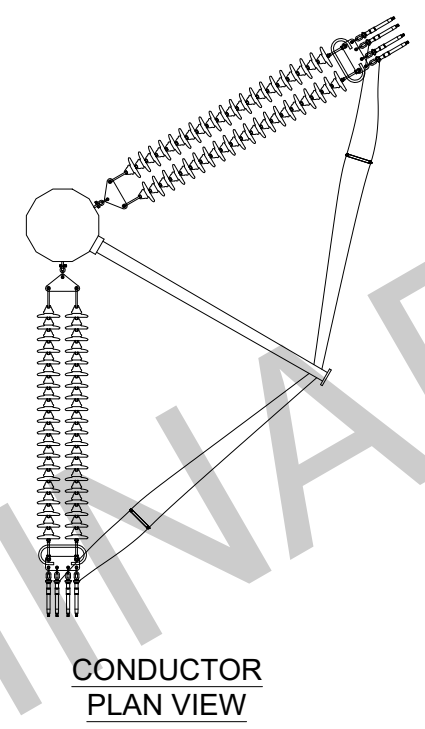
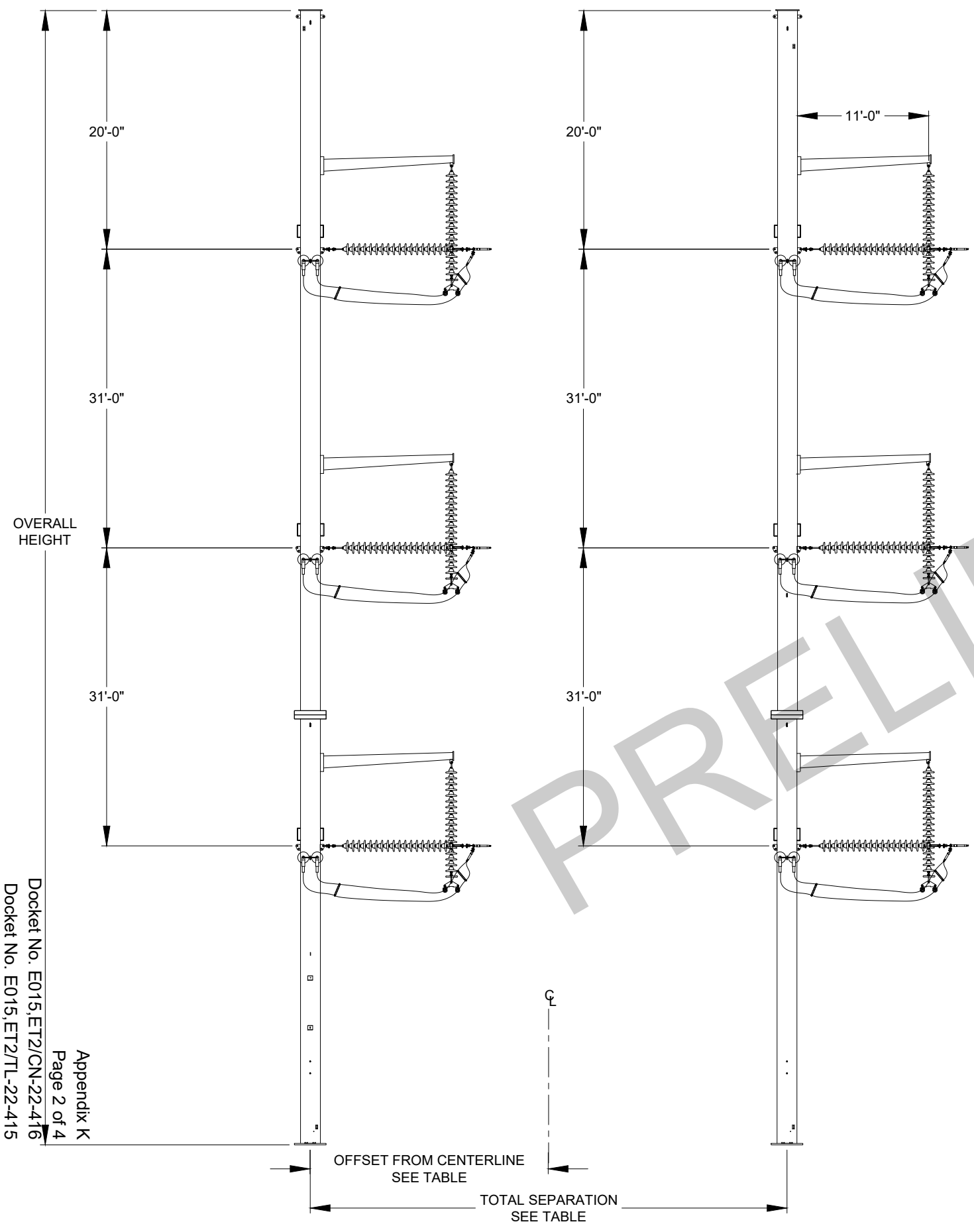




Appendix D
Preliminary Structural Design
Drawings




LINE ANGLE (DEG)	OFFSET FROM CENTERLINE (FT)	TOTAL SEPARATION (FT)
30-40	19.0	38.0
40-50	20.0	40.0
60-80	23.0	46.0
80-90	25.0	50.0

DESIGN DATA:	
POLE TYPE:	(2) STEEL POLES
EMBEDMENT TYPE:	(2) PIER FOUNDATIONS
CIRCUIT TYPE:	DOUBLE CIRCUIT
POLE CONST. TYPE:	TWO POLE DEAD END
LINE ANGLE RANGE:	60°-90°
INSULATOR TYPE:	DEAD END, GLASS
VOLTAGE:	345 kV

Docket No. E015,ET2/CN-22-416
 Docket No. E015,ET2/TL-22-415
 Appendix K
 Page 2 of 4

6	5	4	3	2	1	0
						DRAFT - 345KV DC STANDARD STRUCTURE FAMILY
						05-25-23
						DATE: 05-25-23
						STATUS: W.O.
						REV

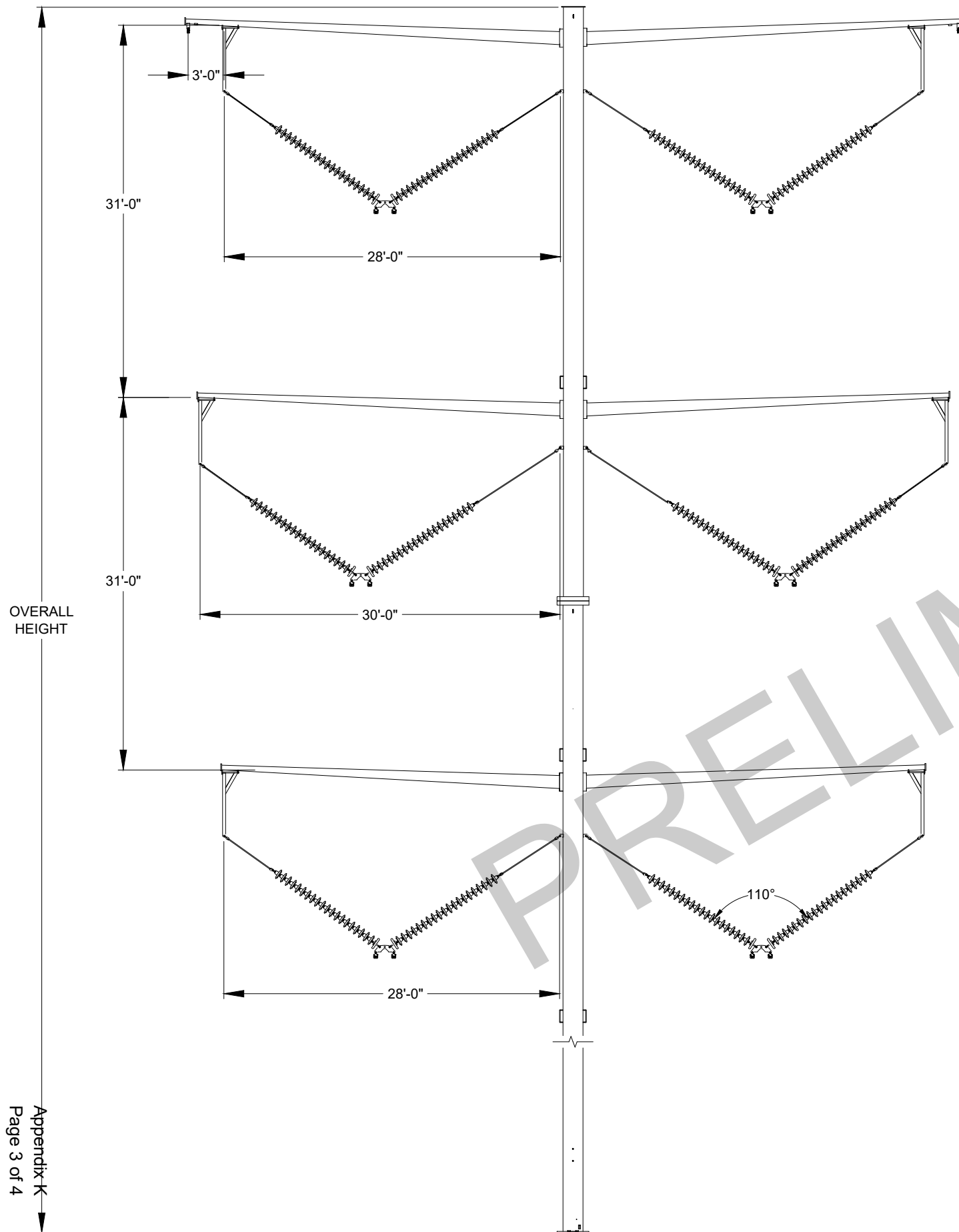
THIS ASSEMBLY HAS BEEN DESIGNED TO MEET THE TRANSMISSION ENGINEERING STANDARDS OF GREAT RIVER ENERGY. THE SUBSTITUTION OF ANY COMPONENT OR PART, CONTAINED IN THIS ASSEMBLY, REQUIRES THE PRIOR APPROVAL OF GRE'S TRANSMISSION ENGINEERING DEPARTMENT.



