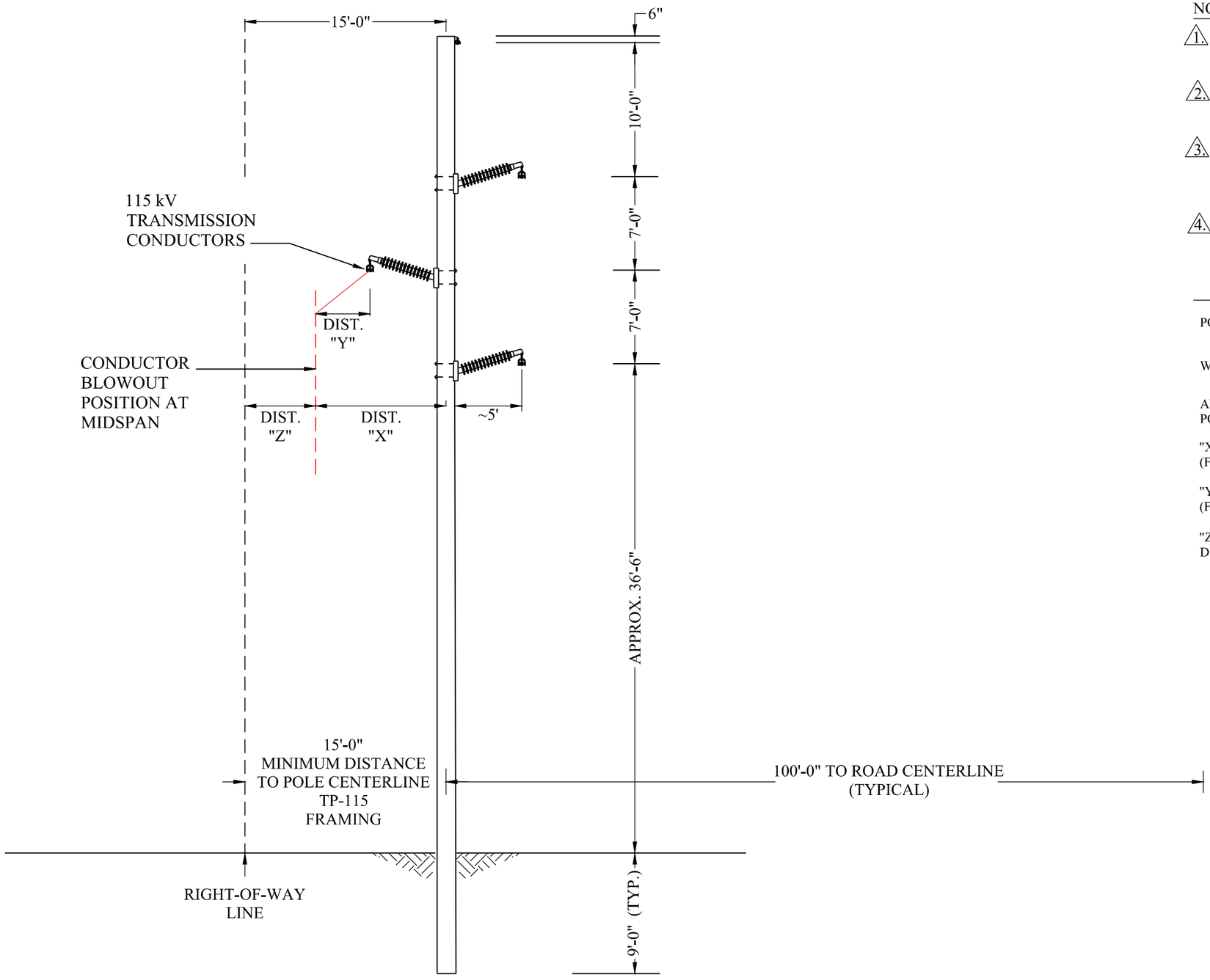
Appendix B Transmission Line Structures



NOTES:

1. Conductor blowout analysis is conducted in accordance with the criteria of the National Electric Safety Code (NESC).
2. Conductor blowout measurements are calculated at mid-span where worst-case conductor displacement occurs.
3. Where total road ROW is less than 200' and poles are less than 15' from ROW line, TP-115B structures shall be installed. See Figure 3B for details.
4. Proposed conductor size is 336 kcmil ACSR, Linnet.

