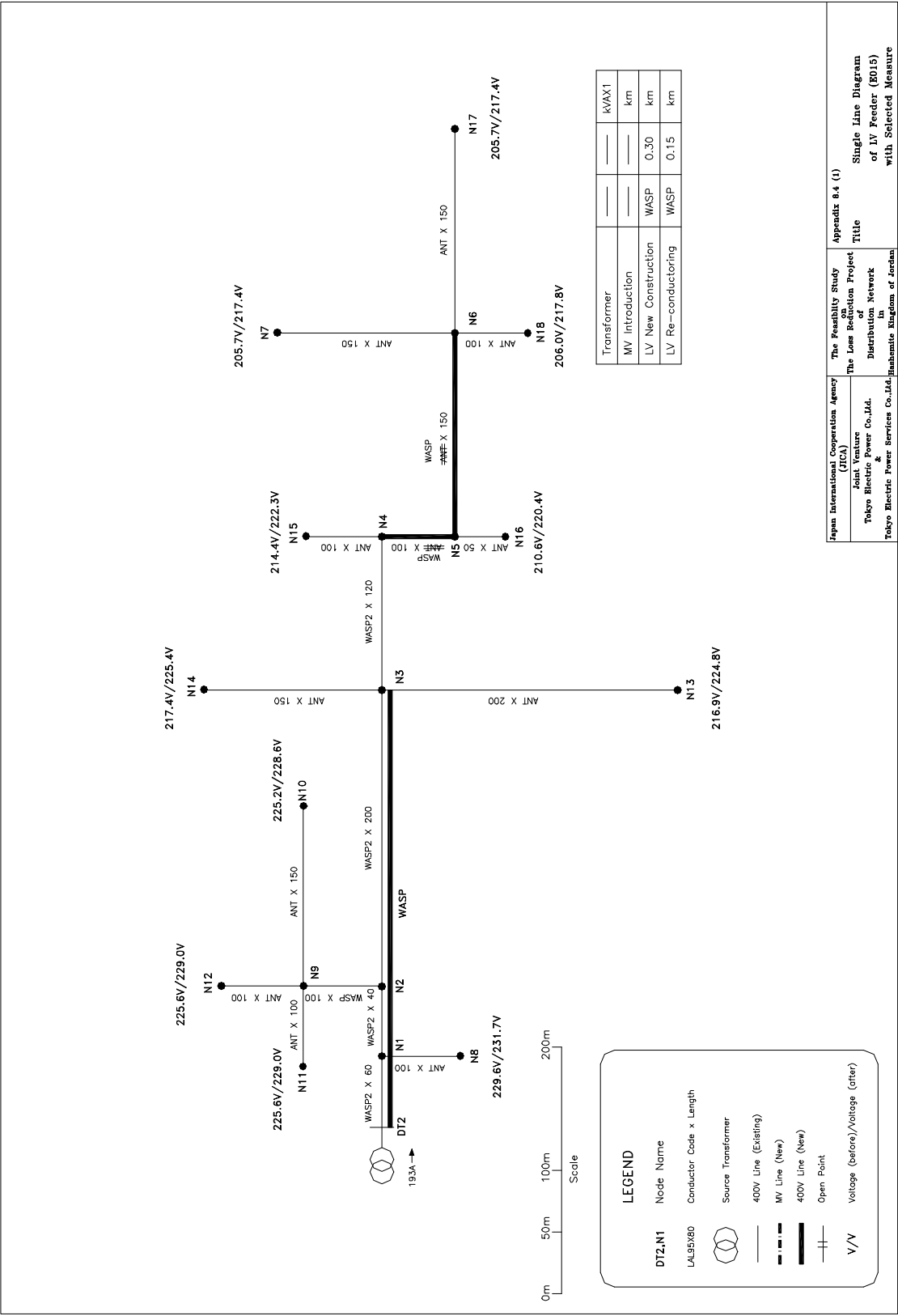
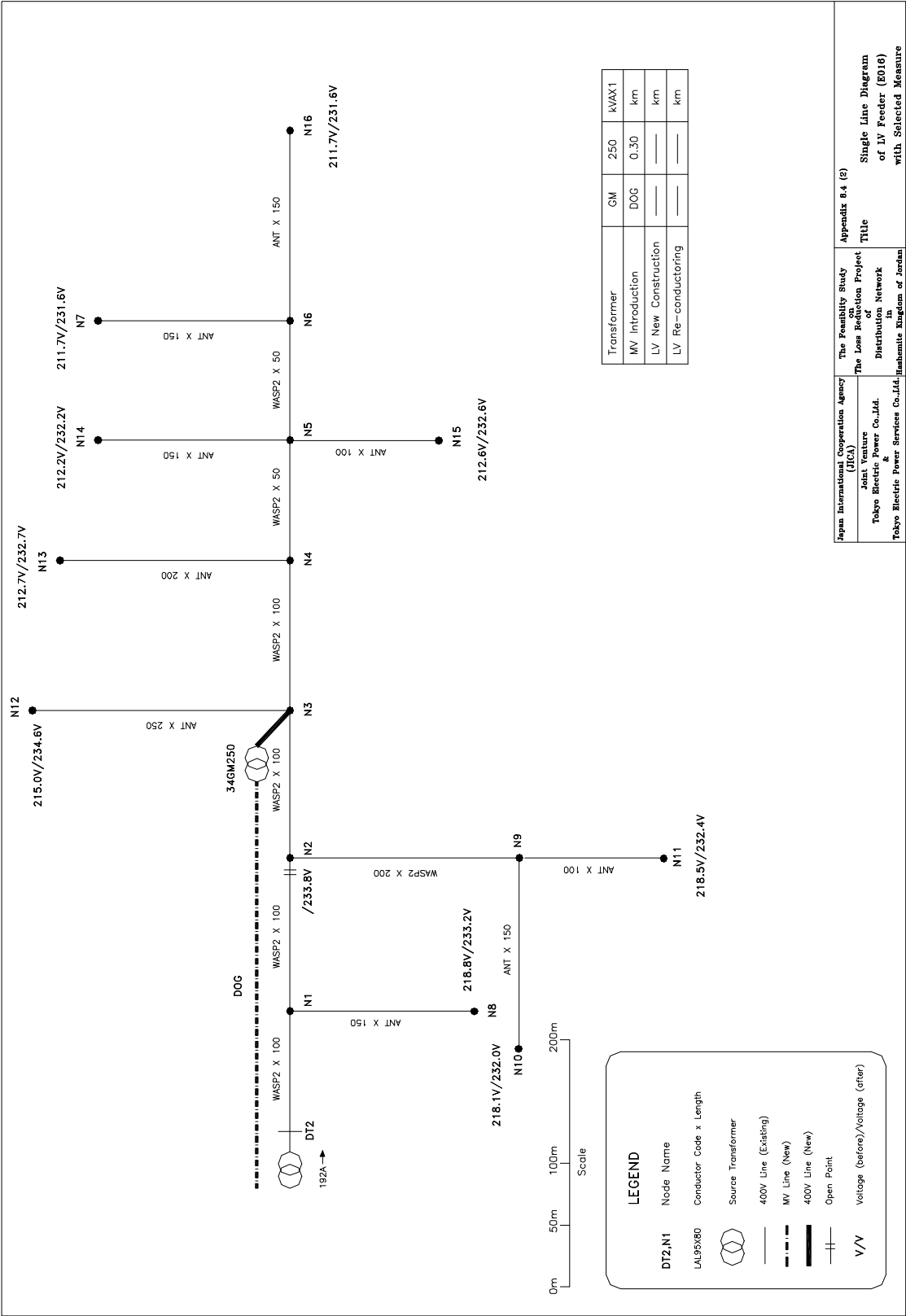