**STRUCTURAL LAYOUT, STEEL, 345 kV
DBL CIRCUIT TWO POLE DEADEND
DEADEND, 30-90°**

DRAWING NUMBER: TS6DC-2P-345	REVISION: 0
--	-----------------------

DISCLOSURE OF THIS DOCUMENT TO A THIRD PARTY EXCLUSIVE OF DIRECT USE FOR OPERATION, MAINTENANCE OR NEW CONSTRUCTION IS SUBJECT TO WRITTEN PERMISSION FROM GREAT RIVER ENERGY.



OVERALL HEIGHT

Docket No. E015,ET2/CN-22-416
 Docket No. E015,ET2/TL-22-415
 Appendix K
 Page 3 of 4

DESIGN DATA:	
POLE TYPE:	(1) STEEL POLE
EMBEDMENT TYPE:	PIER FOUNDATION
CIRCUIT TYPE:	DOUBLE CIRCUIT
POLE CONST. TYPE:	TANGENT W/ V-STRINGS
LINE ANGLE RANGE:	0-2°
INSULATOR TYPE:	V-STRINGS, GLASS
VOLTAGE:	345 kV

REV	DATE / STATUS / W.O.	REVISION DESCRIPTION	REV BY	APP BY
0	05-25-23	DRAFT - 345KV DC STANDARD STRUCTURE FAMILY		
1				
2				
3				
4				
5				
6				

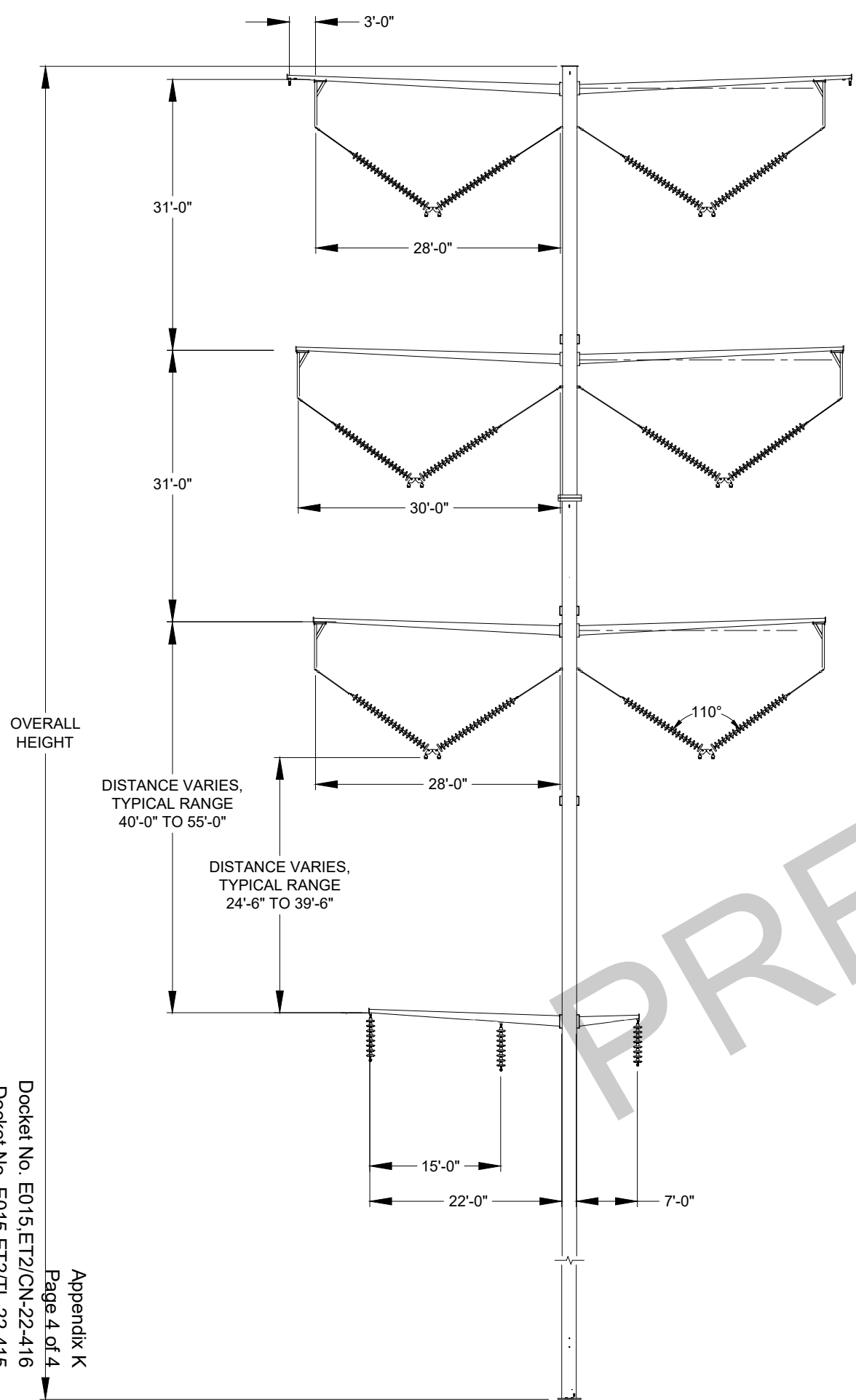
THIS ASSEMBLY HAS BEEN DESIGNED TO MEET THE TRANSMISSION ENGINEERING STANDARDS OF GREAT RIVER ENERGY. THE SUBSTITUTION OF ANY COMPONENT OR PART, CONTAINED IN THIS ASSEMBLY, REQUIRES THE PRIOR APPROVAL OF GRE'S TRANSMISSION ENGINEERING DEPARTMENT.

GREAT RIVER ENERGY™

**STRUCTURAL LAYOUT, STEEL, 345 kV
 SINGLE POLE, DBL CIRCUIT W/ V-STRINGS
 TANGENT, 0-2°**

DRAWING NUMBER:	TSDCV-345	REVISION:	0
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DISCLOSURE OF THIS DOCUMENT TO A THIRD PARTY EXCLUSIVE OF DIRECT USE FOR OPERATION, MAINTENANCE OR NEW CONSTRUCTION IS SUBJECT TO WRITTEN PERMISSION FROM GREAT RIVER ENERGY.




PRELIMINARY

DESIGN DATA:	
POLE TYPE:	(1) STEEL POLE
EMBEDMENT TYPE:	PIER FOUNDATION
CIRCUIT TYPE:	TRIPLE CIRCUIT
POLE CONST. TYPE:	TANGENT W/ V-STRINGS
LINE ANGLE RANGE:	0-2°
INSULATOR TYPE:	V-STRINGS, I-STRINGS, GLASS
VOLTAGE:	(2) 345 kV, (1) 69kV

Docket No. E015,ET2/CN-22-416
 Docket No. E015,ET2/TL-22-415
 Appendix K
 Page 4 of 4

REV	DATE	STATUS	W.O.	DESCRIPTION	REV BY	APP BY
0	05-30-23			DRAFT - 345KV TC STANDARD STRUCTURE FAMILY		
1						
2						
3						
4						
5						
6						



GREAT RIVER ENERGY™

STRUCTURAL LAYOUT, STEEL, 345 kV
SINGLE POLE, TRP CIRCUIT W/ V-STRINGS
TANGENT, 0-2°

THIS ASSEMBLY HAS BEEN DESIGNED TO MEET THE TRANSMISSION ENGINEERING STANDARDS OF GREAT RIVER ENERGY. THE SUBSTITUTION OF ANY COMPONENT OR PART, CONTAINED IN THIS ASSEMBLY, REQUIRES THE PRIOR APPROVAL OF GRE'S TRANSMISSION ENGINEERING DEPARTMENT.

