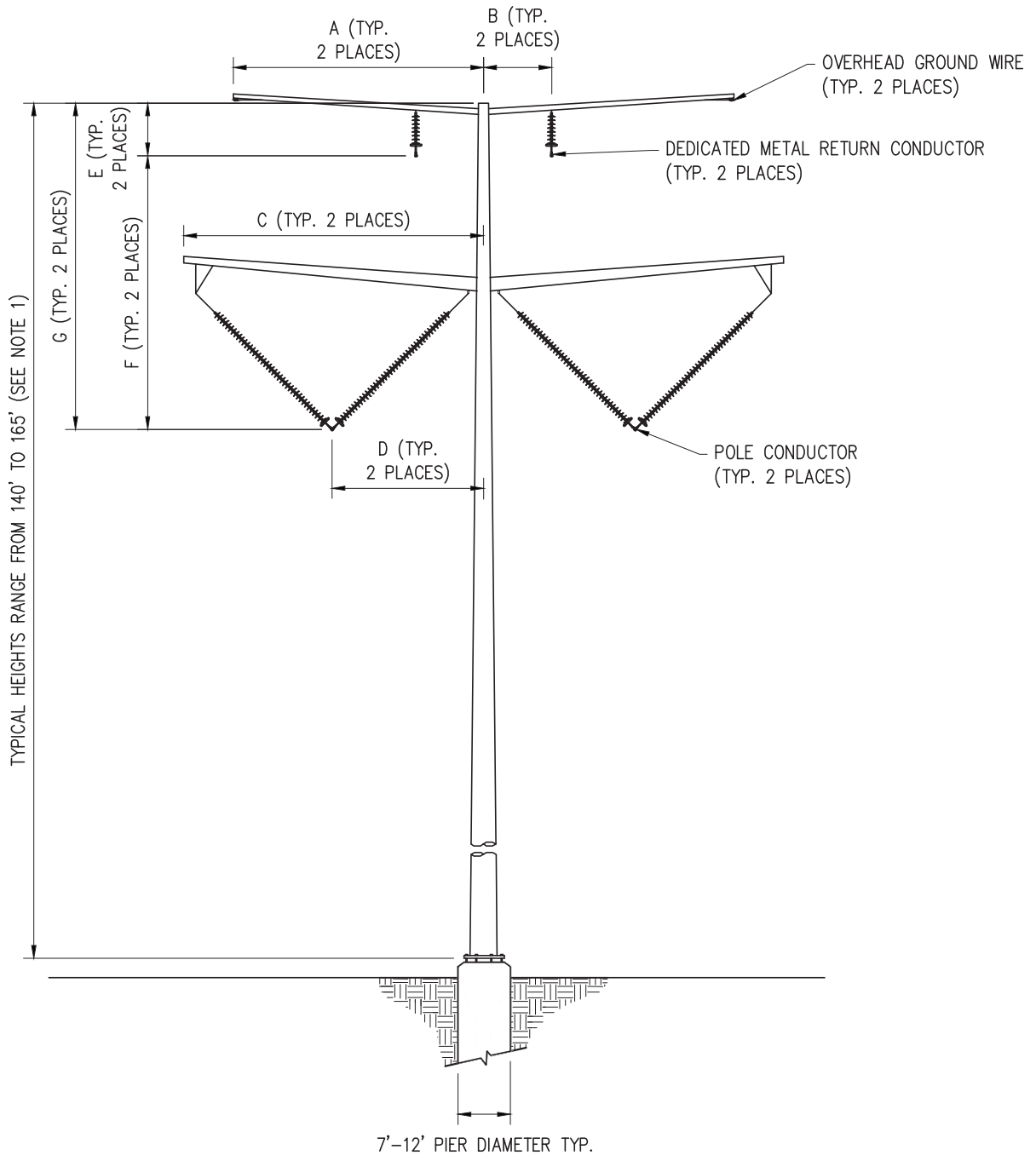


Appendix H
Typical Design Figures

H – 1

Typical Structure Drawings



TYPICAL HEIGHTS RANGE FROM 140' TO 165' (SEE NOTE 1)

7'-12' PIER DIAMETER TYP.

Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	30-40
B	Dedicated Metal Return Conductor Horizontal Offset from Structure Centerline	10-20
C	Pole Conductor Support Arm Length from Structure Centerline	40-50
D	Pole Conductor Horizontal Offset from Structure Centerline	25-35
E	OPGW / Dedicated Metal Return Conductor Vertical Separation at Structure	10-20
F	Dedicated Metal Return Conductor / Pole Conductor Vertical Separation at Structure	25-35
G	OPGW / Pole Conductor Vertical Separation at Structure	40-50

NOTES:
 1. MOST STRUCTURE HEIGHTS RANGE FROM 140' TO 165'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 100' OR AS HIGH AS 195'.

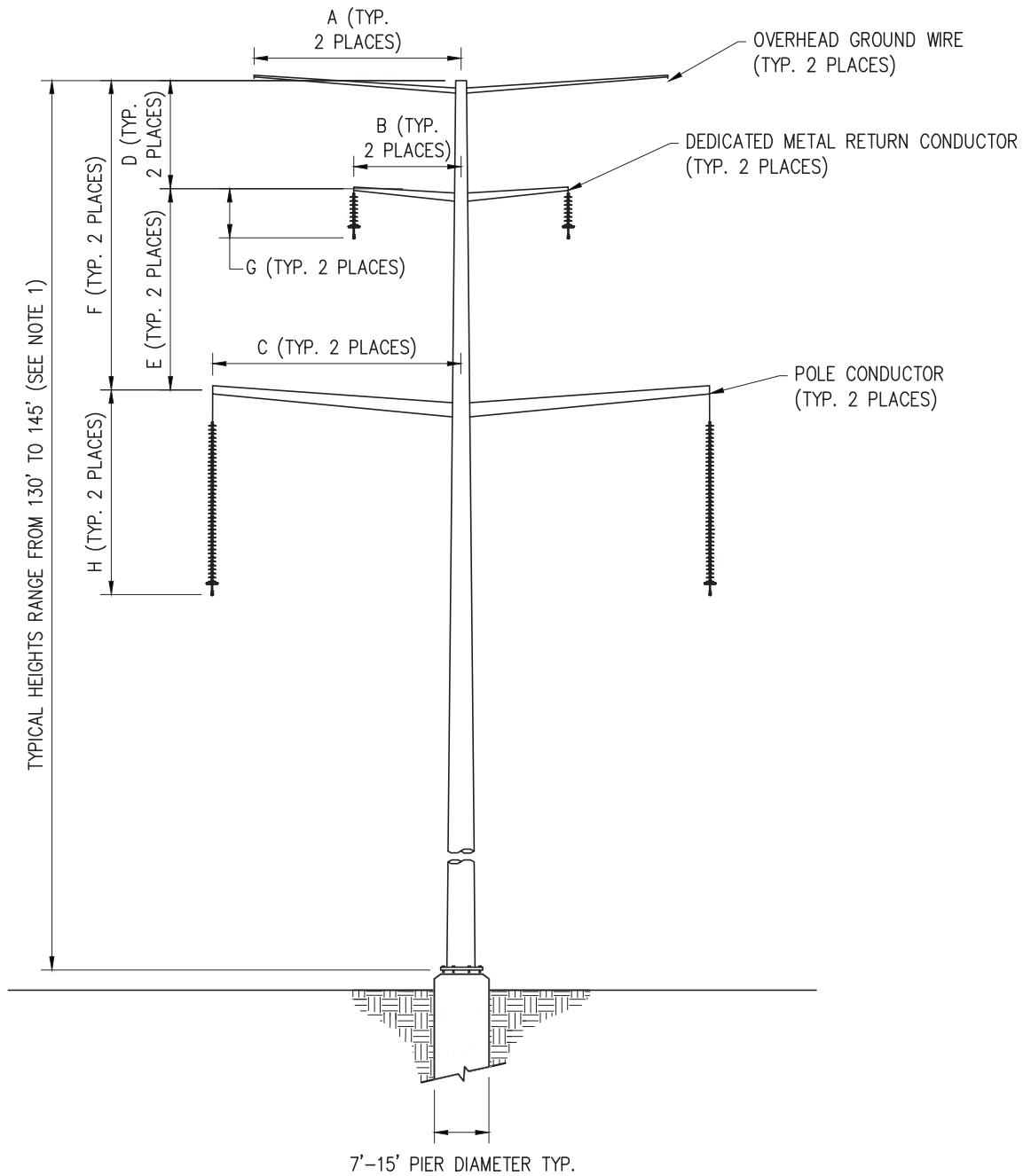
DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW



