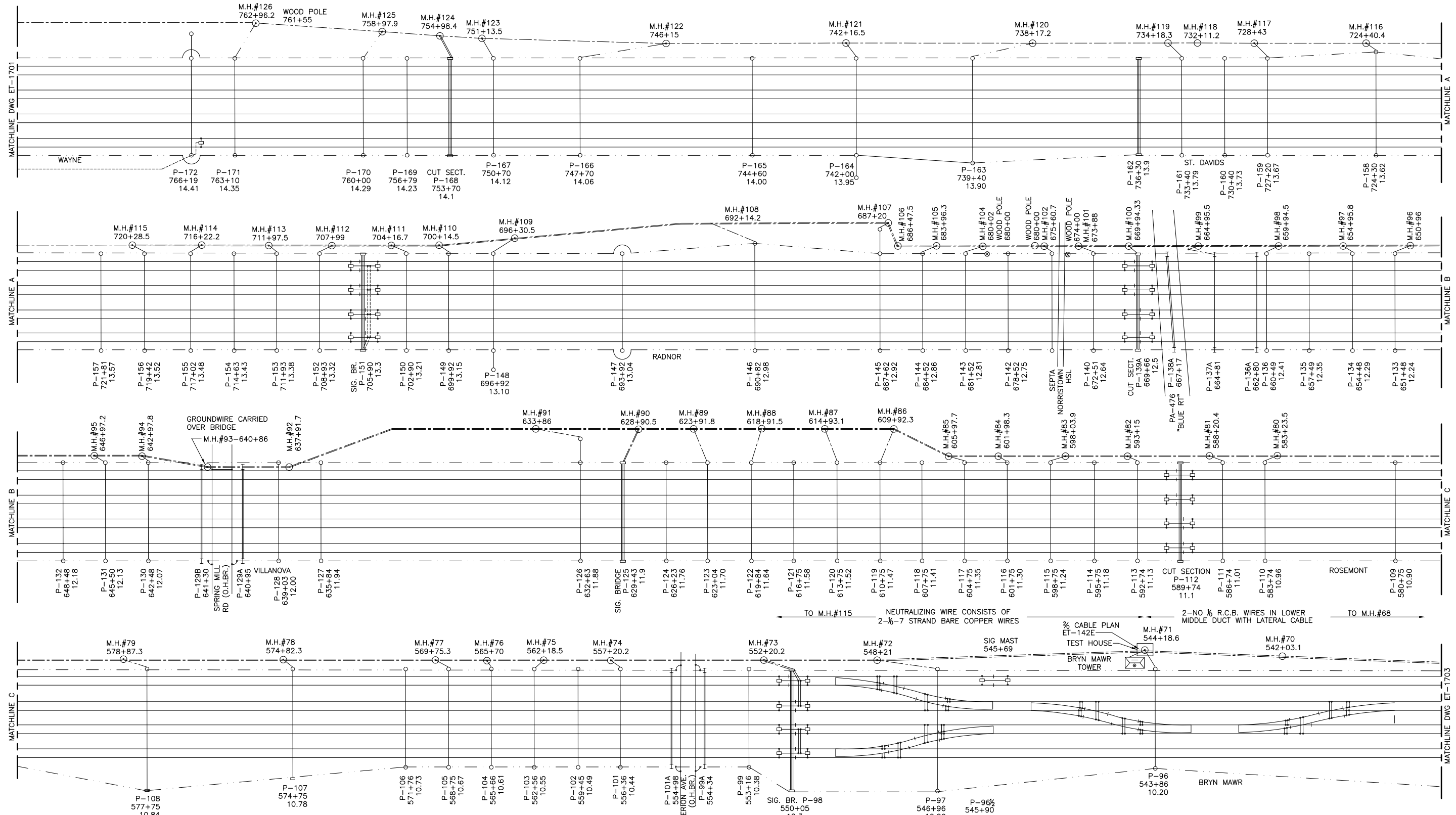
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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
EXISTING, SHEET 2 OF 6**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1701-ENG  
Ref. No.: 2011-059  
Sheet No.: 339 OF 565  
ET-1701



REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-502-9

KEY:

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- NEUTRALIZING WIRE IN DUCT LINE (% COPPER, BARE) - - - - -
- RAIL NOT BONDED FOR PROPULSION ————
- RAIL BONDED FOR PROPULSION ————

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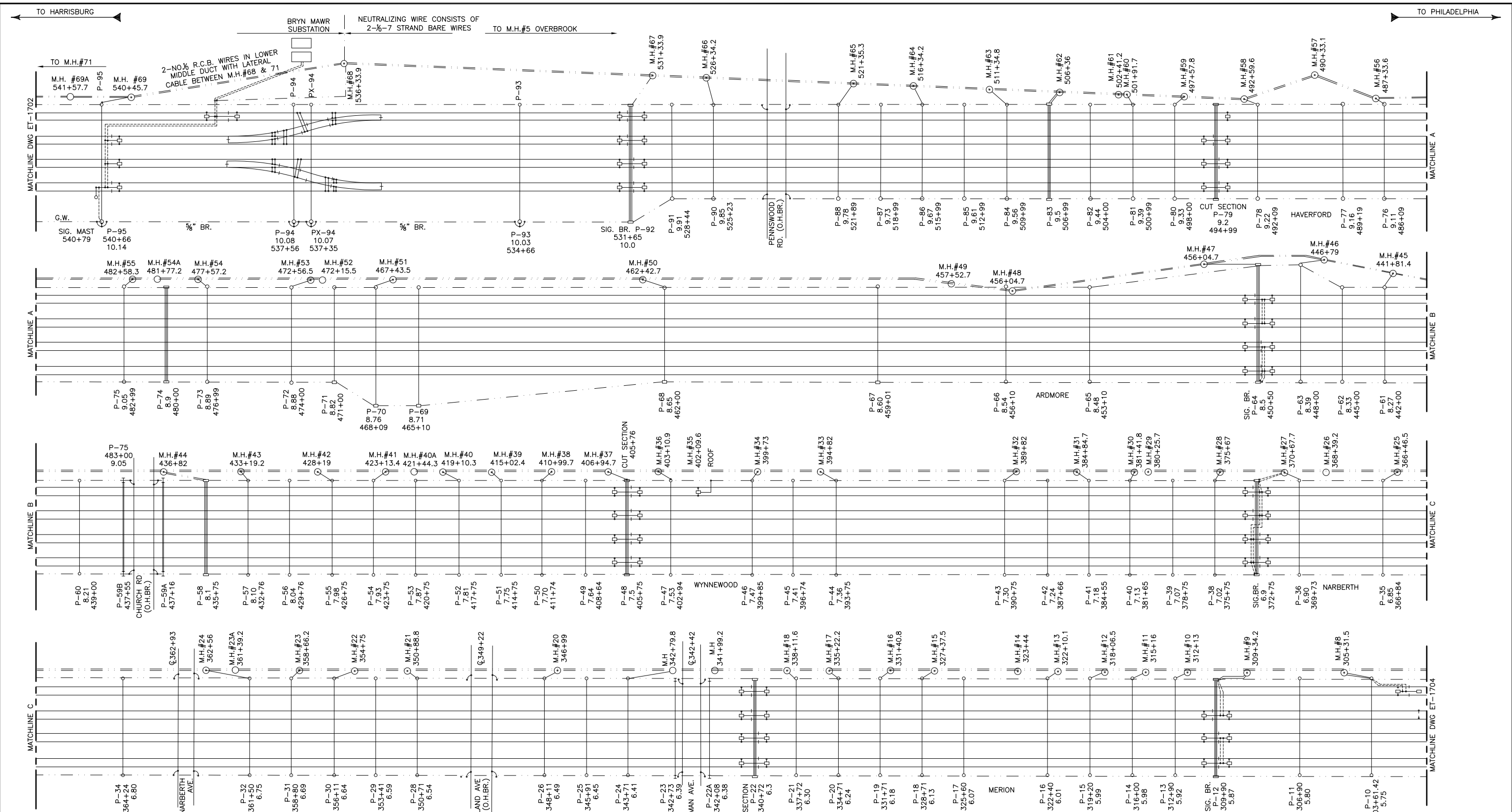
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
EXISTING, SHEET 3 OF 6

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1702.DWG  
Ref. No.: 2011-059  
Sheet No.: 340 OF 565  
ET-1702



**REFERENCE DRAWINGS**

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-501-8

**KEY:**

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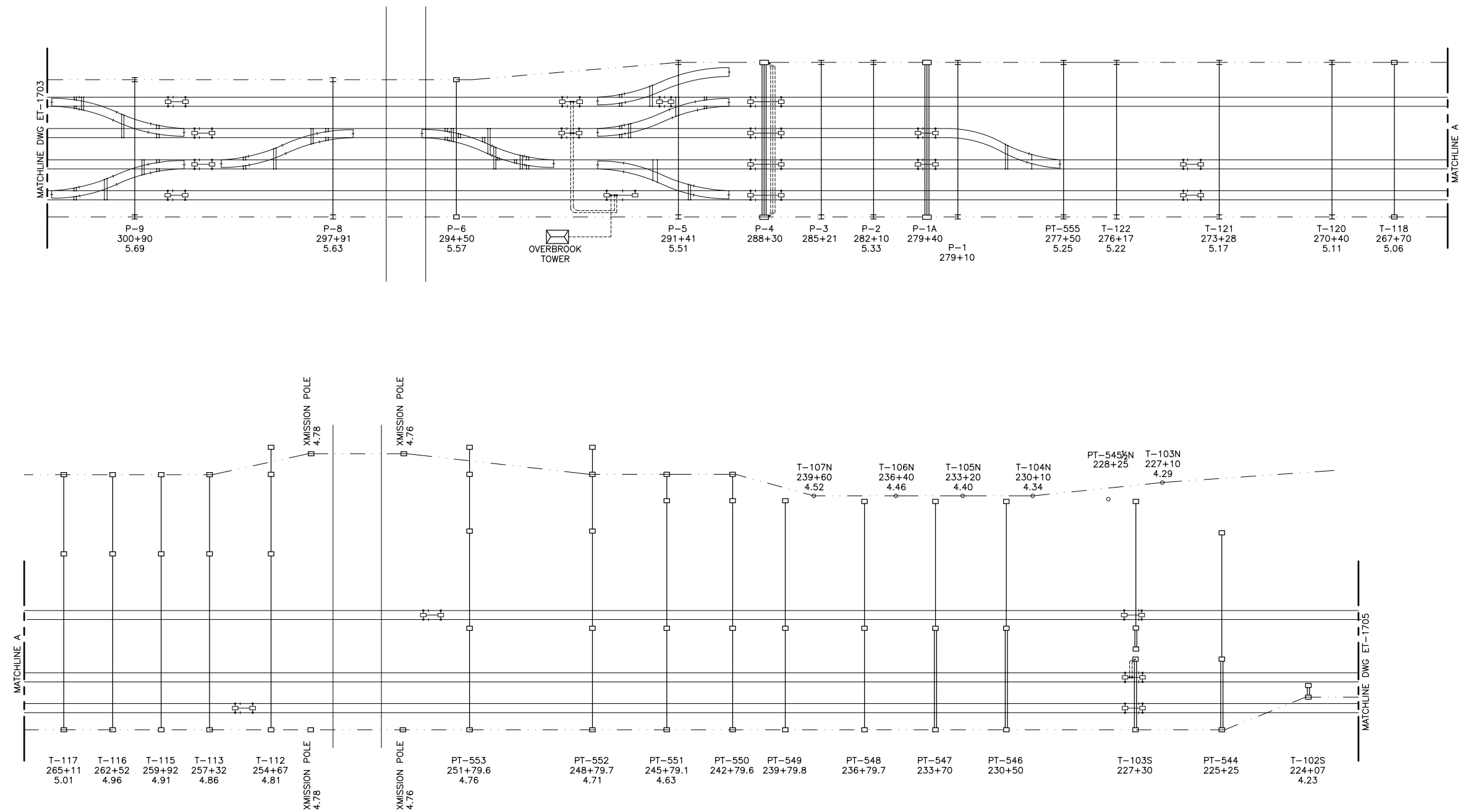
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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
EXISTING, SHEET 4 OF 6**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1703-ENG  
Ref. No.: 2011-059  
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ET-1703

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**REFERENCE DRAWINGS**

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-500-18 and 29C-448-9

**KEY:**

- GROUND WIRE (% COPPER UNLESS NOTED) ————
- NEUTRALIZING WIRE IN DUCT LINE (% COPPER, BARE) ————
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- RAIL BONDED FOR PROPULSION ————

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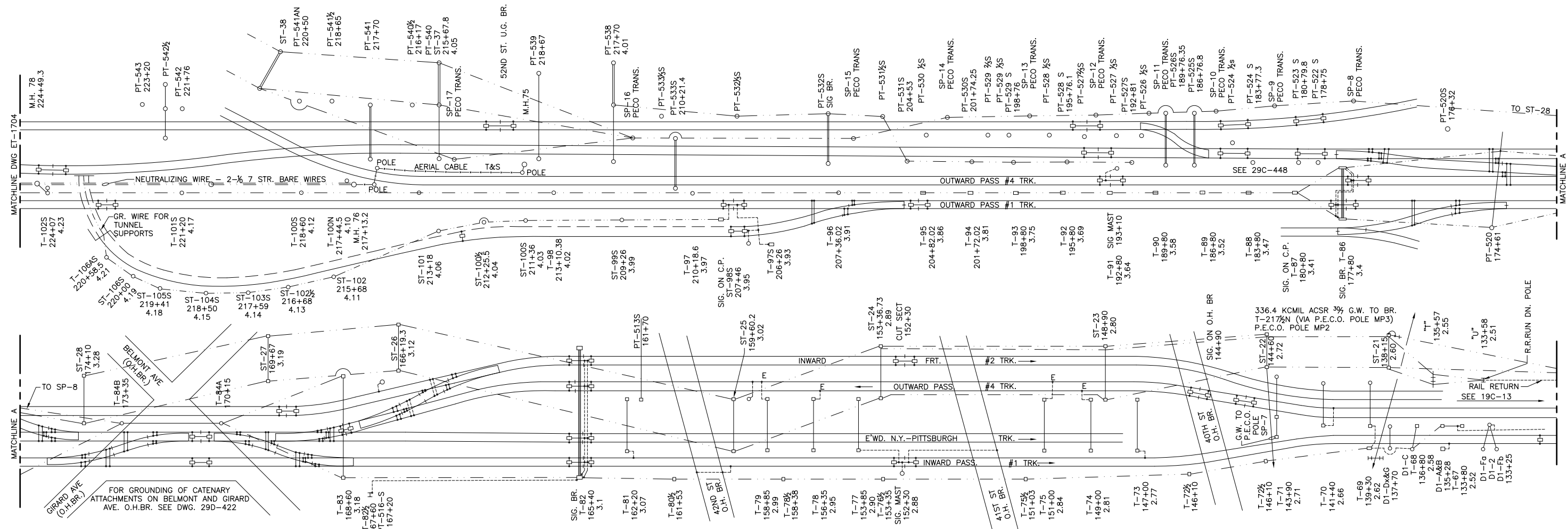


**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
EXISTING, SHEET 5 OF 6**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1704
Ref. No.:	2011-059
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<b>ET-1704</b>	

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REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-500-18 and 29C-448-9

KEY:

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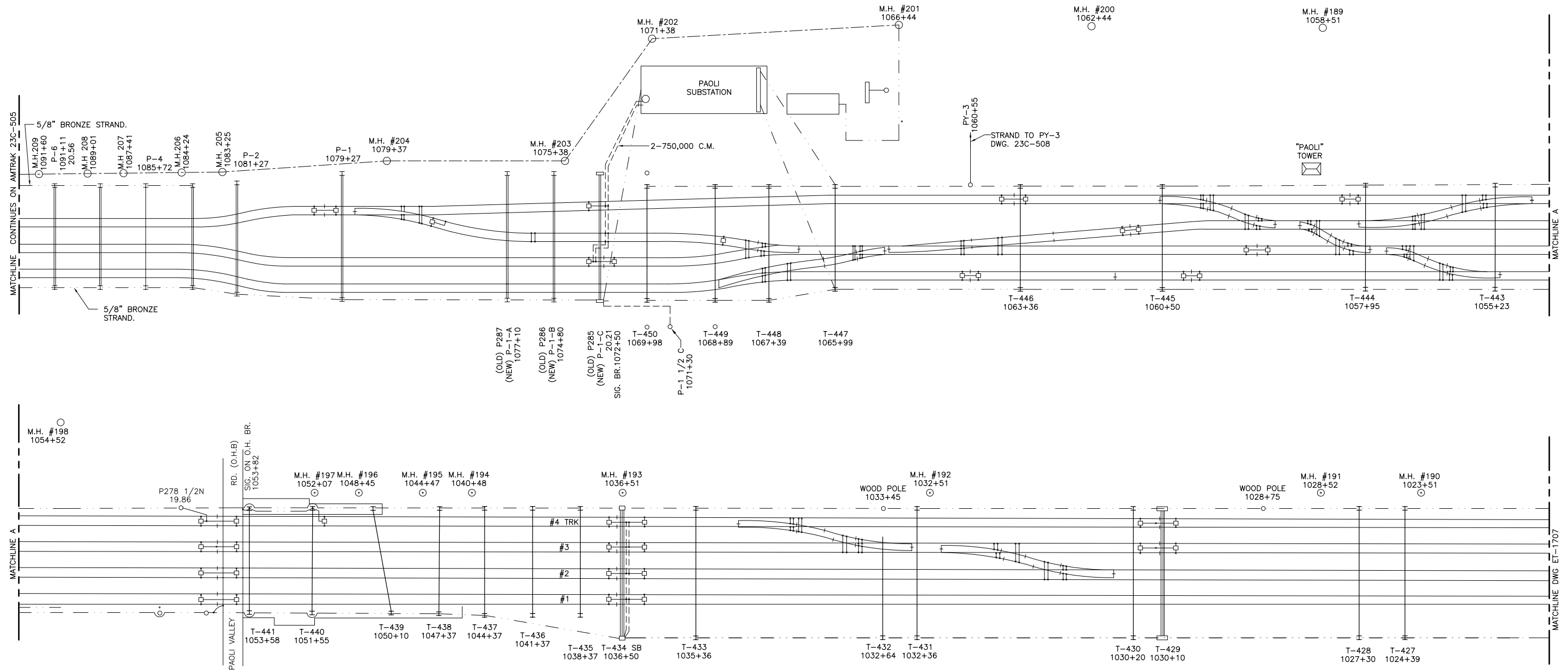
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ELECTRIFICATION  
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EXISTING, SHEET 6 OF 6**

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File No.:	2011-059-ET-1705.DWG
Ref. No.:	2011-059
Sheet No.:	343 OF 565
<b>ET-1705</b>	

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REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-504-16

KEY:

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
PROPOSED, SHEET 1 OF 6

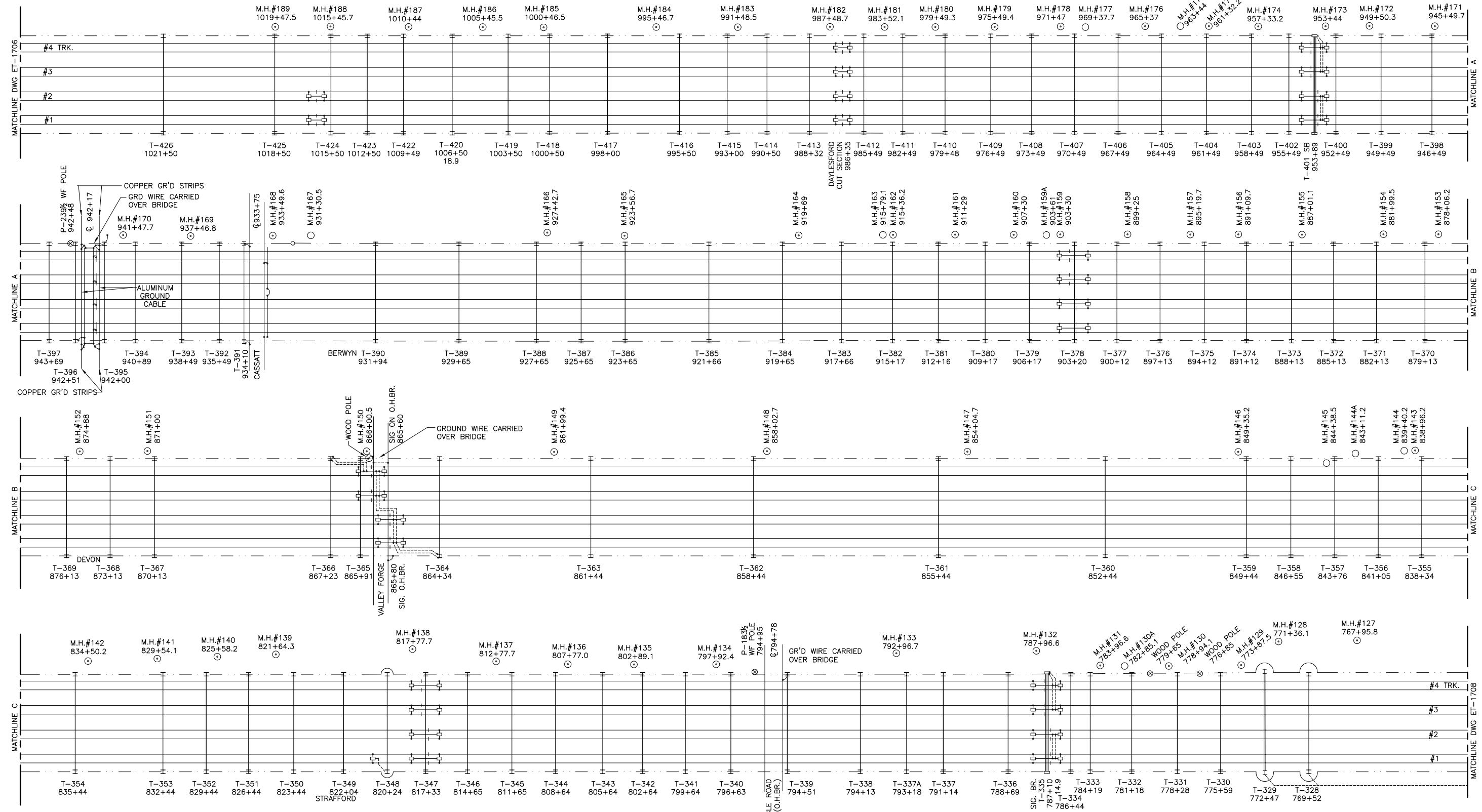
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1706.DWG
Ref. No.:	2011-059
Sheet No.:	344 OF 565
ET-1706	

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REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-503-11

KEY:

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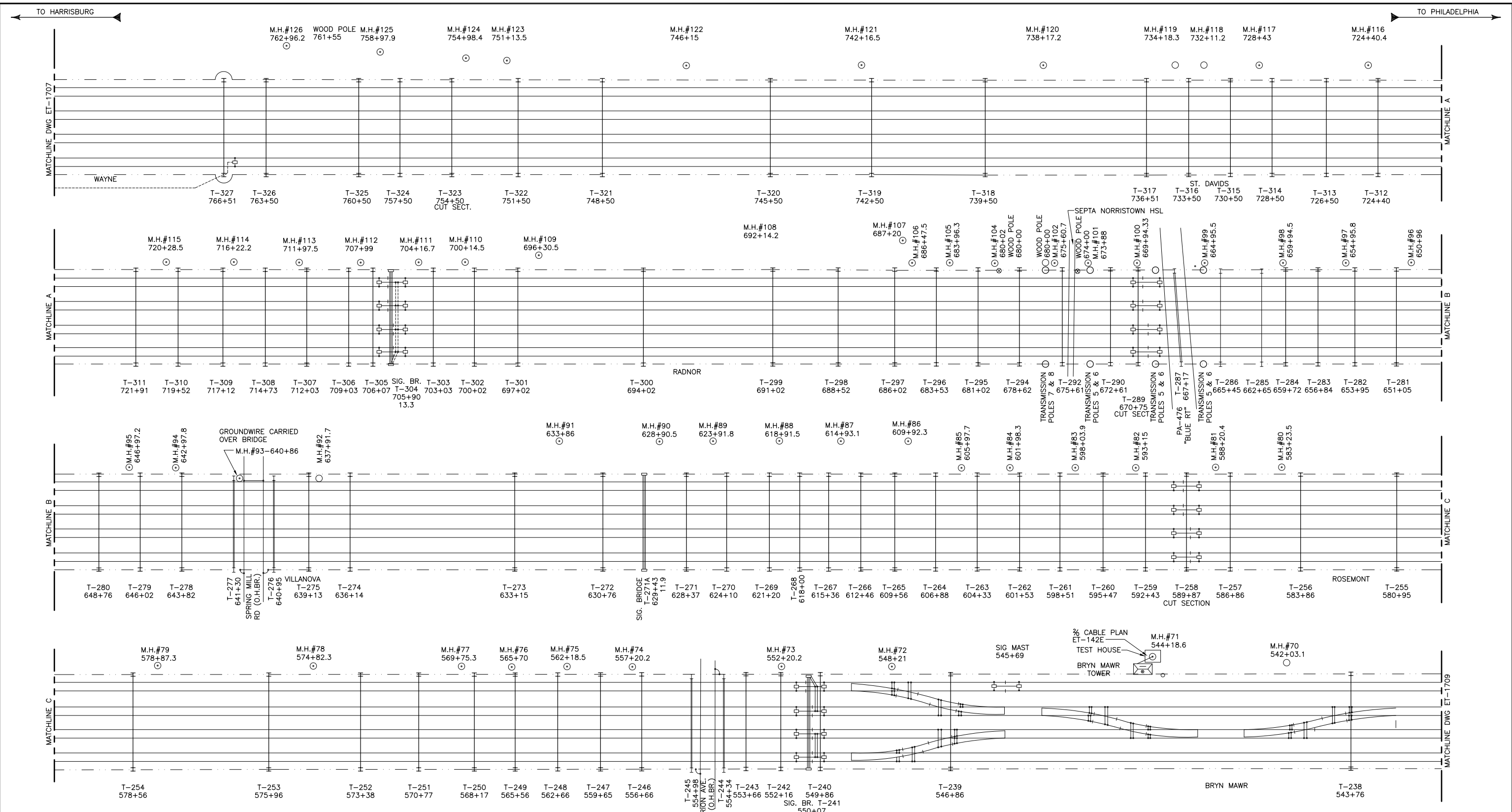


**PAOLI TO BRYN MAWR TRANSMISSION**  
**ELECTRIFICATION**  
**GROUNDING AND BONDING PLAN**  
**PROPOSED, SHEET 2 OF 6**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1707.DWG
Ref. No.:	2011-059
Sheet No.:	345 OF 565
ET-1707	

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**REFERENCE DRAWINGS**

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4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-502-9