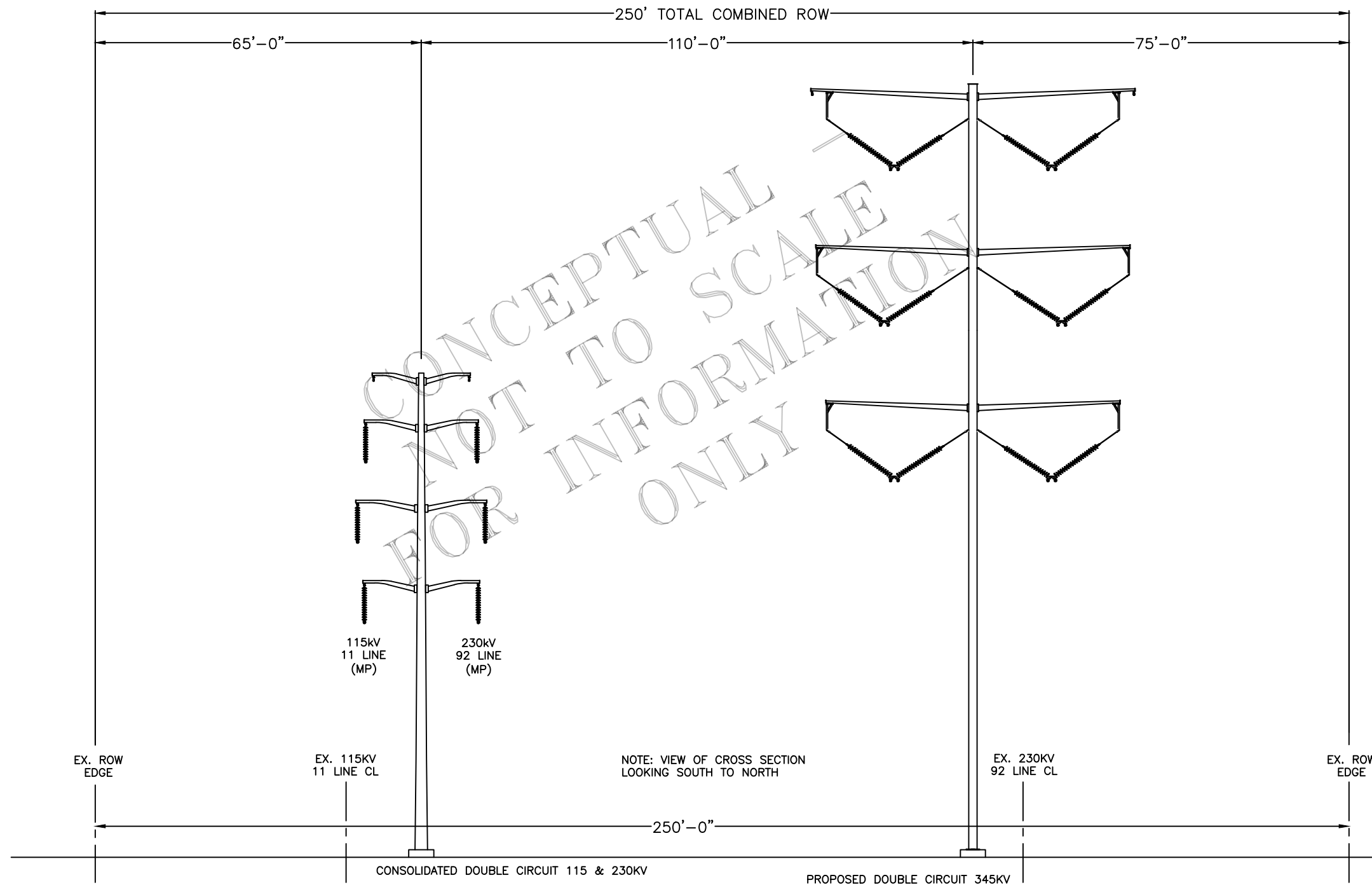
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REVISION: **0**

DISCLOSURE OF THIS DOCUMENT TO A THIRD PARTY EXCLUSIVE OF DIRECT USE FOR OPERATION, MAINTENANCE OR NEW CONSTRUCTION IS SUBJECT TO WRITTEN PERMISSION FROM GREAT RIVER ENERGY.

	CONSOLIDATED 115-230KV DOUBLE CIRCUIT LINE	PROPOSED 345KV DOUBLE CIRCUIT LINE
VOLTAGE	DOUBLE CIRCUIT 115 & 230KV	DOUBLE CIRCUIT 345KV
STRUCTURE TYPE	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	80-110 FEET TALL (TYPICAL)	130-170 FEET TALL (TYPICAL)
FOUNDATION TYPE	CONCRETE PIER	CONCRETE PIER
FOUNDATION DIAMETER	6-8 FEET (TYPICAL)	8-10 FEET (TYPICAL)
SPAN LENGTH	800 FEET (TYPICAL)	900 FEET (TYPICAL)
STRUCTURES PER MILE	6-7 (AVERAGE)	5-6 (AVERAGE)
CONDUCTOR CLEARANCE	20.5 FEET/22.5 FEET (MINIMUM)	25 FEET (MINIMUM)
LINE EASMENT WIDTH	130 FEET	150 FEET

NOTE: CURRENT ROW VARIES FROM 240' TO 270' AS LINES ARE NOT PARALLEL FOR TWO SPANS

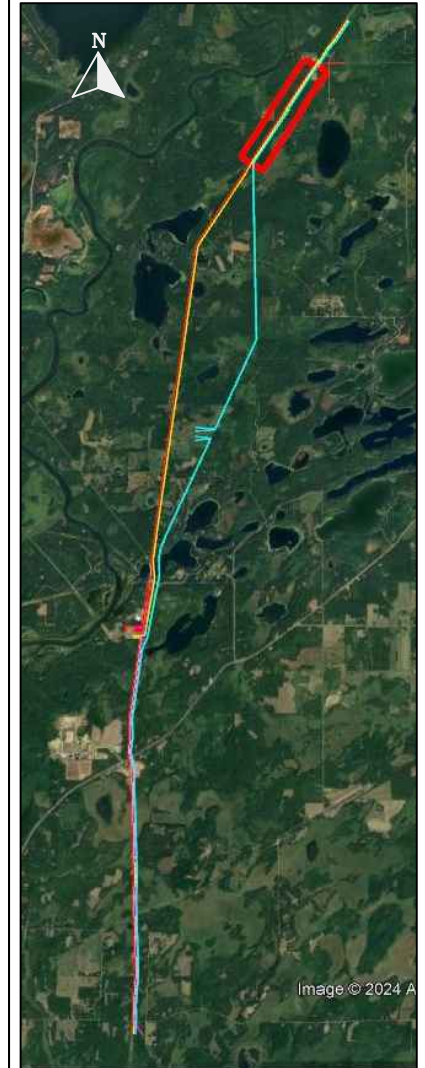
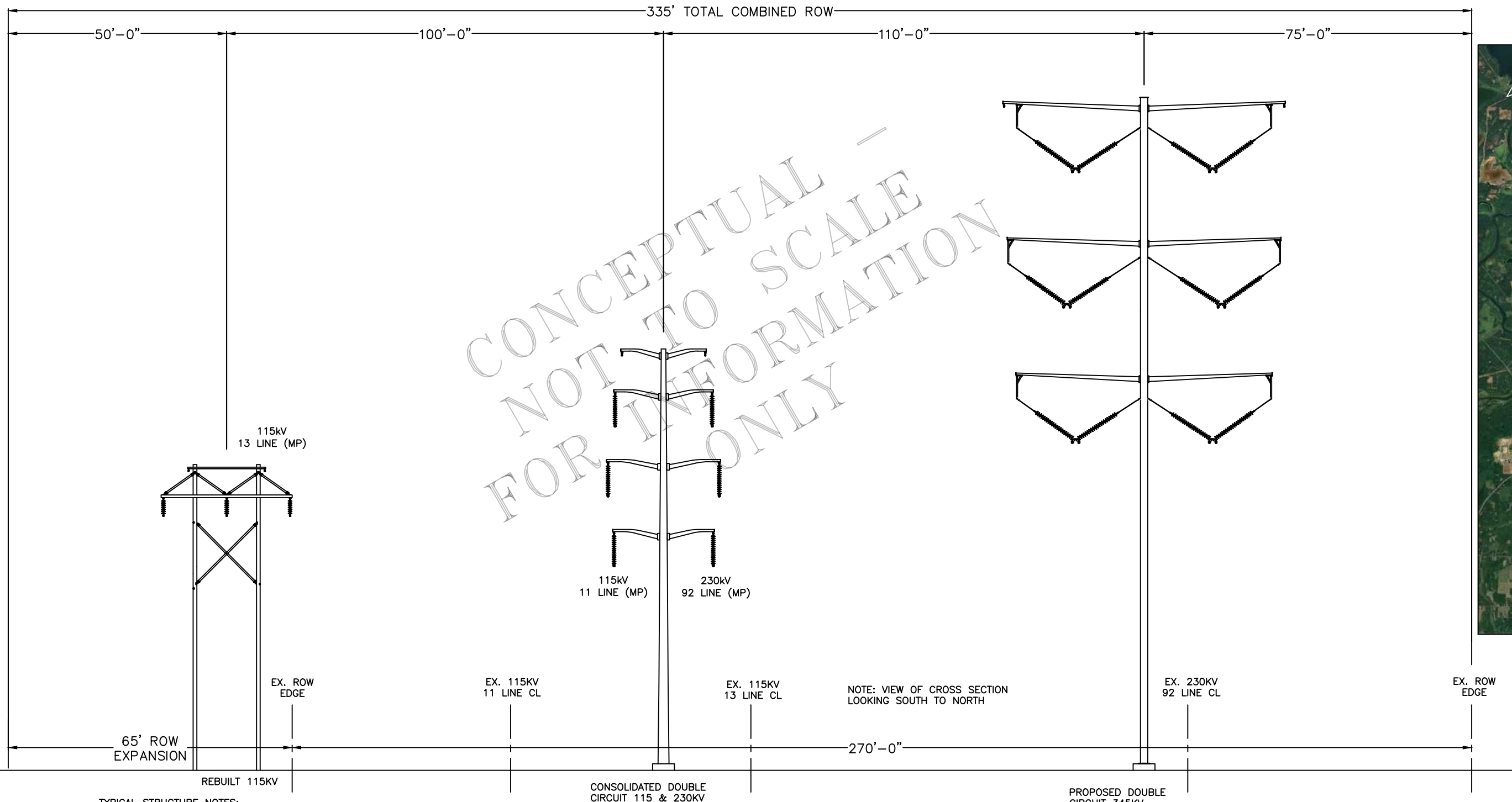