ENGINEERING RECORD		DATE
DRAWN	C. ELLIS	11/06/25
DESIGNED	S. REED	11/06/25
CHECKED	B. MATTHIES	11/06/25
APPROVED	M. HEIKENS	11/06/25
DWG SCALE: NTS		PLT SCALE: 1:1

NORTH PLAINS CONNECTOR	
SELF SUPPORTING STEEL MONOPOLE	
TYPICAL +/- 525kV HVDC TANGENT	
DWG. NAME:	NPC-A-T009-501
REVISION NO :	E



TYPICAL HEIGHTS RANGE FROM 130' TO 145' (SEE NOTE 1)

7'-15' PIER DIAMETER TYP.

Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	30-55
B	Dedicated Metal Return Conductor Horizontal Offset from Structure Centerline	10-30
C	Pole Conductor Horizontal Offset from Structure Centerline	25-50
D	OPGW / Dedicated Metal Return Conductor Vertical Separation at Structure	10-20
E	Dedicated Metal Return Conductor / Pole Conductor Vertical Separation at Structure	25-35
F	OPGW / Pole Conductor Vertical Separation at Structure	40-50
G	Dedicated Metal Return Conductor Jumper String Length	5-15
H	Pole Conductor Jumper String Length	20-30

NOTES:

1. MOST STRUCTURE HEIGHTS RANGE FROM 130' TO 145'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 120' OR AS HIGH AS 195'.

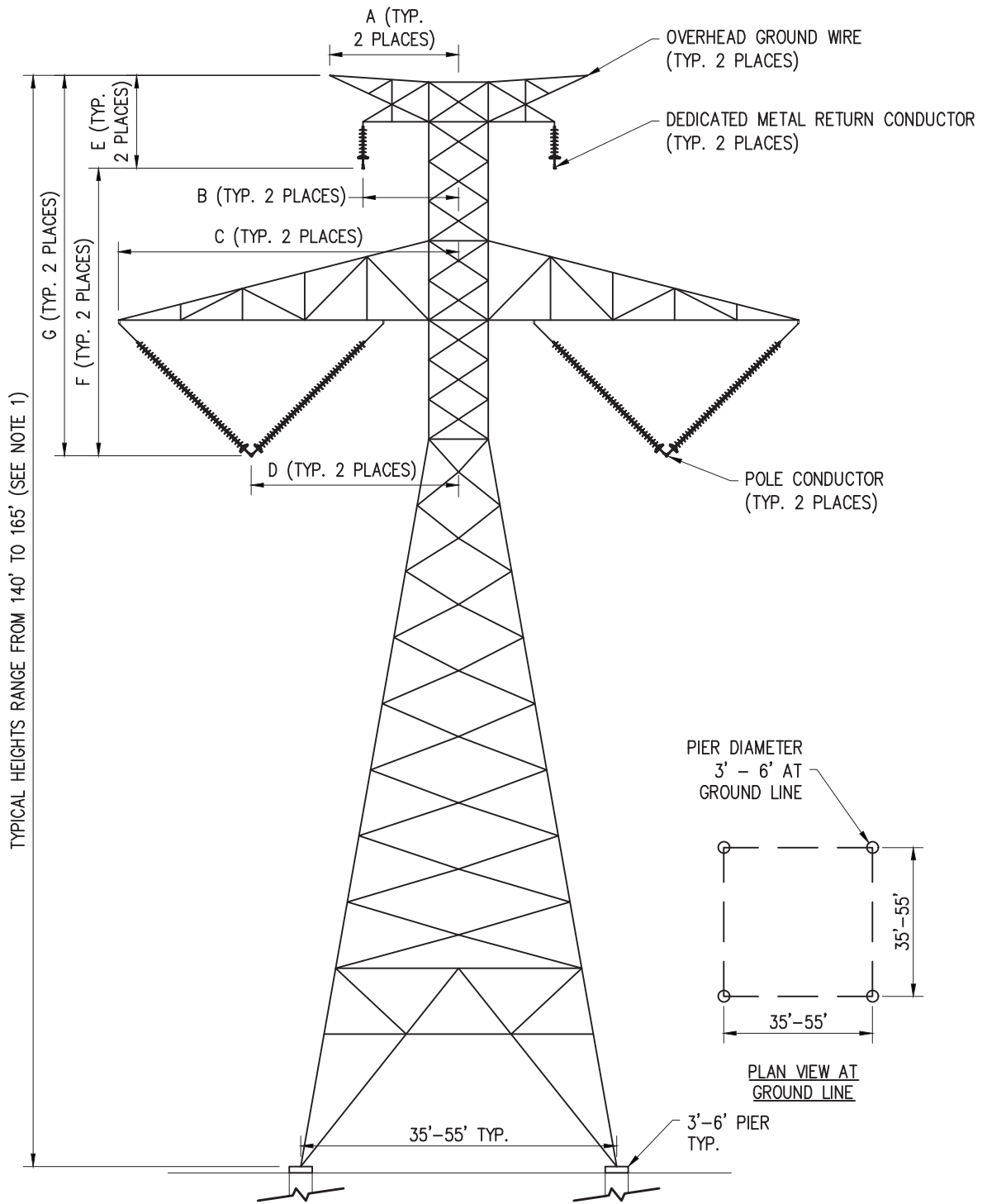
DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW



ENGINEERING RECORD		DATE
DRAWN	C. ELLIS	11/06/25
DESIGNED	S. REED	11/06/25
CHECKED	B. MATTHIES	11/06/25
APPROVED	M. HEIKENS	11/06/25
DWG SCALE: NTS		PLT SCALE: 1:1

NORTH PLAINS CONNECTOR	
SELF SUPPORTING STEEL MONOPOLE	
TYPICAL +/- 525kV HVDC DEADEND	
DWG. NAME:	NPC-A-T009-505
REVISION NO :	F

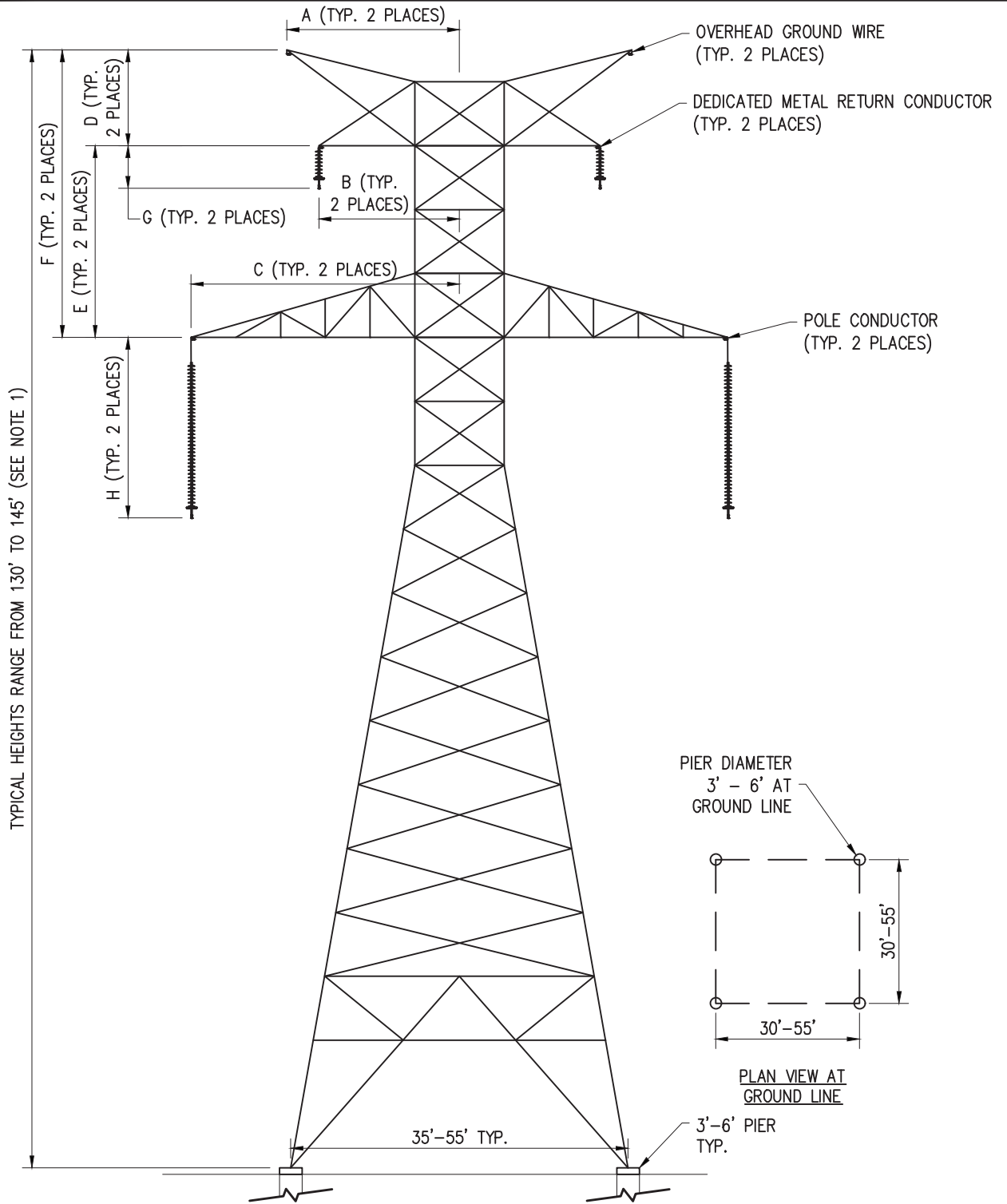


Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	15-30
B	Dedicated Metal Return Conductor Horizontal Offset from Structure Centerline	10-20
C	Pole Conductor Support Arm Length from Structure Centerline	40-50
D	Pole Conductor Horizontal Offset from Structure Centerline	20-35
E	OPGW / Dedicated Metal Return Conductor Vertical Separation at Structure	10-20
F	Dedicated Metal Return Conductor / Pole Conductor Vertical Separation at Structure	30-40
G	OPGW / Pole Conductor Vertical Separation at Structure	40-50

NOTES:
 1. MOST STRUCTURE HEIGHTS RANGE FROM 140' TO 165'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 100' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW