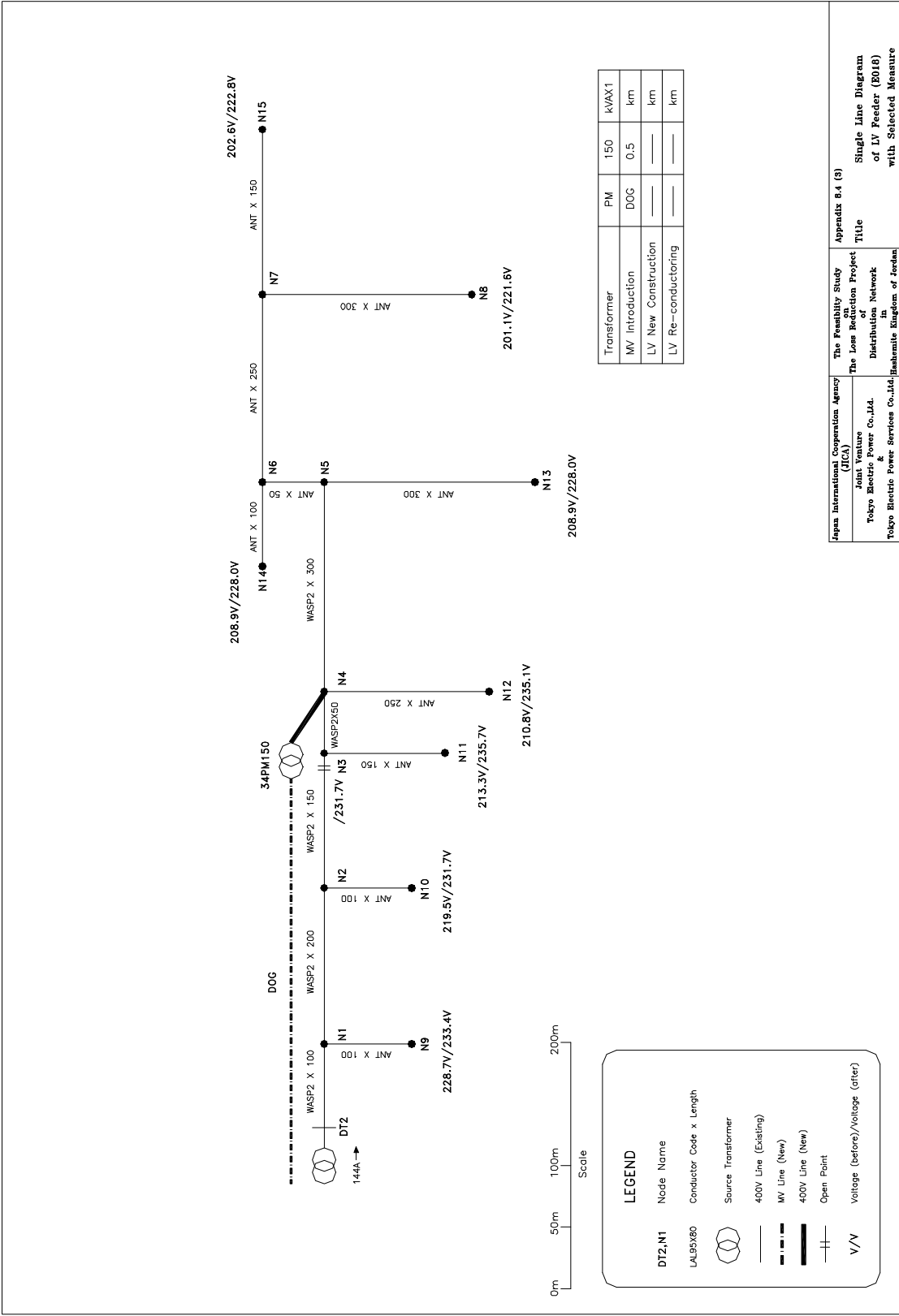
Appendix 8.4 Single Line Diagrams and Countermeasures of LV Feeders