**KEY:**

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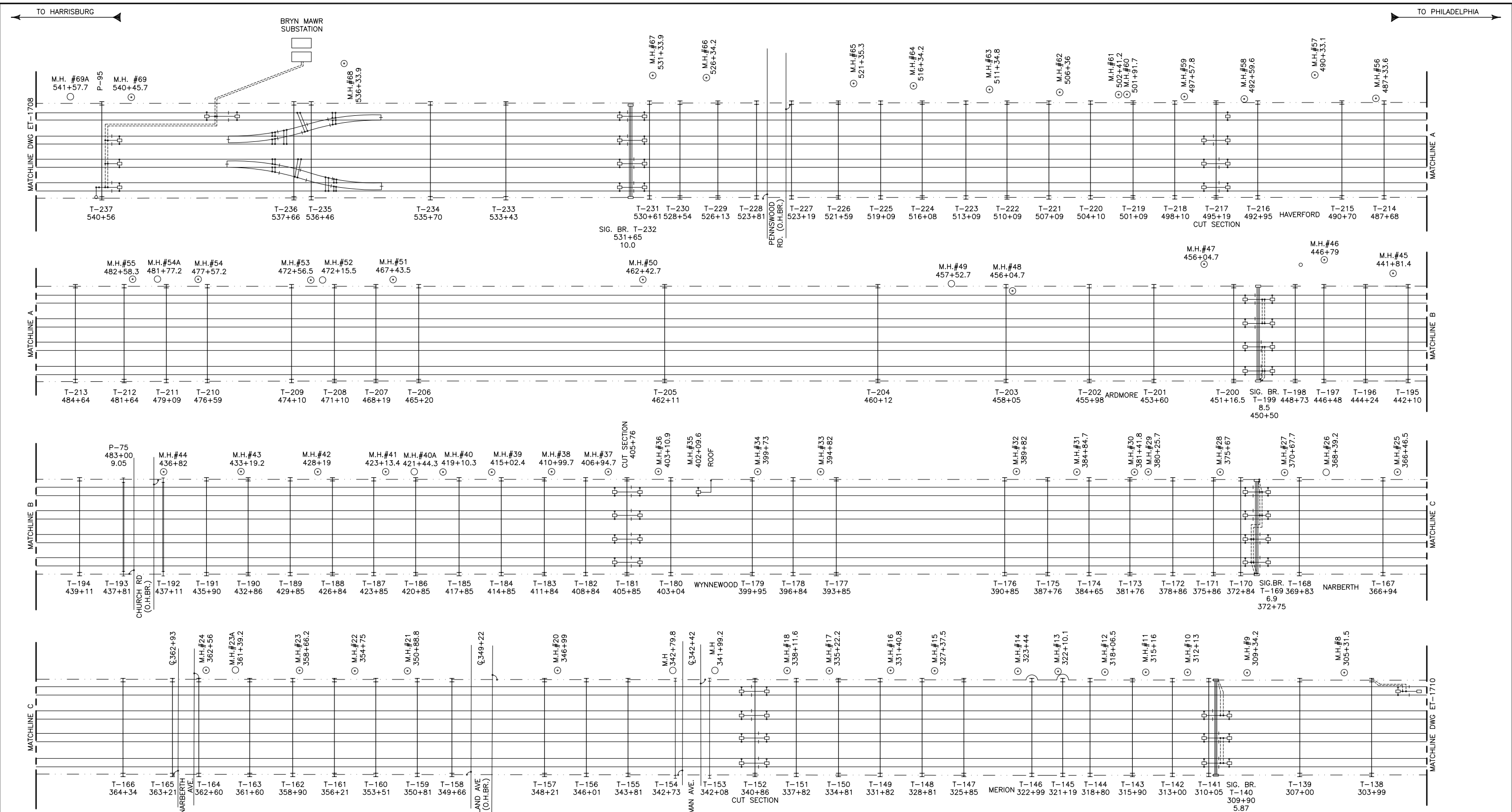
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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
PROPOSED, SHEET 3 OF 6**

Recommended: DP    Drawn: WJC    Checked: MJM    Date: 03/17/16

File No.:	2011-059-ET-1708-ING
Ref. No.:	2011-059
Sheet No.:	346 OF 565
<b>ET-1708</b>	

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1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
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3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-501-8

**KEY:**

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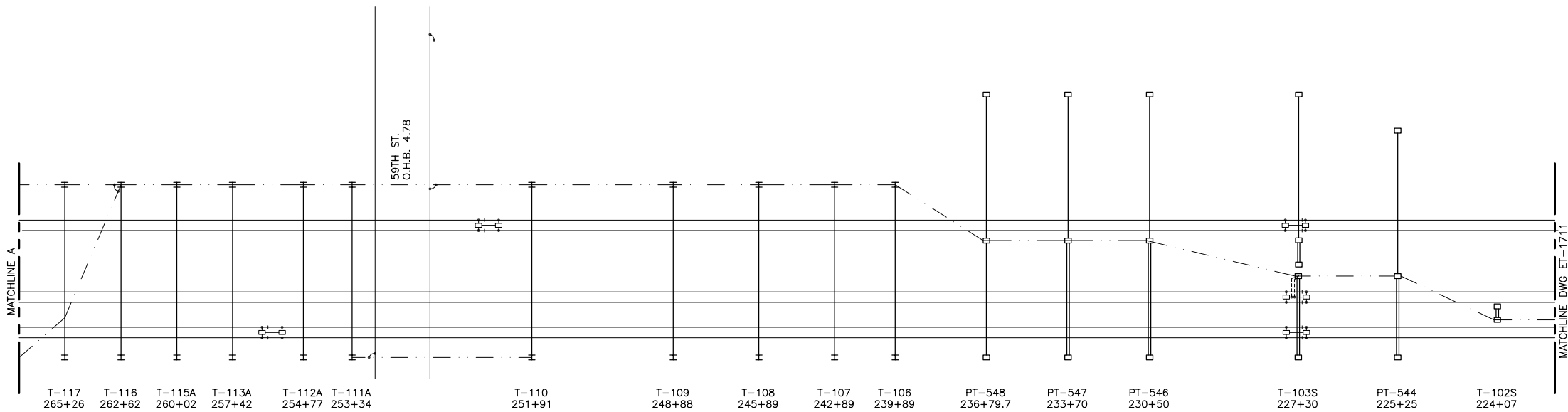
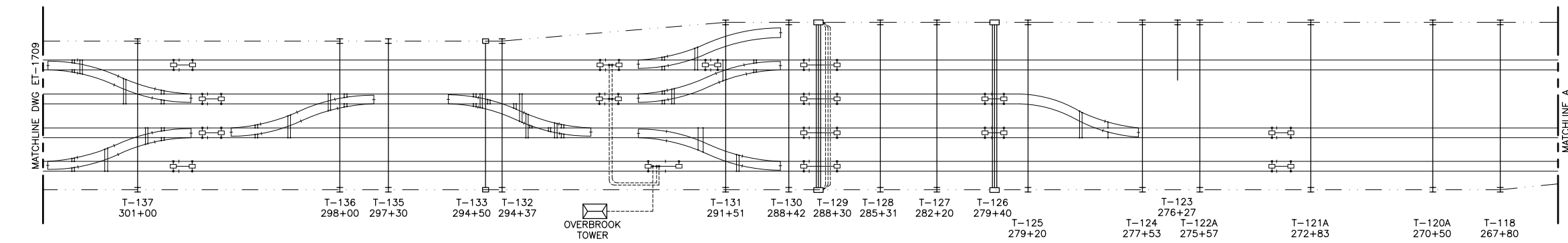
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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
PROPOSED, SHEET 4 OF 6**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1709.DWG
Ref. No.:	2011-059
Sheet No.:	347 OF 565
<b>ET-1709</b>	

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REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
2. TYPICAL DETAILS FOR POWER BONDING OF RAILS ET-1121-C
3. STANDARD BONDING 7 INSULATION OF SWITCHES S-803
4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-500-18 and 29C-448-9

KEY:

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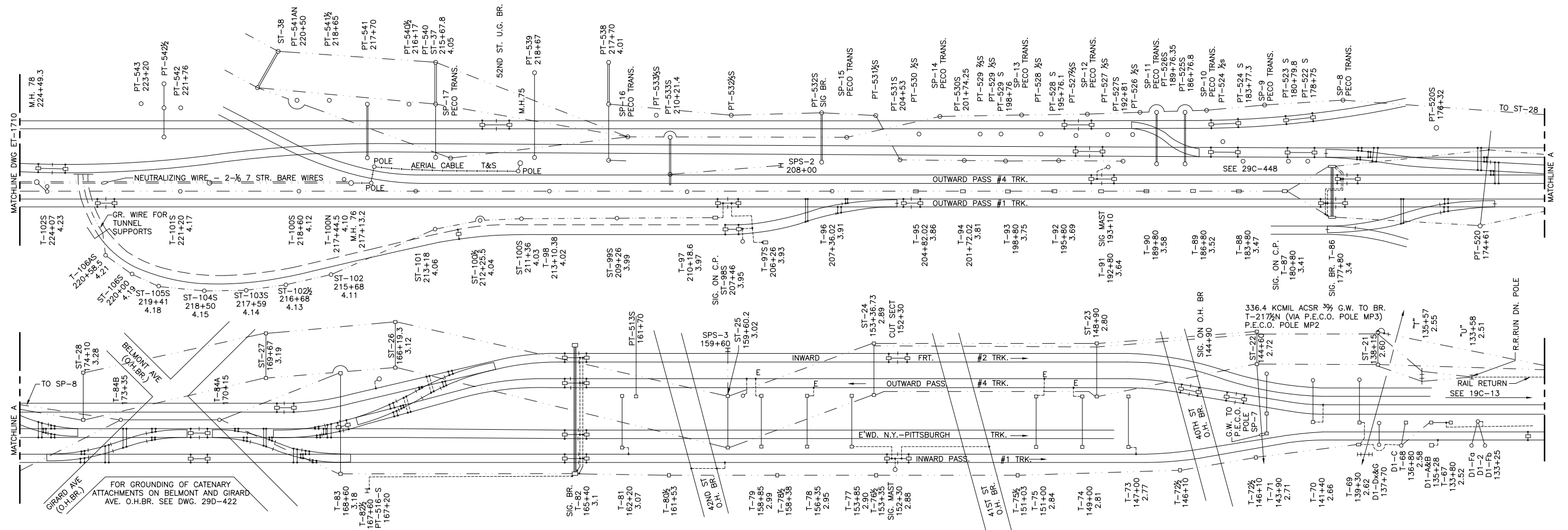
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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
PROPOSED, SHEET 5 OF 6**

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1710
Ref. No.:	2011-059
Sheet No.:	348 OF 565
ET-1710	



REFERENCE DRAWINGS

1. TYPICAL DETAILS FOR POWER BONDING OF STRUCTURES ET-1120-C
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4. NEUTRALIZING WIRE CONNECTION DETAILS ET-561-E
5. REDRAWN FROM AMTRAK 23C-500-18 and 29C-448-9

KEY:

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
GROUNDING AND BONDING PLAN  
PROPOSED, SHEET 6 OF 6**

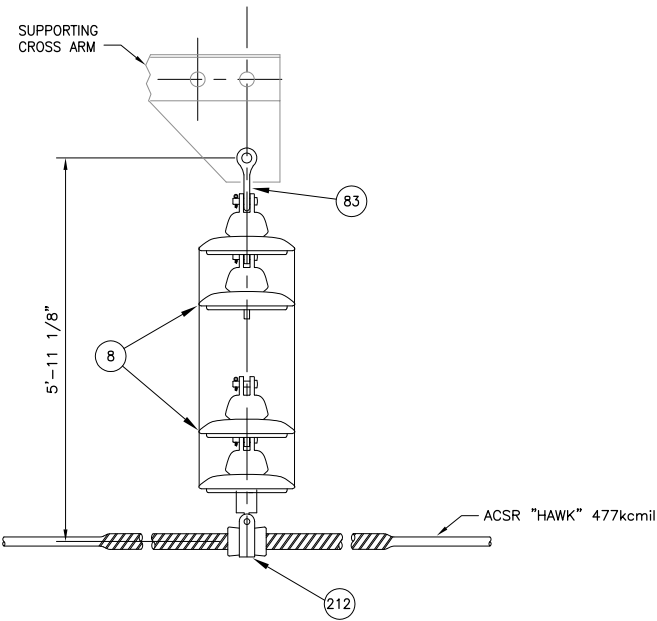
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Ref. No.:	2011-059
Sheet No.:	349 OF 565
ET-1711	

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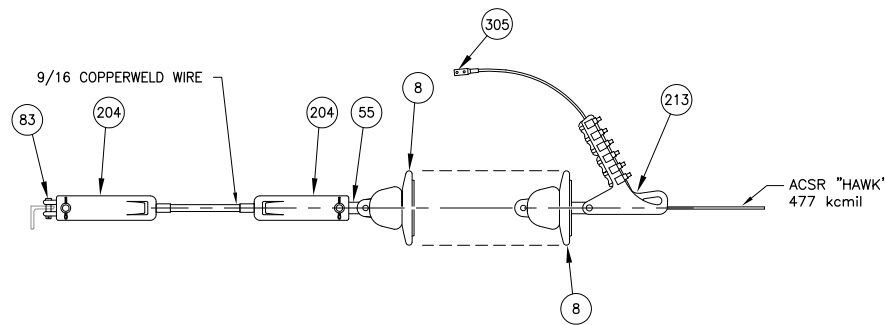
BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	11
83	S4	SHACKLE WITH BOLT	ET-305E	1
212	-	ARMOR GRIP SUSPENSION, AGS-5118	---	1

EXCEPT FURNISH WITH "J" BOLTS



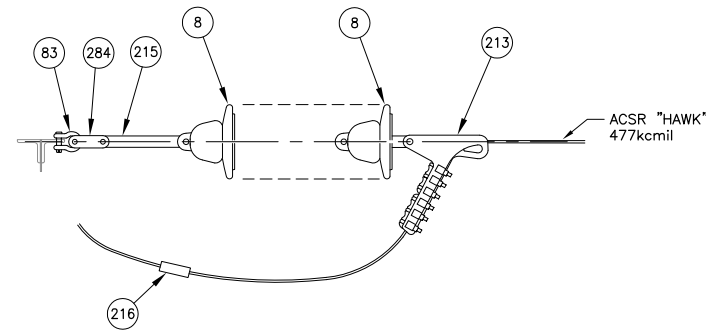
SUSPENSION ASSEMBLY "TSA1"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	13
55	LK2	5/8" CHAIN LINK, CROSBY	-	1
83	S4	SHACKLE W/ BOLT	ET-305E	1
204	-	FORK COLLAR SOCKET, ARTHUR FLURRY NO. 610.090.000	-	2
213	-	DEADEND QUADRANT MACLEAN POWER SYSTEMS ADE-24-C	-	1
305	-	TERMINAL LUG, TIN PLATED, ANDERSON/HUBBELL SWH050C	-	1



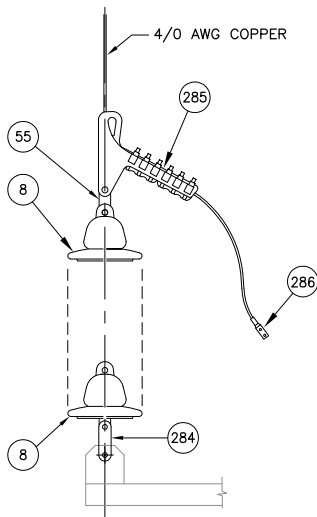
DEADEND ASSEMBLY FOR 477 ACSR "TDA3S2"  
NO GRADING SHIELDS  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	13
83	S4	SHACKLE W/ BOLT	ET-305E	1
213	-	DEADEND QUADRANT MACLEAN POWER SYSTEMS ADE-24-C	---	1
284	-	CLEVIS FITTING CCC30	---	1
215	-	GALVANIZED STRAP 1/2"x2"x12"	---	1
216	-	COMPRESSION SPLICE HUBBLE POWER SYSTEMS JLS1010	---	1



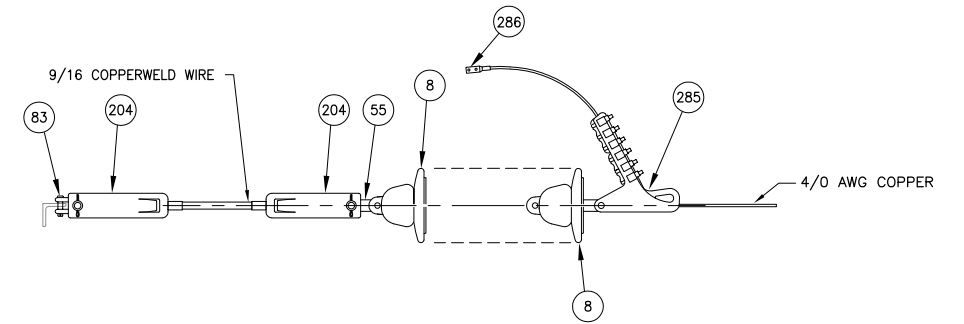
DEADEND ASSEMBLY "TDA3"  
NO GRADING SHIELDS  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	13
55	LK2	5/8" CHAIN LINK, CROSBY	-	1
284	-	CLEVIS FITTING CCC30	---	1
285	-	DEADEND QUADRANT CLAMP, BRZ ANDERSON BSD-68N	-	1
286	-	TERMINAL LUG, 4/0 AWG COPPER, COMPRESSION TYPE, BURNDY YS-282N	-	1



DEADEND ASSEMBLY "TDA3S3"  
NO GRADING SHIELDS  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	13
55	LK2	5/8" CHAIN LINK, CROSBY	-	1
83	S4	SHACKLE W/ BOLT	ET-305E	1
204	-	FORK COLLAR SOCKET, ARTHUR FLURRY NO. 610.090.000	-	2
285	-	DEADEND QUADRANT CLAMP, BRZ ANDERSON BSD-68N	-	1
286	-	TERMINAL LUG, 4/0 AWG COPPER, COMPRESSION TYPE, BURNDY YS-282N	-	1



DEADEND ASSEMBLY FOR 4/0 COPPER "TDA3S1"  
NO GRADING SHIELDS  
SCALE: NONE

2:10:42 PM 3/14/2016 J:\2011\2011-059\Drawings\working drawings\paoli to bryn mawr\electrical\Catenary\_Details\2011-059-ET-1800.dwg

No	Revisions	Date	By



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Engineering  
National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

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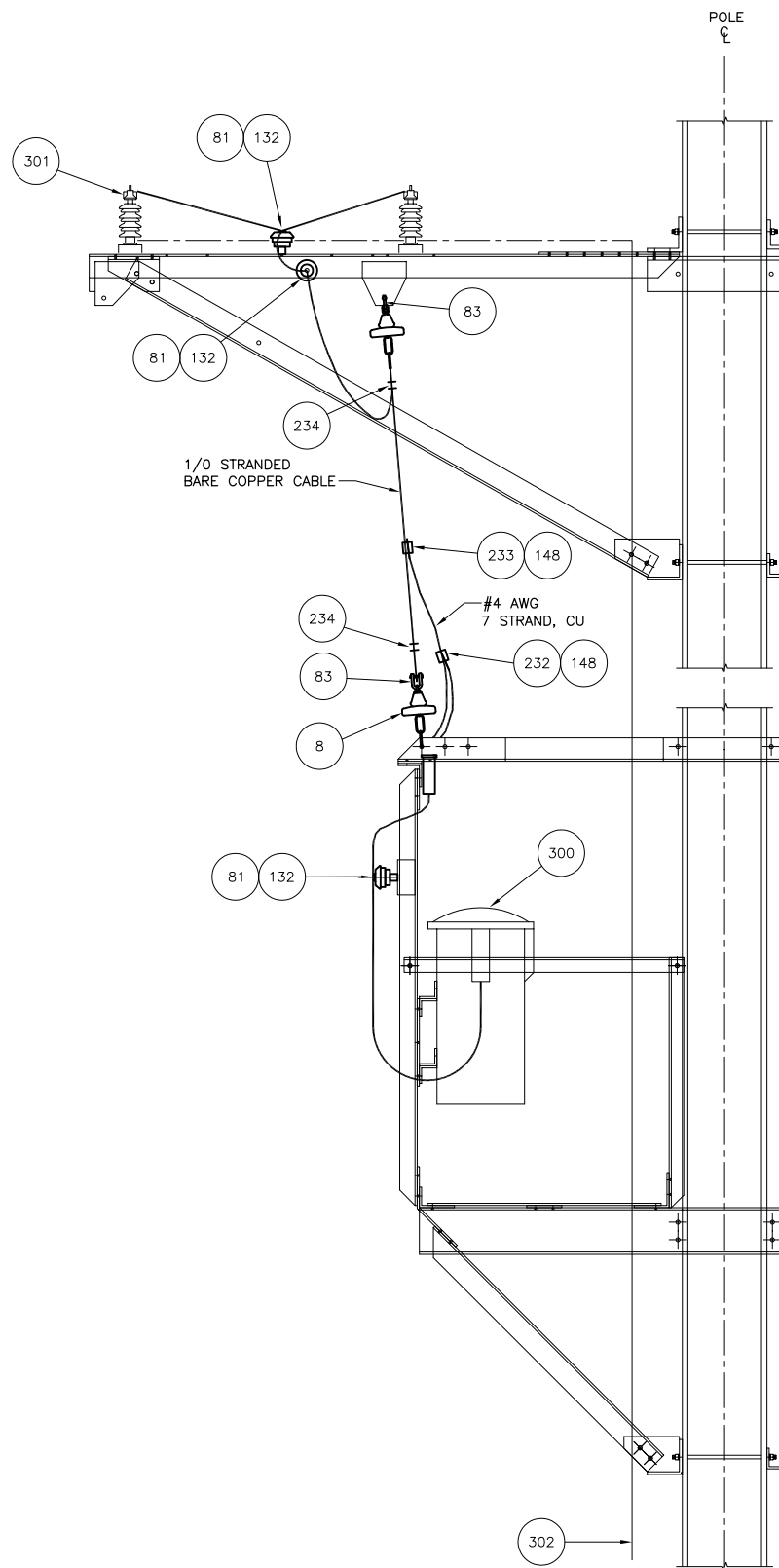
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
TRANSMISSION DETAILS  
TRANSMISSION ASSEMBLIES

File No.: 2011-059-ET-1800.DWG  
Ref. No.: 2011-059  
Sheet No: 350 OF 565

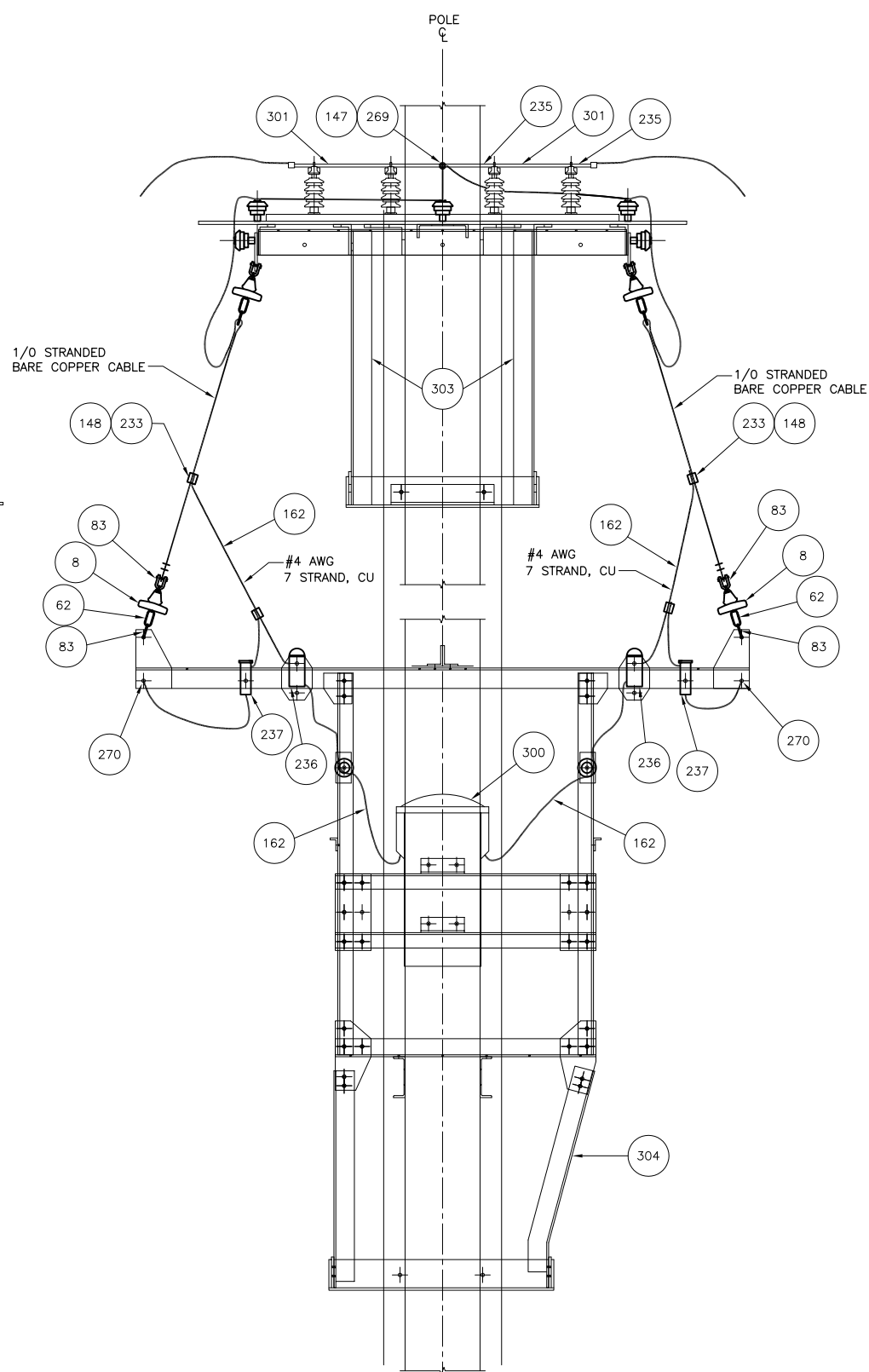
ET-1800

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16





ELEVATION ALONG TRACKS  
NOT TO SCALE



ELEVATION ACROSS TRACKS  
NOT TO SCALE

BILL OF MATERIAL					
ITEM	MARK	DESCRIPTION	REFERENCE DRAWING	MANUFACTURER OR AMTRAK PART #	QTY.
<b>SIGNAL POWER EQUIPMENT</b>					
300		SIGNAL POWER TRANSFORMER, OIL FILLED 6.9KV TO 240V/120V, 10KVA		44-300-44301	1
301		DISCONNECT SWITCH DPST, 15KV, 600A, W/ALL OPERATING RODS AND HARDWARE, SEE NOTE 2		44-015-20258	2
302		MANUAL OPERATOR FOR DISCONNECT SWITCH	S-5216		2
303		SIGNAL POWER SWITCH PLATFORM	S-5216		1
304		SIGNAL POWER TRANSFORMER PLATFORM	S-5216		1
<b>CATENARY EQUIPMENT</b>					
8	B1	INSULATOR, 10" PORCELAIN		44-770-04402	4
62	ND-1	ADAPTER, CLEVIS TYPE, MALLEABLE IRON, GALVANIZED	ET-449E	44-562-00201	4
81	S	INSULATOR, PIN TYPE	ET1-003	442400111	8
83	S-4	SHACKLE, CHAIN TYPE, FORGED STEEL, GALVANIZED	ET-305E	44-562-27009	6
132		PIN, FOR TYPE-S INSULATOR	ET-288-E4	44-240-0111X	8
147		CARTRIDGE, WHITE, AMPACT# 69338-5		44-423-00607	2
148		CARTRIDGE, RED, AMPACT 69338-2		44-015-00309	4
162		CABLE, #4 AWG, 7 STRAND, HD COPPER PE COVERED		44-045-02355	50'
232		TAP, CABLE WEDGE, #4 TO #4 277060-3		-	2
233		TAP, CABLE WEDGE, 1/0 TO #4 277060-1		-	2
234		CLIP, 3/8" CABLE, BRONZE, BRIDESBURG FOUNDRY WIRE LOCK		44-045-09901	8
235		LUG - FOR 1/0, COMP. TYPE		02-180-03562	8
236		CUTOUT FUSE, ENCLOSED, 7.8KV, 50 AMP		44-950-01600	2
237		LIGHTNING ARRESTOR, 9KV		02-949-50705	2
269		TAP, 1/0 CU. TO 1/0 CU. AMPACT# 1-275187-8		44-230-02004	2
270		SERVIT POST, #4 AWG TO FLAT, BURNDY KC23, 1/2-13 STUD			2
-		TIE WIRE, #4 AWG, BARE COPPER SOLID SOFT DRAWN		-	27'
-		CONDUCTOR, 1/0 7 STRAND HD COPPER		44-045-00202	25'

**NOTES:**

- SECONDARY INSULATED CABLE AND CONDUIT FURNISHED AND INSTALLED BY C&S DEPARTMENT.
- SWITCH UNITS TO BE SUPPLIED WITH 2 SETS COMPLETE OF OPERATION RODS WITH NECESSARY GUIDES, BEARINGS UNIVERSALS, LOCKING AND MANUAL OPERATORS BY SWITCH MANUFACTURER.