NESC CONDUCTOR BLOWOUT SUMMARY

POLE FRAMING =	TP-115
WIND SPEED (MPH) =	48.5
APPROXIMATE MAXIMUM POLE SPAN =	307.0 FT
"X" - BLOWOUT DISTANCE (FROM POLE CENTERLINE) =	9.07 FT
"Y" - BLOWOUT DISTANCE (FROM CONDUCTOR ATTACHMENT) =	4.07 FT
"Z" - CLEARANCE FROM ROW TO DISPLACED CONDUCTOR =	5.93 FT

ROW DETAIL
TYPICAL
115 kV STRUCTURE
TP-115

REV	DATE	DESCRIPTION

DGR ENGINEERING

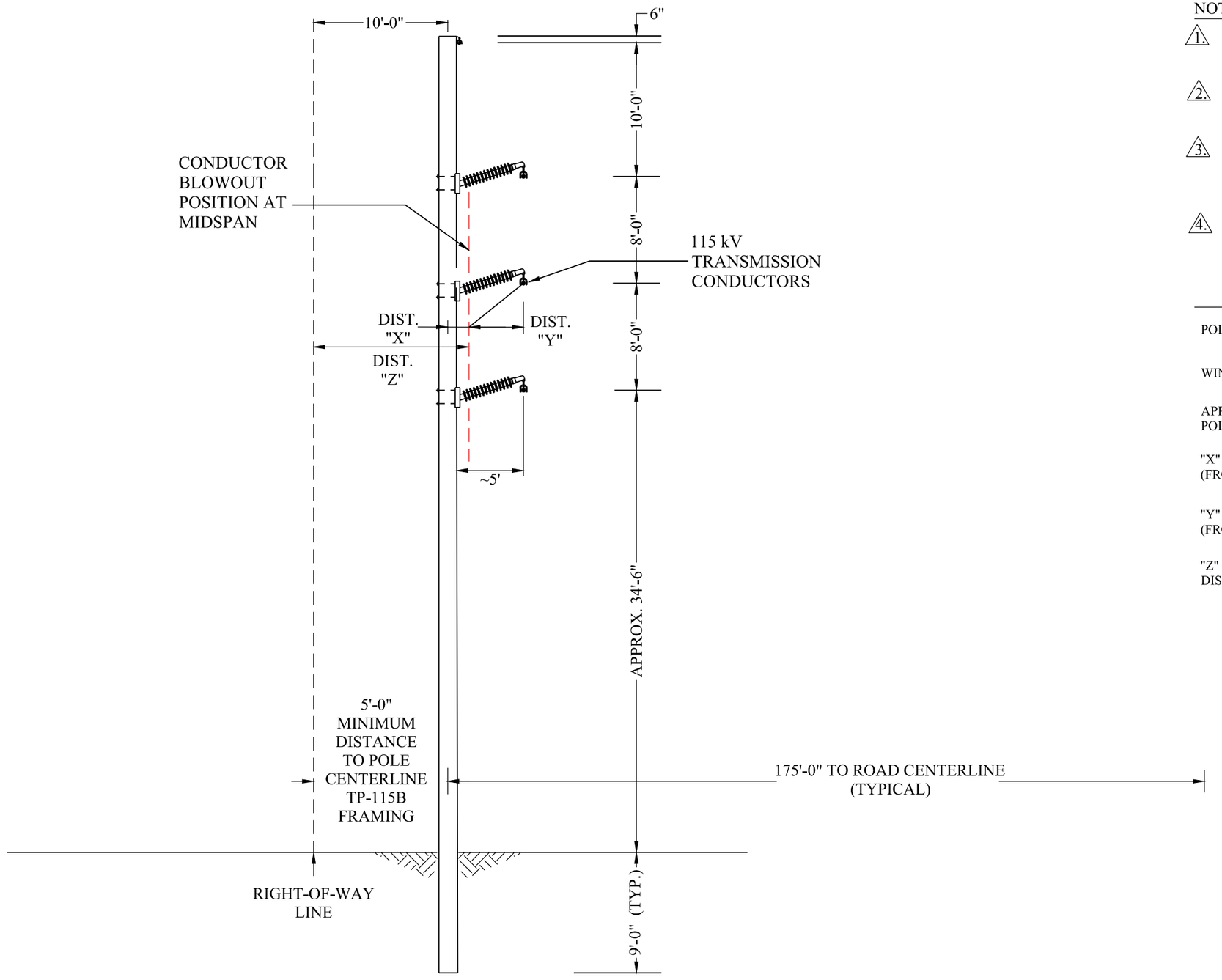
Project Manager: DJH
Designer: JDL
Project Number: 419115
Phone: (712) 472-2531