TYPICAL STRUCTURE NOTES:

1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE.
2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
4. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.

CROSS SECTION 1
APPROX. 2000'

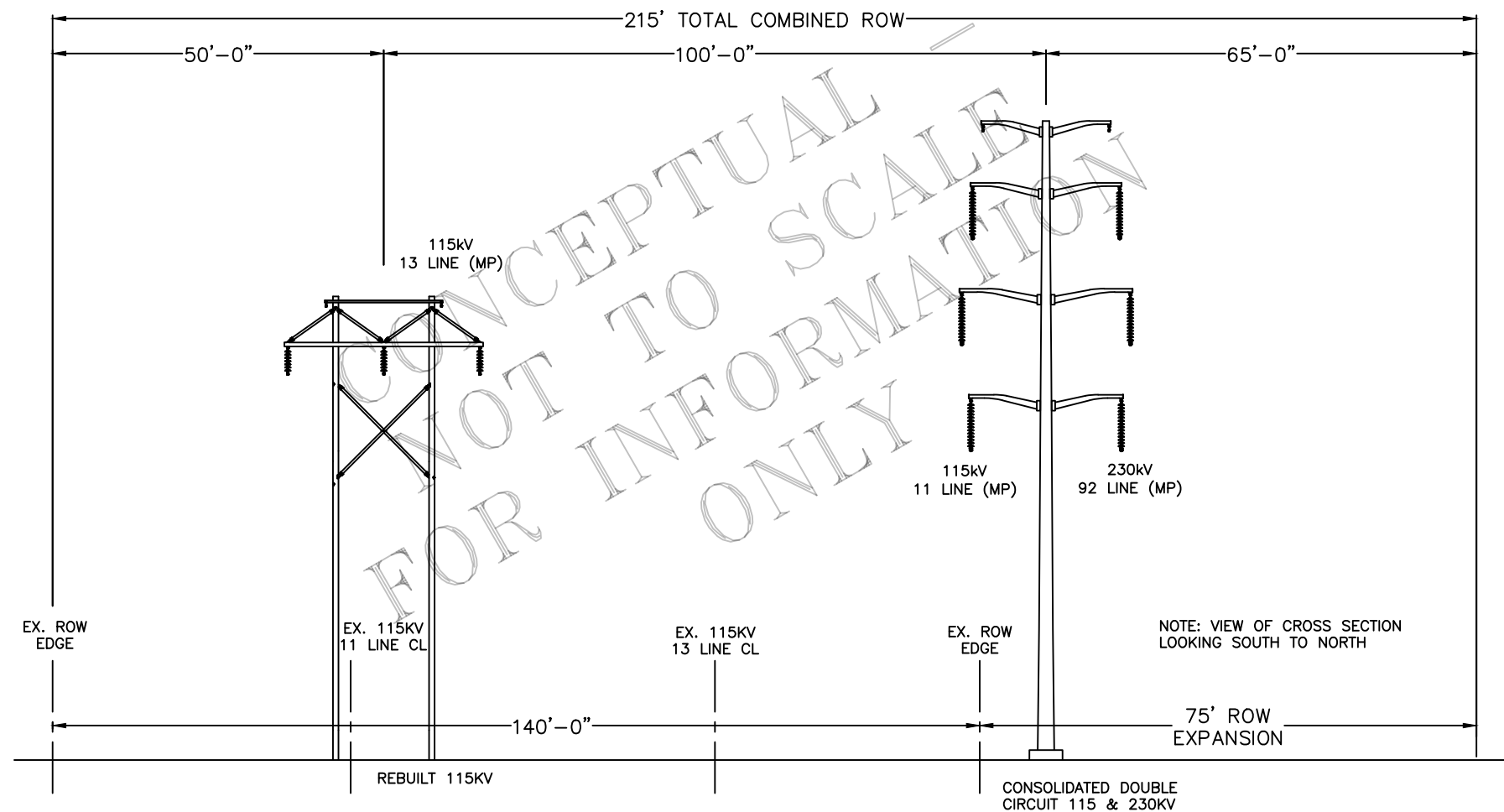
	REBUILT 115KV LINE	CONSOLIDATED 115-230KV DOUBLE CIRCUIT LINE	PROPOSED 345KV DOUBLE CIRCUIT LINE
VOLTAGE	SINGLE CIRCUIT 115KV	DOUBLE CIRCUIT 115 & 230KV	DOUBLE CIRCUIT 345KV
STRUCTURE TYPE	WOOD H-FRAMES	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	60-80 FEET	80-110 FEET TALL (TYPICAL)	130-170 FEET TALL (TYPICAL)
FOUNDATION TYPE	DIRECT EMBED	CONCRETE PIER	CONCRETE PIER
FOUNDATION DIAMETER	N/A	6-8 FEET (TYPICAL)	8-10 FEET (TYPICAL)
SPAN LENGTH	700 FEET (TYPICAL)	800 FEET (TYPICAL)	900 FEET (TYPICAL)
STRUCTURES PER MILE	7-8 (AVERAGE)	6-7 (AVERAGE)	5-6 (AVERAGE)
CONDUCTOR CLEARANCE	20.5 FEET (MINIMUM)	20.5 FEET/22.5 FEET (MINIMUM)	25 FEET (MINIMUM)
LINE EASMENT WIDTH	100 FEET	130 FEET	150 FEET



- TYPICAL STRUCTURE NOTES:
1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE.
 2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
 3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
 4. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.

CROSS SECTION 2
APPROX. 1.3 MILES

	REBUILT 115KV LINE	CONSOLIDATED 115-230KV DOUBLE CIRCUIT LINE
VOLTAGE	SINGLE CIRCUIT 115KV	DOUBLE CIRCUIT 115 & 230KV
STRUCTURE TYPE	WOOD H-FRAMES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	60-80 FEET	80-110 FEET TALL (TYPICAL)
FOUNDATION TYPE	DIRECT EMBED	CONCRETE PIER
FOUNDATION DIAMETER	N/A	6-8 FEET (TYPICAL)
SPAN LENGTH	700 FEET (TYPICAL)	800 FEET (TYPICAL)
STRUCTURES PER MILE	7-8 (AVERAGE)	6-7 (AVERAGE)
CONDUCTOR CLEARANCE	20.5 FEET (MINIMUM)	20.5 FEET/22.5 FEET (MINIMUM)
LINE EASMENT WIDTH	100 FEET	130 FEET