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

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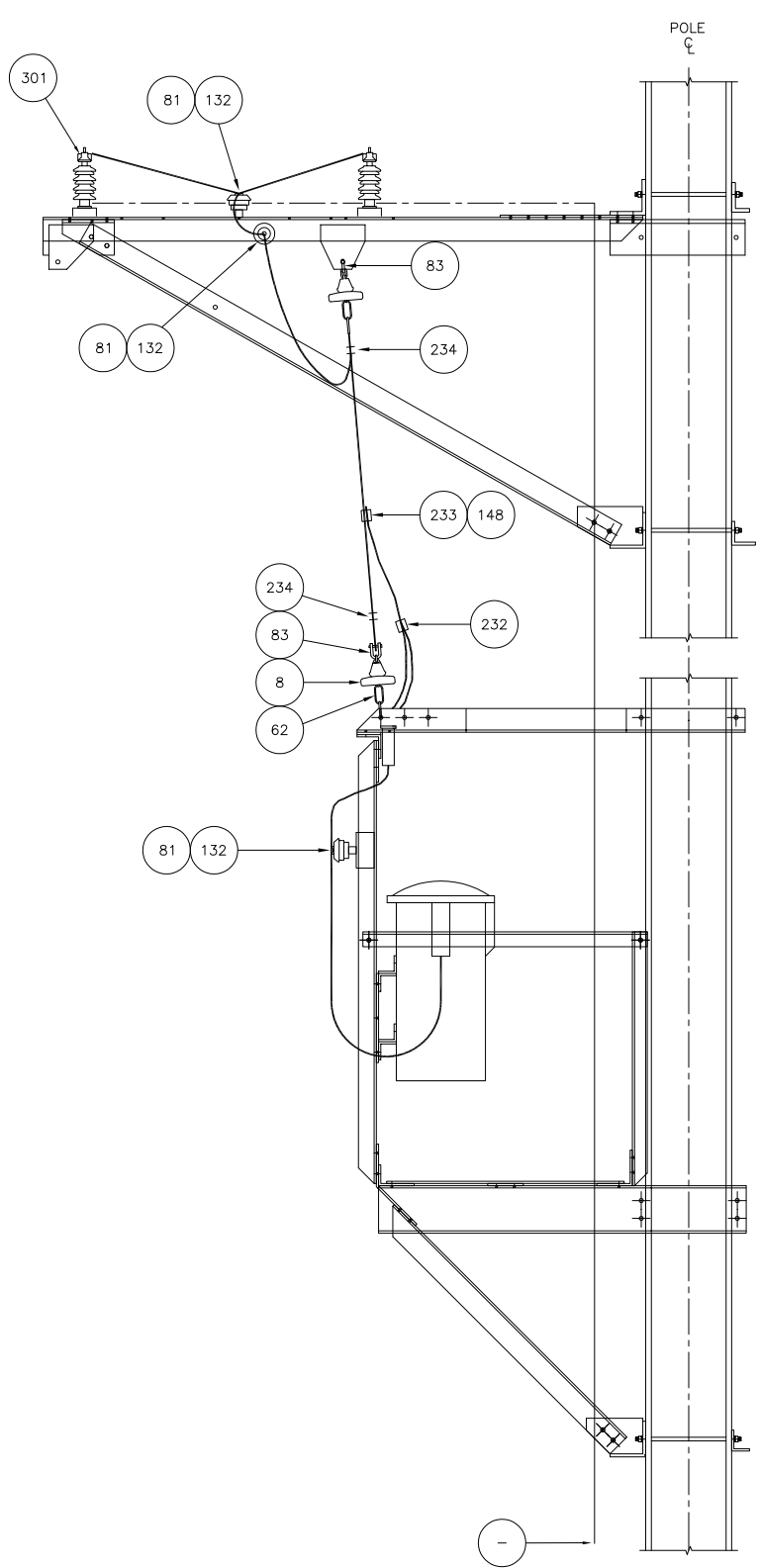
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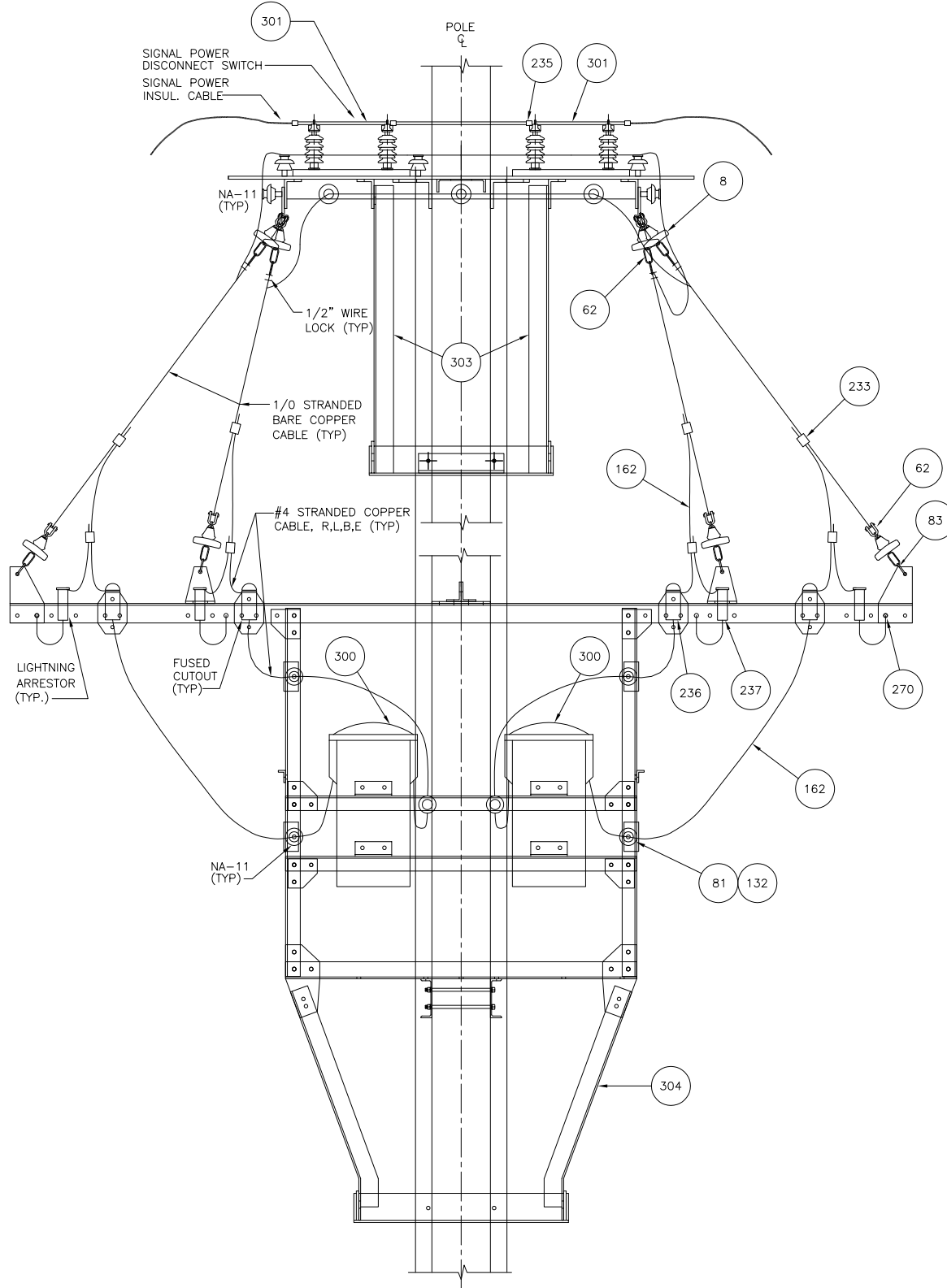
**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION**  
SIGNAL POWER CUT SECTION ASSEMBLY  
SINGLE TRANSFORMER, MANUAL OPERATORS  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1810  
Ref. No.: 2011-059  
Sheet No.: 351 OF 565  
**ET-1810**

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ELEVATION ALONG TRACKS  
NOT TO SCALE



ELEVATION ACROSS TRACKS  
NOT TO SCALE

BILL OF MATERIAL					
ITEM	MARK	DESCRIPTION	REFERENCE DRAWING	MANUFACTURER OR AMTRAK PART #	QTY.
SIGNAL POWER EQUIPMENT					
300		SIGNAL POWER TRANSFORMER, OIL FILLED 6.9KV TO 240V/120V, 10KVA		44-300-44301	2
301		DISCONNECT SWITCH DPST, 15KV, 600A, W/ALL OPERATING RODS AND HARDWARE, SEE NOTE 2		44-015-20258	2
302		MOTOR OPERATOR FOR DISCONNECT SWITCH	S-5224		2
303		SIGNAL POWER SWITCH PLATFORM	S-5231		1
304		SIGNAL POWER TRANSFORMER PLATFORM	S-5231		1
CATENARY EQUIPMENT					
8	B1	INSULATOR, 10" PORCELAIN		44-770-04402	8
62	ND-1	ADAPTER, CLEVIS TYPE, MALLEABLE IRON, GALVANIZED	ET-449E	44-562-00201	8
81	S	INSULATOR, PIN TYPE	ET1-003	442400111	8
83	S-4	SHACKLE, CHAIN TYPE, FORGED STEEL, GALVANIZED	ET-305E	44-562-27009	12
132		PIN, FOR TYPE-S INSULATOR	ET-288-E4	44-240-0111X	12
147		CARTRIDGE, WHITE, AMPACT# 69338-5		44-423-00607	4
148		CARTRIDGE, RED, AMPACT 69338-2		44-015-00309	4
162		CABLE, #4 AWG, 7 STRAND, HD COPPER PE COVERED		44-045-02355	75'
232		TAP, CABLE WEDGE, #4 TO #4 277060-3		-	2
233		TAP, CABLE WEDGE, 1/0 TO #4 277060-1		-	2
234		CLIP, 3/8" CABLE, BRONZE, BRIDESBURG FOUNDRY WIRE LOCK		44-045-09901	8
235		LUG - FOR 1/0, COMP. TYPE		02-180-03562	4
236		CUTOUT FUSE, ENCLOSED, 7.8KV, 50 AMP		44-950-01600	4
237		LIGHTNING ARRESTOR, 9KV		02-949-50705	4
238		LUG - FOR 2/0, COMP. TYPE			4
269		TAP, 1/0 CU. TO 1/0 CU. AMPACT# 1-275187-8		44-230-02004	4
270		SERVIT POST, #4 AWG TO FLAT, BURNDY KC23, 1/2-13 STUD			4
-		TIE WIRE, #4 AWG, BARE COPPER SOLID SOFT DRAWN		-	40'
-		CONDUCTOR, 1/0 7 STRAND HD COPPER		44-045-00202	25'

- NOTES:**
- SECONDARY INSULATED CABLE AND CONDUIT FURNISHED AND INSTALLED BY C&S DEPARTMENT.
  - SWITCH UNITS TO BE SUPPLIED WITH 2 SETS COMPLETE OF OPERATION RODS WITH NECESSARY GUIDES, BEARINGS UNIVERSALS, LOCKING AND MOTOR OPERATOR BY SWITCH MANUFACTURER.
  - SIGNAL POWER CUT SECTIONS IN INTERLOCKINGS SHALL HAVE TWO TRANSFORMERS AND MOTOR OPERATORS FOR REMOTE OR LOCAL OPERATION.

No	Revisions	Date	By



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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION**  
SIGNAL POWER CUT SECTION ASSEMBLY  
TWO TRANSFORMERS, MOTOR OPERATORS

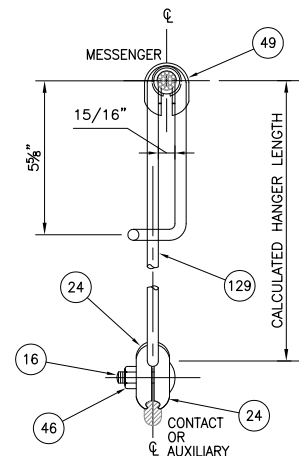
Recommended: DP Drawn: VJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1811.DWG
Ref. No.:	2011-059
Sheet No.:	352 OF 565
ET-1811	

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BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB-22	BOLT, STAINLESS STEEL	ET-148E	1
24	BC-26B	GROOVE WIRE TO 0.34" HANGER ROD, CLIP	ET-1078E	2
49	FHS	MESSENGER SADDLE	ET-652E	1
129	---	0.34" LOOP HANGER	ET-1095E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	1

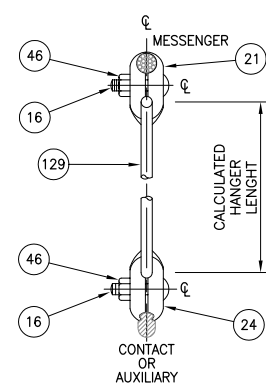
\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "ME"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB-22	BOLT, STAINLESS STEEL	ET-148E	2
21	BC-24B	5/8" TO 0.34" HANGER ROD, CLIP	ET-1087E	2
24	BC-26B	GROOVE WIRE TO 0.34" HANGER ROD, CLIP	ET-1078E	2
129	---	0.34" HANGER HOOK TYPE	ET-1095E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

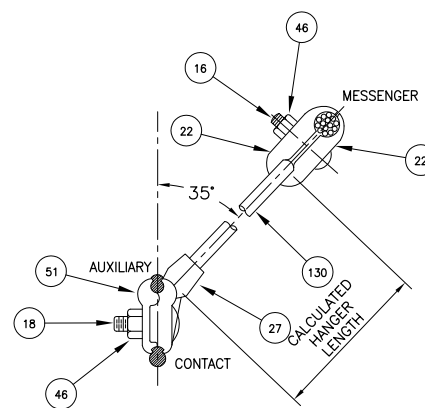
\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "J"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	1
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	1
22	BC24C	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1086E	2
27	BC32	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1178E	1
51	HC29A	INTERMEDIATE CATENARY CLIP	ET-1029E	1
130	---	0.42" HANGER ROD THR'D & HOOK TYPE	ET-1096E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

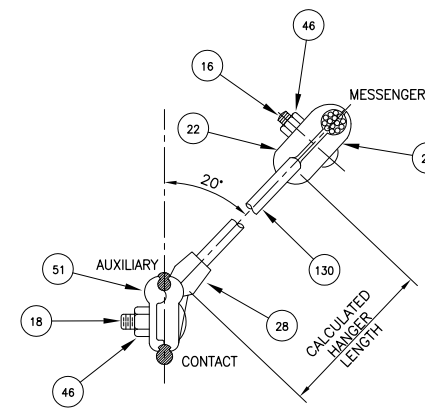
\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "C"  
FOR HANGERS OVER 3'-0"  
FOR CATENARY STANDARD IV

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	1
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	1
22	BC24C	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1086E	2
28	BC33	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1081E	1
51	HC29A	INTERMEDIATE CATENARY CLIP	ET-1029E	1
130	---	0.42" HANGER ROD THR'D & HOOK TYPE	ET-1096E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

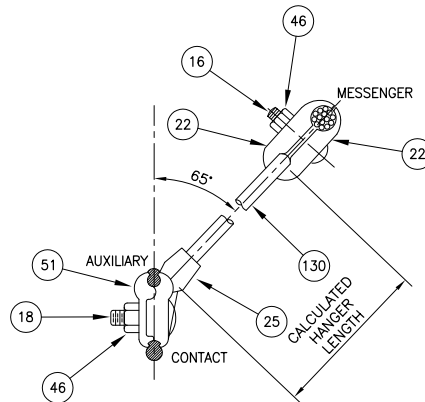
\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "D"  
FOR HANGERS OVER 3'-0"  
FOR CATENARY STANDARD IV

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	1
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	1
22	BC24C	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1086E	2
25	BC30	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1079E	1
51	HC29A	INTERMEDIATE CATENARY CLIP	ET-1029E	1
130	---	0.42" HANGER ROD THR'D & HOOK TYPE	ET-1096E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

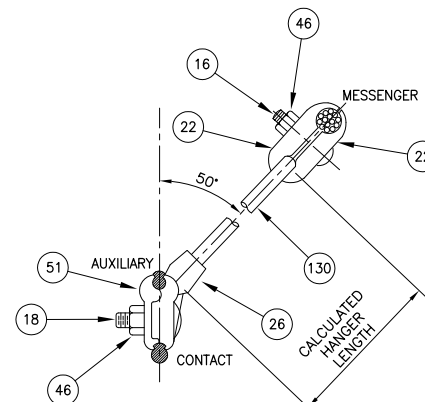
\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "A"  
FOR HANGERS OVER 3'-0"  
FOR CATENARY STANDARD IV

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	1
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	1
22	BC24C	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1086E	2
26	BC31	GROOVE WIRE TO 0.42" HANGER ROD, CLIP	ET-1080E	1
51	HC29A	INTERMEDIATE CATENARY CLIP	ET-1029E	1
130	---	0.42" HANGER ROD THR'D & HOOK TYPE	ET-1096E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

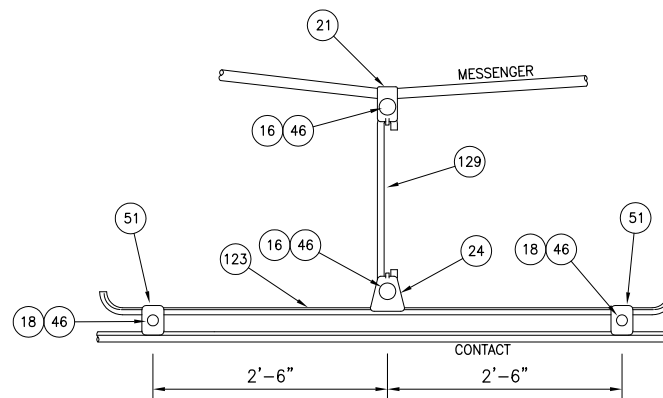
\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "B"  
FOR HANGERS OVER 3'-0"  
FOR CATENARY STANDARD IV

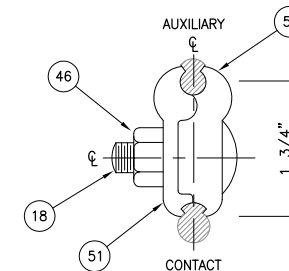
BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	2
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	2
21	BC24B	5/8" TO 0.34" HANGER ROD, CLIP	ET-1087E	2
24	BC26B	GROOVE WIRE TO 0.34" HANGER ROD, CLIP	ET-1078E	2
51	HC29A	INTERMEDIATE CATENARY CLIP	ET-1029E	4
123	---	4/0 DUMMY, 6'-0" LONG	-----	1
129	---	0.34" HANGER HOOK TYPE	ET-1095E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	4

\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "JD"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
18	SSB-34	BOLT, STAINLESS STEEL	ET-148E	1
51	HC-29A	INTERMEDIATE CATENARY CLIP	ET-1029E	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	1



ASSEMBLY "H"  
SCALE: NONE

2:10:59 PM 3/14/2016 J:\2011\0211-059\Drawings\working drawings\paoli to bryn mawr\electrical\Catenary\_Details\2011-059-ET-1900.dwg

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
HANGER ASSEMBLIES, SHEET 1 OF 2

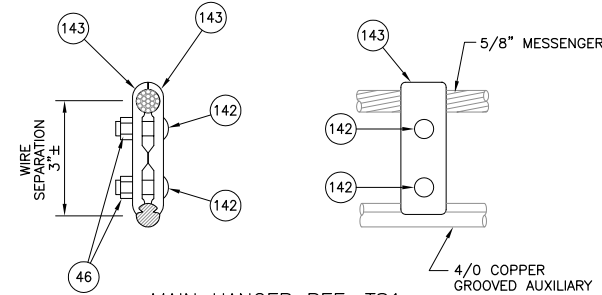
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File No.: 2011-059-ET-1900.DWG  
Ref. No.: 2011-059  
Sheet No.: 353 OF 565  
ET-1900

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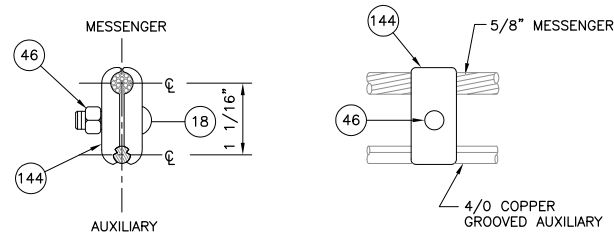
BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
142	BB31	BOLT, CARRIAGE, BRONZE, WITH HEX. NUT,	ET-148-E	2
143	TS1	CLIP, GROOVED WIRE TO 5/8" MESSENGER, BRONZE	ET-76-E	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2



MAIN HANGER REF: TS1

NOTE: THIS CLIP ALLOWS SLIGHT ADJUSTMENT OF THE LOWER WIRE BY ABOUT 1/4"

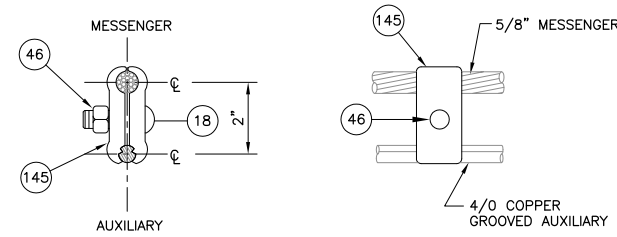
BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
18	SSB34	BOLT, STAINLESS STEEL	---	1
144	TS22	CLIP, GROOVED WIRE TO 5/8" MESSENGER, BRONZE	ET-90-E	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	1



HANGER REF: TS22

N.T.S.

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
18	SSB34	BOLT, STAINLESS STEEL	---	1
145	TS25	CLIP, GROOVED WIRE TO 5/8" MESSENGER, BRONZE	ET-170-E	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	1

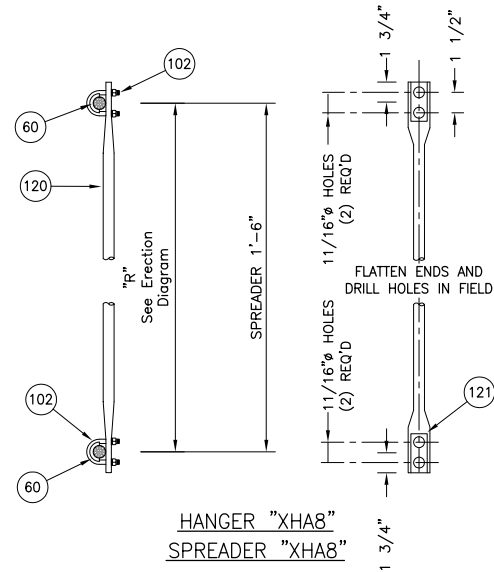


HANGER REF: TS25

N.T.S.

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
60	MWS	MESSENGER SADDLE, SWS OR MWS	ET-170E	2
102	UB27	U-BOLT	ET-782E	2
120	-	1.125" O.D. TUBE BRONZE	---	*
121	-	1/4" COPPER FILLER	---	2

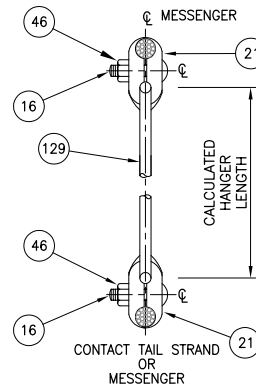
\* - FOR LENGTH SEE ERECTION DIAGRAM



HANGER "XHA8"  
SPREADER "XHA8"

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	2
21	BC24B	5/8" TO 0.34" HANGER ROD	ET-1087E	4
129	-	0.34" HANGER HOOK TYPE	ET-1095E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



ASSEMBLY "K"  
SCALE: NONE

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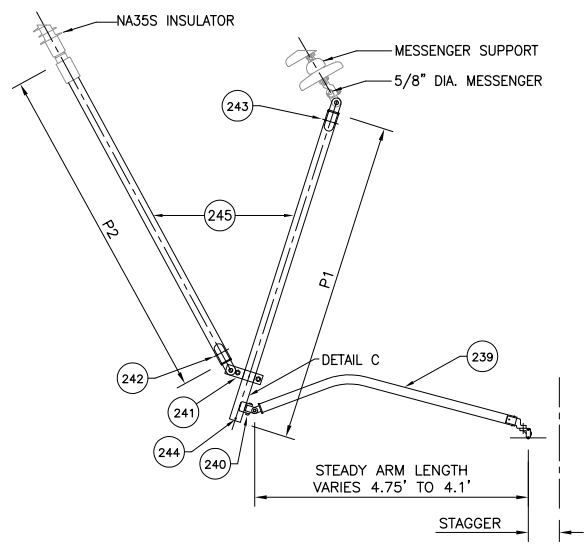
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
HANGER ASSEMBLIES, SHEET 2 OF 2

File No.: 2011-059-ET-1901.DWG  
Ref. No.: 2011-059  
Sheet No.: 354 OF 565

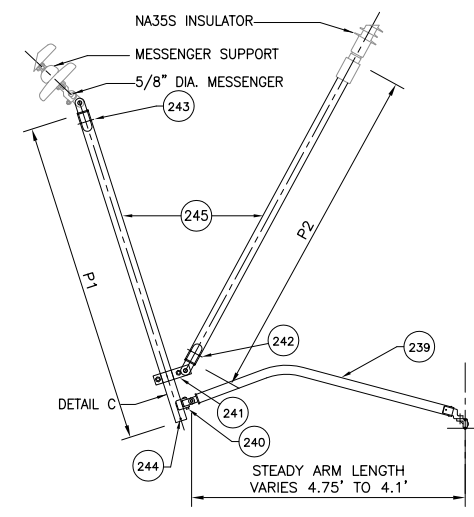
ET-1901

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16



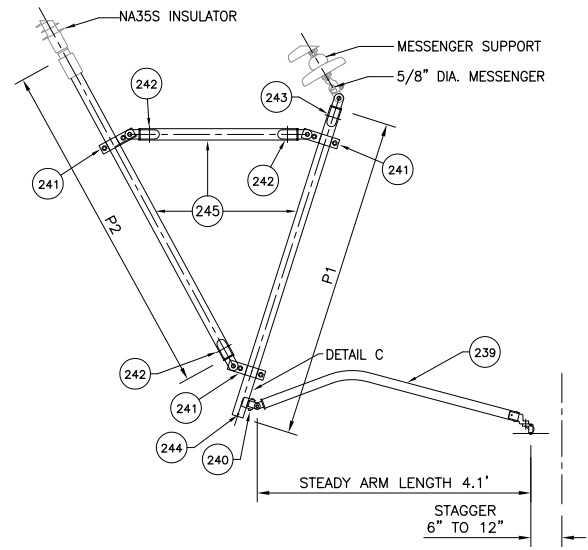
ASSEMBLY POA70A  
SCALE: NONE  
3-WIRE SYSTEM

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
239	-	STEADY ARM ALUMINUM WITH CLEVIS END LENGTH VARIES: 4.75', 4.43', 4.1' END FITTING FOR AUX & CW.	SA-FTSA47-01 SA-FTSA43-01 SA-FTSA41-01	1
240	-	CLEVIS PIPE FOR STEADY ARM	B3431-01	1
241	-	CLEVIS CLAMP FOR PIPE	B0408-01	1
242	-	COMPONENT EYE FOR PIPE, SCH 80	B0505-01	1
243	-	COMPONENT CLEVIS FOR PIPE, SCH 80	B0505-03	1
244	-	COTTER PIN, STN STEEL, 3/16" DIA X 1"	---	1
245	-	PIPE, 2" NOM. DIA, ALUMINUM, SCH 80	---	A/R



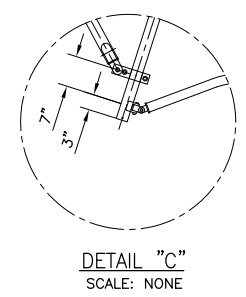
ASSEMBLY POA70C  
SCALE: NONE  
3-WIRE SYSTEM

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
239	-	STEADY ARM ALUMINUM WITH CLEVIS END LENGTH VARIES: 4.75', 4.43', 4.1' END FITTING FOR AUX & CW.	SA-FTSA47-01 SA-FTSA43-01 SA-FTSA41-01	1
240	-	CLEVIS PIPE FOR STEADY ARM	B3431-01	1
241	-	CLEVIS CLAMP FOR PIPE	B0408-01	1
242	-	COMPONENT EYE FOR PIPE, SCH 80	B0505-01	1
243	-	COMPONENT CLEVIS FOR PIPE, SCH 80	B0505-03	1
244	-	COTTER PIN, STN STEEL, 3/16" DIA X 1"	---	1
245	-	PIPE, 2" NOM. DIA, ALUMINUM, SCH 80	---	A/R