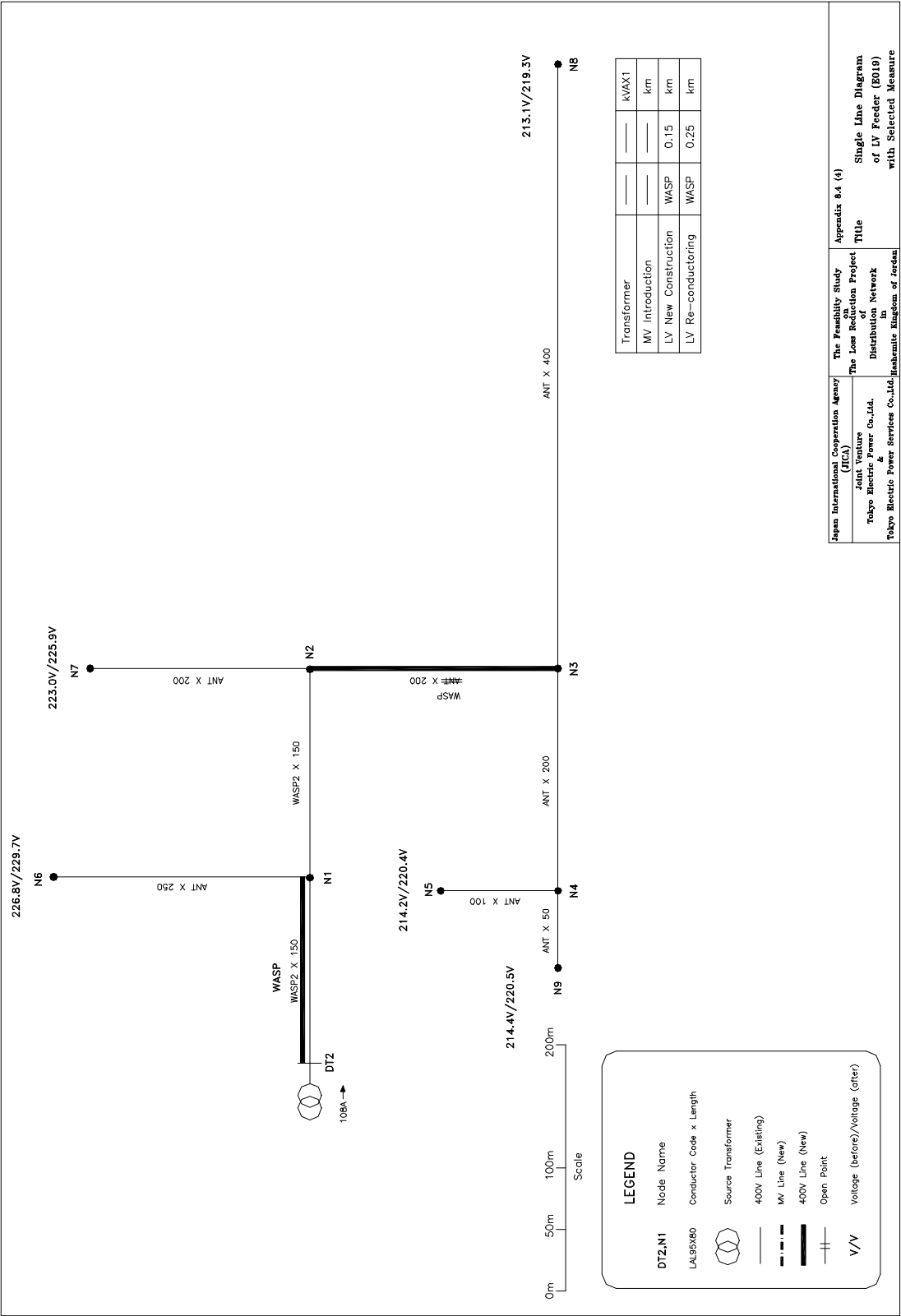
Followings are list of randomly selected forty LV feeders and their single line diagrams with network reinforcement loss reduction countermeasures.