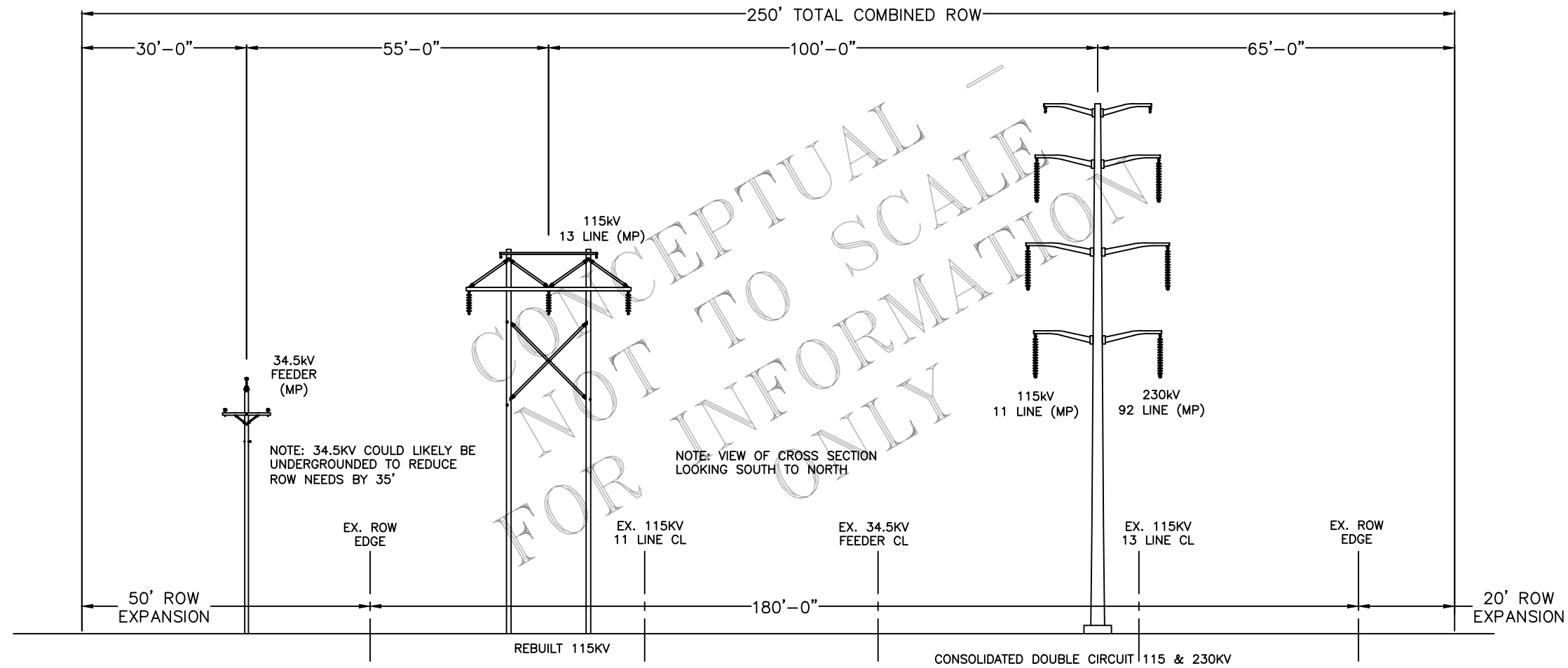
TYPICAL STRUCTURE NOTES:

1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE.
2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
4. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.



CROSS SECTION 3
APPROX. 3.9 MILES

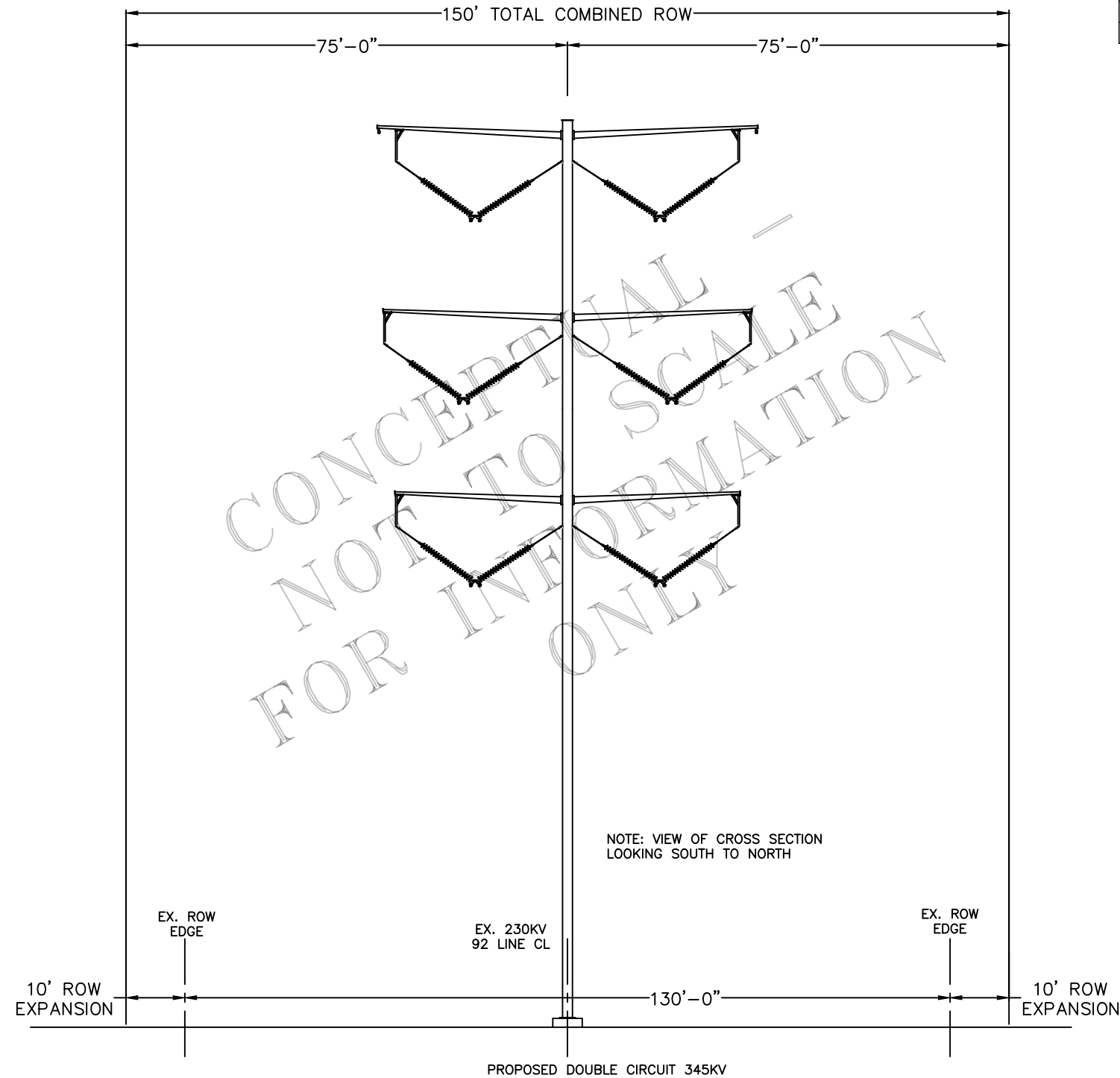
	REBUILT 34.5KV FEEDER	REBUILT 115KV LINE	CONSOLIDATED 115-230KV DOUBLE CIRCUIT LINE
VOLTAGE	SINGLE CIRCUIT 34.5KV	SINGLE CIRCUIT 115KV	DOUBLE CIRCUIT 115 & 230KV
STRUCTURE TYPE	SINGLE WOOD POLES	WOOD H-FRAMES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	40-50 FEET (TYPICAL)	60-80 FEET	80-110 FEET TALL (TYPICAL)
FOUNDATION TYPE	DIRECT EMBED	DIRECT EMBED	CONCRETE PIER
FOUNDATION DIAMETER	N/A	N/A	6-8 FEET (TYPICAL)
SPAN LENGTH	300 FEET (TYPICAL)	700 FEET (TYPICAL)	800 FEET (TYPICAL)
STRUCTURES PER MILE	17-18 (AVERAGE)	7-8 (AVERAGE)	6-7 (AVERAGE)
CONDUCTOR CLEARANCE	15.5 FEET (MINIMUM)	20.5 FEET (MINIMUM)	20.5 FEET/22.5 FEET (MINIMUM)
LINE EASMENT WIDTH	60 FEET	100 FEET	130 FEET



TYPICAL STRUCTURE NOTES:

1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE.
2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
4. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.

PROPOSED 345KV DOUBLE CIRCUIT LINE	
VOLTAGE	DOUBLE CIRCUIT 345KV
STRUCTURE TYPE	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	130-170 FEET TALL (TYPICAL)
FOUNDATION TYPE	CONCRETE PIER
FOUNDATION DIAMETER	8-10 FEET (TYPICAL)
SPAN LENGTH	900 FEET (TYPICAL)
STRUCTURE PER MILE	5-6 (AVERAGE)
CONDUCTOR CLEARANCE	25 FEET (MINIMUM)
LINE EASMENT WIDTH	150 FEET



TYPICAL STRUCTURE NOTES:

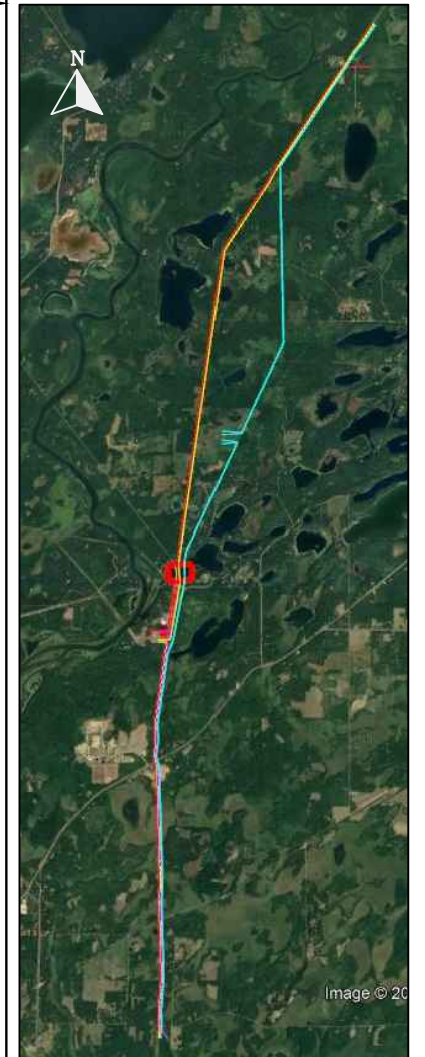
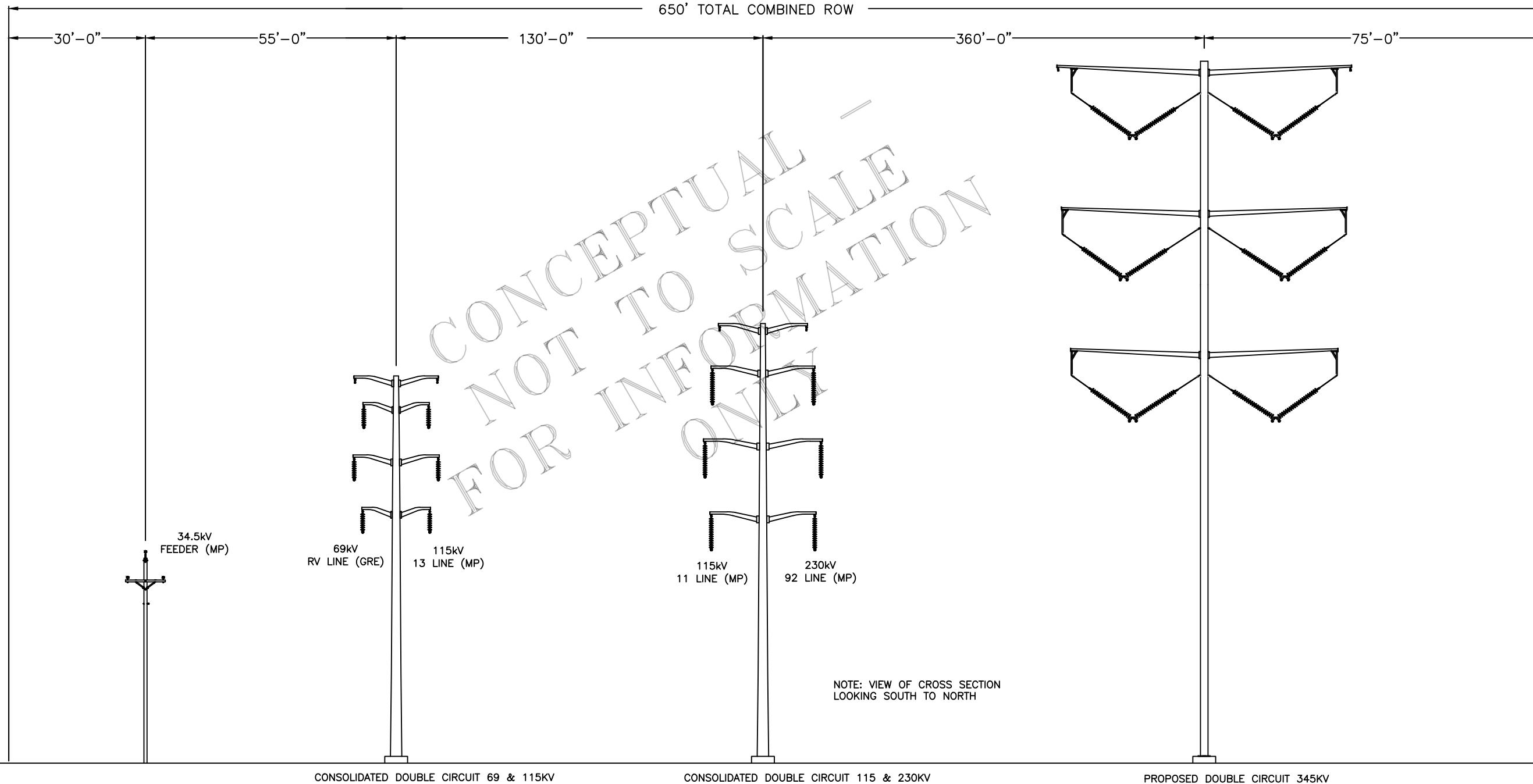
1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE.
2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
4. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.



CROSS SECTION 5
APPROX. 4.7 MILES

	REBUILT 34.5KV FEEDER	CONSOLIDATED 69-115KV DOUBLE CIRCUIT LINE	CONSOLIDATED 115-230KV DOUBLE CIRCUIT LINE	PROPOSED 345KV DOUBLE CIRCUIT LINE
VOLTAGE	SINGLE CIRCUIT 34.5KV	SINGLE CIRCUIT 115KV	DOUBLE CIRCUIT 115 & 230KV	DOUBLE CIRCUIT 345KV
STRUCTURE TYPE	SINGLE WOOD POLES	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	40-50 FEET (TYPICAL)	70-100 FEET TALL (TYPICAL)	80-110 FEET TALL (TYPICAL)	130-170 FEET TALL (TYPICAL)
FOUNDATION TYPE	DIRECT EMBED	CONCRETE PIER	CONCRETE PIER	CONCRETE PIER
FOUNDATION DIAMETER	N/A	5-7 FEET (TYPICAL)	6-8 FEET (TYPICAL)	8-10 FEET (TYPICAL)
SPAN LENGTH	300 FEET (TYPICAL)	700 FEET (TYPICAL)	800 FEET (TYPICAL)	900 FEET (TYPICAL)
STRUCTURES PER MILE	17-18 (AVERAGE)	7-8 (AVERAGE)	6-7 (AVERAGE)	5-6 (AVERAGE)
CONDUCTOR CLEARANCE	15.5 FEET (MINIMUM)	19.5 FEET/20.5 FEET (MINIMUM)	20.5 FEET/22.5 FEET (MINIMUM)	25 FEET (MINIMUM)
LINE EASMENT WIDTH	60 FEET	100 FEET	130 FEET	150 FEET

NOTE: ROW WIDTH ENCOMPASES ALL 7 CIRCUITS.
THERE WOULD LIKELY BE GAPS BETWEEN ROW
AFTER DESIGN IS COMPLETE.



CONSOLIDATED DOUBLE CIRCUIT 69 & 115KV

CONSOLIDATED DOUBLE CIRCUIT 115 & 230KV

PROPOSED DOUBLE CIRCUIT 345KV

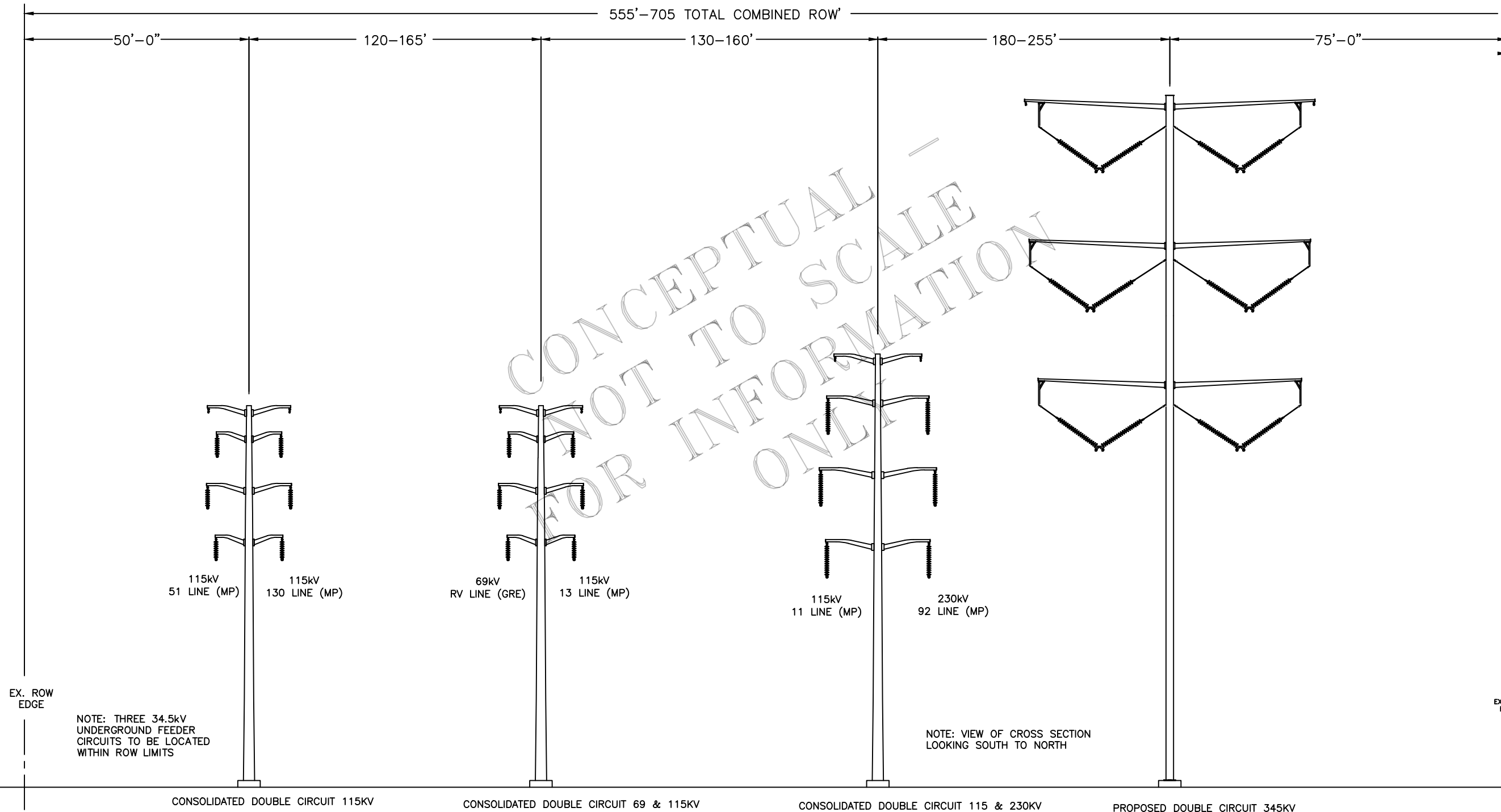
TYPICAL STRUCTURE NOTES:

1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE. SPACING BETWEEN CENTERLINES HAS BEEN ALTERED TO FIT PAGE
2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
4. EXISTING ROW AND CENTERLINES NOT SHOWN AS THE NEW LAKE CROSSING WOULD NOT PARALLEL EXISTING CROSSING.
5. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.

CROSS SECTION 6
APPROX. 1100'
RABBIT LAKE XING

	CONSOLIDATED 115-115KV DOUBLE CIRCUIT LINE	CONSOLIDATED 69-115KV DOUBLE CIRCUIT LINE	CONSOLIDATED 115-230KV DOUBLE CIRCUIT LINE	PROPOSED 345KV DOUBLE CIRCUIT LINE
VOLTAGE	DOUBLE CIRCUIT 115 & 115KV	SINGLE CIRCUIT 115KV	DOUBLE CIRCUIT 115 & 230KV	DOUBLE CIRCUIT 345KV
STRUCTURE TYPE	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	70-100 FEET TALL (TYPICAL)	70-100 FEET TALL (TYPICAL)	80-110 FEET TALL (TYPICAL)	130-170 FEET TALL (TYPICAL)
FOUNDATION TYPE	CONCRETE PIER	CONCRETE PIER	CONCRETE PIER	CONCRETE PIER
FOUNDATION DIAMETER	5-7 FEET (TYPICAL)	5-7 FEET (TYPICAL)	6-8 FEET (TYPICAL)	8-10 FEET (TYPICAL)
SPAN LENGTH	700 FEET (TYPICAL)	700 FEET (TYPICAL)	800 FEET (TYPICAL)	900 FEET (TYPICAL)
STRUCTURES PER MILE	7-8 (AVERAGE)	7-8 (AVERAGE)	6-7 (AVERAGE)	5-6 (AVERAGE)
CONDUCTOR CLEARANCE	20.5 FEET (MINIMUM)	19.5 FEET/20.5 FEET (MINIMUM)	20.5 FEET/22.5 FEET (MINIMUM)	25 FEET (MINIMUM)
LINE EASMENT WIDTH	100 FEET	100 FEET	130 FEET	150 FEET

NOTE: THERE ARE GAPS IN CURRENT ROW BETWEEN CIRCUITS, ALL ROW BETWEEN EXISTING OUTSIDE EDGES WOULD NEED TO BE ACQUIRED.



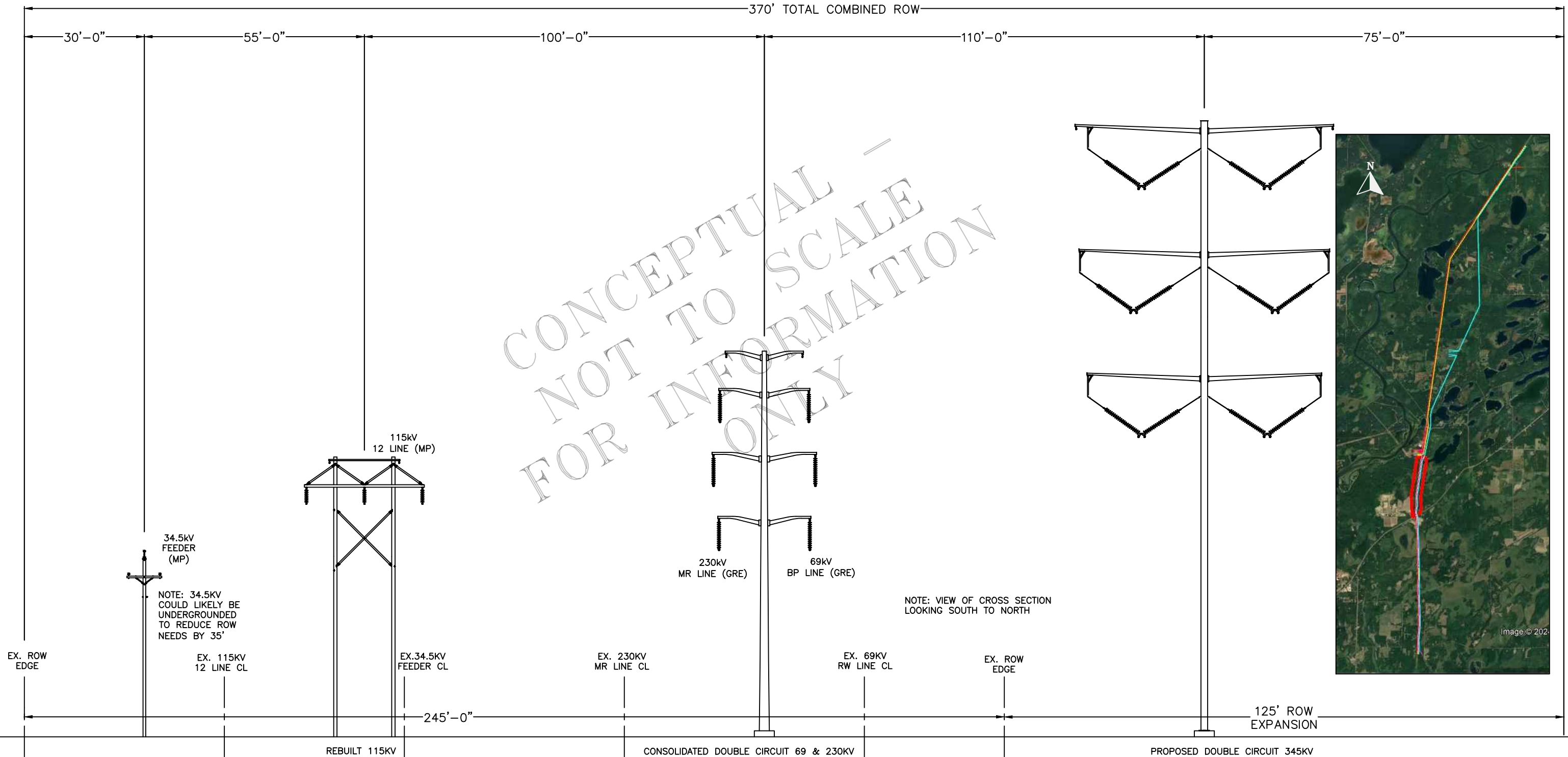
- TYPICAL STRUCTURE NOTES:
1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE. SPACING BETWEEN CENTERLINES HAS BEEN ALTERED TO FIT PAGE
 2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
 3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
 4. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.

CROSS SECTION 7
APPROX. .6 MILES
RABBIT LAKE-RIVERTON

TYPICAL STRUCTURE NOTES:

1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE.
2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
4. ROW EXPANSION IS SHOWN FOR EAST SIDE ONLY. EXPANSION ON EAST vs. WEST SIDE OF THE EXISTING ROW VARIES THROUGHOUT THIS SECTION OF LINE TO AVOID IMPACTS TO RESIDENCES.
5. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.