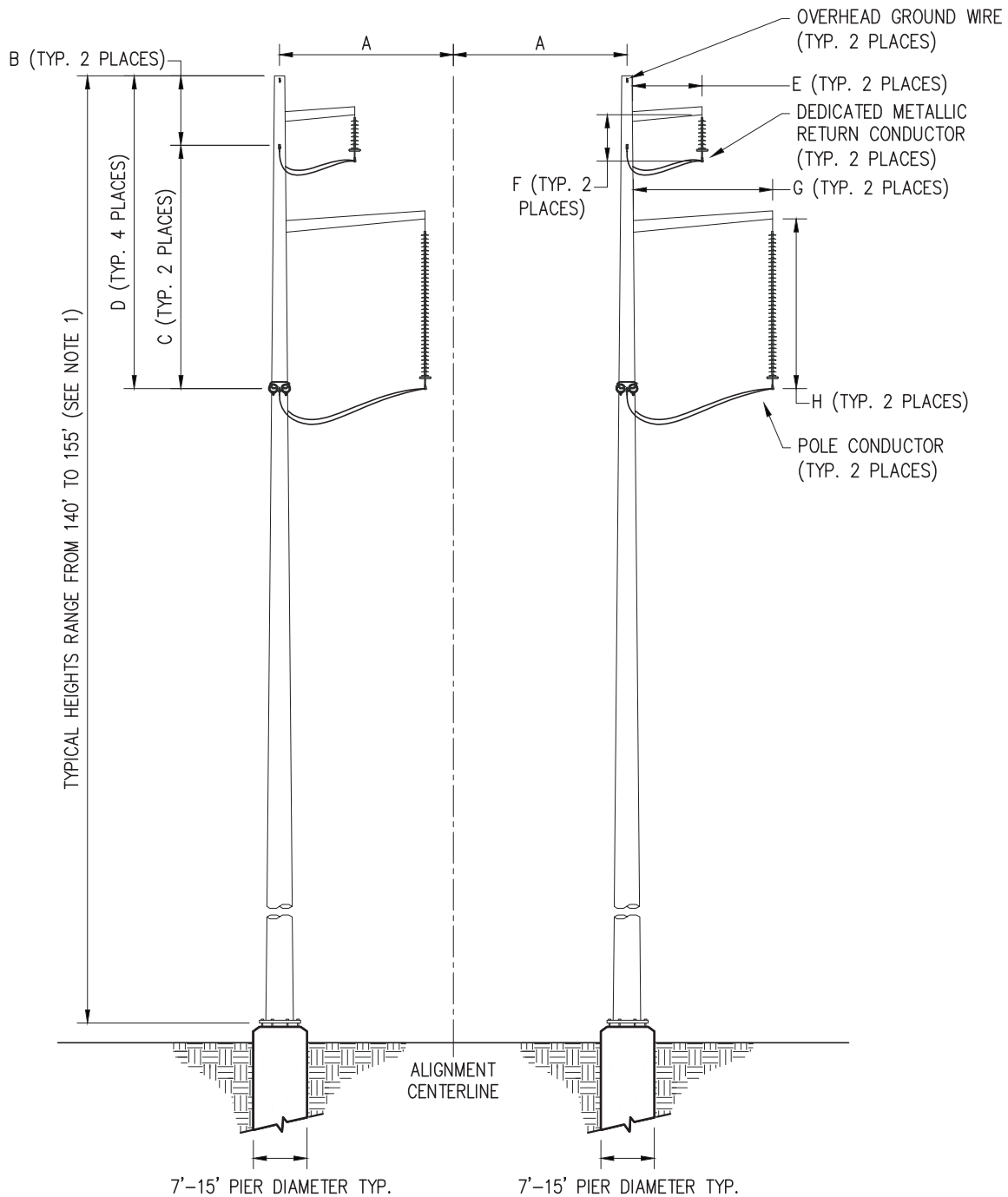
Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	15-30
B	Dedicated Metal Return Conductor Horizontal Offset from Structure Centerline	10-20
C	Pole Conductor Horizontal Offset from Structure Centerline	35-50
D	OPGW / Dedicated Metal Return Conductor Vertical Separation at Structure	10-20
E	Dedicated Metal Return Conductor / Pole Conductor Vertical Separation at Structure	30-40
F	OPGW / Pole Conductor Vertical Separation at Structure	40-50
G	Dedicated Metal Return Conductor Jumper String Length	5-10
H	Pole Conductor Jumper String Length	25-30

NOTES:

1. MOST STRUCTURE HEIGHTS RANGE FROM 130' TO 145'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 120' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW



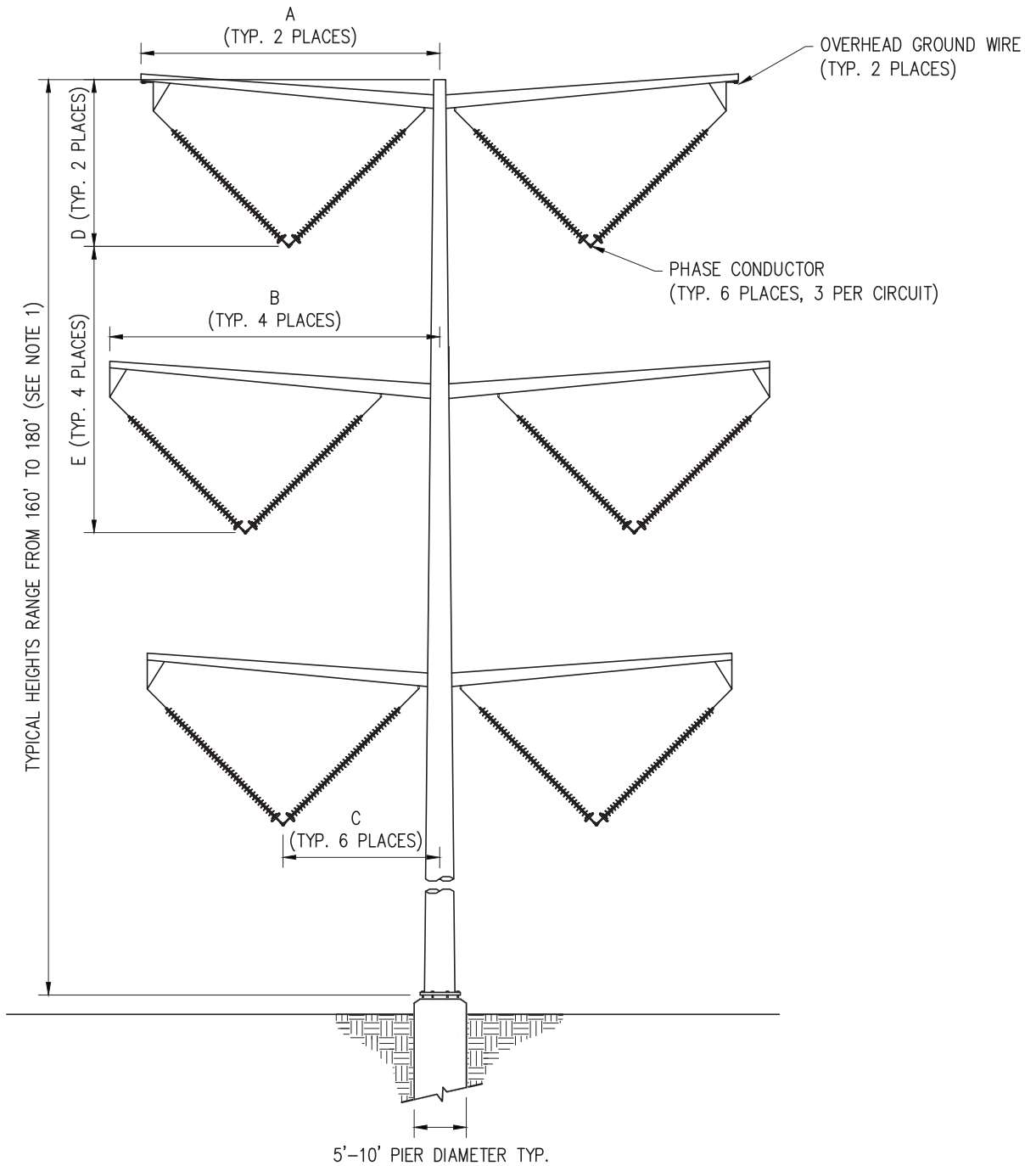
Dimension	Description	Range (ft)
A	Pole Offset from Alignment Centerline	20-30
B	OPGW / Dedicated Metal Return Conductor Vertical Separation at Structure	10-20
C	Dedicated Metal Return Conductor / Pole Conductor Vertical Separation at Structure	35-50
D	OPGW / Pole Conductor Vertical Separation at Structure	45-60
E	Dedicated Metal Return Conductor Jumper Arm Length	10-15
F	Dedicated Metal Return Conductor Jumper String Length	5-10
G	Pole Conductor Jumper Arm Length	20-30
H	Pole Conductor Jumper String Length	25-30