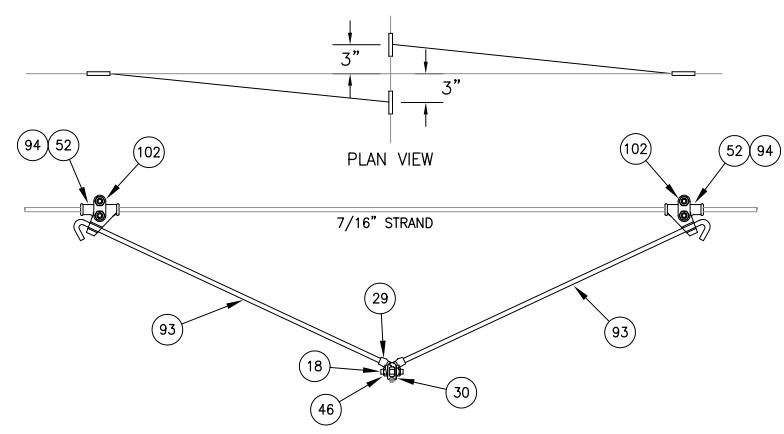
ASSEMBLY POA70B  
SCALE: NONE  
3-WIRE SYSTEM

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
239	-	STEADY ARM ALUMINUM WITH CLEVIS END LENGTH VARIES: 4.75', 4.43', 4.1' END FITTING FOR AUX & CW.	SA-FTSA47-01 SA-FTSA43-01 SA-FTSA41-01	1
240	-	CLEVIS PIPE FOR STEADY ARM	B3431-01	1
241	-	CLEVIS CLAMP FOR PIPE	B0408-01	3
242	-	COMPONENT EYE FOR PIPE, SCH 80	B0505-01	3
243	-	COMPONENT CLEVIS FOR PIPE, SCH 80	B0505-03	1
244	-	COTTER PIN, STN STEEL, 3/16" DIA X 1"	---	1
245	-	PIPE, 2" NOM. DIA, ALUMINUM, SCH 80	---	A/R



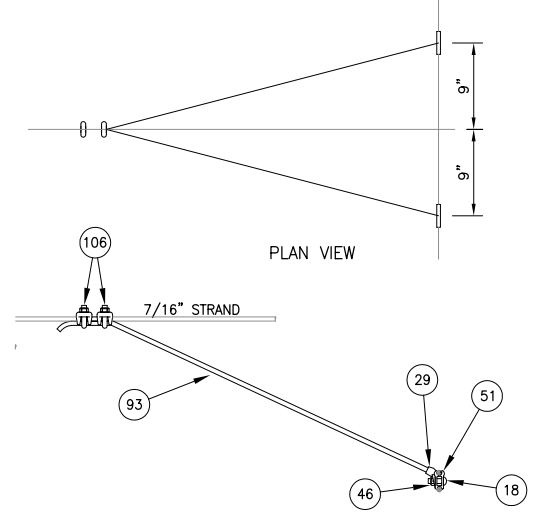
DETAIL "C"  
SCALE: NONE

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
18	SSB-34	BOLT, STAINLESS STEEL	ET-148E	2
29	BC-34	HORIZONTAL STEADY CLIP	ET-1089E	2
30	BC-37	FACING CLIP	ET-1083E	2
52	HSC	CLAMP	ET-918E	2
93	SR	0.48" Ø BRONZE ROD	ET-1095E	2
94	SWS	7/16" SADDLE	ET-170E	2
102	UB-27	U-BOLT	ET-145E24	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2



ASSEMBLY "SA50a"  
SCALE: NONE

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
18	SSB-34	BOLT, STAINLESS STEEL	ET-148E	2
29	BC-34	HORIZONTAL STEADY CLIP	ET-1089E	2
51	HC29A	INTERMEDIATE CLIP	ET-1029E	2
93	SR	0.48" Ø BRONZE ROD	ET-1095E	2
106	WL3	7/16" WIRE CLIP	ET-556E	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2



ASSEMBLY "SA51a"  
SCALE: NONE

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No	Revisions	Date	By



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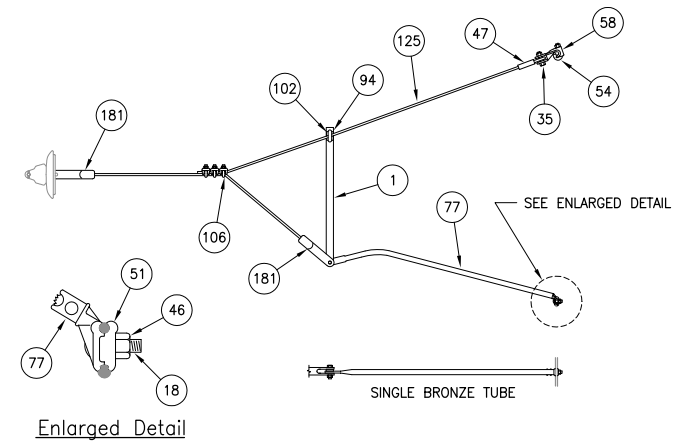
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
REGISTRATION ASSEMBLIES

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

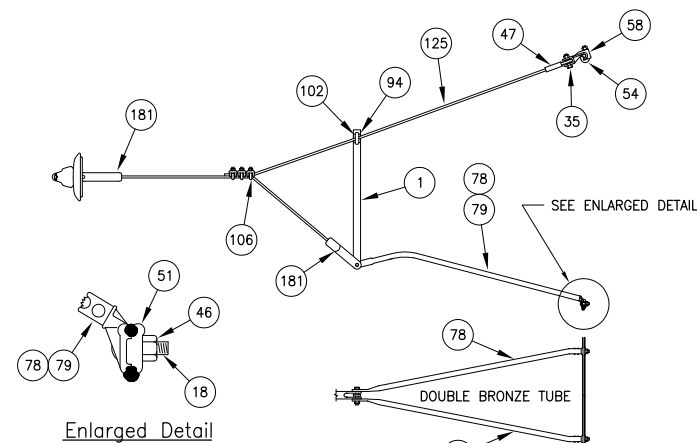
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Ref. No.: 2011-059  
Sheet No.: 355 OF 565  
ET-1902

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
1	1130A	STRAP	ET-1130E	1
18	SSB-34	BOLT, STAINLESS STEEL	ET-148E	1
35	BG-2	BOLT	ET-145E	1
47	ES7/16	EYELET COLLAR SOCKET FOR 7/16"	-----	1
51	HC-29A	INTERMEDIATE CLIP	ET-1029E	1
54	JB	J-BOLT	ET-148E	2
58	MK-1	MESSENGER HOOK	ET-1146D	1
77	PO-3	PULL OFF ARM	14B-63	1
94	SWS	SADDLE, 7/16" SWS	ET-170E	1
96	TH-3	THIMBLE	11B-1234	1
102	UB-27	U-BOLT	ET-145E	1
106	WL3	WIRE CLIP, 7/16"	ET-556E	3
125	-	7/16" COPPERWELD STRAND	-----	1
181	CS7/16	FORKED COLLAR SOCKET, FOR 7/16"	-----	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	1



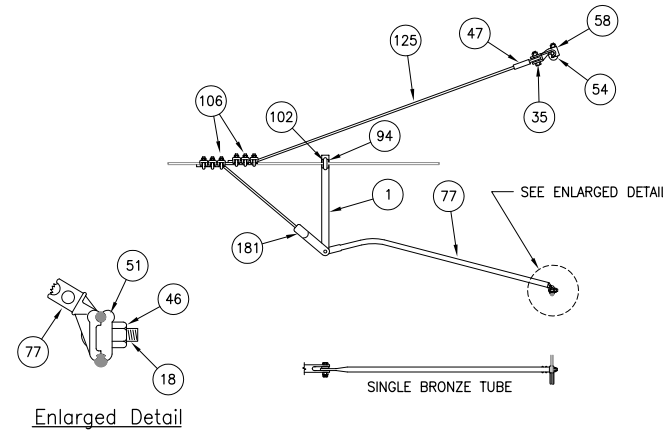
POA61a  
HORIZ. STRAND PULL OFF ASS'Y

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
1	1130A	STRAP	ET-1130E	1
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	2
35	BG2	BOLT	ET-145E	1
47	ES7/16	EYELET COLLAR SOCKET FOR 7/16"	-----	1
51	HC29A	INTERMEDIATE CLIP	ET-1029E	2
54	JB	J-BOLT	ET-148E	2
58	MK1	MESSENGER HOOK	ET-1146D	1
78	POL4	PULL OFF ARM	14B-63	1
79	POR4	PULL OFF ARM	14B-63	1
94	SWS	SADDLE, 7/16" SWS	ET-170E	1
96	TH3	THIMBLE	11B-1234	1
102	UB27	U-BOLT	ET-145E	1
106	WL3	WIRE CLIP, 7/16"	ET-556E	3
125	-	7/16" COPPERWELD STRAND	-----	1
181	CS7/16	FORKED COLLAR SOCKET, FOR 7/16"	-----	2
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2



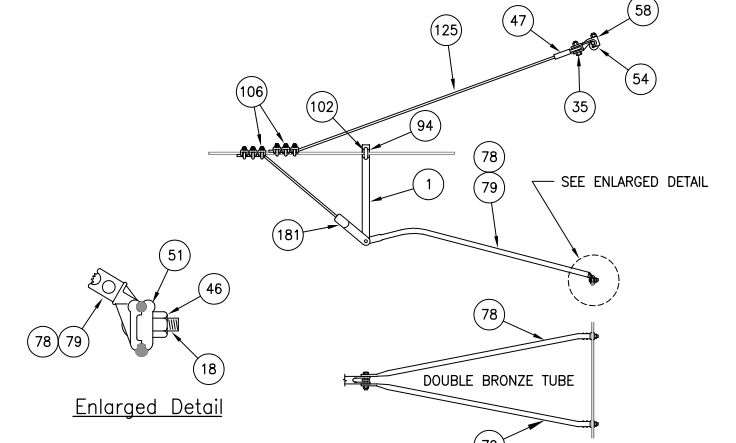
POA61b  
HORIZ. STRAND PULL OFF ASS'Y

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
1	1130A	STRAP	ET-1130E	1
18	SSB-34	BOLT, STAINLESS STEEL	ET-148E	1
35	BG-2	BOLT	ET-145E	1
47	ES7/16	EYELET COLLAR SOCKET FOR 7/16"	-----	1
51	HC-29A	INTERMEDIATE CLIP	ET-1029E	1
54	JB	J-BOLT	ET-148E	2
58	MK-1	MESSENGER HOOK	ET-1146D	1
77	PO-3	PULL OFF ARM	14B-63	1
94	SWS	SADDLE, 5/8" MWS OR 7/16" SWS	ET-170E	1
102	UB-27	U-BOLT	ET-145E	1
106	WL3	WIRE CLIP, 7/16"	ET-556E	6
125	-	7/16" COPPERWELD STRAND	-----	1
181	CS7/16	FORKED COLLAR SOCKET, FOR 7/16"	-----	1
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	1



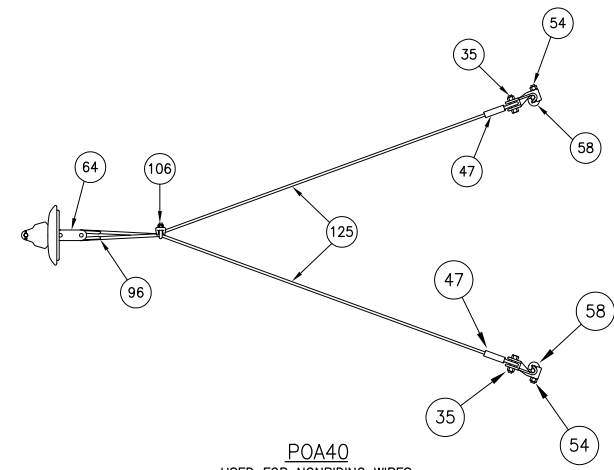
POA63a  
HORIZ. STRAND PULL OFF ASS'Y

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
1	1130A	STRAP	ET-1130E	1
18	SSB-34	BOLT, STAINLESS STEEL	ET-148E	2
35	BG-2	BOLT	ET-145E	1
47	ES7/16	EYELET COLLAR SOCKET FOR 7/16"	-----	1
51	HC-29A	INTERMEDIATE CLIP	ET-1029E	2
54	JB	J-BOLT	ET-148E	2
58	MK-1	MESSENGER HOOK	ET-1146D	1
78	POL4	PULL OFF ARM	14B-63	1
79	POR4	PULL OFF ARM	14B-63	1
94	SWS	SADDLE, 7/16" SWS	ET-170E	1
102	UB-27	U-BOLT	ET-145E	1
106	WL3	WIRE CLIP, 7/16"	ET-556E	6
125	-	7/16" COPPERWELD STRAND	-----	1
181	CS7/16	FORKED COLLAR SOCKET, FOR 7/16"	-----	1
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2



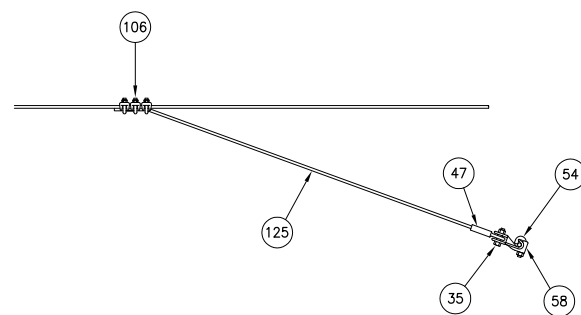
POA63b  
HORIZ. STRAND PULL OFF ASS'Y

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
35	BG2	BOLT	ET-145E	2
47	ES7/16	EYELET COLLAR SOCKET FOR 7/16"	-----	2
54	JB	J-BOLT	ET-148E	4
58	MK1	MESSENGER HOOK	ET-1146D	2
64	ND4	CLEVIS ADAPTER	ET-394E	1
96	TH3	THIMBLE	11B-1234	1
106	WL3	WIRE CLIP, 7/16"	ET-556E	1
125	-	7/16" COPPERWELD STRAND	-----	AS REQ'D



POA40  
USED FOR NONRIDING WIRES

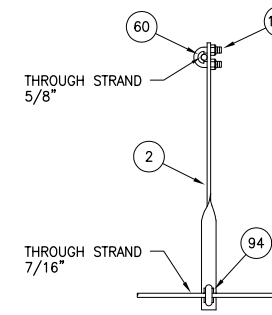
BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
35	BG2	BOLT	ET-145E	1
47	ES7/16	EYELET COLLAR SOCKET FOR 7/16"	-----	1
54	JB	J-BOLT	ET-148E	2
58	MK1	MESSENGER HOOK	ET-1146D	1
106	WL3	WIRE CLIP, 7/16"	ET-556E	3
125	-	7/16" COPPERWELD STRAND	-----	AS REQ'D



POA41  
USED FOR NONRIDING WIRES

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
2	1130B	STRAP	ET-1130E	1
60	MWS	SADDLE FOR 5/8 THROUGH WIRE	ET-170E	1
94	SWS	SADDLE FOR 7/16 THROUGH WIRE	ET-170E	1
102	UB-27	U-BOLT	ET-145E	2

FOR 5/8" STRAND USE MWS, AND FOR 7/16" STRAND USE SWS



POHA  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
139	--	CLAMP, CROSS, WIRE FOR 7/16" STRAND	-----	1

USE ON 7/16" Ø STRAND



SA55a  
SCALE: NONE

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
PULL-OFF ASSEMBLIES

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1903.DWG  
Ref. No.: 2011-059  
Sheet No: 356 OF 565  
ET-1903

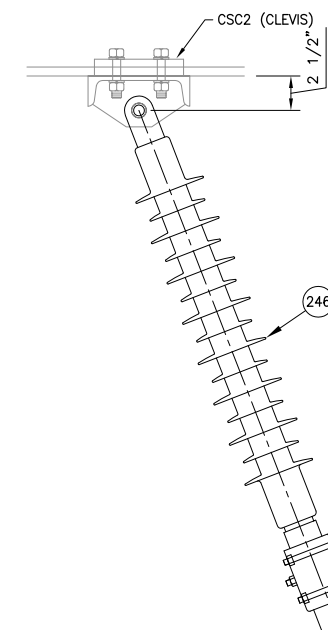
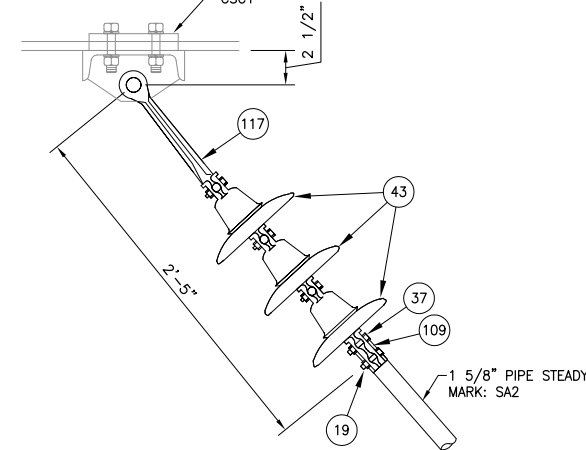
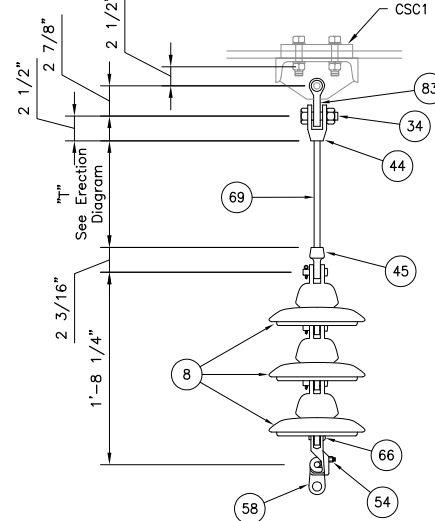
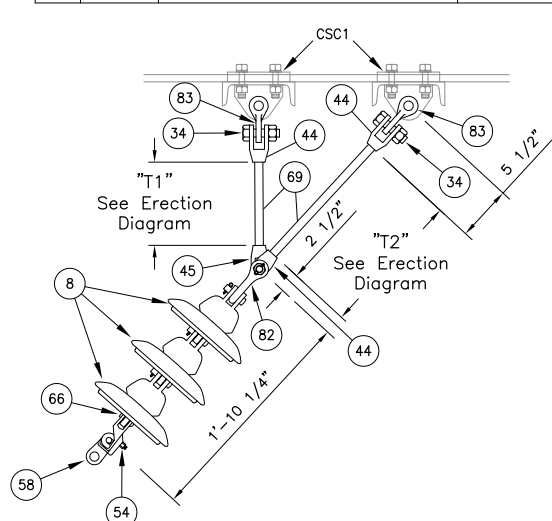
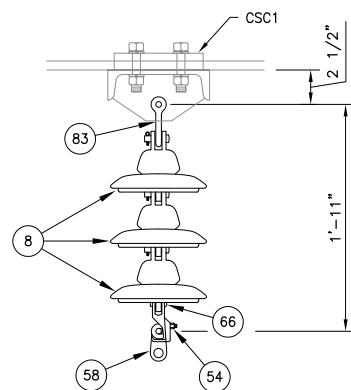
BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
54	JB	J-BOLT	ET-148E	2
58	MK1	MESSENGER HOOK	ET-1146D	1
66	NP1	PIN WITH COTTER, 5/8"	11B-1206	1
83	S4	SHACKLE	ET-305	1

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
34	BG-1	BOLT	ET-145E	2
44	CE-1	CLEVIS END	11B-1227	3
45	EE-1	EYE END	11B-1227	1
54	JB	J-BOLT	ET-148E	2
58	MK-1	MESSENGER HOOK	ET-1146D	1
66	NP-1	PIN WITH COTTER, 5/8"	11B-1206	1
69	NR-2	HANGER ROD, 0.72" ROD	14E-433	2
82	S-2	SHACKLE WITH BOLT	ET-305	1
83	S-4	SHACKLE WITH BOLT	ET-305	2

BILL OF MATERIAL					
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	NA83 QTY	NA83X QTY
8	B1	INSULATOR	ET1-003	3	-
34	BG-1	3/4" BOLT WITH COTTER	ET-145E	1	1
44	CE-1	CLEVIS END	11B-1227	1	1
45	EE-1	EYE END	11B-1227	1	1
54	JB	J-BOLT	ET-148E	2	2
58	MK-1	MESSENGER HOOK	ET-1146D	1	1
66	NP-1	PIN WITH COTTER, 5/8"	11B-1206	1	1
69	NR-2	HANGER ROD, 0.72"	14E-433	1	1
83	S-4	SHACKLE & BOLT	ET-305	1	1

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
19	BB55	BOLT	ET-516E	1
37	BG29	BOLT	ET-145E	1
43	C	INSULATOR	ET1-003	3
109	XC5	PIPE CLAMP	11B-1231	1
117	XT17	RIGID INSULATOR STRAP WITH PIN	ET-907E	1

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
246	-	SYNTHETIC PIPE INSULATOR, 2" DIA PIPE SEDIVER INC REF # TU80XG015	B0407-01	1



1 INSULATOR ASSEMBLY "NA29"  
ET-1904 N.T.S.

2 INSULATOR ASSEMBLY "NA27A"  
ET-1904 N.T.S.

3 INSULATOR ASSEMBLY "NA83 & NA83X"  
ET-1904 N.T.S.

4 INSULATOR ASSEMBLY "NA35"  
ET-1904 N.T.S.

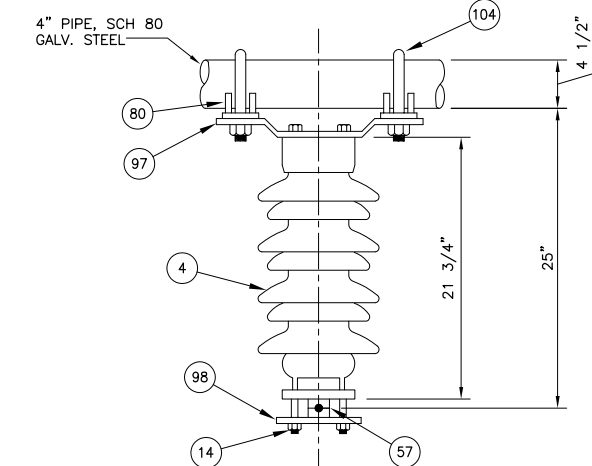
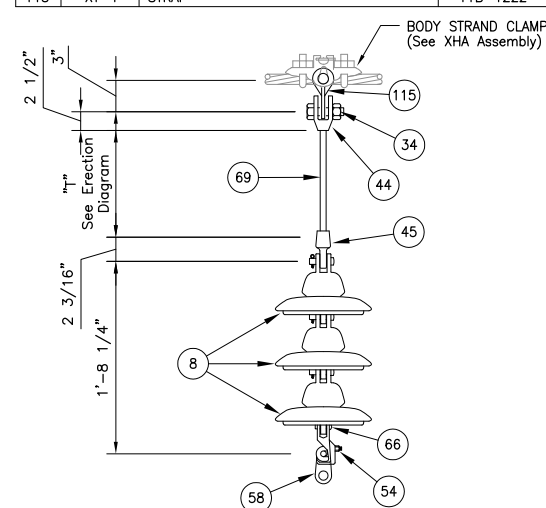
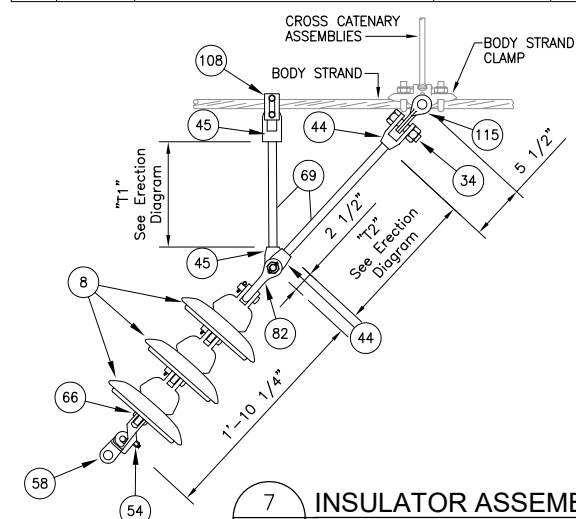
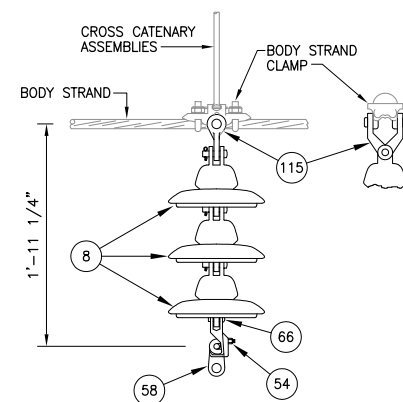
5 INSULATOR ASSEMBLY "NA35S"  
ET-1904 N.T.S.

