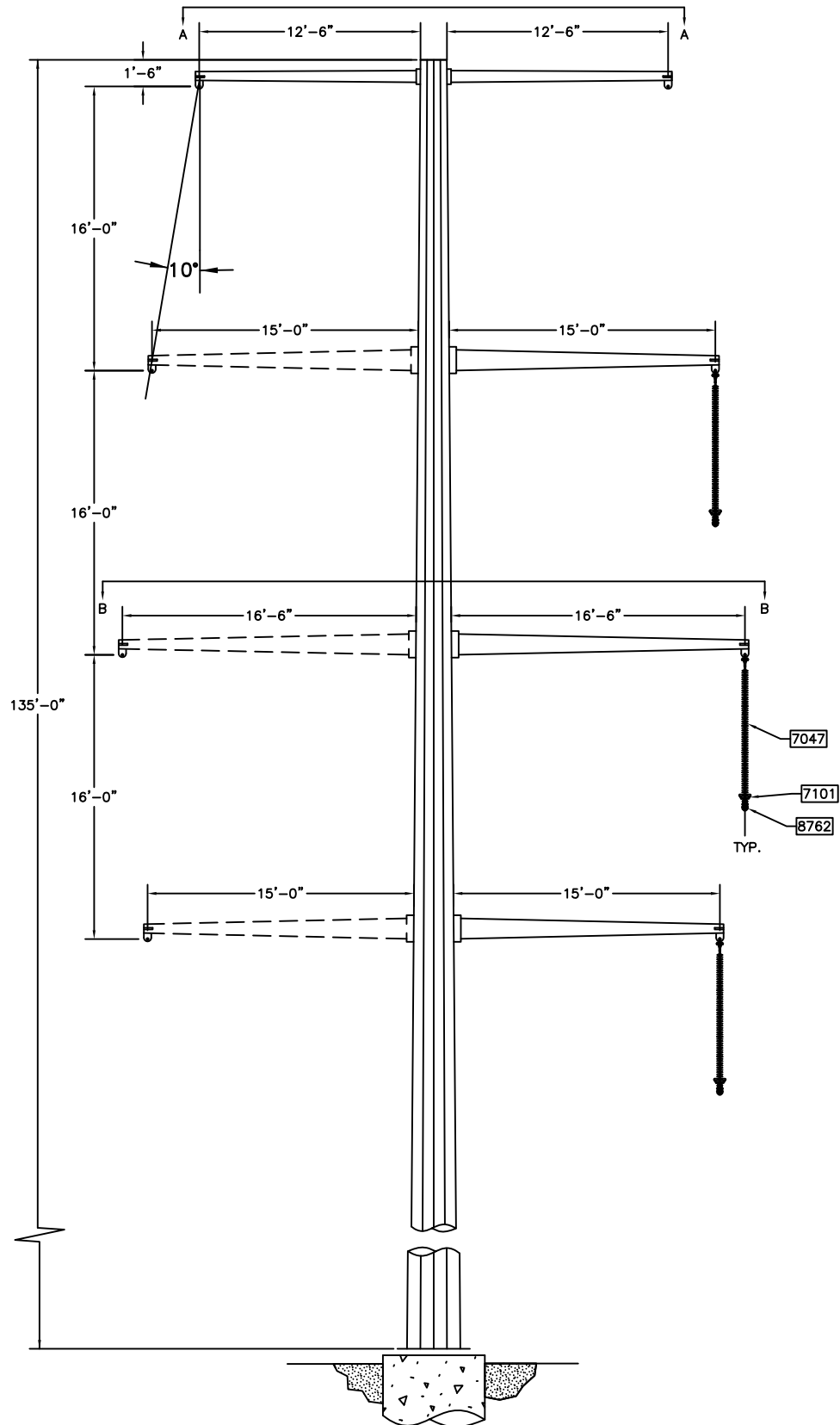


## **APPENDIX D**

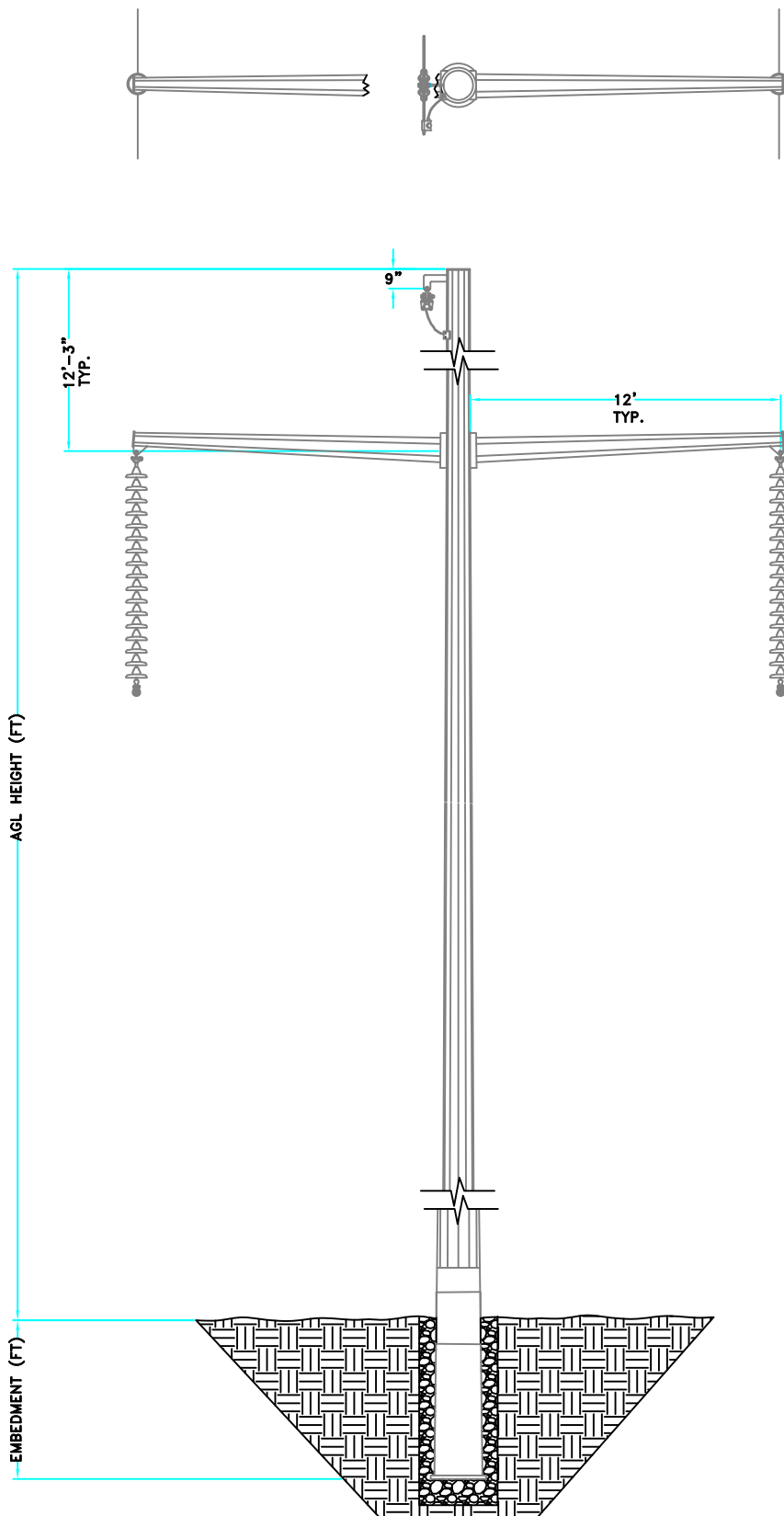
### **Project Design Figures**



DRAWN: N.A.O./B&V  
 CHECKED: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_  
 REV. 0 DATE: 12-18-09