NOTES:

1. MOST STRUCTURE HEIGHTS RANGE FROM 130' TO 155'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 120' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW



- NOTES:
1. MOST STRUCTURE HEIGHTS RANGE FROM 160' TO 180'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 120' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

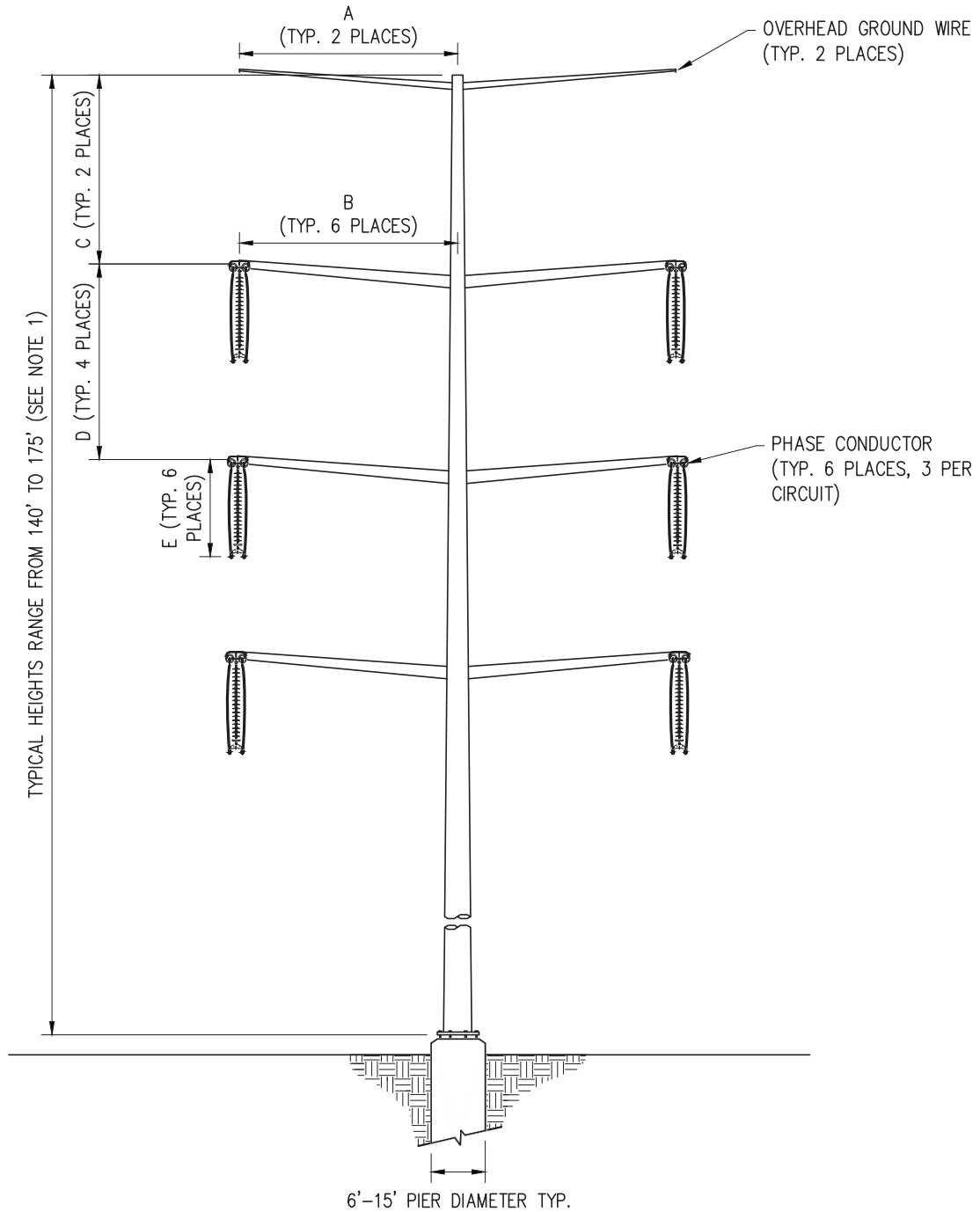
ISSUED FOR REVIEW

Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	30-40
B	Phase Conductor Support Arm Length from Structure Centerline	25-45
C	Phase Conductor Horizontal Offset from Structure Centerline	15-30
D	OPGW / Phase Conductor Vertical Separation at Structure	15-25
E	Phase Conductor / Phase Conductor Vertical Separation at Structure	25-35



ENGINEERING RECORD		DATE
DRAWN	C. ELLIS	11/06/25
DESIGNED	S. REED	11/06/25
CHECKED	B. MATTHIES	11/06/25
APPROVED	M. HEIKENS	11/06/25
DWG SCALE: NTS		PLT SCALE: 1:1

NORTH PLAINS CONNECTOR	
SELF SUPPORTING STEEL MONOPOLE	
TYPICAL 345kV EHV AC DOUBLE CIRCUIT TANGENT	
DWG. NAME:	NPC-A-T009-311
REVISION NO :	E



NOTES:
 1. MOST STRUCTURE HEIGHTS RANGE FROM 140' TO 175'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 120' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