DETROIT LAKES PUBLIC UTILITIES
DETROIT LAKES, MN

115 kV TRANSMISSION LINE
SOUTH SUBSTATION

SHEET

FIGURE 3A



NOTES:

1. Conductor blowout analysis is conducted in accordance with the criteria of the National Electric Safety Code (NESC).
2. Conductor blowout measurements are calculated at mid-span where worst-case conductor displacement occurs.
3. Where total road ROW is 200' or greater and poles are 15' or more from the ROW line, TP-115 structures shall be installed. See Figure 3A for details.
4. Proposed conductor size is 336 kcmil ACSR, Linnet.

NESC CONDUCTOR BLOWOUT SUMMARY

POLE FRAMING =	TP-115B
WIND SPEED (MPH) =	48.5
APPROXIMATE MAXIMUM POLE SPAN =	307.0 FT
"X" - BLOWOUT DISTANCE (FROM POLE CENTERLINE) =	0.93 FT
"Y" - BLOWOUT DISTANCE (FROM CONDUCTOR ATTACHMENT) =	4.07 FT
"Z" - CLEARANCE FROM ROW TO DISPLACED CONDUCTOR =	10.93 FT

ROW DETAIL
TYPICAL
115 kV STRUCTURE
TP-115B

REV	DATE	DESCRIPTION

DGR ENGINEERING

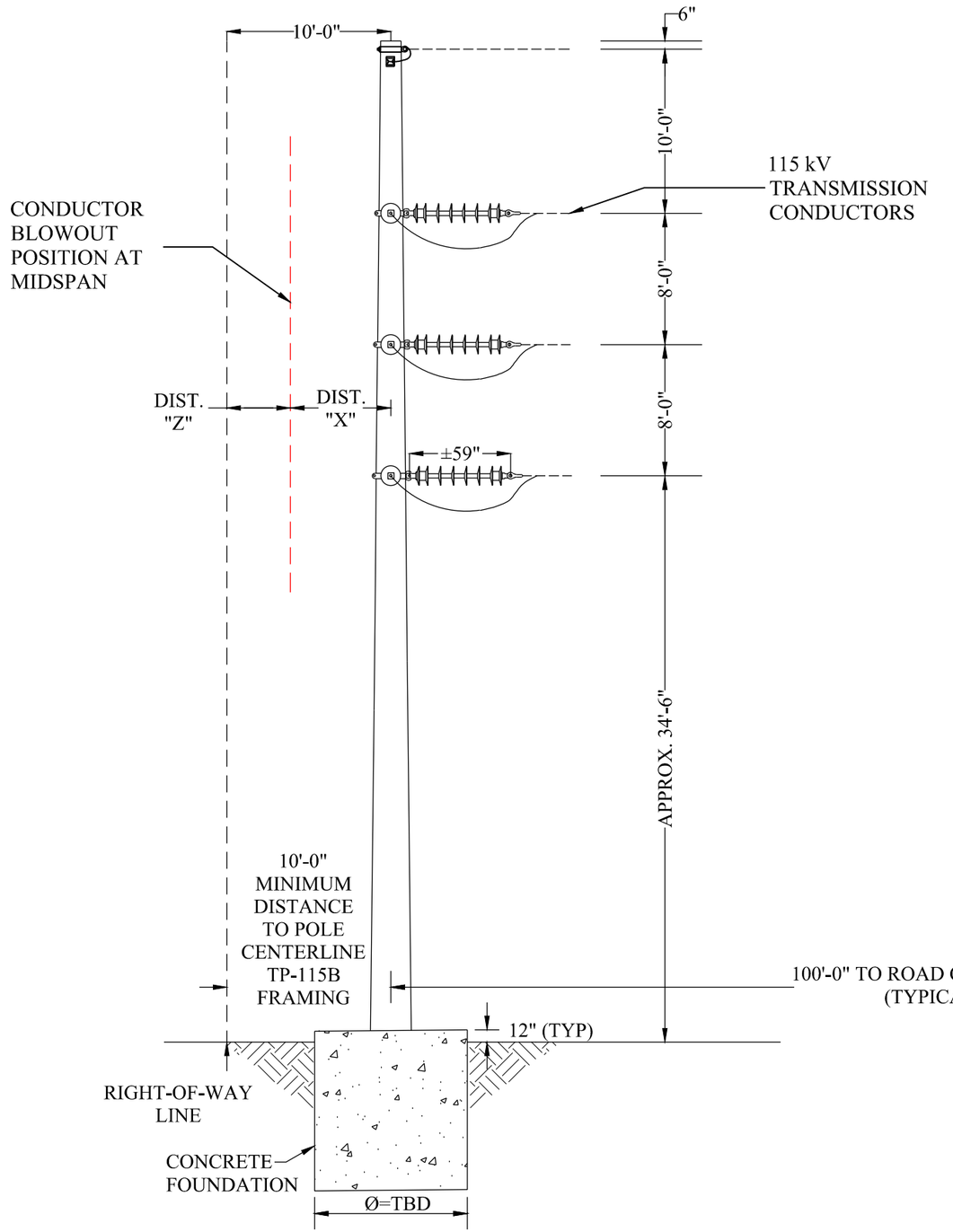