  
 minnesota power  
 TRANSMISSION ENGINEERING

230 kV BISON-SQ. BUTTE LINE NO. 84  
 STR. # 132  
 TYPE DC-DE-90 DEG. STR. ASSEMBLY  
 SHEET 1 OF 4 DB-E444-P509



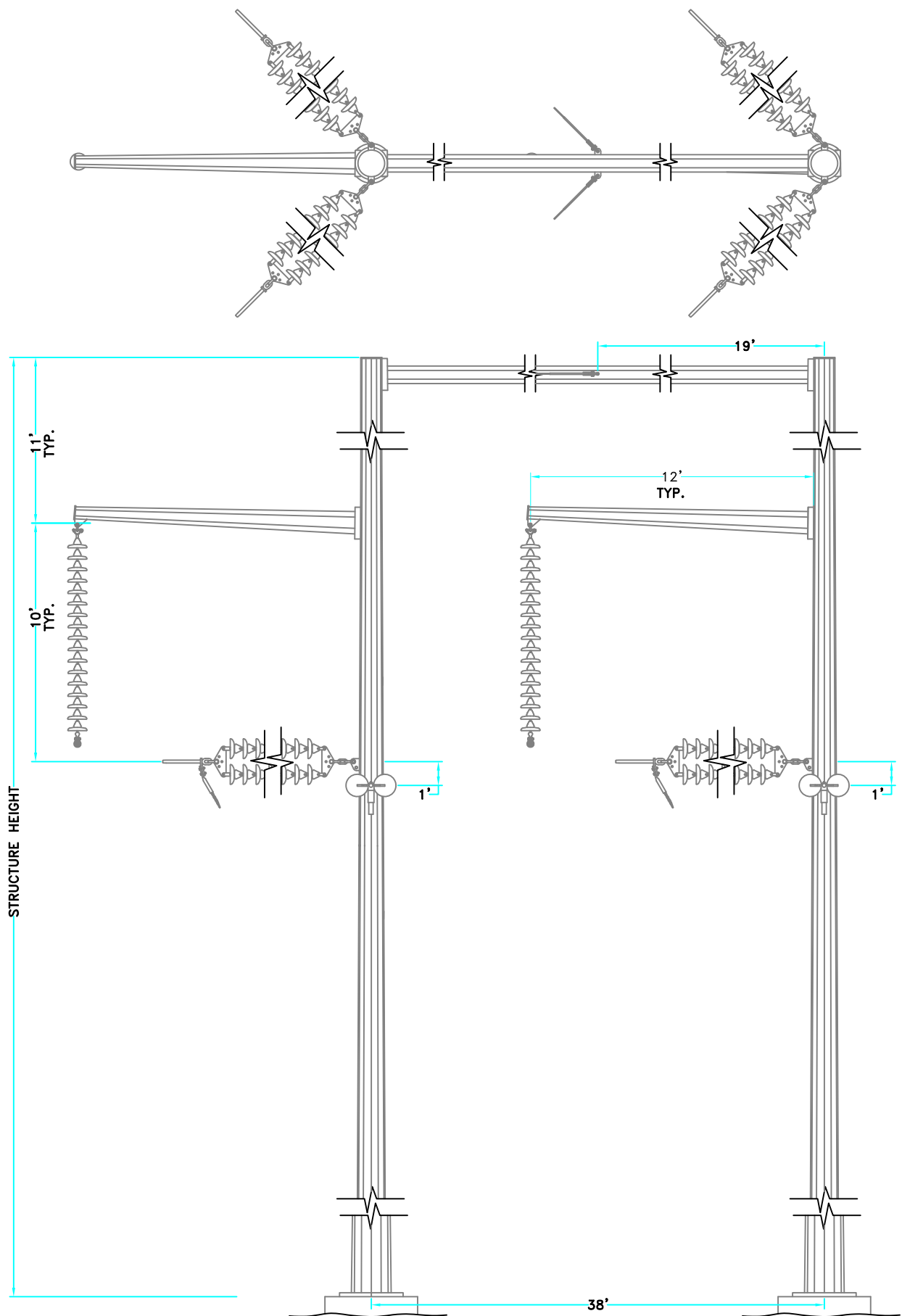
Drawn: L.R.H.  
 Checked: —  
 Approved: \_\_\_\_\_  
 Rev. 0 Date: 02-02-24