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
54	JB	J-BOLT	ET-148E	2
58	MK-1	MESSENGER HOOK	ET-1146D	1
66	NP-1	PIN WITH COTTER, 5/8"	11B-1206	1
115	XT-1	STRAP	11B-1222	2

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
34	BG-1	BOLT	ET-145E	1
44	CE-1	CLEVIS END	11B-1227	2
45	EE-1	EYE END	11B-1227	2
54	JB	J-BOLT	ET-148E	2
58	MK-1	MESSENGER HOOK	ET-1146D	1
66	NP-1	PIN WITH COTTER, 5/8"	11B-1206	1
69	NR-2	HANGER ROD, 0.72" ROD	14E-433	2
82	S-2	SHACKLE WITH BOLT	ET-305	1
108	WL5	3/4" WIRE CLIP	ET-556E	1
115	XT-1	STRAP	11B-1222	2

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
34	BG-1	3/4" BOLT WITH COTTER	ET-145E	1
44	CE-1	CLEVIS END	11B-1227	1
45	EE-1	EYE END	11B-1227	1
54	JB	J-BOLT	ET-148E	2
58	MK-1	MESSENGER HOOK	ET-1146D	1
66	NP-1	PIN WITH COTTER, 5/8"	11B-1206	1
69	NR-2	HANGER ROD, 0.72"	14E-433	1
115	XT-1	STRAP	11B-1222	2

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
4	3T	RIGID INSULATOR	ET1-003	1
14	BB7	5/8" BRONZE BOLT W/ LOCKWASHER	ET-148E	2
57	MD5	MESSENGER SADDLE	ET-1124E	2
80	PS1A	PIPE SADDLE	14E-133	2
97	TP1	BENT PLATE	ET-1183E	1
98	TP2	BENT PLATE	ET-1183E	1
104	UB60	U-BOLT	-----	2



6 INSULATOR ASSEMBLY "NA20"  
ET-1904 N.T.S.

7 INSULATOR ASSEMBLY "NA24A"  
ET-1904 N.T.S.

8 INSULATOR ASSEMBLY "NA82"  
ET-1904 N.T.S.

9 INSULATOR ASSEMBLY "1122A"  
ET-1904 N.T.S.

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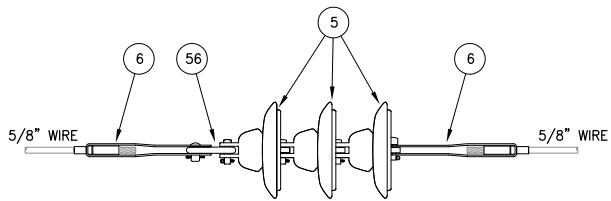
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
MESSENGER SUPPORT ASSEMBLIES

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.: 2011-059-ET-1904.DWG  
Ref. No.: 2011-059  
Sheet No: 357 OF 565  
ET-1904

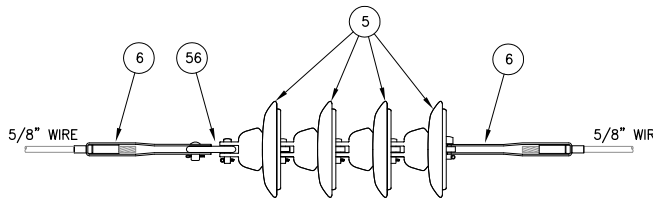
2:11:29 PM 3/14/2016 J:\2011\2011-059\Drawings\working drawings paoli to bryn mawr\electrical\Catenary\_Details\2011-059-ET-1905.dwg

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
5	A2	INSULATOR	ET1-003	3
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	-----	2
56	LK3	3/4" CHAIN LINK, CROSBY	-----	1



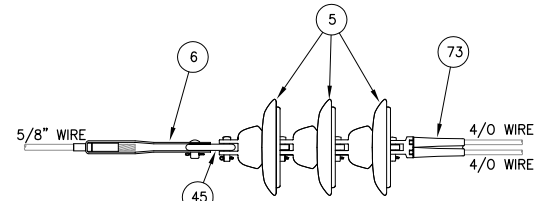
ASSEMBLY "SE1A"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
5	A2	INSULATOR	ET1-003	4
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	-----	2
56	LK3	3/4" CHAIN LINK, CROSBY	-----	1



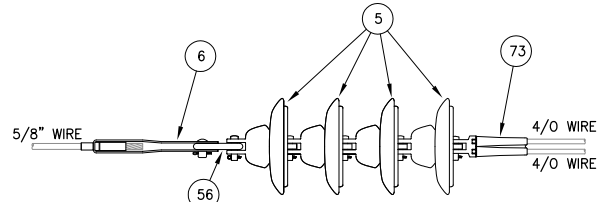
ASSEMBLY "SE1B"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
5	A2	INSULATOR	ET1-003	3
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	-----	1
56	LK3	3/4" CHAIN LINK, CROSBY	-----	1
73	OB22307	DOUBLE, 4/0 & 4/0 CLAMP, CLEVIS	-----	1



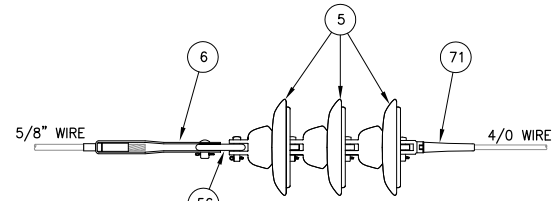
ASSEMBLY "SE12A"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
5	A2	INSULATOR	ET1-003	4
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	-----	1
56	LK3	3/4" CHAIN LINK, CROSBY	-----	1
73	OB22307	DOUBLE, 4/0 & 4/0 CLAMP, CLEVIS	-----	1



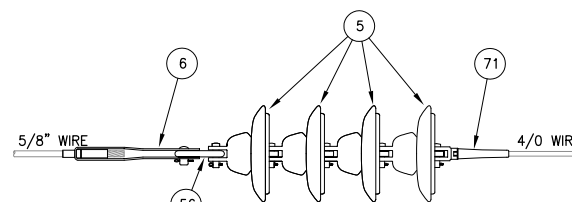
ASSEMBLY "SE12B"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
5	A2	INSULATOR	ET1-003	3
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	-----	1
56	LK3	3/4" CHAIN LINK, CROSBY	-----	1
71	OB-20720	TROLLEY DEAD END CLAMP, CLEVIS	-----	1



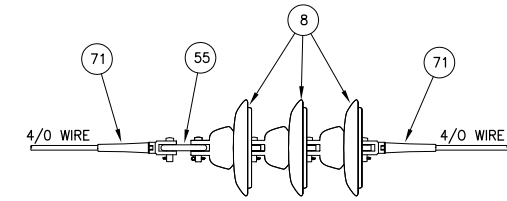
ASSEMBLY "SE5A"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
5	A2	INSULATOR	ET1-003	4
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	-----	1
56	LK3	3/4" CHAIN LINK, CROSBY	-----	1
71	OB-20720	TROLLEY DEAD END CLAMP, CLEVIS	-----	1



ASSEMBLY "SE5B"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
55	LK2	5/8" CHAIN LINK, CROSBY	-----	1
71	OB20720	TROLLEY DEAD END CLAMP, CLEVIS	-----	2



ASSEMBLY "SE9A"  
SCALE: NONE

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National Railroad Passenger Corporation  
30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date



**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
DEADEND INSULATOR ASSEMBLIES**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1905.DWG
Ref. No.:	2011-059
Sheet No.:	358 OF 565
<b>ET-1905</b>	

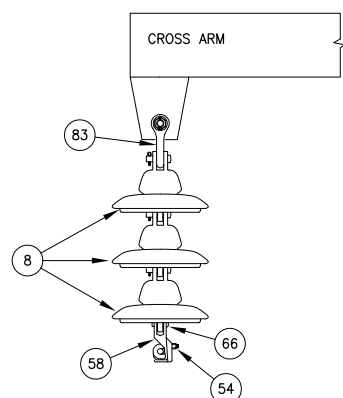


BILL OF MATERIAL			
ITEM	MARK	DESCRIPTION	QTY
224	-	FIBERLIGN CUSHION CLAMP W/ Y-CLEVIS, 4700113	1



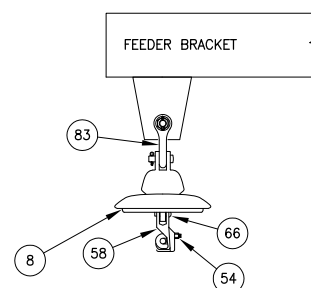
OPS1  
FIBER OPTIC SUPPORT

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
54	JB	J-BOLT	ET-148E	2
58	MK1	MESSENGER HOOK	ET-1146D	1
66	NP1	PIN WITH COTTER, 5/8"	11B-1206	1
83	S4	SHACKLE WITH BOLT	ET-305	1



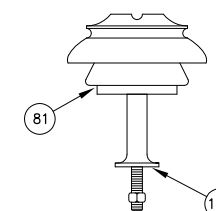
NA16  
FEEDER INSULATOR ASSEMBLY

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	1
54	JB	J-BOLT	ET-148E	2
58	MK1	MESSENGER HOOK	ET-1146D	1
66	NP1	PIN WITH COTTER, 5/8"	11B-1206	1
83	S4	SHACKLE WITH BOLT	ET-305	1

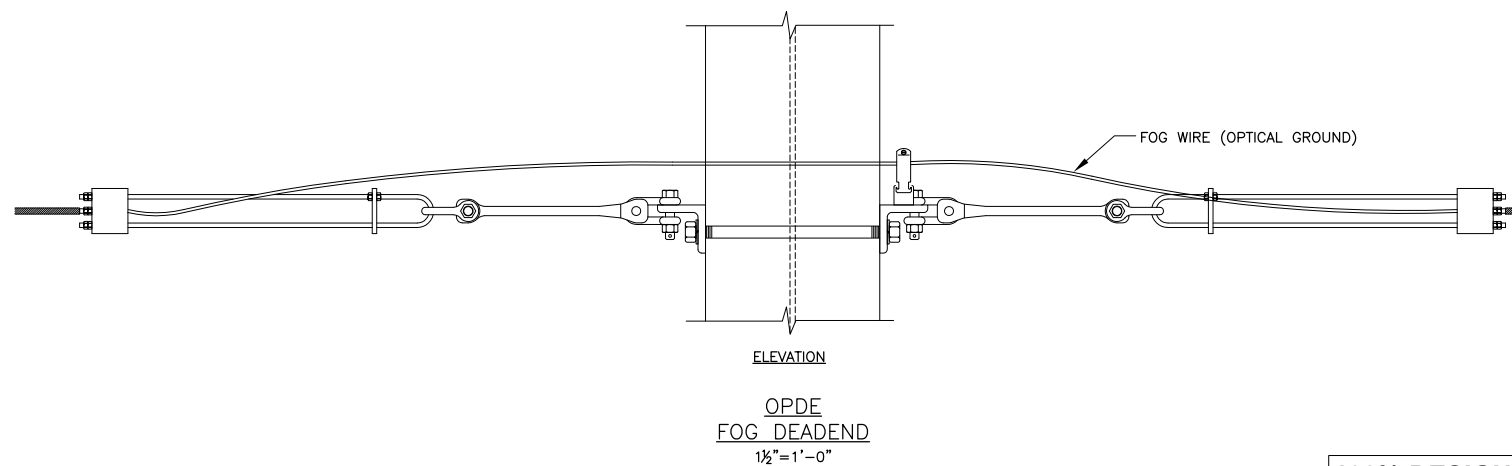
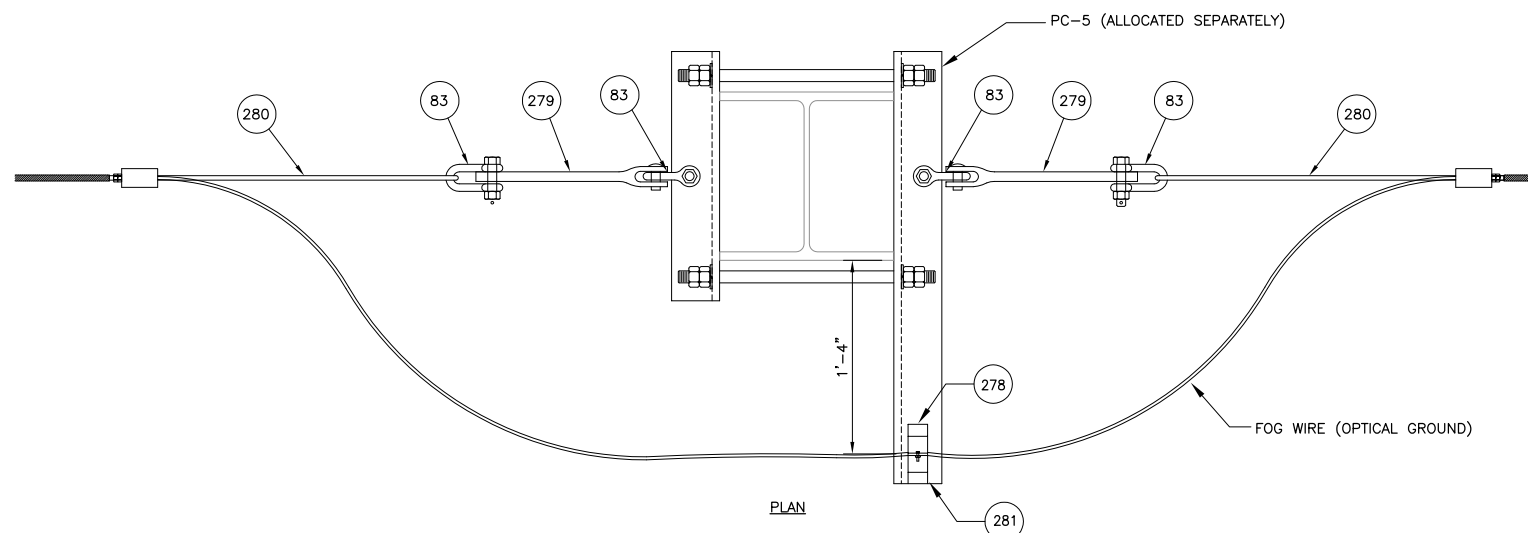


NA74  
RAIL RETURN INSULATOR ASSEMBLY

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
81	S	INSULATOR, OHIO BRASS-#38246	ET1-003	1
132	-	PIN FOR "S" INSULATOR, W/ 3/4 NUT	ET-288	1



NA11  
SIGNAL INSULATOR ASSEMBLY  
CATENARY BRIDGE



BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	REF. DWG.	QUANTITY
83	S4	SHACKLE	ET-305	4
278	-	UNI-STRUT SPOOL, HDG		2
279		EXTENSION LINK		2
280		FIBERLIGN DEAD-END		2
281	-	UNI-STRUT P1100, 1 5/8" x 1 5/8", HDG		1'-0"

2:11:35 PM 3/14/2016 J:\2011\2011-059\Drawings\working drawings\paoli to bryn mawr\electrical\Catenary\_Details\2011-059-ET-1906.dwg

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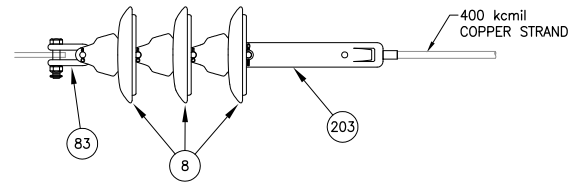
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
UTILITY WIRE ASSEMBLIES

File No.: 2011-059-ET-1906.DWG  
Ref. No.: 2011-059  
Sheet No.: 359 OF 565

ET-1906

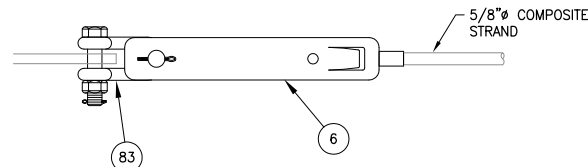
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
83	S-4	SHACKLE	ET-305E	1
203	CS400	FORKED COLLAR SOCKET, FOR 400 kcmil	-----	1



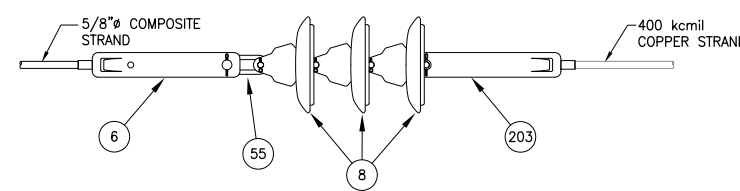
1 ASSEMBLY "FD1"  
ET-1907 N.T.S.

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	6.3225	1
83	S-4	SHACKLE	ET-305E	1



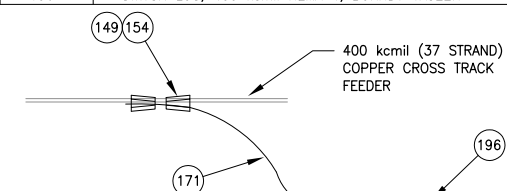
2 ASSEMBLY "FD9"  
ET-1907 N.T.S.

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
6	CS5/8	FORKED COLLAR SOCKET, 610.047.000	-----	1
8	B1	INSULATOR	ET1-003	3
55	LK2	5/8" CHIAN LINK, CROSBY	-----	1
203	CS400	FORKED COLLAR SOCKET, FOR 400 kcmil	-----	1



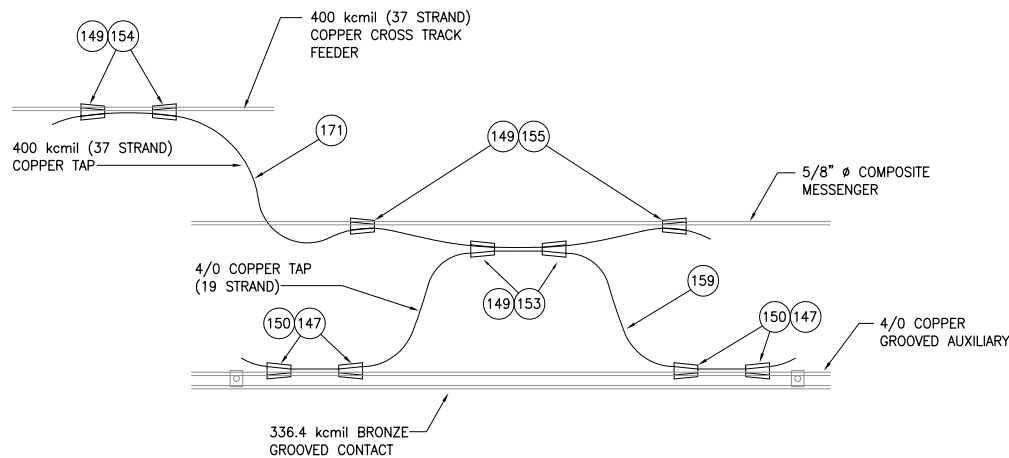
3 ASSEMBLY "FS9"  
ET-1907 N.T.S.

BILL OF MATERIALS		
ITEM	DESCRIPTION	QTY
149	CARTRIDGE, BLUE (FOR INSTALLATION), 69338-1	4
154	TAP, CABLE WEDGE, 400 kcmil TO 400 kcmil, 3-276337-0	2
171	WIRE, 400 kcmil COPPER, 37 STRAND HD	10 ft
196	SWITCH LUG, 400 kcmil NEMA 4, BURNDY YA322N	1



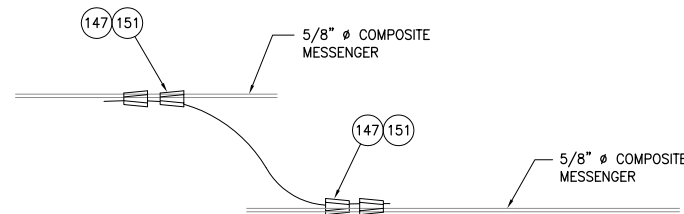
4 ASSEMBLY "FT2"  
ET-1907 N.T.S.

BILL OF MATERIALS			
ITEM	DESCRIPTION	AMP NO.	QUANTITY
147	CARTRIDGE, WHITE (FOR INSTALLATION)	69338-5	4
149	CARTRIDGE, BLUE (FOR INSTALLATION)	69338-1	6
150	TAP, CABLE WEDGE, 4/0 TO 4/0 GROOVE	275187-7	4
153	TAP, CABLE WEDGE, 400 kcmil TO 4/0	3-276337-4	2
154	TAP, CABLE WEDGE, 400 kcmil TO 400 kcmil	3-276337-0	2
155	TAP, CABLE WEDGE, 400 kcmil TO 5/8" DIA.	3-276337-3	2
159	WIRE, 4/0 AWG COPPER, 19 STRAND HD. 112-C		10 ft
171	WIRE, 400 kcmil COPPER, 37 STRAND HD.		20 ft



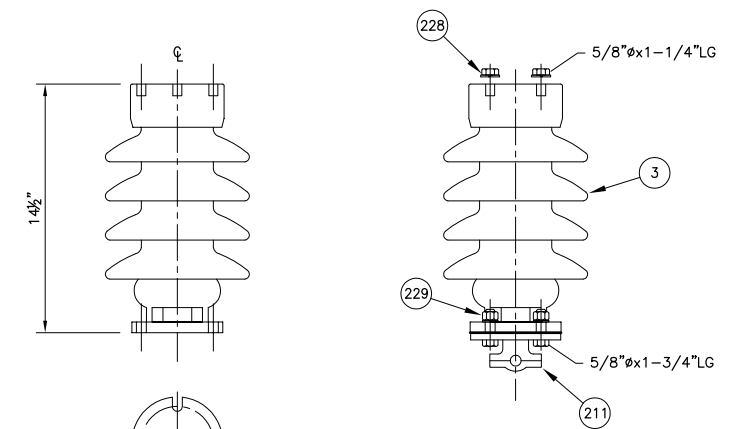
5 ASSEMBLY "FT1"  
ET-1907 N.T.S.

BILL OF MATERIALS			
ITEM	DESCRIPTION	AMP NO.	QUANTITY
147	CARTRIDGE, WHITE (FOR INSTALLATION)	69338-5	4
151	AMP TAP, CU, 5/8 MESS. COMPOSITE TO 4/0 19 STRND CU.	275187-1	4



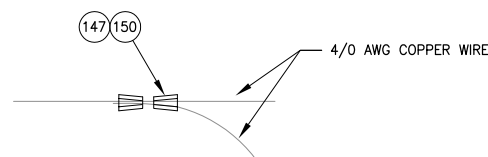
6 CONTINUITY JUMPER "CJ1"  
ET-1907 N.T.S.

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
3	2T	PORCELAIN INSULATOR 5" D.B.C.	ET1-003	1
211	-	BUS SUPPORT, BRZ, 400 MCM, 5" D.B.C.	-	1
228	-	5/8"-11 + 1 1/4" HEX BOLT & WASHERS	-	4
229	-	5/8"-11 + 1 3/4" HEX BOLT, NUT & WASHERS	-	4



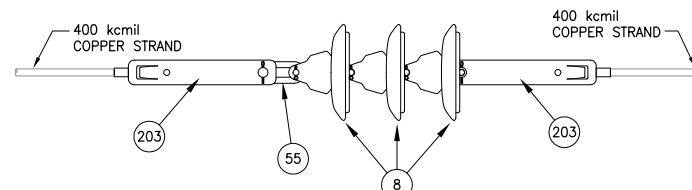
7 ASSEMBLY "NA98"  
ET-1907 N.T.S.

BILL OF MATERIALS			
ITEM	DESCRIPTION	AMP NO.	QUANTITY
147	CARTRIDGE, WHITE (FOR INSTALLATION)	69338-5	2
150	AMP TAP, CU, 4/0 TO 4/0 19 STRND CU.	275187-7	2



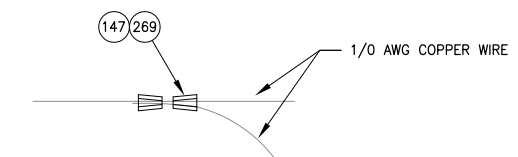
8 ASSEMBLY "FT3"  
ET-1907 N.T.S.

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
55	LK2	5/8" CHIAN LINK, CROSBY	-----	1
203	CS400	FORKED COLLAR SOCKET, FOR 400 kcmil	-----	2



9 ASSEMBLY "FS13"  
ET-1907 N.T.S.

BILL OF MATERIALS			
ITEM	DESCRIPTION	AMP NO.	QUANTITY
147	CARTRIDGE, WHITE (FOR INSTALLATION)	69338-5	2
269	AMP TAP, CU, 1/0 TO 1/0 19 STRND CU.	275187-8	2



10 ASSEMBLY "FT4"  
ET-1907 N.T.S.

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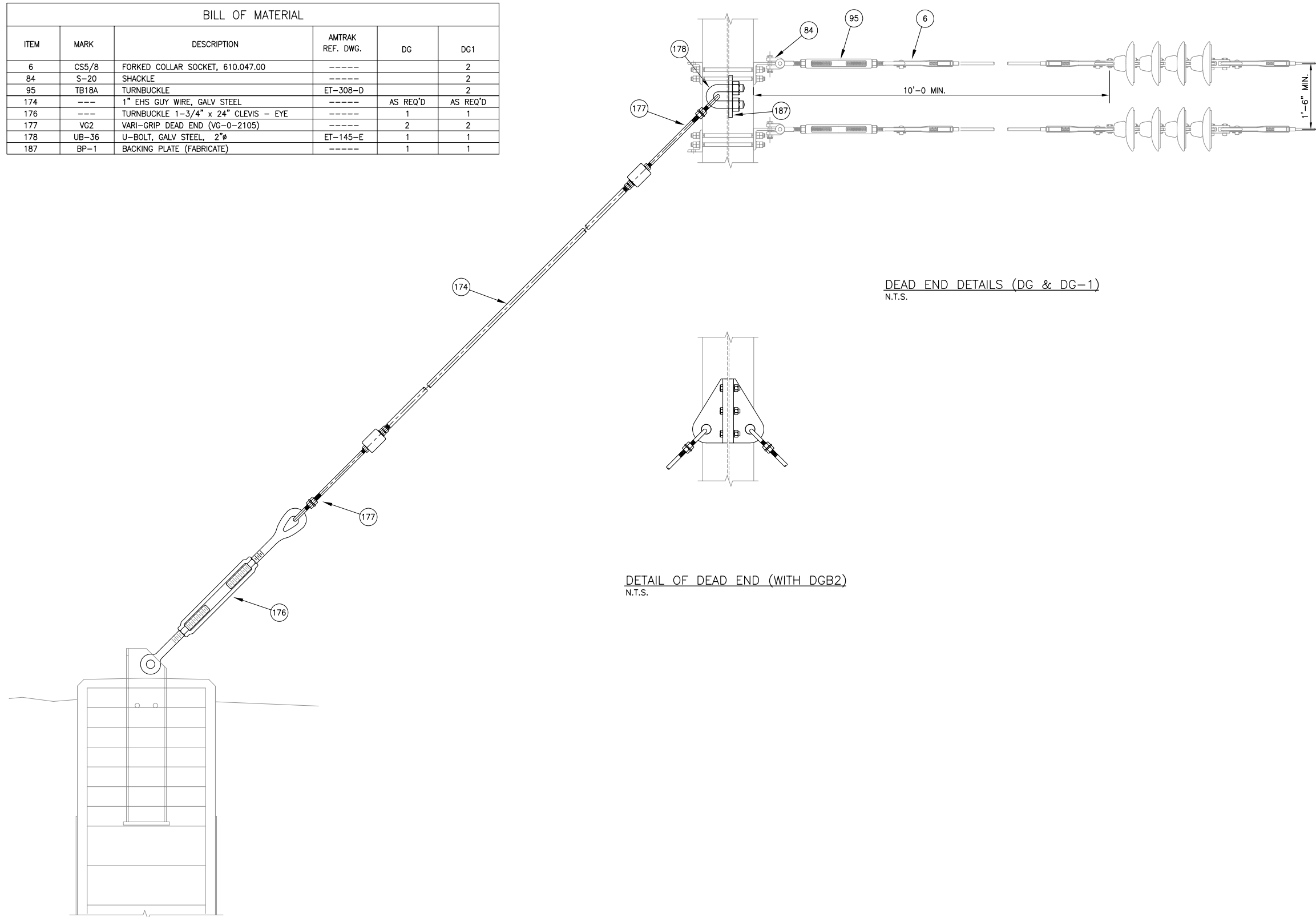
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
FEEDER ASSEMBLIES  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1907.DWG
Ref. No.:	2011-059
Sheet No.:	360 OF 565
ET-1907	

BILL OF MATERIAL					
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	DG	DG1
6	CSS/8	FORKED COLLAR SOCKET, 610.047.00	-----		2
84	S-20	SHACKLE	-----		2
95	TB18A	TURNBUCKLE	ET-308-D		2
174	---	1" EHS GUY WIRE, GALV STEEL	-----	AS REQ'D	AS REQ'D
176	---	TURNBUCKLE 1-3/4" x 24" CLEVIS - EYE	-----	1	1
177	VG2	VARI-GRIP DEAD END (VG-0-2105)	-----	2	2
178	UB-36	U-BOLT, GALV STEEL, 2"Ø	ET-145-E	1	1
187	BP-1	BACKING PLATE (FABRICATE)	-----	1	1



DEAD END DETAILS (DG & DG-1)  
N.T.S.

DETAIL OF DEAD END (WITH DGB2)  
N.T.S.

9:14:30 AM 3/15/2016 J:\2011\2011-059\Drawings\working drawings paoli to bryn mawr\electrical\Catenary Details\2011-059-ET-1908.dwg

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**Burns** IN ASSOCIATION WITH **Baker** **AECOM**

BURNS ENGINEERING, INC. | 215 979-7700  
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
PHILADELPHIA, PA 19103

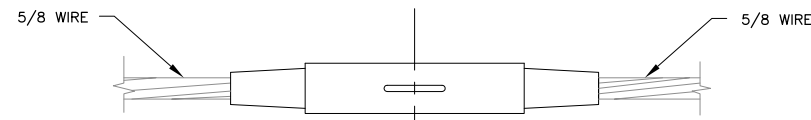
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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
DOWN GUY DETAILS

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

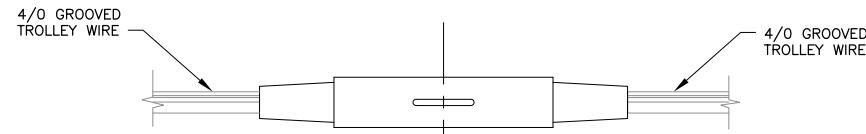
File No.: 2011-059-ET-1908.DWG  
Ref. No.: 2011-059  
Sheet No.: 361 OF 565  
ET-1908

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	REF. DWG.	QTY
209	CC5/8	CONICAL SPLICE, FOR 5/8" CAT. MESS. WIRE, ARTHUR FLURY, 615.006.106	---	1



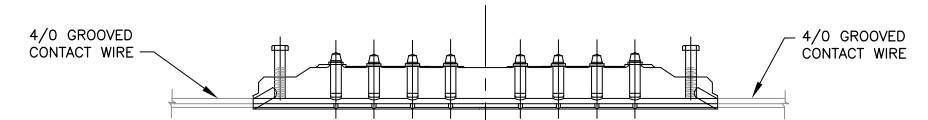
1 CONICAL SPLICE "CC5/8"  
ET-1909 N.T.S.