Project Manager: DJH
Designer: JDL
Project Number: 419115
Phone: (712) 472-2531

DETROIT LAKES PUBLIC UTILITIES
DETROIT LAKES, MN

115 kV TRANSMISSION LINE
SOUTH SUBSTATION

SHEET

FIGURE 3B



NOTES:

1. Conductor blowout analysis is conducted in accordance with the criteria of the National Electric Safety Code (NESC).
2. Conductor blowout measurements are calculated at mid-span where worst-case conductor displacement occurs.
3. Proposed conductor size is 336 kcmil ACSR, Linnet.

NESC CONDUCTOR BLOWOUT SUMMARY

POLE FRAMING =	TS-5G
WIND SPEED (MPH) =	48.5
APPROXIMATE MAXIMUM POLE SPAN =	309.0 FT
"X" - BLOWOUT DISTANCE (FROM POLE CENTERLINE) =	6.12 FT
"Z" - CLEARANCE FROM ROW TO DISPLACED CONDUCTOR =	3.88 FT

ROW DETAIL
TYPICAL
115 kV STRUCTURE
TS-5G

REV	DATE	DESCRIPTION

DGR ENGINEERING

Project Manager: DJH
Designer: JDL
Project Number: 419115
Phone: (712) 472-2531

DETROIT LAKES PUBLIC UTILITIES
DETROIT LAKES, MN

115 kV TRANSMISSION LINE
SOUTH SUBSTATION

SHEET

FIGURE 3C