  
 TRANSMISSION ENGINEERING

250 kV DC LINE  
 0-1° TANGENT "B" STRUCTURE

Sheet 1 of 6

DB-E458-P202



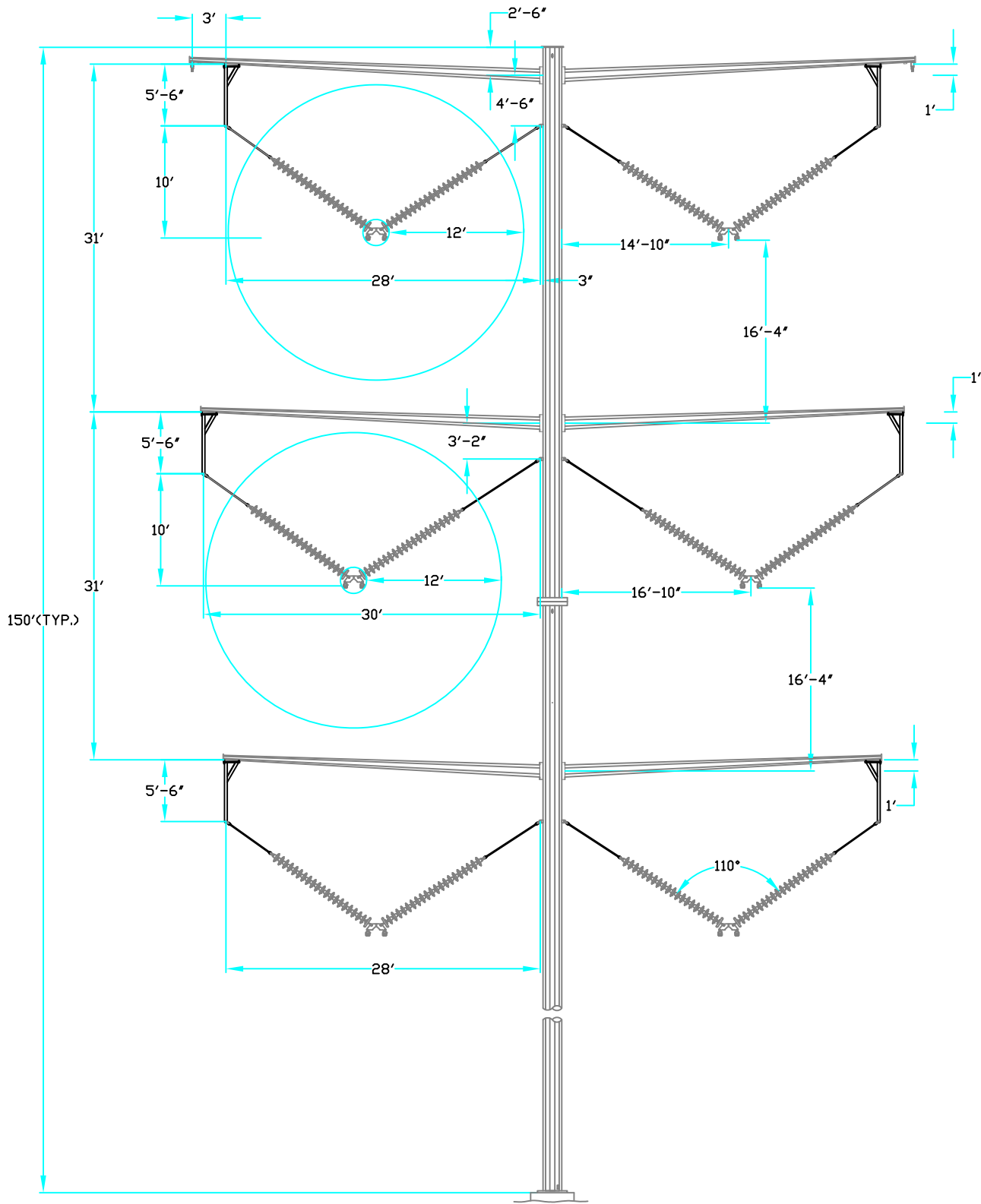
Drawn: L.R.H.  
 Checked: \_\_\_\_\_  
 Approved: —  
 Rev. 0 Date: 02/02/24