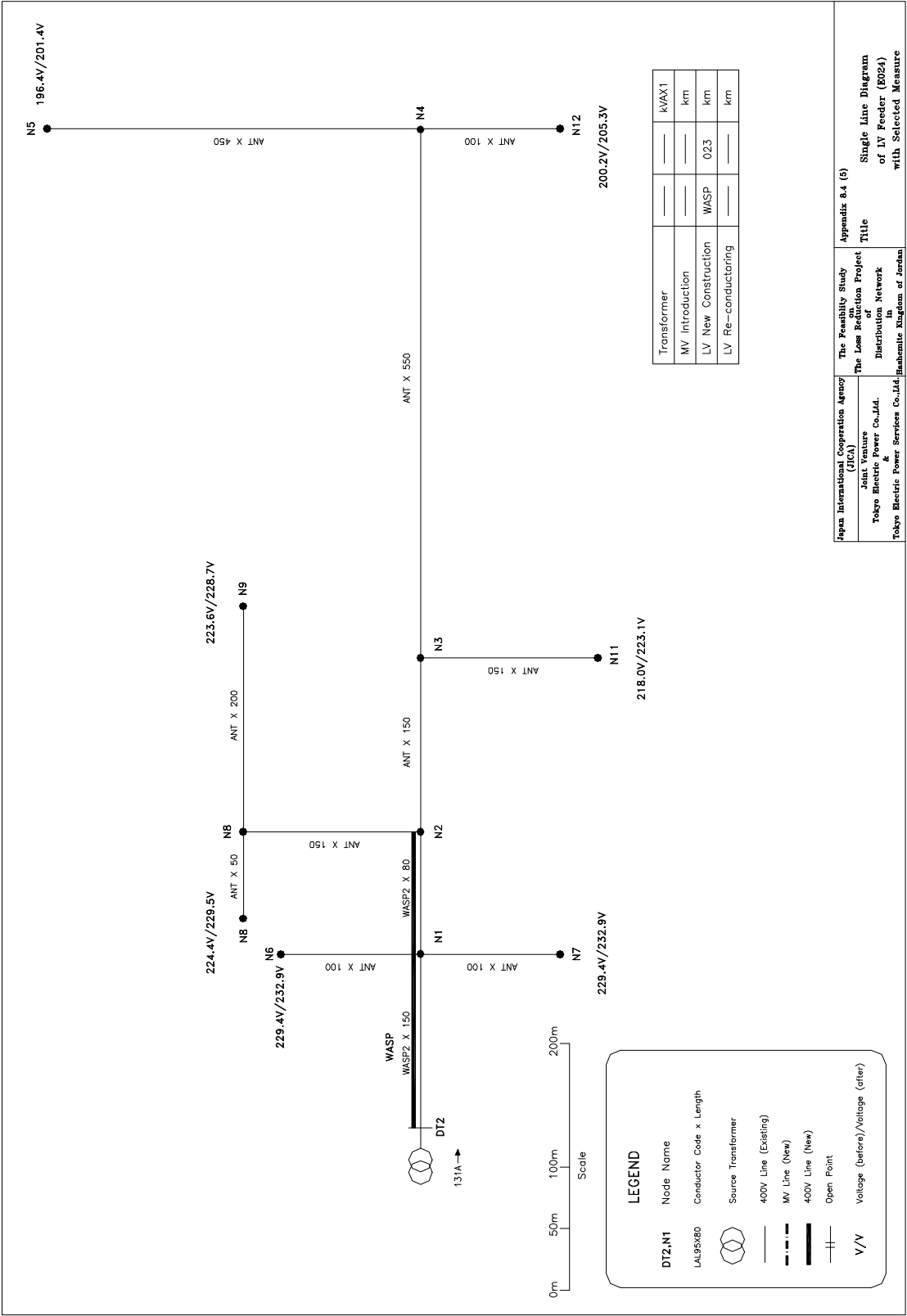
EDCO		JEPCO		IDECO	
Feeder No.	Figure No.	Feeder No.	Figure No.	Feeder No.	Figure No.