BILL OF MATERIALS AUXILIARY SPLICE				
ITEM	MARK	DESCRIPTION	REF. DWG.	QTY
207	CC4/0T	CONICAL SPLICE, FOR 4/0 BRNZ OR CU. TROLLEY, ARTHUR FLURY, 615.233.000	---	1



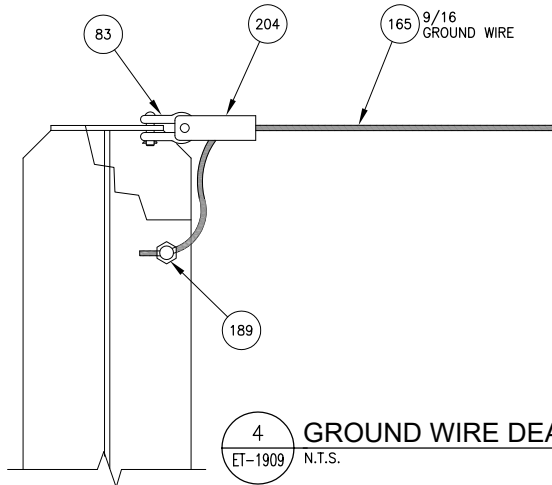
2 CONICAL SPLICE "CC4/0T"  
ET-1909 N.T.S.

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	REF. DWG.	QTY
92	SPL3	SPLICE FOR 4/0 GROOVED CONTACT	---	1



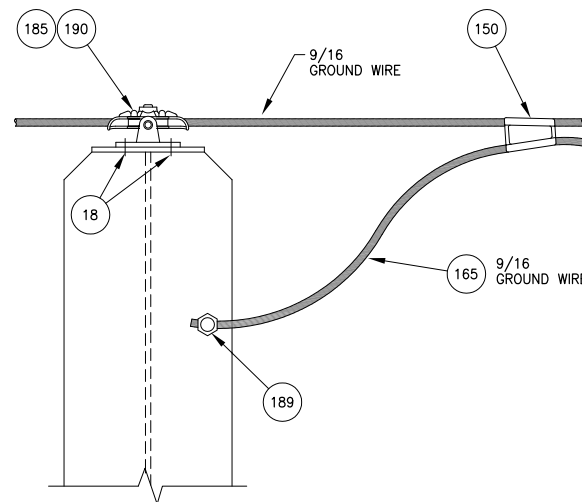
3 TROLLEY SPLICE "SPL3"  
ET-1909 N.T.S.

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	UNITS	QTY
83	S4	SHACKLE, GALV STEEL	EA	1
165	--	9/16 CONDUCTOR	FT	3
189	--	SERVIT POST, BRONZE BURNDY KC31B1	EA	1
204	--	FORKED COLLAR SOCKET, ARTHUR FLURY NO. 610.090.000	EA	1



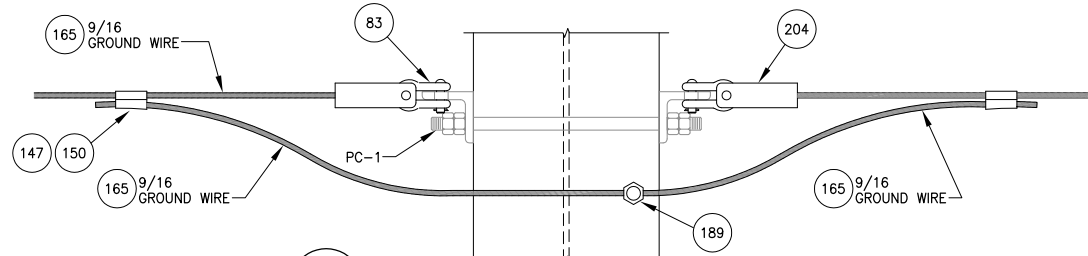
4 GROUND WIRE DEADEND "GWD1"  
ET-1909 N.T.S.

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	UNITS	QTY
18	SSB34	BOLT, STAINLESS STEEL 1/2"x1 5/8" W/ NUT AND LOCKWASHER	EA	2
150	--	WIRE TO WIRE TAP, COPPER AMP NO. 2-275187-8	EA	1
165	--	9/16 CONDUCTOR	FT	3
185	--	CLAMP TOP BRACKET, MALLEABLE IRON, GALV. LAPP 57111	EA	1
189	--	SERVIT POST, BRONZE BURNDY KC31B1	EA	1
190	--	CLAMP TOP BRACKET, MALLEABLE IRON, GALV. LAPP 47102	EA	2



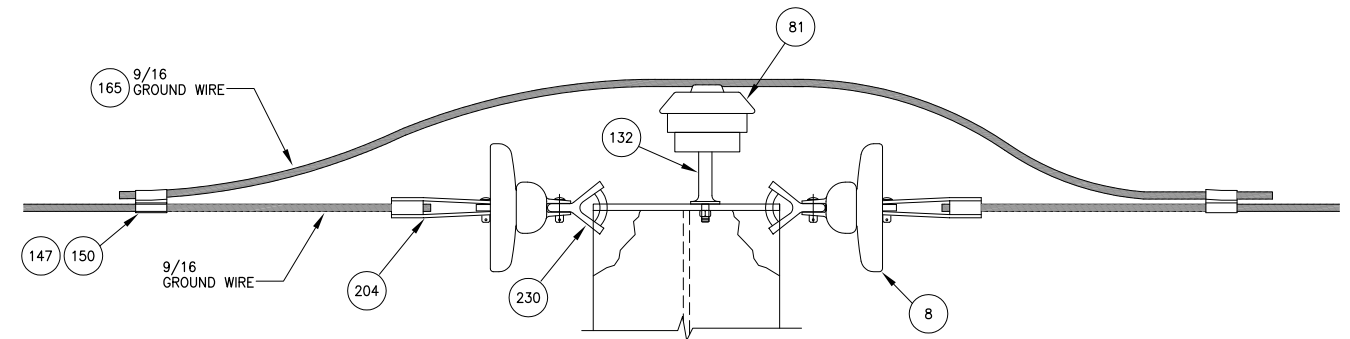
5 GROUND WIRE SUPPORT "GWS1"  
ET-1909 N.T.S.

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	UNITS	QTY
83	S4	SHACKLE WITH BOLT	EA	2
150	--	WIRE TO WIRE TAP, COPPER AMP NO. 2-275187-8	EA	2
147	--	AMPACT WHITE CARTRIDGE 693385	EA	2
165	--	9/16 CONDUCTOR	FT	6
204	--	FORKED COLLAR SOCKET, ARTHUR FLURY NO. 610.090.000	EA	2
189	--	SERVIT POST, BRONZE BURNDY KC31B1	EA	1



6 GROUND WIRE DEADEND "GWD2"  
ET-1909 N.T.S.

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	UNITS	QTY
8	B1	INSULATOR	EA	2
81	--	TYPE S INSULATOR	EA	1
132	--	PIN FOR TPE "S" INSULATOR W/ 3/4" NUT	EA	1
147	--	AMPACT WHITE CARTRIDGE 693385	EA	2
150	--	WIRE TO WIRE TAP, COPPER AMP NO. 2-275187-8	EA	2
165	--	9/16 CONDUCTOR	FT	6
204	--	FORKED COLLAR SOCKET, ARTHUR FLURY NO. 610.090.000	EA	2
230	--	Y CLEVIS EYE, GALV. HUBBELL YCC3090	EA	2



7 GROUND WIRE DEADEND "GWS2"  
ET-1909 N.T.S.

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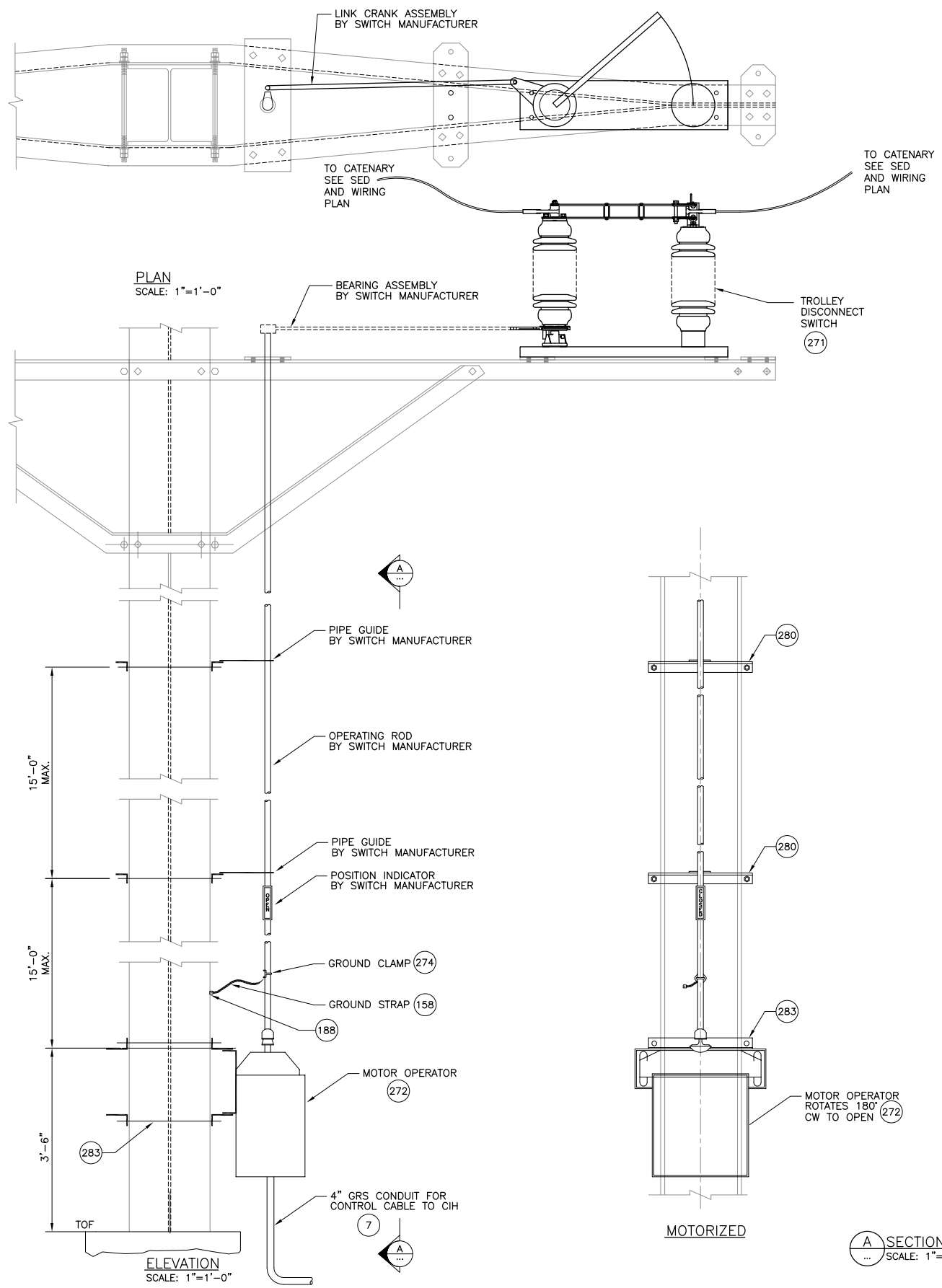
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
GROUNDING AND SPLICE ASSEMBLIES  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

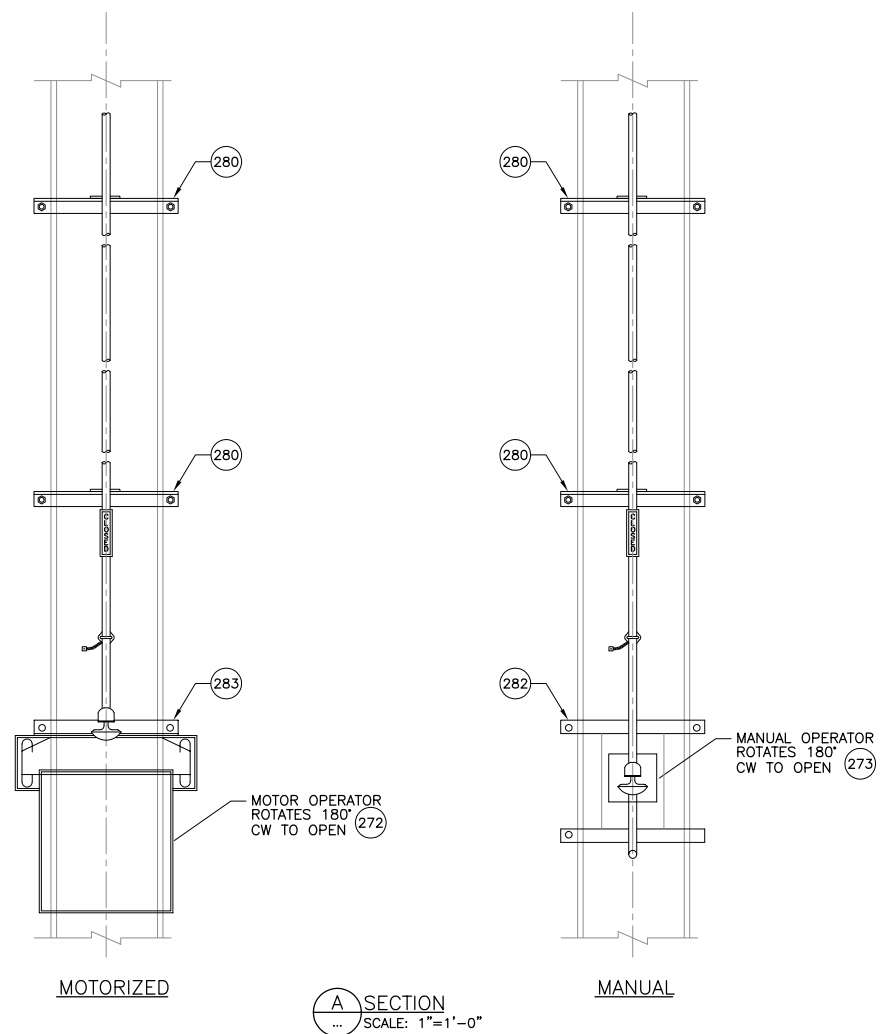
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BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DRAWING	QTY.
158		2/0 AWG GROUND WIRE	1275187-5	VARIABLES
188		SERVIT POST CONNECTOR BURNDY KC28B1	-	1
271	SW	DISCONNECT SWITCH, 34.5 kV, 1200 AMP. SPST WITH OPERATING PIPES, COUPLINGS, LINKS, BEARINGS AND GUIDES	ET-1919	1
272	MOD	MOTOR OPERATOR FOR DISCONNECT SWITCH		1
273	HAN	HAND OPERATOR FOR DISCONNECT SWITCH		1
274	-	GROUND CLAMP FOR 1 1/2" DIA PIPE. BURNDY GAR-1629		1
280	RS14	ROD SUPPORT	S-5225	*
282	HO14	HAND OPERATOR SUPPORT	S-5225	1
283	MOS14	MOTOR OPERATOR SUPPORT	S-5225	1
286	-	4" RGS CONDUIT	-	VARIABLES

**NOTES:**  
 1. INSTALL ROD SUPPORTS AT 15'-0" MAXIMUM SPACING UNLESS LESSER SPACING IS RECOMMENDED BY MANUFACTURER.



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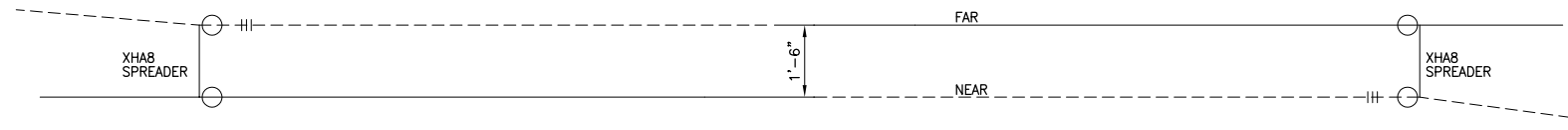


**PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION CATENARY DETAILS TROLLEY DISCONNECT SWITCH DETAILS**  
 Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

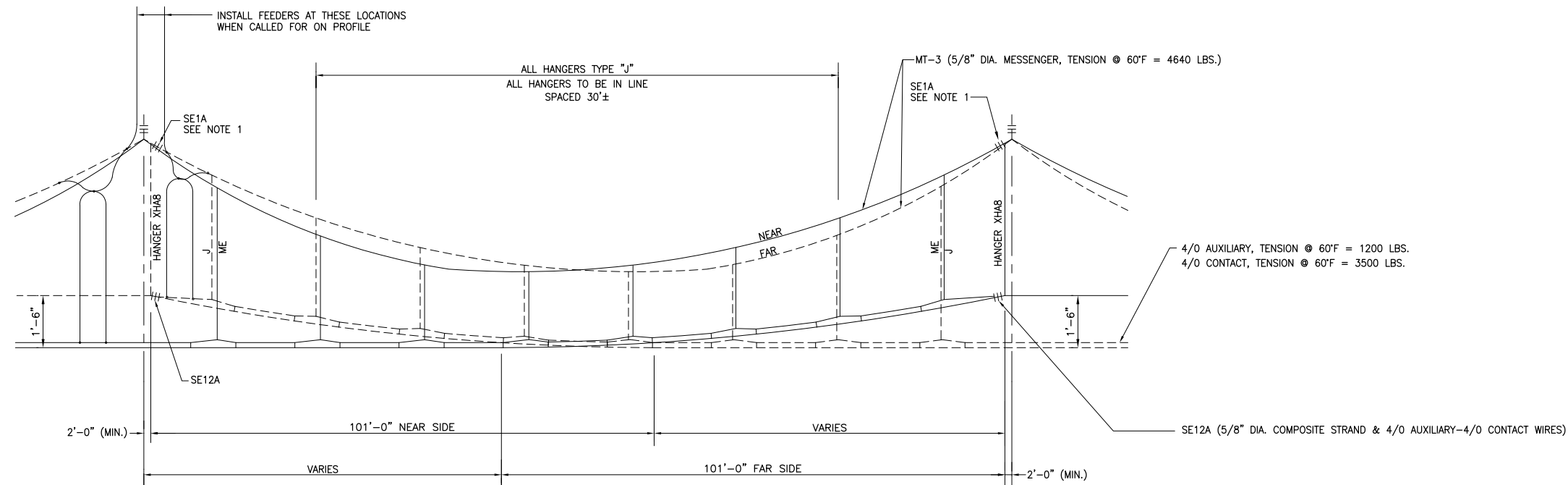
File No.:	2011-059-ET-1910.DWG
Ref. No.:	2011-059
Sheet No.:	363 OF 565
<b>ET-1910</b>	

BILL OF MATERIAL – PREFERRED ASSEMBLIES

MARK	DESCRIPTION OF CONTACT WIRE	SE1A	SE4A	SE6A	SE8A	SE12A	XHAB SPREADER	XHAB HANGER
REF. DWG		ET1-017	ET1-017	ET1-017	ET1-017	ET1-017	ET1-019	ET1-019
UNIT		EA.	EA.	EA.	EA.	EA.	EA.	EA.
MT-3a		2				2	2	2
MT-3b		2			2		2	2
MT-3c		2			1	1	2	2



PLAN VIEW



PROFILE

MAIN TRACK AIR BREAK (FULL TENSION)

MT-3

5/8" DIA. MESSENGER, 4/0 AUXILIARY & 4/0 CONTACT WIRES

NOTES:

- WHENEVER INSULATORS SLOPE UPWARD FROM XHAB HANGER, REVERSE INSULATORS FROM THEIR NORMAL POSITION, (SEE ET1-018, ELECTRIFICATION STANDARDS)
- ALL HANGER LENGTHS ARE TO BE CALCULATED USING THE APPROPRIATE HANGER HARDWARE CONSTANTS AND TABULATED ON THE CATENARY PROFILE.

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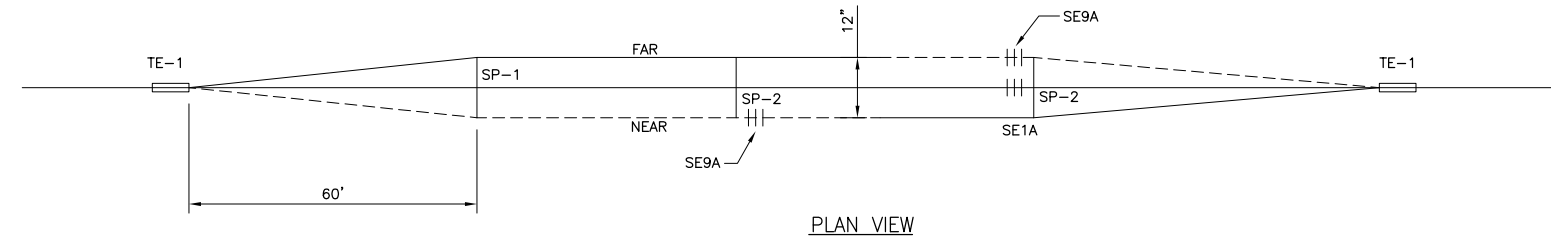
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
FULL TENSION AIR BREAK (MT-3)

File No.: 2011-059-ET-1911.DWG  
Ref. No.: 2011-059  
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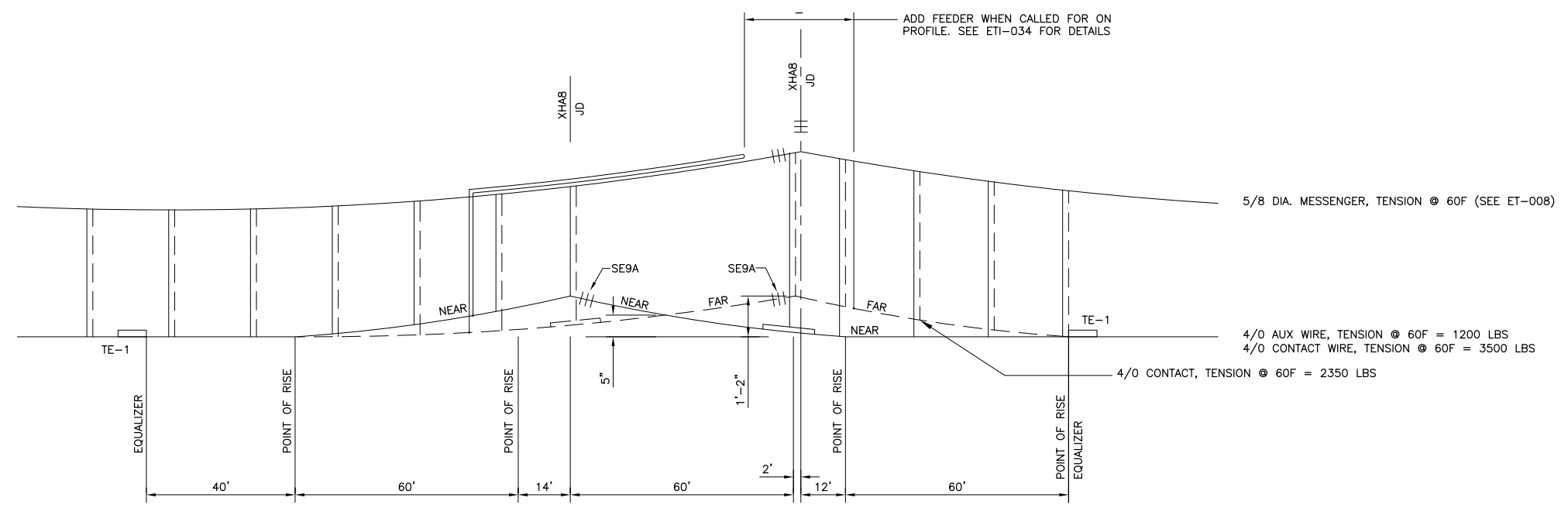
ET-1911

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

BILL OF MATERIAL - PREFERRED ASSEMBLIES							
MARK	SE1A	SE9A	SP-1	SP-2	TE-1	XHAB	JD
REF. DWG	ET1-017	ET1-017	ET1-019	ET1-019	ET1-019	ET1-019	ET1-020
UNIT	EA.	EA.	EA.	EA.	EA.	EA.	EA.
Y-60A	1	2	1	2	2	2	2



PLAN VIEW



PROFILE

MAIN TRACK AIR BREAK (HALF TENSION) 3 WIRE SYSTEM

Y-60A

MESSENGER WIRE IS 5/8", AUX AND CONTACT WIRES ARE 4/0 BRONZE

NOTES:

1. USE CATENARY STANDARD XVI BEYOND TENSION EQUALIZERS FOR 5/8" MESSENGER WIRE.
2. USE CATENARY STANDARD XVII BEYOND TENSION EQUALIZERS FOR 7/16" MESSENGER WIRE.
3. ALL HANGER LENGTH ARE TO BE CALCULATED USING THE APPROPRIATE HANGER HARDWARE CONSTANTS AND TABULATED ON THE CATENARY PROFILE.
4. WHENEVER INSULATORS SLOPE UPWARD FROM HANGER "XHAB", REVERSE INSULATORS FROM THEIR NORMAL POSITION, SEE AMTRAK DRAWING ET1-018.
5. THIS DRAWING IS BASED ON AMTRAK DRAWING ET1-012.