250 kV DC LINE  
 46-90° ANGLE DEADEND "E3" STRUCTURE

Sheet 6 of 6

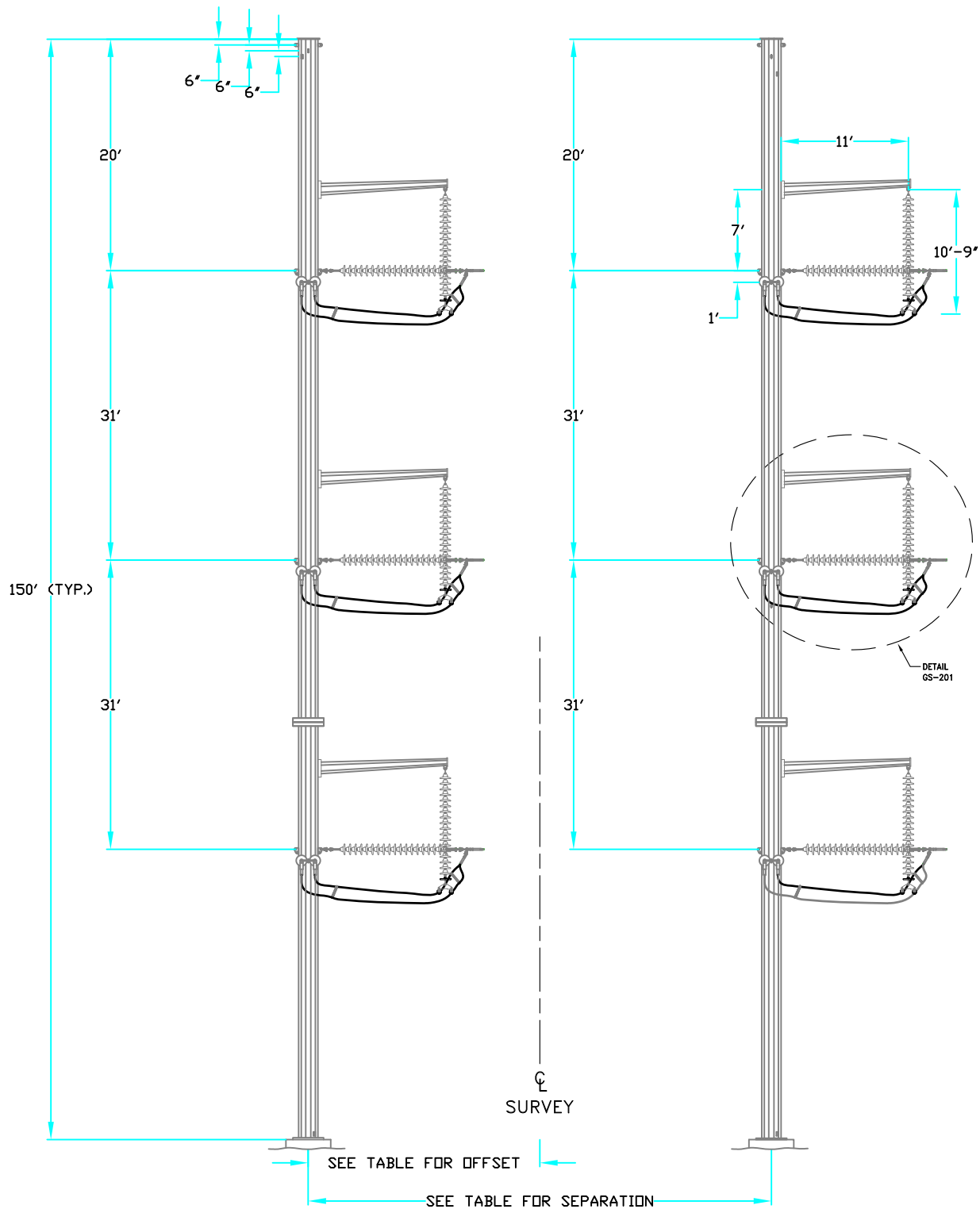
DB-E458-P202



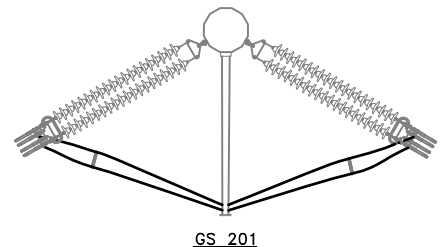
Drawn: L.R.H.  
 Checked: \_\_\_\_\_  
 Approved: \_\_\_\_\_  
 Rev. 0 Date: 02/01/24