	REBUILT 34.5KV FEEDER	REBUILT 115KV LINE	CONSOLIDATED 69-230KV DOUBLE CIRCUIT LINE	PROPOSED 345KV DOUBLE CIRCUIT LINE
VOLTAGE	SINGLE CIRCUIT 34.5KV	SINGLE CIRCUIT 115KV	DOUBLE CIRCUIT 69 & 230KV	DOUBLE CIRCUIT 345KV
STRUCTURE TYPE	SINGLE WOOD POLES	WOOD H-FRAMES	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	40-50 FEET (TYPICAL)	60-80 FEET	80-110 FEET TALL (TYPICAL)	130-170 FEET TALL (TYPICAL)
FOUNDATION TYPE	DIRECT EMBED	DIRECT EMBED	CONCRETE PIER	CONCRETE PIER
FOUNDATION DIAMETER	N/A	N/A	6-8 FEET (TYPICAL)	8-10 FEET (TYPICAL)
SPAN LENGTH	300 FEET (TYPICAL)	700 FEET (TYPICAL)	800 FEET (TYPICAL)	900 FEET (TYPICAL)
STRUCTURES PER MILE	17-18 (AVERAGE)	7-8 (AVERAGE)	6-7 (AVERAGE)	5-6 (AVERAGE)
CONDUCTOR CLEARANCE	15.5 FEET (MINIMUM)	20.5 FEET (MINIMUM)	19.5 FEET/22.5 FEET (MINIMUM)	25 FEET (MINIMUM)
LINE EASMENT WIDTH	60 FEET	100 FEET	150 FEET	150 FEET

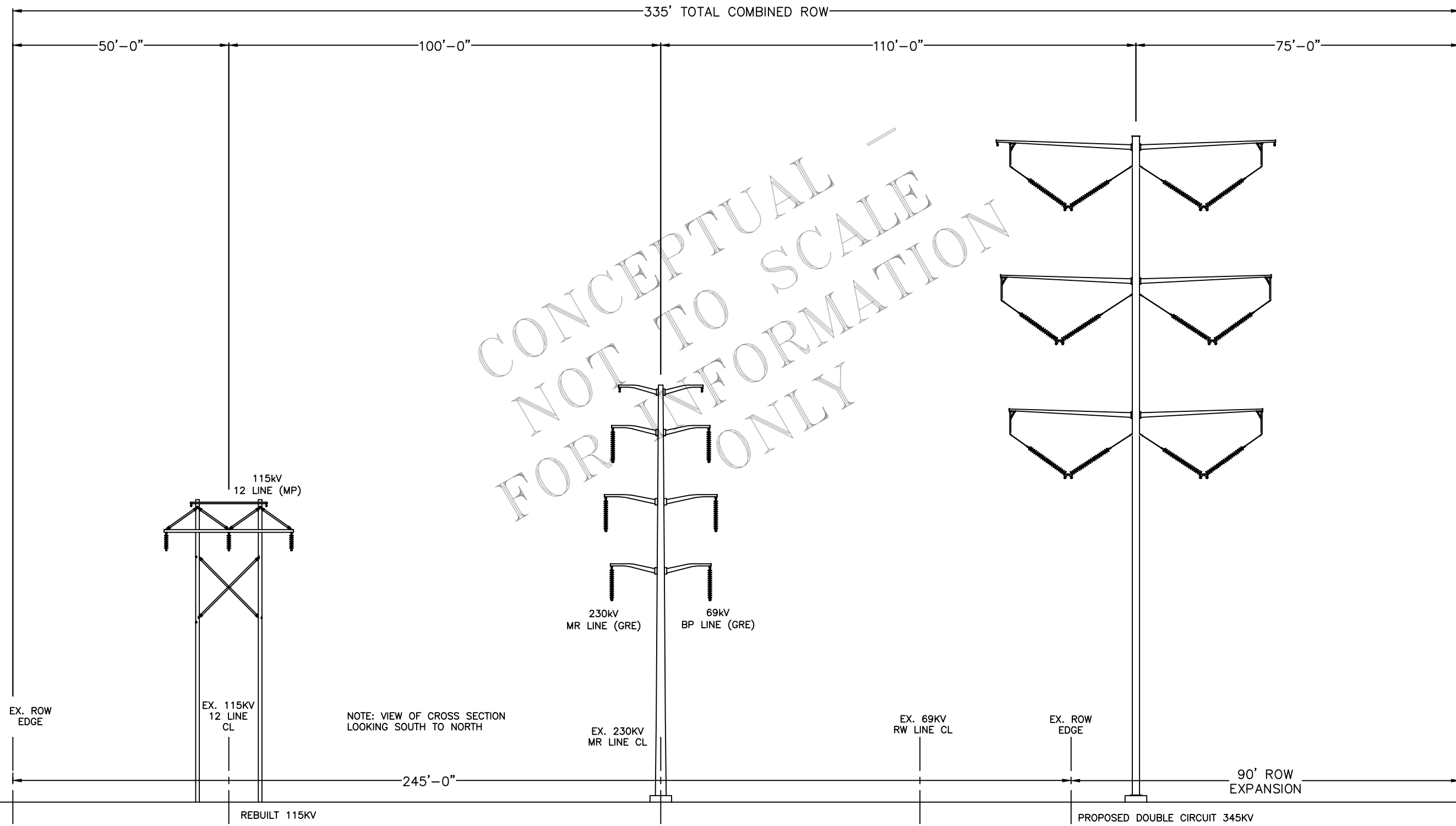


CROSS SECTION 8
APPROX. 1.4 MILES

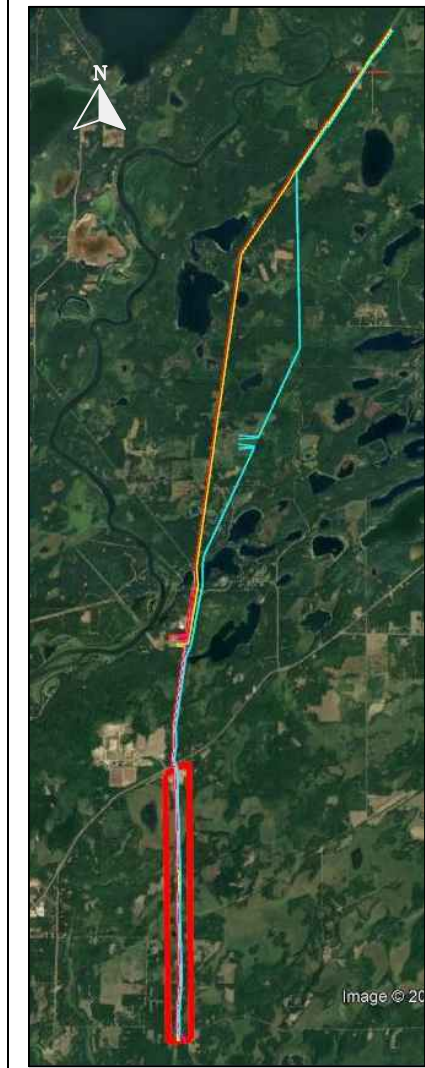
TYPICAL STRUCTURE NOTES:

1. DRAWINGS ARE CONCEPTUAL AND NOT TO SCALE.
2. TYPICAL HEIGHT RANGES INDICATE THE AVERAGE EXPECTED HEIGHT OF THE MAJORITY OF STRUCTURES BASED ON SIMILAR FACILITIES. ACTUAL STRUCTURE HEIGHT IS A FUNCTION OF SPAN PROPERTIES AND TOPOGRAPHY AND MAY VARY OUTSIDE TYPICAL VALUES AS NECESSARY.
3. TYPICAL STRUCTURES PROVIDED ARE TANGENT TYPE STRUCTURES WHICH ARE ANTICIPATED TO BE THE MOST COMMON ON A GIVEN LINE. LESS COMMON STRUCTURE CONFIGURATIONS FOR DEADENDS, ANGLES, CROSSINGS, AND TRANSPOSITIONS WILL ALSO BE NECESSARY.
4. ROW EXPANSION IS SHOWN FOR EAST SIDE ONLY. EXPANSION ON EAST vs. WEST SIDE OF THE EXISTING ROW VARIES THROUGHOUT THIS SECTION OF LINE TO AVOID IMPACTS TO RESIDENCES.
5. ROW EXPANSION DISTANCES AND DIRECTIONS ARE CONCEPTUAL AND WILL BE DETERMINED BY DETAILED DESIGN AND LAND RIGHTS.

	REBUILT 115KV LINE	CONSOLIDATED 69-230KV DOUBLE CIRCUIT LINE	PROPOSED 345KV DOUBLE CIRCUIT LINE
VOLTAGE	SINGLE CIRCUIT 115KV	DOUBLE CIRCUIT 69 & 230KV	DOUBLE CIRCUIT 345KV
STRUCTURE TYPE	WOOD H-FRAMES	SINGLE SHAFT STEEL POLES	SINGLE SHAFT STEEL POLES
HEIGHT RANGE	60-80 FEET	80-110 FEET TALL (TYPICAL)	130-170 FEET TALL (TYPICAL)
FOUNDATION TYPE	DIRECT EMBED	CONCRETE PIER	CONCRETE PIER
FOUNDATION DIAMETER	N/A	6-8 FEET (TYPICAL)	8-10 FEET (TYPICAL)
SPAN LENGTH	700 FEET (TYPICAL)	800 FEET (TYPICAL)	900 FEET (TYPICAL)
STRUCTURES PER MILE	7-8 (AVERAGE)	6-7 (AVERAGE)	5-6 (AVERAGE)
CONDUCTOR CLEARANCE	20.5 FEET (MINIMUM)	19.5 FEET/22.5 FEET (MINIMUM)	25 FEET (MINIMUM)
LINE EASMENT WIDTH	100 FEET	150 FEET	150 FEET



CONCEPTUAL - NOT TO SCALE - FOR INFORMATION ONLY



CROSS SECTION 9
APPROX. 3.1 MILES