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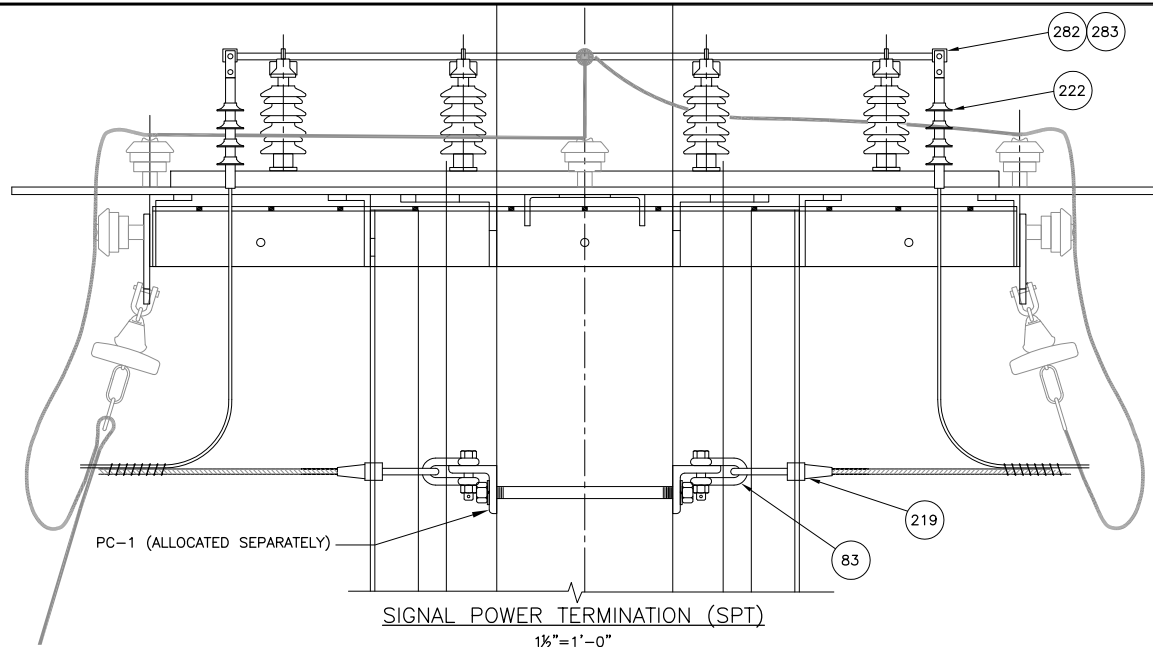
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TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
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**AECOM**

PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
HALF TENSION AIR BREAK (Y-60)  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

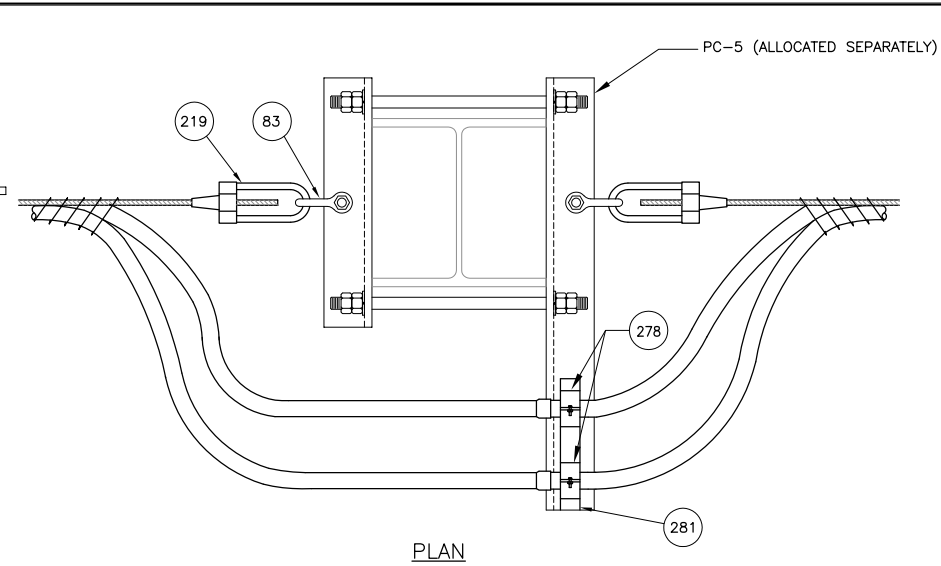
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Ref. No.:	2011-059
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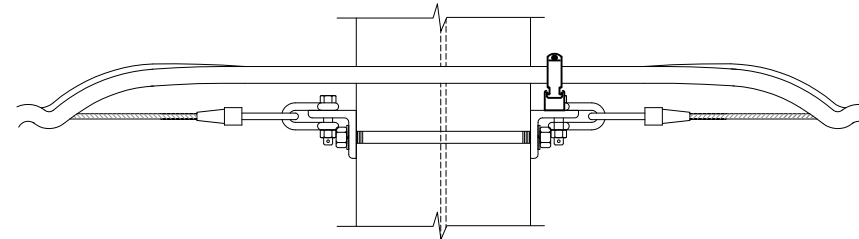
SIGNAL POWER TERMINATION (SPT)

1 1/2" = 1'-0"

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QUANTITY
83	S4	SHACKLE WITH BOLT	ET-305	2
219		AUTOMATIC DEAD END HUBBELL POWER SYSTEMS CAT. NO. GDE-702		2
222		3M COLD SHRINK TERMINATION 5633K		4
282	-	COPPER BAR 90°		2
283	-	1/2"x13-2" HEX BOLT, NUT & LOCK WASHER, BRONZE		12



PLAN

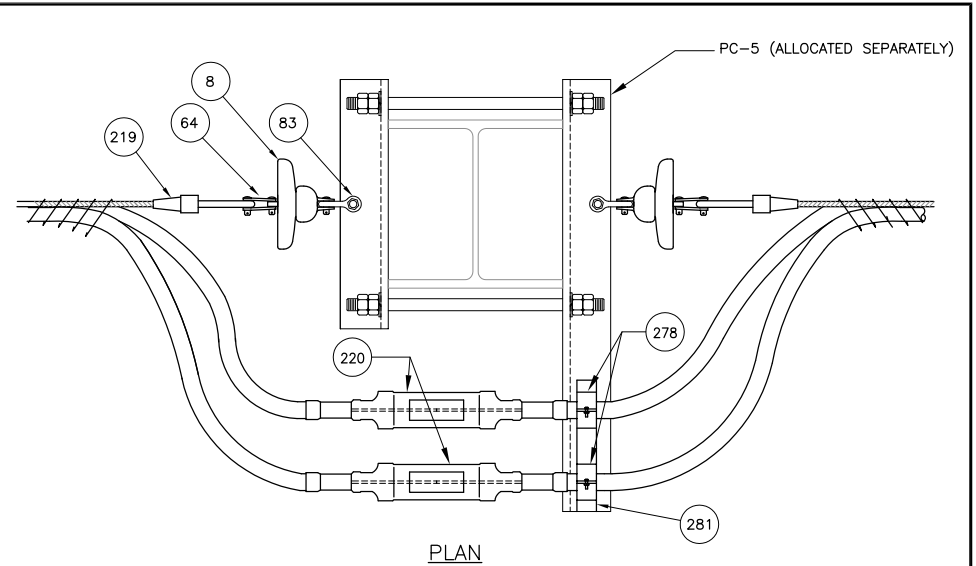


ELEVATION

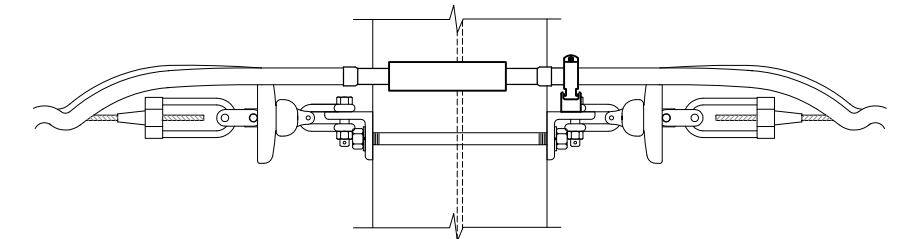
BILL OF MATERIALS					
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	SPDE2 QUANTITY	SPDE3 QUANTITY
83	S4	SHACKLE WITH BOLT	ET-305	2	2
219		AUTOMATIC DEAD END HUBBELL POWER SYSTEMS CAT. NO. GDE-702		2	2
278	-	UNI-STRUT SPOOL, HDG		2	-
281	-	UNI-STRUT P1100, 1 5/8" x 1 5/8", HDG		1'-0"	-

SIGNAL POWER DEAD END (SPDE2 & SPDE3)

1 1/2" = 1'-0"  
NOTE: FOR INSULATED CABLE ONLY



PLAN

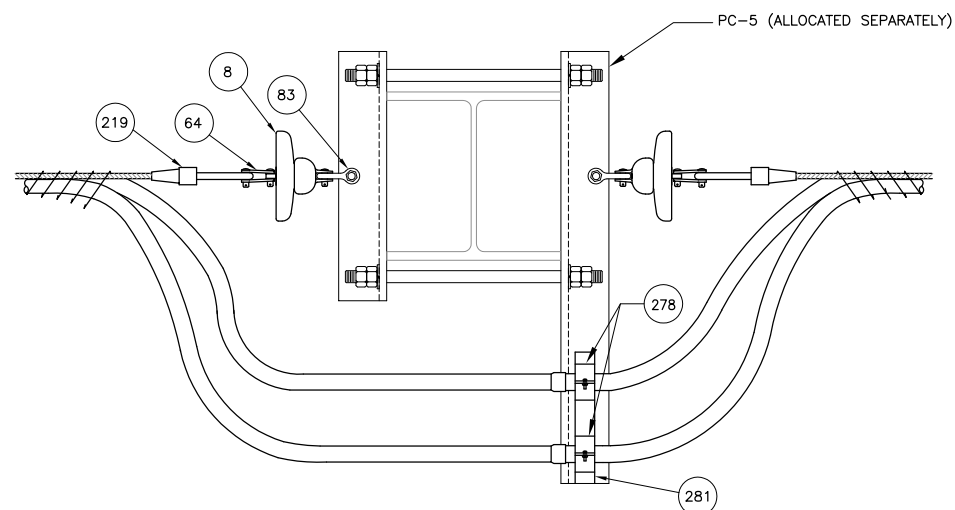


ELEVATION

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QUANTITY
8	B1	SUSPENSION INSULATOR	ET1-003	2
64	ND4	ADAPTER CLEVIS	ET-394E1	2
219		AUTOMATIC DEAD END HUBBELL POWER SYSTEMS CAT. NO. GDE-702		2
83	S4	SHACKLE WITH BOLT	ET-305	2
278	-	UNI-STRUT SPOOL, HDG		2
281	-	UNI-STRUT P1100, 1 5/8" x 1 5/8", HDG		1'-0"
220		COLD SHRINK SPLICE FOR #2 15KV		2

SIGNAL POWER SPLICE (SPSPL)

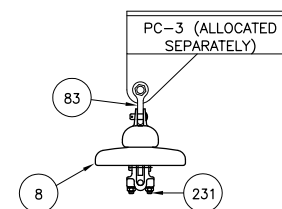
1 1/2" = 1'-0"



BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QUANTITY
8	B1	SUSPENSION INSULATOR	ET1-003	2
64	ND4	ADAPTER CLEVIS	ET-394E	2
219		AUTOMATIC DEAD END HUBBELL POWER SYSTEMS CAT. NO. GDE-702		2
83	S4	SHACKLE WITH BOLT	ET-305	2
278	-	UNI-STRUT SPOOL, HDG		2
281	-	UNI-STRUT P1100, 1 5/8" x 1 5/8", HDG		1'-0"

SIGNAL POWER DEAD END (SPDE1)

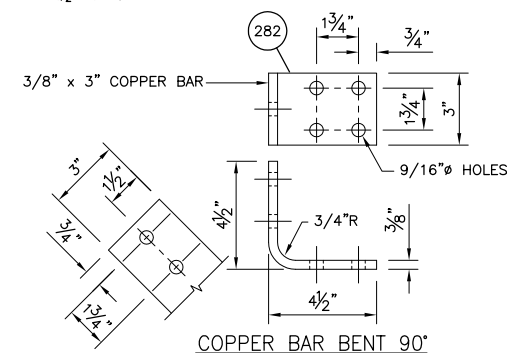
1 1/2" = 1'-0"  
NOTE: FOR INSULATED CABLE ONLY



BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	1
83	S4	SHACKLE WITH BOLT	ET-305	1
231	-	SUSPENSION CLAMP HUBBELL MS-70N		1

SIGNAL POWER SUPPORT (SPS)

NOT TO SCALE



COPPER BAR BENT 90°

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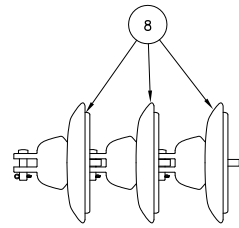
PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
SIGNAL POWER SPLICING AND TERMINATION ASSEMBLIES  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

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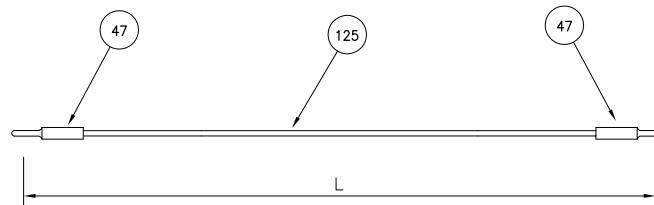
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ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3



ASSEMBLY "SE40a"  
USE ON 7/16"Ø STRAND

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
47	ES7/16	EYE SOCKET, 615.157.103	-----	2
125	---	7/16"Ø COPPERWELD STRAND	-----	*

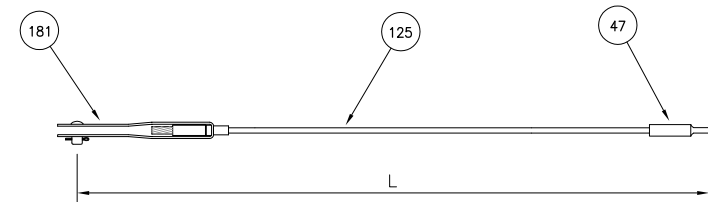
\* - FOR LENGTH "L" SEE ERECTION DIAGRAM



ASSEMBLY "Za"  
USE ON 7/16"Ø STRAND

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
47	ES7/16	EYE SOCKET, 615.157.103	-----	1
125	---	7/16"Ø COPPERWELD STRAND	-----	*
181	CS7/16	FORK COLLAR SOCKET F/ 7/16 WIRE	-----	1

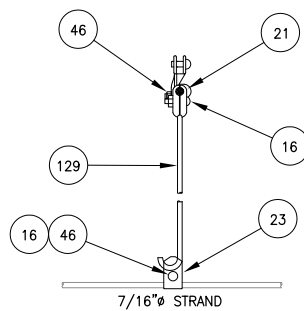
\* - FOR LENGTH "L" SEE ERECTION DIAGRAM



ASSEMBLY "Ya"  
USE ON 7/16"Ø STRAND

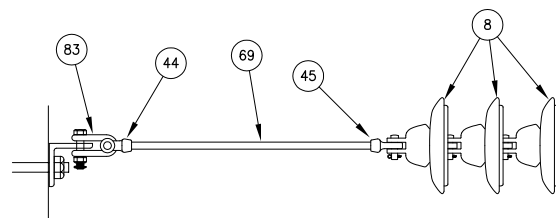
BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB-22	BOLT, STAINLESS STEEL	ET-148E	2
21	BC-24B	5/8"Ø TO 0.34"Ø HANGER ROD, CLIP	ET-1087E	2
23	BC-25	7/16"Ø TO 0.34"Ø HANGER ROD, CLIP	ET-1088E	2
129	---	0.34"Ø BRONZE ROD	ET-1095E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

\* - FOR LENGTH SEE ERECTION DIAGRAM



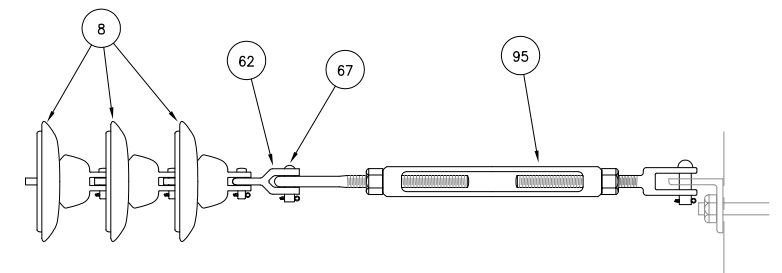
ASSEMBLY "SH60a"  
SCALE: NONE

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
44	CE1	CLEVIS END	11B-1227	1
45	EE1	EYE END	11B-1227	1
69	NR2	ROD, 0.72"Ø, BRONZE	14E-433	1
83	S4	CHAIN SHACKLE	ET-305E	1



ASSEMBLY "SD30a"  
USE ON 7/16"Ø STRAND

BILL OF MATERIALS				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	3
62	ND-1	ADAPTER CLEVIS	ET-449E	1
67	NP-3	PIN WITH COTTER	11B-1206	1
95	TB-18A	TURNBUCKLE	ET-308D	1



ASSEMBLY "SD31a"  
USE ON 7/16"Ø STRAND

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
STEADY SPAN ASSEMBLIES  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1914.DWG
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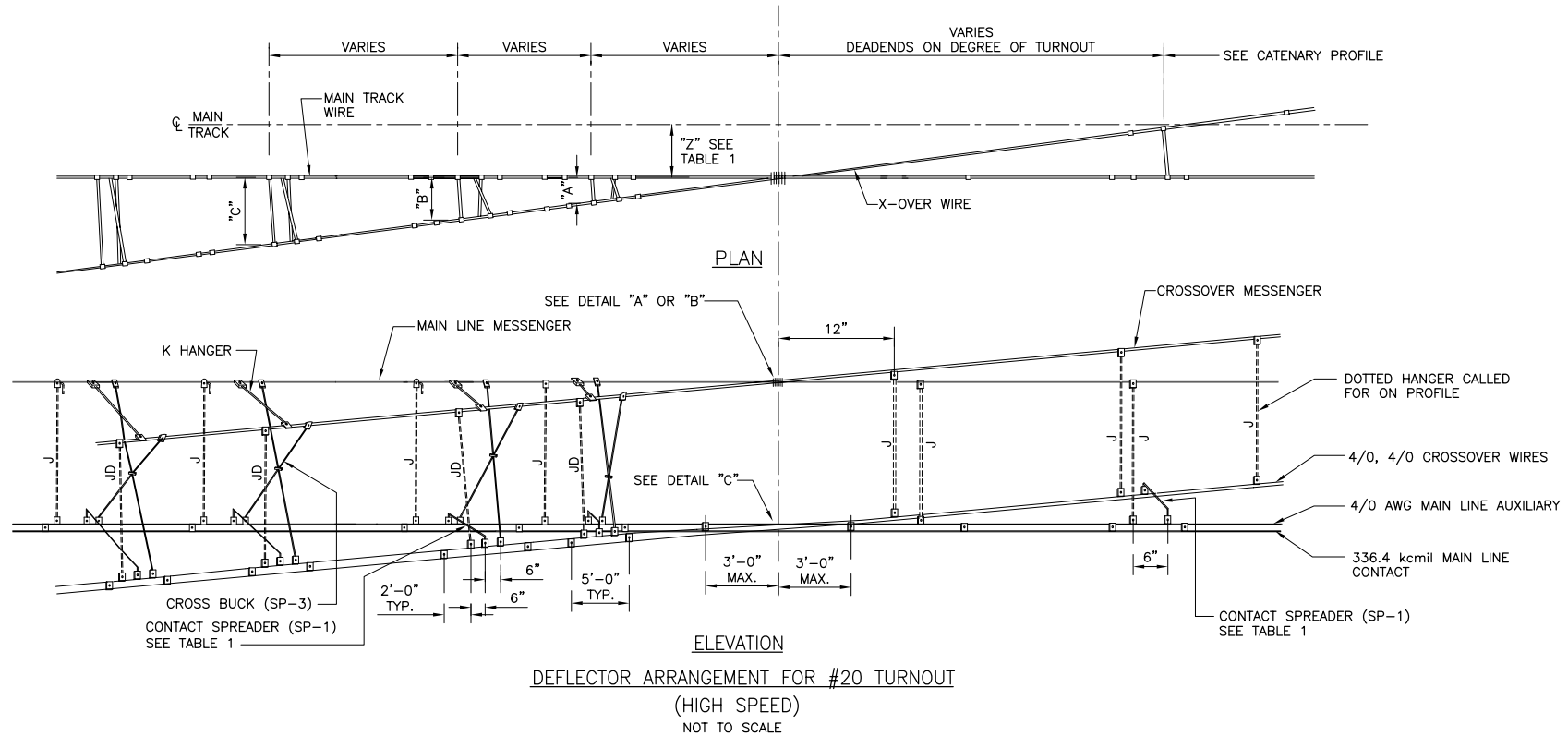
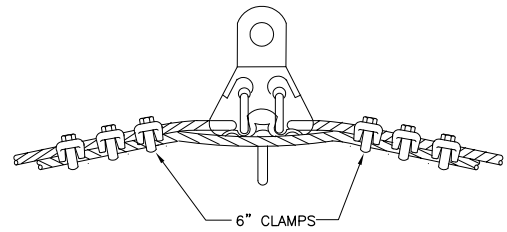
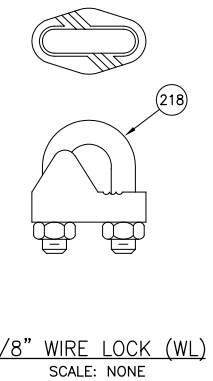
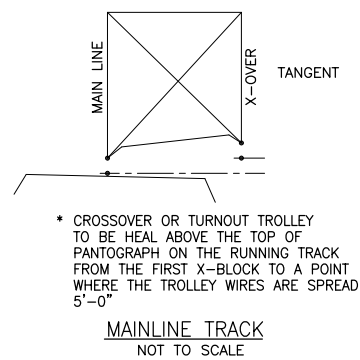
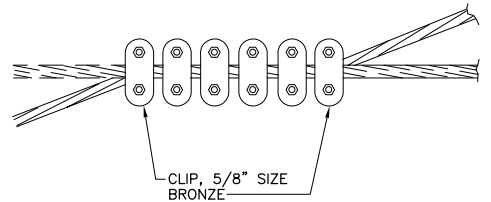


TABLE 1  
SPREADER LENGTHS MAIN TRACK DEFLECTOR

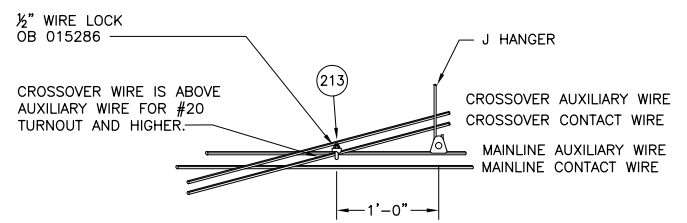
ALIGN.	'z'	#20 & #15 X-OVER			#10 X-OVER		
		"A"	"B"	"C"	"A"	"B"	"C"
TAN.	0 to 4"	24"	30"	36"	18"	-	36"
TAN.	4" to 8"	18"	24"	30"	19"	-	30"
TAN.	8" to 12"	12"	18"	24"	12"	-	24"
CURVE	-	24"	30"	36"	24"	-	36"



SHOWING RUNNING MESS. AND CROSSOVER SIDING MESSENGER WHEN CLIPPED TOGETHER AT A SUPPORT.  
DETAIL "A"  
NOT TO SCALE



SHOWING RUNNING MESS. AND CROSSOVER OR SIDING MESSENGER WHEN CLIPPED TOGETHER BETWEEN SUPPORTS.  
DETAIL "B"  
NOT TO SCALE



CONTACT TIE ARRANGEMENT  
DETAIL "C"  
NOT TO SCALE

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PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
DEFLECTOR ASSEMBLES

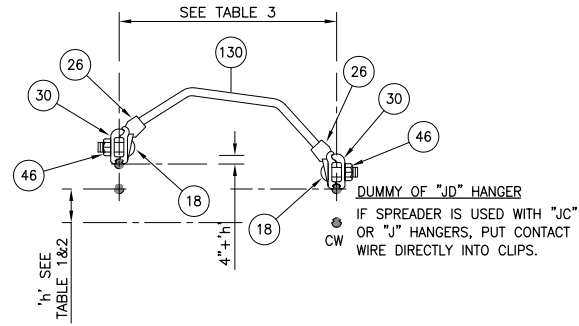
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ET-1915

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	2
26	BC31	GROOVE WIRE TO 0.42"Ø HANGER ROD	ET-1080E	2
30	BC37	FACING CLIP	ET-1083E	2
130	---	0.42"Ø HANGER THR'D & THR'D TYPE	ET-1096E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

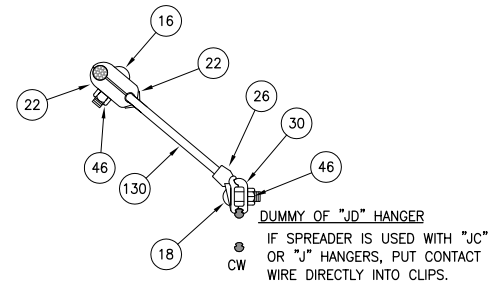
\* - FOR LENGTH SEE TABULATION OR CATENARY PROFILES



DETAIL "SP1"  
SPREADER ASSEMBLY

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	1
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	1
22	BC24C	5/8"Ø TO 0.42"Ø HANGER ROD	ET-1086E	2
26	BC31	GROOVE WIRE TO 0.42"Ø HANGER ROD	ET-1080E	1
30	BC37	FACING CLIP	ET-1083E	1
130	---	0.42"Ø HANGER THR'D & HOOK TYPE	ET-1096E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	2

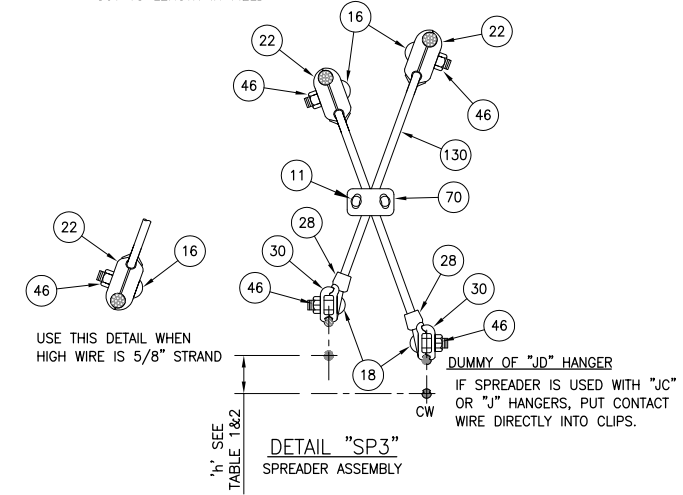
\* - CUT TO LENGTH IN FIELD



DETAIL "SP2"  
SPREADER ASSEMBLY

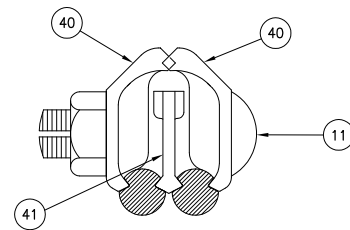
BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
11	BB3	BOLT	ET-148E	2
16	SSB22	BOLT, STAINLESS STEEL	ET-148E	2
18	SSB34	BOLT, STAINLESS STEEL	ET-148E	2
22	BC24C	5/8"Ø TO 0.42"Ø HANGER ROD	ET-1086E	4
28	BC33	GROOVE WIRE TO 0.42"Ø HANGER ROD	ET-1081E	2
30	BC37	FACING CLIP	ET-1083E	2
70	DB	DEFLECTOR BRACE CLAMP	14E-100	2
130	---	0.42"Ø HANGER THR'D & HOOK TYPE	ET-1096E	*
46	ERM	NUT ERM, 1/2 UNC SLOTTED SELF-LOCKING WASHER, 316 SS W/ ANTI-GALLING	ET1-100	4

\* - CUT TO LENGTH IN FIELD



DETAIL "SP3"  
SPREADER ASSEMBLY

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
11	BB3	BOLT	ET-148E	4
40	BTE2	CONTACT CLIP	ET-782E	2
41	BTE4	CONTACT CLIP	ET-782E	1



DETAIL TE1  
FOR 4/0 CONTACT WIRE

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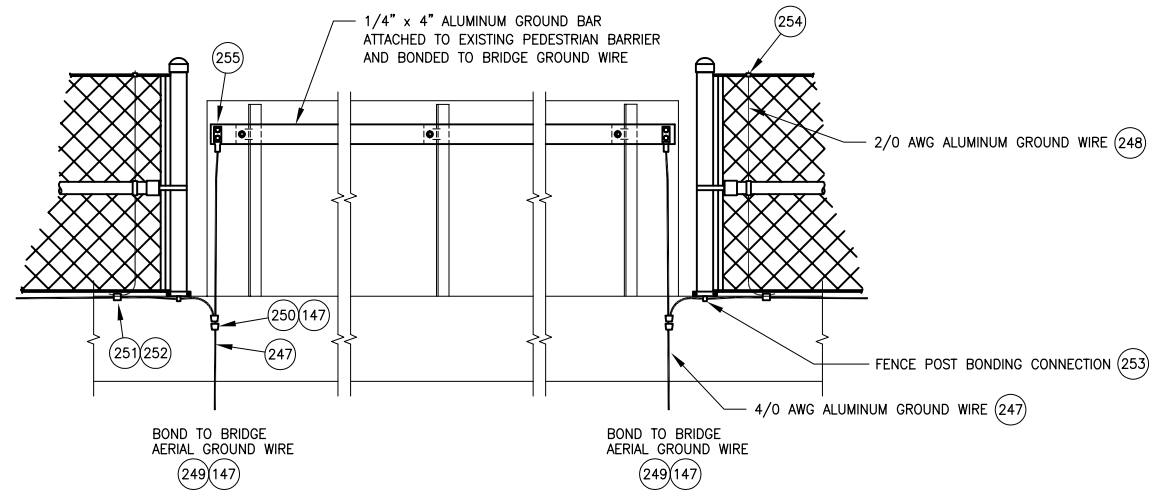
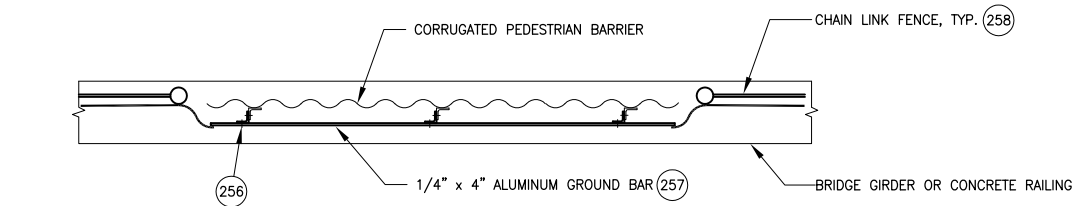


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PAOLI TO BRYN MAWR TRANSMISSION ELECTRIFICATION CATENARY DETAILS DEFLECTOR ASSEMBLIES		File No.:	2011-059-ET-1916.DWG
		Ref. No.:	2011-059
Recommended: DP		Drawn: WJC	Checked: MJM
Date: 03/17/16		ET-1916	

Sheet No: 369 OF 565

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BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	MANUFACTURER CATALOG NO.	QTY
247	-	4/0 AWG ALUMINUM WIRE, INSULATED 600V	-	50'
248	-	2/0 AWG ALUMINUM WIRE, INSULATED 600V	-	12'
249	-	AMPACT WEDGE CONNECTOR 4/0 TO 9/16"	275187-1	2
147	-	AMPACT CARTRIDGE WHITE	69338-5	4
250	-	AMPACT WEDGE CONNECTOR 4/0 TO 4/0 ALUM.	600466	2
251	-	PARALLEL CLAMP 4/0 TO 2/0 ALUM, BURNDY	KVS-28-A	2
252	-	JOINT COMPOUND, PENETROX, BURNDY	-	A/R
253	-	PIPE CONNECTOR, TINNED CU FOR 4/0 ALUM, BURNDY	GAR - TP	2
254	-	PIPE CONNECTOR, TINNED CU FOR 2/0 ALUM, BURNDY	GAR - TP	2
255	-	COMPRESSION LUG FOR 4/0 ALUM. BURNDY	-	2
256	-	1/2" MOUNTING HARDWARE, STN STEEL	-	A/R
257	-	1/4" x 4" ALUM BAR, ALLOY 6101-T6	-	60 FT
258	-	CHAIN LINK FENCE (INSTALLED BY CONTRACTOR)	-	A/R



BRIDGE BARRIER GROUNDING DETAIL "BBDG"  
NOT TO SCALE

NOTE:

- SEE DRAWING ET-031 FOR ADDITIONAL AMTRAK REQUIREMENTS AT O.H. BRIDGES.