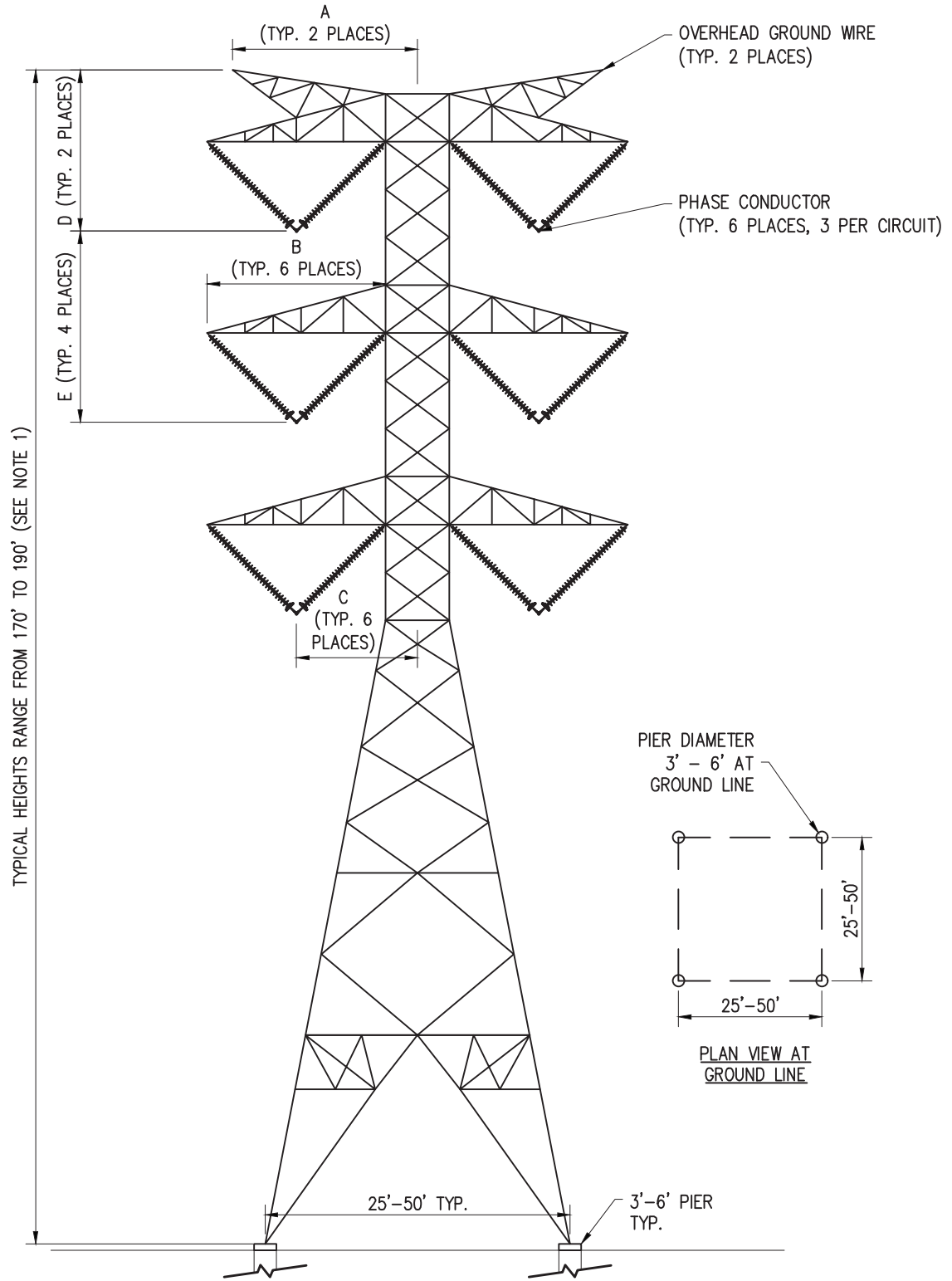
ISSUED FOR REVIEW

Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	30-50
B	Phase Conductor Horizontal Offset from Structure Centerline	15-45
C	OPGW / Phase Conductor Vertical Separation at Structure	15-25
D	Phase Conductor / Phase Conductor Vertical Separation at Structure	25-35
E	Phase Conductor Jumper String Length	15-20



ENGINEERING RECORD		DATE
DRAWN	C. ELLIS	11/06/25
DESIGNED	S. REED	11/06/25
CHECKED	B. MATTHIES	11/06/25
APPROVED	M. HEIKBNS	11/06/25
DWG SCALE: NTS		PLT SCALE: 1:1

NORTH PLAINS CONNECTOR	
SELF SUPPORTING STEEL MONOPOLE	
TYPICAL 345kV EHV AC DOUBLE CIRCUIT DEADEND	
DWG. NAME:	NPC-A-T009-315
REVISION NO :	F

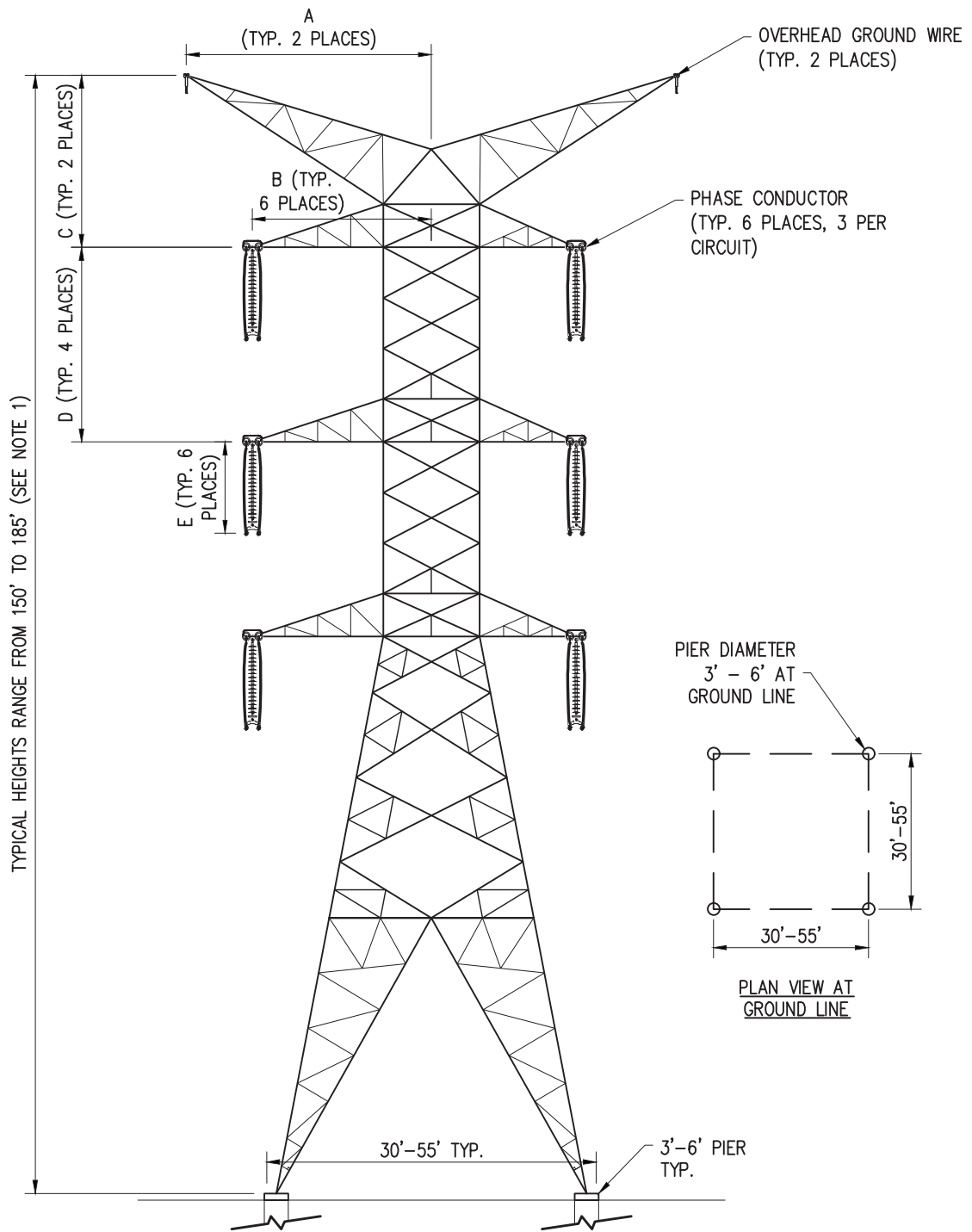


- NOTES:
1. MOST STRUCTURE HEIGHTS RANGE FROM 170' TO 190'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 130' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW

Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	10-30
B	Phase Conductor Support Arm Length from Structure Centerline	25-30
C	Phase Conductor Horizontal Offset from Structure Centerline	18-23
D	OPGW / Phase Conductor Vertical Separation at Structure	20-25
E	Phase Conductor / Phase Conductor Vertical Separation at Structure	25-35



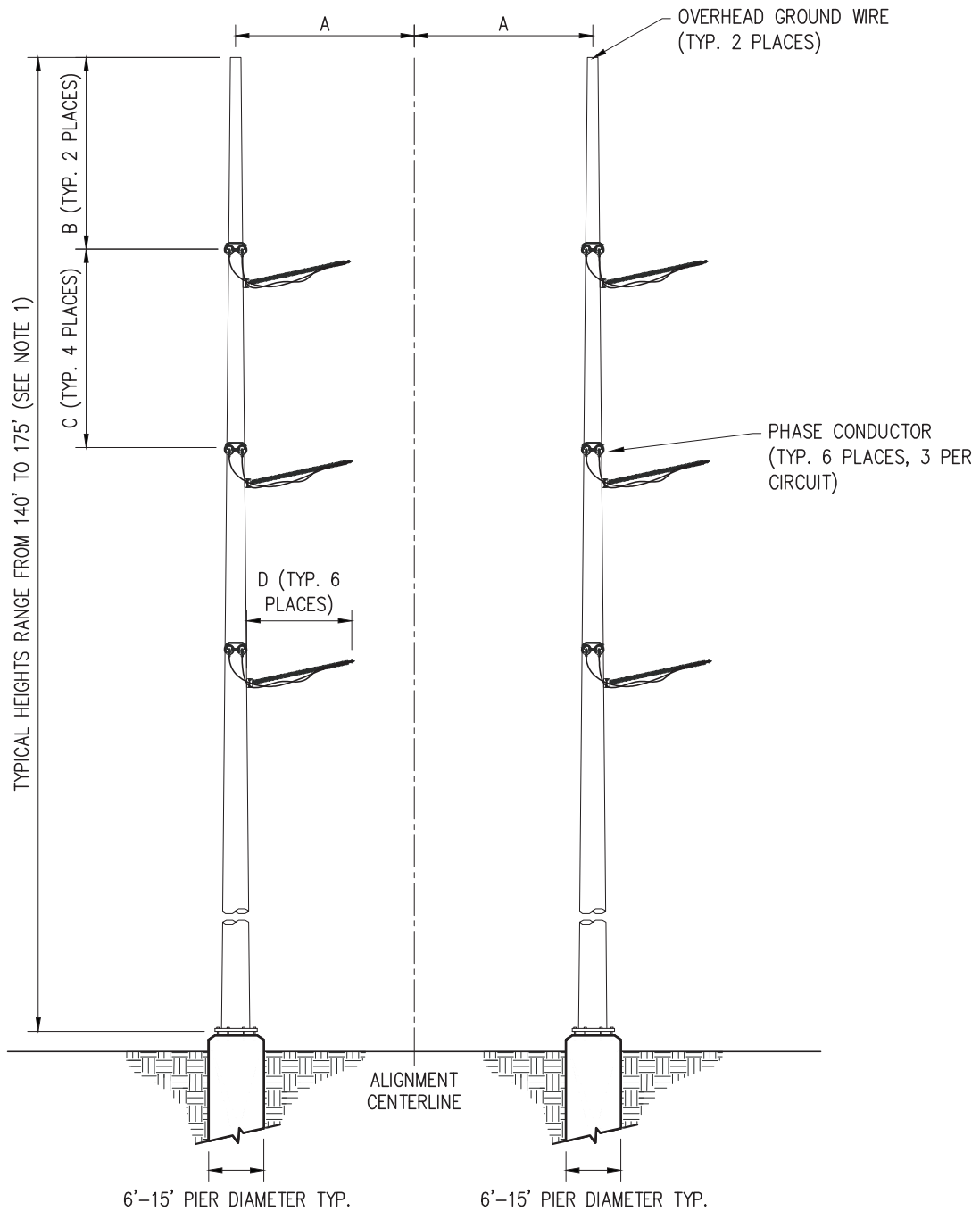
NOTES:

1. MOST STRUCTURE HEIGHTS RANGE FROM 150' TO 185'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 130' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW

Dimension	Description	Range (ft)
A	OPGW Horizontal Offset from Structure Centerline	10-30
B	Phase Conductor Horizontal Offset from Structure Centerline	23-32
C	OPGW / Phase Conductor Vertical Separation at Structure	20-25
D	Phase Conductor / Phase Conductor Vertical Separation at Structure	25-35
E	Phase Conductor Jumper String Length	15-20



TYPICAL HEIGHTS RANGE FROM 140' TO 175' (SEE NOTE 1)

NOTES:

1. MOST STRUCTURE HEIGHTS RANGE FROM 140' TO 175'. HOWEVER, ANTICIPATED STRUCTURE HEIGHTS CAN BE AS LOW AS 120' OR AS HIGH AS 195'.

DISCLAIMER: FINAL FRAMING DIMENSIONS SUBJECT TO CHANGE PENDING DETAILED ENGINEERING.

ISSUED FOR REVIEW

Dimension	Description	Range (ft)
A	Pole Offset from Alignment Centerline	15-25
B	OPGW / Phase Conductor Vertical Separation at Structure	15-25
C	Phase Conductor / Phase Conductor Vertical Separation at Structure	20-30
D	Jumper Post Length	10-15