345kV LINE NO. NELSON LAKE - EAST OLIVER TSDCV STRUCTURE CONCEPT	
Sheet 1 of 3	DB-E458-P201



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

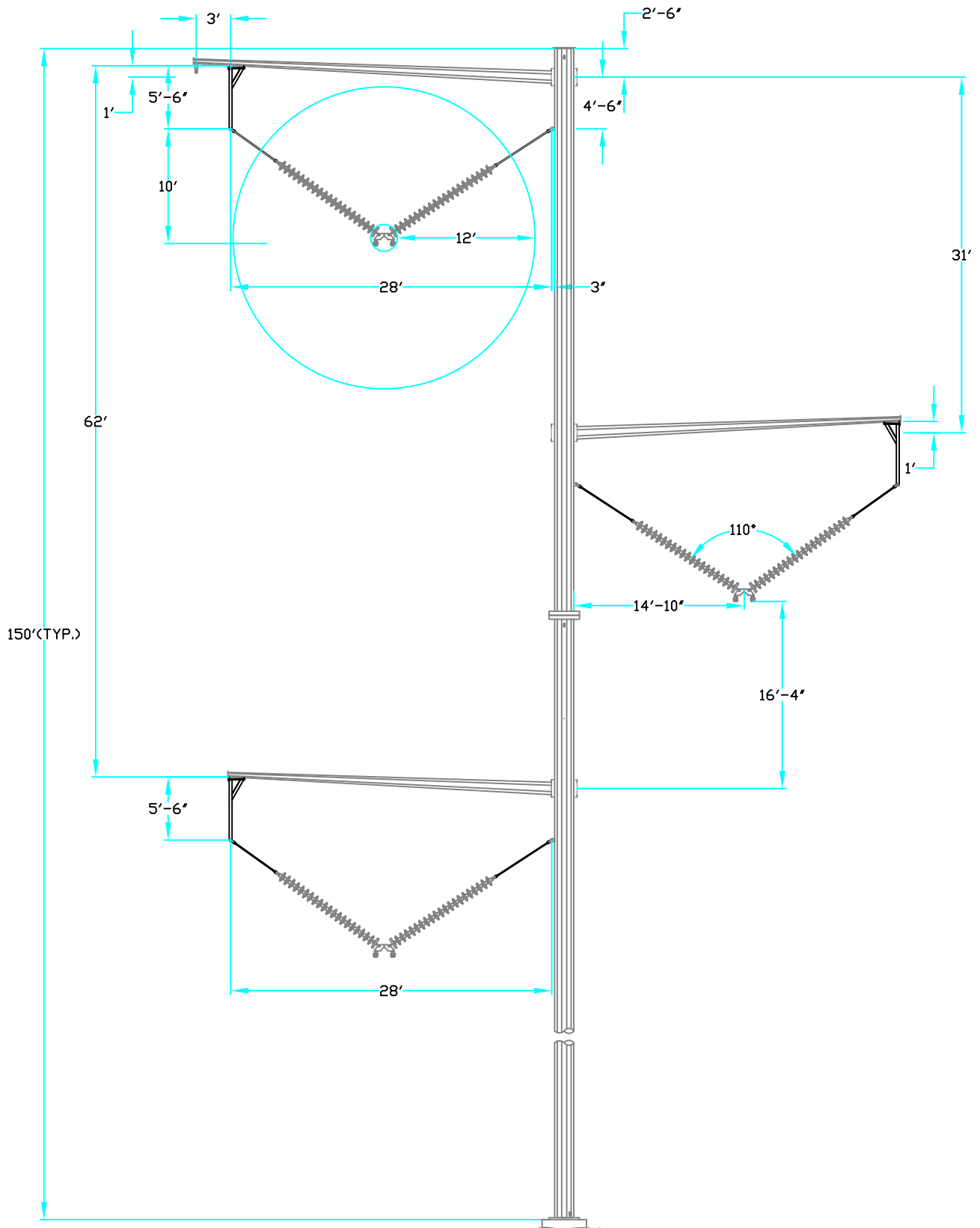


GS\_201

Drawn: L.R.H.  
 Checked: \_\_\_\_\_  
 Approved: \_\_\_\_\_  
 Rev. 0 Date: 02/01/24

**minnesota power**  
 TRANSMISSION ENGINEERING

345KV LINE NO.  
 NELSON LAKE - EAST OLIVER  
 TS6DC-2P STRUCTURE CONCEPT  
 Sheet 2 of 3 DB-E458-P201



Drawn: L.R.H.  
 Checked: \_\_\_\_\_  
 Approved: \_\_\_\_\_  
 Rev. 0 Date: 02/01/24



345kV LINE NO.  
 EAST OLIVER - POLE 1  
 TSV STRUCTURE CONCEPT

Sheet 3 of 3

DB-E458-P201