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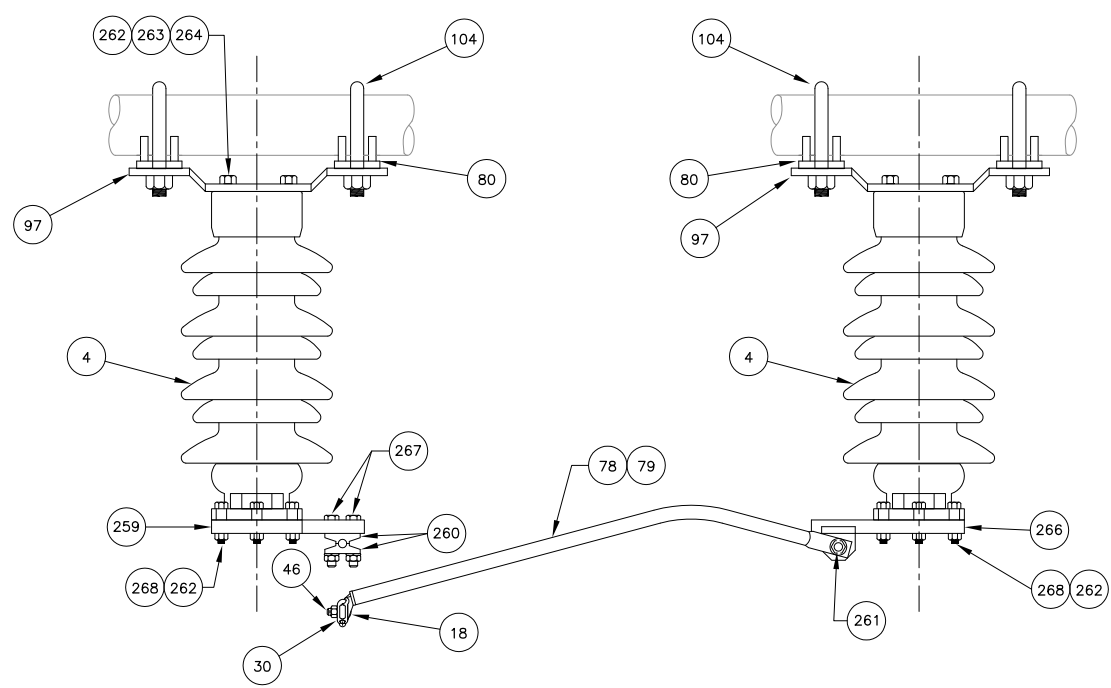


PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
O.H. BRIDGE GROUNDING AND BONDING  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

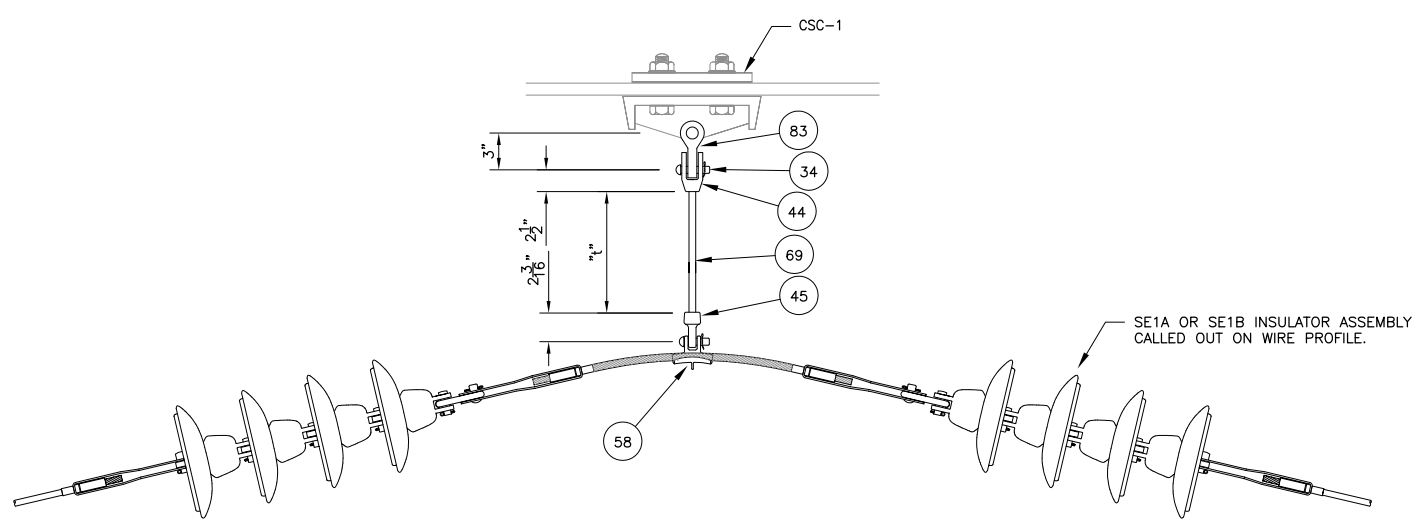
File No.:	2011-059-ET-1917.DWG
Ref. No.:	2011-059
Sheet No.:	370 OF 565
ET-1917	

BILL OF MATERIAL					
ITEM	MARK	DESCRIPTION	FAB STEEL DWG.	AMTRAK REF. DWG.	QTY
4	JT	RIGID INSULATOR		ET1-003	2
18	SSB-34	CARRIAGE BOLT		ET-148E	2
30	BC-37	FACING CLIP		ET-1083E	2
46	ERM	NUT 1/2"-13 SLOTTED SELF LOCKING		ET1-100	2
78	POL4	PULL OFF CATENARY TROLLEY BRZ (L)		14B-63	1
79	POR4	PULL OFF CATENARY TROLLEY BRZ (R)		14B-63	1
80	PS1A	PIPE SADDLE, GALV STEEL	S-5228	14E-133	4
97	TP1	BENT PLATE, GALV STEEL	S-5229	ET-1183E1	2
104	UB60	U-BOLT, 0.875 DIA. X 7.812 LNG X 5.5		ET-145-E	4
259	TP3	PLATE FOR PULLOFF ARMS, GALV STEEL	S-5229	ET-1182E	1
260	1-B	YOKE BLOCK ASSEMBLY		ET-978-E	2
261	-	3/4" DIA SHAFT W/ 5/8" NUTS, GALV.		-	1
262		LOCKWASHER 5/8" GALVANIZED			8
263		HEX HEAD BOLT 5/8" X 1 1/2" GALV.			8
264		FLAT WASHER 5/8" GALVANIZED			8
266	TP4	PLATE FOR PULLOFF ARMS, GALV STEEL	S-5229		1
267	BB37	BRONZE BOLT W/ NUT 1/2" DIA.		ET-516-E	2
268	-	5/8" X 2 1/2" BOLT AND NUT, GALV.			8

BILL OF MATERIAL (NA28X MESSENGER ASSEMBLY)				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QUANTITY
34	BG1	BOLT	ET-145E	1
44	CE1	CLEVIS END	11B-1227	1
45	EE1	EYE END	11B-1227	1
58	MK1	MESSENGER HOOK	ET-1146-D	1
69	NR2	HANGER ROD, .72" DIA.	14E-433	1
83	S4	SHACKLE	ET-305	1



ASSEMBLY POA90A  
SCALE: NONE



NA28X  
MESSENGER ASSEMBLY  
SCALE: NONE

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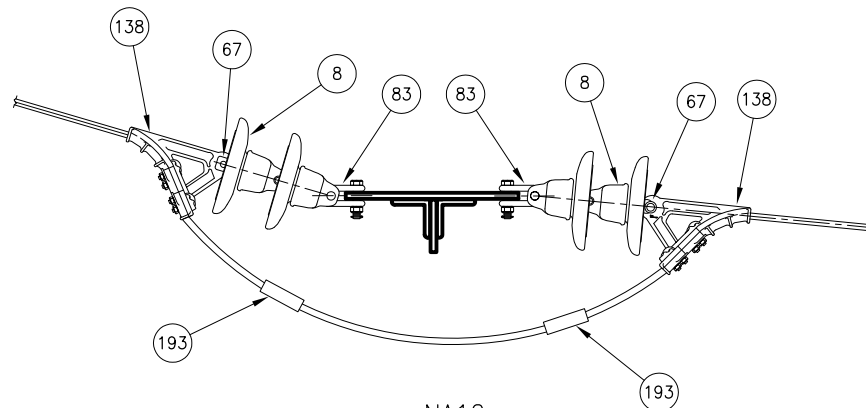
Approved	Date



PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
MESSENGER SUPPORT ASSEMBLY  
  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

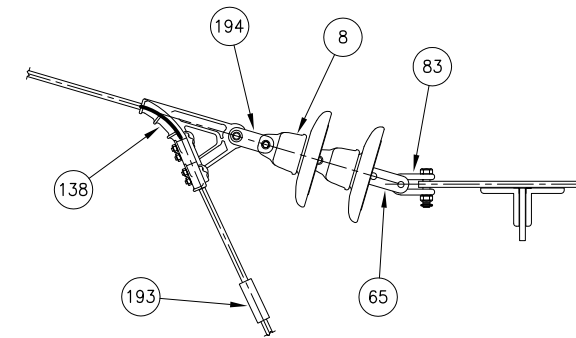
File No.:	2011-059-ET-1918.DWG
Ref. No.:	2011-059
Sheet No.:	371 OF 565
ET-1918	

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	4
67	NP3	PIN	11B-1206	2
83	S4	SHACKLE WITH BOLT	ET-305	2
138	NC3	STRAIN CLAMP	11B-1211	2
193	---	SPLICE SLEEVE, FOR 1/0 WIRE	11B-1226	2



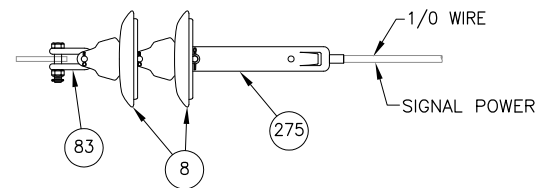
NA12  
MIN. CLEAR. FROM STEEL-12"  
O.H. BRIDGE SIGNAL INSULATOR  
N.T.S.

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	2
65	ND5	CLEVIS ADAPTER WITH PIN	ET-394E	1
83	S4	SHACKLE WITH BOLT	ET-305	1
138	NC3	STRAIN CLAMP	11B-1211	1
193	---	SPLICE SLEEVE, FOR 1/0 WIRE	11B-1226	1
194	NT	EXTENSION STRAP	11B-1222	1



NA14  
FOR STEEP SLOPES, UPWARD  
O.H. BRIDGE SIGNAL INSULATOR  
N.T.S.

BILL OF MATERIAL				
ITEM	MARK	DESCRIPTION	AMTRAK REF. DWG.	QTY
8	B1	INSULATOR	ET1-003	2
83	S4	SHACKLE WITH BOLT	ET-305	1
275	-	FORKED COLLAR SOCKET, FOR 1/0 WIRE	-----	1



FD1G  
FEEDER DEADEND  
N.T.S.

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
CATENARY DETAILS  
SIGNAL POWER BARE WIRE SPLICE AND TERMINATIONS**  
Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

File No.:	2011-059-ET-1920.DWG
Ref. No.:	2011-059
Sheet No.:	372 OF 565
ET-1920	



SUBSTATION AND SIGNAL POWER BILL OF MATERIAL

ID	MARK NO.	AMMES	DESCRIPTION	UNIT	QTY	REF. DRAWING
83	S4	4456227009	SHACKLE CHAIN WBOLT NUT & COTTER	EA	4	ET-305
219			AUTOMATIC DEADEND, HUBBELL GDE-702	EA	74	
220			COLD SHRINK SPLICE	EA	18	
222			COLD SHRINK TERMINATION, 3M 5513A	EA	72	
232			WIRE TAP #4 TO #4	EA	32	
233			WIRE TAP 1/0 TO #4	EA	32	
234		4404509901	CLIP 3/8", BRONZE	EA	128	
235		02-180-03562	LUG - FOR 1/0, COMP. TYPE	EA	140	
236		44-950-01600	CUTOUT FUSE, ENCLOSED, 7.8KV, 50 AMP	EA	36	
237		02-949-50705	LIGHTNING ARRESTOR, 9KV	EA	36	
238			LUG - FOR 2/0 COMP.	EA	8	
286			COMPRESSION LUG 4/0 COPPER, BURNDY YA28-2N	EA	20	
301			AIR BREAK DISCONNECT SWITCH WITH GROUND, 161KV RATING, 2 POLE	EA	2	
302			AIR BREAK DISCONNECT SWITCH, 161KV RATING, 2 POLE	EA	2	
303			MOTOR OPERATOR FOR AIR BREAK DISCONNECT SWITCH	EA	3	
304			MANUAL OPERATOR FOR AIR BREAK DISCONNECT SWITCH	EA	1	
320			TRANSFORMER, POTENTIAL, OIL-IMMERSED, 100Hz, 6.9kV/120V	EA	10	
323			LIGHTNING ARRESTOR, 1-POLE, 9kV	EA	12	
324			SIGNAL POWER TRANSFORMER, 75 KVA, 100 Hz, 480V TO 6.9kV	EA	1	
325			DISCONNECT SWITCH, 15kV, 2 POLE, 600 AMP	EA	9	
326			CIRCUIT BREAKER, OUTDOOR, HIGH-SPEED, 2-POLE, 100Hz, 15kV@ (SIG PWR)	EA	4	
333			CONDUCTOR - #1/0 COPPER CABLE, BARE, HARD DRAWN	LF	120	
350			LIGHTNING MAST	EA	11	
351			CABLE SUPPORTS, UNISTRUT WITH PLASTIC SPOOLS	EA	8	
354			SIGNAL POWER HOUSE	EA	1	
359			WEATHER HEAD, CONDUIT, FOR 600V CABLES	EA	1	
360			PORCELAIN TERMINATION, 15kV, 1/C #2	EA	6	
363			SIGNAL POWER HAND HOLD, BOX & COVER, SOLID BOTTOM W/ GASKET	EA	2	
365			CURRENT TRANSFORMER, 25 KV, 100 HZ, BB-25-973, ABB	EA	4	
366			FUSED DISCONNECT, 7.8 KV EU, 100A WITH MOUNTING BRACKET, ABB	EA	16	
367			STATION POST, 15KV, TR-205, LAPP	EA	4	
369			AUTOMATIC DEADEND, MODEL #GDE5100	EA	2	
370			FIBER ALIGN ALUM. SUSPENSION SUPPORT, #4450199, PREFORMED LINE PRODUCTS W/ SHACKLE OPTION	EA	141	

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
MASTER BILL OF MATERIAL  
SUBSTATION AND SIGNAL POWER**

File No.:	ET-1933.016
Ref. No.:	2011-059
Sheet No.:	374 OF 565

**ET-1933**

Recommended: DP Drawn: SZM Checked: MJM Date: 03/17/16



CATENARY STEEL BILL OF MATERIAL

ITEM	MARK	DESCRIPTION	DRAWING	QTY
S-1	P	POLE	S-5103	399
S-2	MP	MONO POLE	S-5109	4
S-3	F1	FOUNDATION FOR K-FRAME (4'-0" DIA.)	S-5102	401
S-4	F7	FOUNDATION FOR MONOPOLE (4'-6" DIA.)	S-5111	4
S-5	SB1	SAG BRACE	S-5105	396
S-6	CB1	CROSS BEAM	S-5104	198
S-7	DGA	DOWN GUY ANCHOR	S-5101	32
S-8	DGA2	DOWN GUY ANCHOR - DOUBLE	S-5101	2
S-9	DGP	DOWN GUY POLE	S-5123	2
S-10	BA1	TRANSMISSION BRACKET - DOUBLE	S-5200	144
S-11	BA2	TRANSMISSION BRACKET	S-5201	86
S-12	BA2A	TRANSMISSION BRACKET	S-5201	NOTE 1
S-13	BA2B	TRANSMISSION BRACKET	S-5201	NOTE 1
S-14	BA3	TRANSMISSION BRACKET - DOUBLE	S-5202	39
S-15	BA4	TRANSMISSION BRACKET	S-5203	40
S-16	BA4L	TRANSMISSION BRACKET	S-5203	4
S-17	BA6	TRANSMISSION BRACKET	S-5204	16
S-18	BA7	TRANSMISSION BRACKET	S-5205	94
S-19	BA7A	TRANSMISSION BRACKET	S-5205	NOTE 1
S-20	BA8	TRANSMISSION BRACKET - DOUBLE	S-5206	57
S-21	CSC1	SLIDING BRACKET	S-5214	1645
S-22	CA1	FEEDER CROSS ARM	S-5212	12
S-23	SPA	SPIDER ARM BRACKET	S-5213	7
S-24	PC1	SLIDING CLAMP	S-5214	63
S-25	PC1D	SLIDING CLAMP	S-5211	NOTE 1
S-26	PC1G	SLIDING CLAMP	S-5211	NOTE 1
S-27	PC1H	SLIDING CLAMP	S-5211	1
S-28	PC2	SLIDING CLAMP	S-5214	27
S-29	PC3	SLIDING CLAMP	S-5215	164
S-30	PC4	SLIDING CLAMP	S-5215	183
S-31	PC3L	SLIDING CLAMP	S-5215	13
S-32	PC4L	SLIDING CLAMP	S-5215	9
S-33	PC5	SLIDING CLAMP	S-5215	14
S-34	PC7	SLIDING CLAMP	S-5239	7
S-35	PC8	SLIDING CLAMP	S-5240	11
S-36	UBA1	UNDER BRIDGE BRACKET	S-5228	21
S-37	UBSP	UNDER BRIDGE BRACKET	S-5240	5
S-38	FB1	FEEDER BRACKET - FOUR	S-5226	NOTE 1
S-39	FB2	FEEDER BRACKET - SINGLE	S-5227	NOTE 1
S-40	POST	POST EXTENSION	S-5106	NOTE 1
S-41	DGB	DOWN GUY BRACE	S-5110	NOTE 1
S-42	---	CANTILEVER ARM		NOTE 1
S-43	BN1	CANTILEVER END BRACKET		NOTE 1
S-44	TP1	FORMED MOUNTING PLATE (CAT BOM #97)	S-5229	22
S-45	TP2	TOP PLATE (CAT BOM #98)	S-5229	22
S-46	TP3	BASE PLATE (CAT BOM #259)	S-5229	NOTE 1
S-47	TP4	BASE PLATE (CAT BOM #266)	S-5229	NOTE 1
S-48	BP1	BACK PLATE DETAIL FOR DOWN GUY (CAT BOM #187)	S-5230	39
S-49	RS1	ROD SUPPORT	S-5225	16
S-50	HO1	MANUAL OPERATOR SUPPORT	S-5225	NOTE 1
S-51	MO1	MOTOR OPERATOR SUPPORT	S-5225	8
S-52	PS1A	PIPE SADDLE WELDMENT (CAT BOM #80)	S-5228	44
S-53	---	STEEL STRAP 1/2" x 2" x 1'-2" LG, GALV STEEL (CAT BOM #215)	S-5229	376
S-54	---	3/4" DIA ROD, WITH THREADED ENDS, GALV STEEL (CAT BOM #261)	S-5229	NOTE 1
S-55	---	SIGNAL POWER SWITCH PLATFORM	S-5220	16
S-56	---	SIGNAL POWER TRANSFORMER PLATFORM - SINGLE	S-5217	14
S-57	---	SIGNAL POWER TRANSFORMER PLATFORM - DOUBLE	S-5232	2

SUBSTATION 138KV STEEL BILL OF MATERIAL

ITEM	DESCRIPTION	DRAWINGS	QTY
S-100	EAST GANTRY, 85' TALL WITH LADDERS, WIRE CONNECTIONS, SWITCH MOUNTING DETAILS, PLATFORMS AND RAILINGS	S-5402, S-5404, S-5405, S-5406	1
S-101	TIE STRUCTURE POLE	S-5409	2
FOUNDATIONS:			
S-102	GANTRY FOUNDATIONS, F6	S-5403	2
S-103	TIE STRUCTURE FOUNDATIONS, F1	S-5102	2
S-104	SIGNAL POWER CONTROL HOUSE PIER FOUNDATIONS, F7	S-5408, DET 2	11
S-105	STAIR LANDING PAD FOR SIGNAL POWER CONTROL HOUSE	S-5408, DET 3	3
S-106	PECO TRANSFORMER FOUNDATION	S-5410	1

SIGNAL POWER STEEL BILL OF MATERIAL

ITEM	DESCRIPTION	DRAWING	QTY
S-200	252 FRAME STRUCTURE WITH MOUNTING BRACKETS AT PAOLI SUB	S-5407	1
S-201	252 STRUCTURE FOUNDATION, F4	S-5501, DET 2	4
S-202	252 BREAKER FOUNDATION	S-5501, DET B	2
S-203	TRANSFORMER FOUNDATION		1
S-204	352 FRAME STRUCTURE WITH EQUIPMENT MOUNTING BRACKETS (NEAR FRAZER AND STRAFFORD)	S-5501, S-5503	2
S-205	352 STRUCTURE FOUNDATION, F4	S-5501, DET 2	8
S-206	CABINET FOUNDATION	S-5503, DET G	2
S-207	352 BREAKER FOUNDATION	S-5501, DET B	2
S-208	SIGNAL POWER POLE, W14X90 AT P-35 (NEAR FRAZER)		1
S-209	SIGNAL POWER POLE FOUNDATION, F1 AT P-35 (NEAR FRAZER)		1
S-210	SLIDING BRACKET		*
S-211	DEADEND BRACKET		*
S-212	DOWN GUY FOUNDATION DGA	S-5101	1

CONTRACTOR FENCE BILL OF MATERIAL

ITEM	DESCRIPTION	DRAWINGS	QTY
S-300	N. VALLEY ROAD	ET-1917	1
S-301	WEST BRIDGE AVE	ET-1917	1
S-302	N. VALLEY FORGE ROAD	ET-1917	1
S-303	EAGLE ROAD	ET-1917	1

NOTES:

- ITEMS NOT INCLUDED IN PAOLI TO BRYN MAWR PORTION OF ZOO TO PAOLI PROJECT.

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TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600  
PHILADELPHIA, PA 19103

IN ASSOCIATION WITH

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**PAOLI TO BRYN MAWR TRANSMISSION  
ELECTRIFICATION  
MASTER BILL OF MATERIAL  
STEEL**

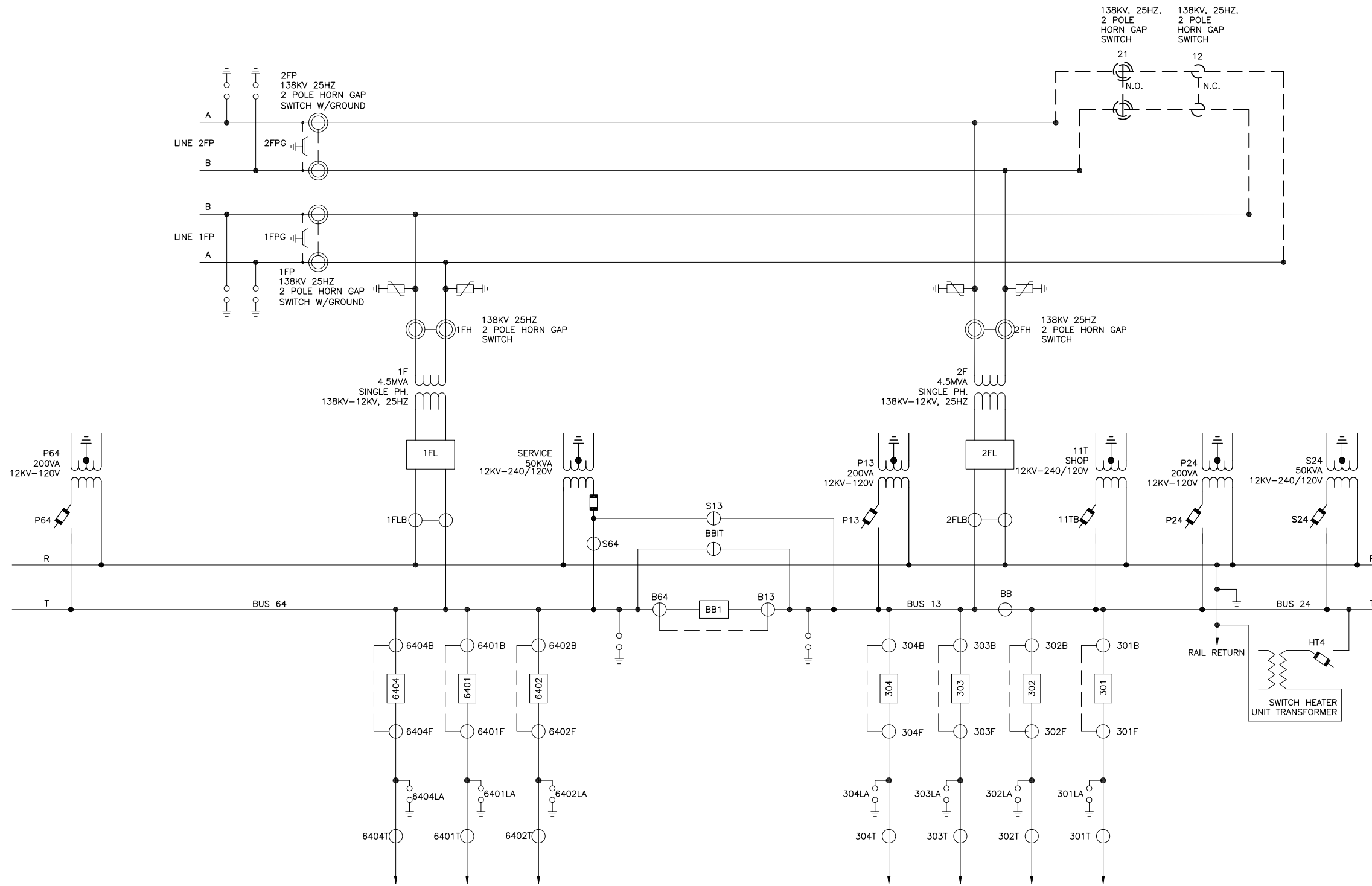
Recommended: DP    Drawn: SZM    Checked: MJM    Date: 03/17/16

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**ET-1934**

NOTES:

- 1. FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS SEE DRAWING ET-0012.
- 2. THE EXISTING 25 HZ TWO-LINE DIAGRAM WAS DEVELOPED FROM ORIGINAL AMTRAK DRAWINGS.



1 EXISTING 25 HZ TWO-LINE DIAGRAM  
 ET-2300 SCALE: NONE

100% DESIGN SUBMISSION

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No	Revisions	Date	By



OFFICE OF  
 Chief Engineer  
 Engineering  
 National Railroad Passenger Corporation  
 30TH Street Station-Philadelphia, Pennsylvania 19104

Approved	Date

**Burns** IN ASSOCIATION WITH **Baker**  
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**AECOM**

PAOLI TO BRYN MAWR TRANSMISSION  
 ELECTRIFICATION  
 PAOLI SUBSTATION  
 EXISTING 25 HZ TWO-LINE DIAGRAM

Recommended: DP Drawn: WJC Checked: MJM Date: 03/17/16

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