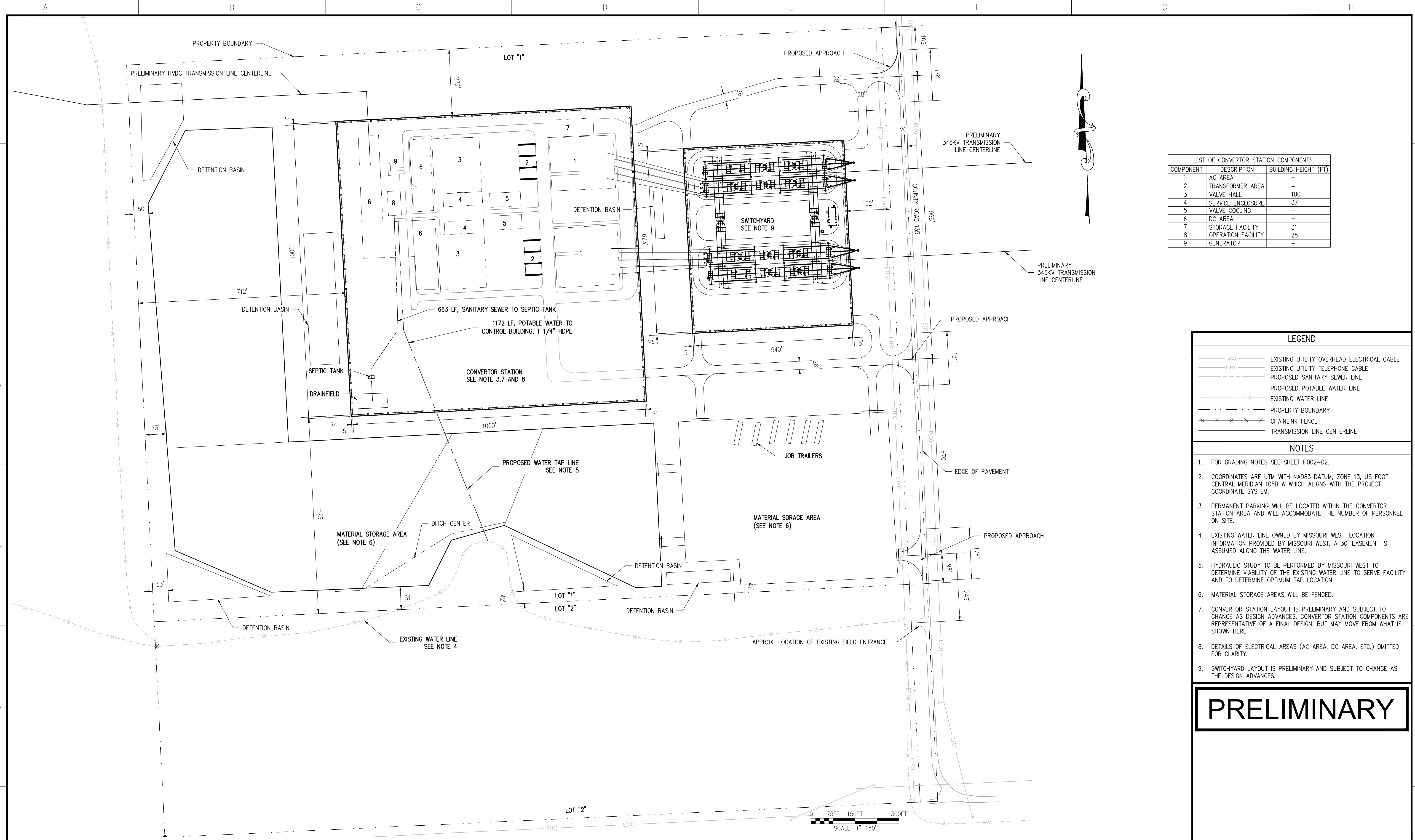
ENGINEERING RECORD		DATE
DRAWN	C. ELLIS	03/14/25
DESIGNED	S. REED	03/14/25
CHECKED	B. MATTHIES	03/14/25
APPROVED	M. HEIKBNS	03/14/25

NORTH PLAINS CONNECTOR	
SELF SUPPORTING STEEL TWO POLE	
TYPICAL 345kV EHV AC DOUBLE CIRCUIT DEADEND	
DWG. NAME:	NPC-A-T009-335
REVISION NO :	B

DWG SCALE: NTS | PLT SCALE: 1:1

H – 2

Morton County Converter Station Preliminary Site Plan



LIST OF CONVERTOR STATION COMPONENTS		
COMPONENT	DESCRIPTION	BUILDING HEIGHT (FT)
1	AC AREA	-
2	TRANSFORMER AREA	-
3	VALVE HALL	100
4	SERVICE ENCLOSURE	37
5	VALVE COOLING	-
6	DC AREA	-
7	STORAGE FACILITY	31
8	OPERATION FACILITY	25
9	GENERATOR	-

LEGEND	
	EXISTING UTILITY OVERHEAD ELECTRICAL CABLE
	EXISTING UTILITY TELEPHONE CABLE
	PROPOSED SANITARY SEWER LINE
	PROPOSED POTABLE WATER LINE
	EXISTING WATER LINE
	PROPERTY BOUNDARY
	CHAINLINK FENCE
	TRANSMISSION LINE CENTERLINE

- NOTES**
- FOR GRADING NOTES SEE SHEET P002-02.
 - COORDINATES ARE UTM WITH NAD83 DATUM, ZONE 13, US FOOT; CENTRAL MERIDIAN 1050 W WHICH ALIGNS WITH THE PROJECT COORDINATE SYSTEM.
 - PERMANENT PARKING WILL BE LOCATED WITHIN THE CONVERTOR STATION AREA AND WILL ACCOMMODATE THE NUMBER OF PERSONNEL ON SITE.
 - EXISTING WATER LINE OWNED BY MISSOURI WEST. LOCATION INFORMATION PROVIDED BY MISSOURI WEST. A 30' EASEMENT IS ASSUMED ALONG THE WATER LINE.
 - HYDRAULIC STUDY TO BE PERFORMED BY MISSOURI WEST TO DETERMINE VIABILITY OF THE EXISTING WATER LINE TO SERVE FACILITY AND TO DETERMINE OPTIMUM TAP LOCATION.
 - MATERIAL STORAGE AREAS WILL BE FENCED.
 - CONVERTOR STATION LAYOUT IS PRELIMINARY AND SUBJECT TO CHANGE AS DESIGN ADVANCES. CONVERTOR STATION COMPONENTS ARE REPRESENTATIVE OF A FINAL DESIGN, BUT MAY MOVE FROM WHAT IS SHOWN HERE.
 - DETAILS OF ELECTRICAL AREAS (AC AREA, DC AREA, ETC.) OMITTED FOR CLARITY.
 - SWITCHYARD LAYOUT IS PRELIMINARY AND SUBJECT TO CHANGE AS THE DESIGN ADVANCES.

PRELIMINARY

FILE LOCATION: N:\SHARED\01 ECI\GRID UNITED\02 PROJECTS\GU-012 NORTH PLAINS CONNECTOR (500+ KV HVDC)\STATIONS\NORTH DAKOTA\300 DESIGN\320 CIVIL AND STRUCTURAL\325 SITE DESIGN\NORTH DAKOTA CIVIL DESIGN.DWG LAST SAVED BY: kfulton 1/14/2026 8:36 AM PLOTTED BY: Kyle J. Fulton 1/15/2026 10:33 AM Tab:overall site plan

ECI ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
OD	PRELIMINARY	10/10/25	KJF	SKC
OC	PRELIMINARY	09/15/25	KJF	SKC
OB	PRELIMINARY	08/29/25	KJF	SKC
OA	PRELIMINARY	07/25/25	KJF	SKC



ENGINEERING RECORD		
DRAWN	DESIGNED	CHECKED
K. FULTON	K. FULTON	S. CAMPOSAN
DATE	DATE	DATE
07/24/25	07/24/25	07/25/25
APPROVED		
DWG SCALE: 1"=150'	PLT SCALE:	

NORTH PLAINS CONNECTOR
NORTH DAKOTA CONVERTER SITE
OVERALL SITE PLAN

DWG. NAME: NSY-D-P002-01 REVISION NO : 00