E015	Appendix 8.4 (1)	J002	Appendix 8.4 (16)	I004	Appendix 8.4 (26)
E016	Appendix 8.4 (2)	J010	Appendix 8.4 (17)	I009	Appendix 8.4 (27)
E018	Appendix 8.4 (3)	J017	Appendix 8.4 (18)	I014	Appendix 8.4 (28)
E019	Appendix 8.4 (4)	J020	Appendix 8.4 (19)	I023	Appendix 8.4 (29)
E024	Appendix 8.4 (5)	J025	Appendix 8.4 (20)	I026	Appendix 8.4 (30)
E025	Appendix 8.4 (6)	J039	Appendix 8.4 (21)	I040	Appendix 8.4 (31)
E026	Appendix 8.4 (7)	J047	Appendix 8.4 (22)	I046	Appendix 8.4 (32)
E035	Appendix 8.4 (8)	J057	Appendix 8.4 (23)	I063	Appendix 8.4 (33)
E038	Appendix 8.4 (9)	J069	Appendix 8.4 (24)	I074	Appendix 8.4 (34)
E054	Appendix 8.4 (10)	J088	Appendix 8.4 (25)	I084	Appendix 8.4 (35)
E058	Appendix 8.4 (11)			I095	Appendix 8.4 (36)
E063	Appendix 8.4 (12)			I106	Appendix 8.4 (37)
E073	Appendix 8.4 (13)			I117	Appendix 8.4 (38)
E108	Appendix 8.4 (14)			I119	Appendix 8.4 (39)
E110	Appendix 8.4 (15)			I135	Appendix 8.4 (40)

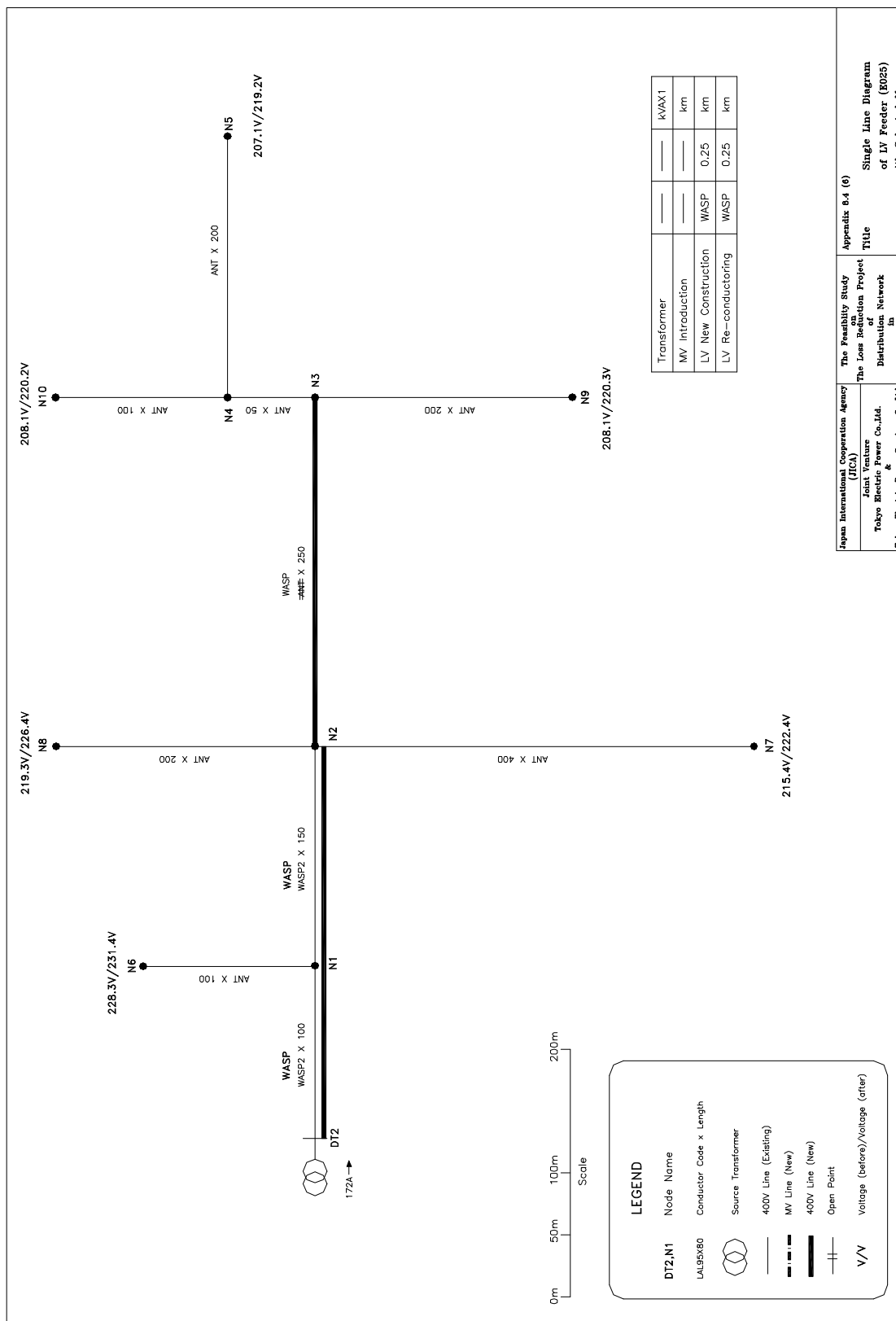


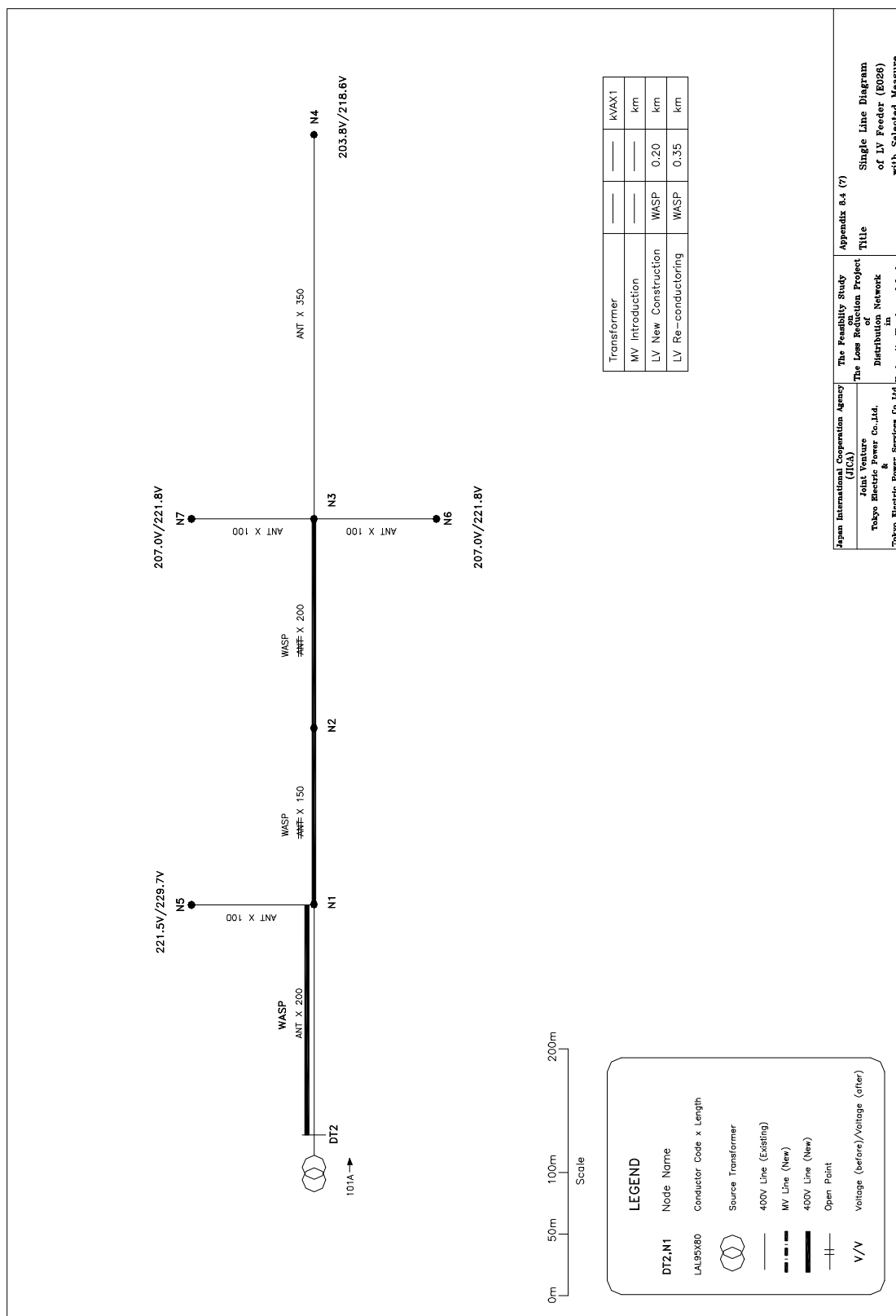


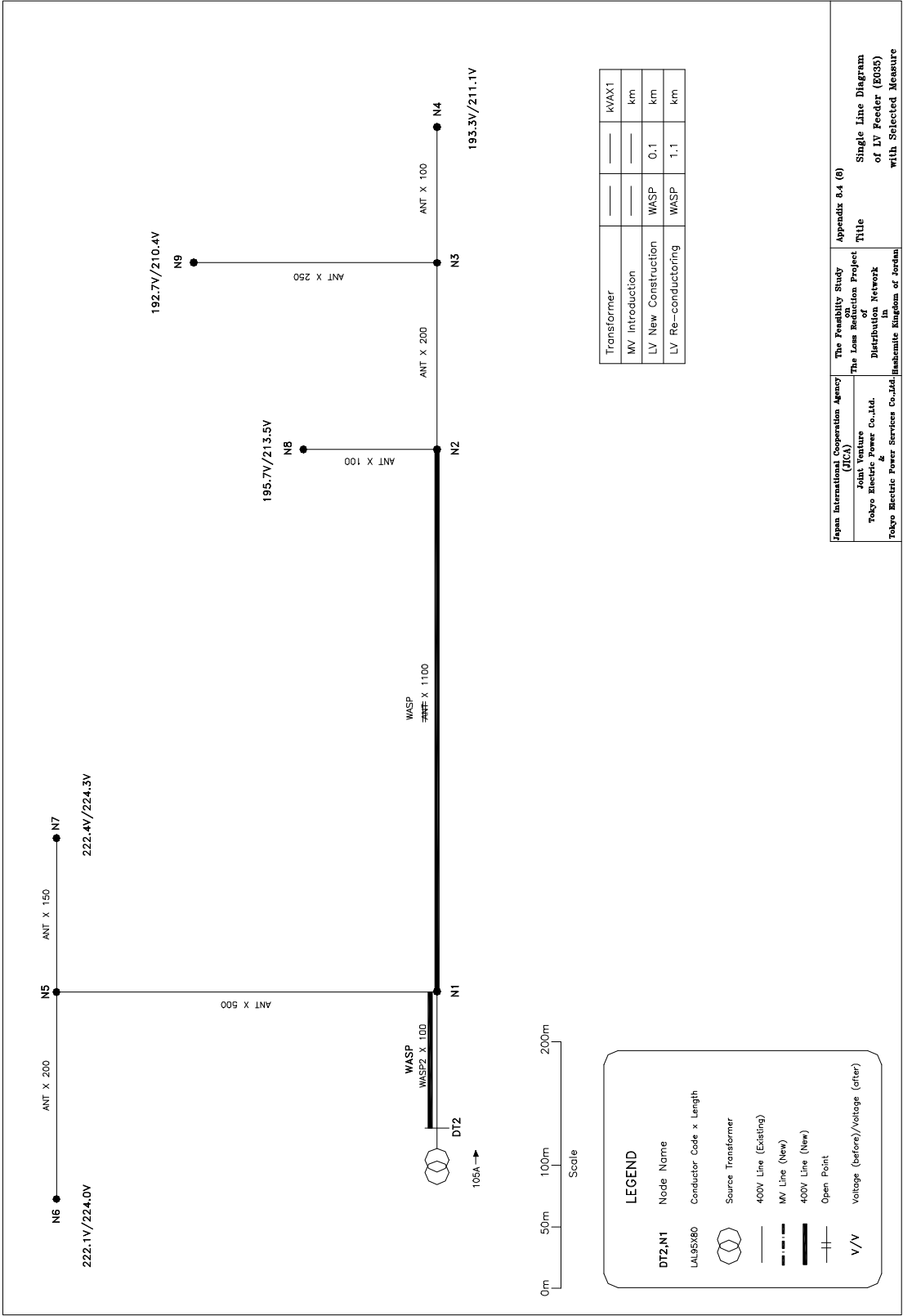


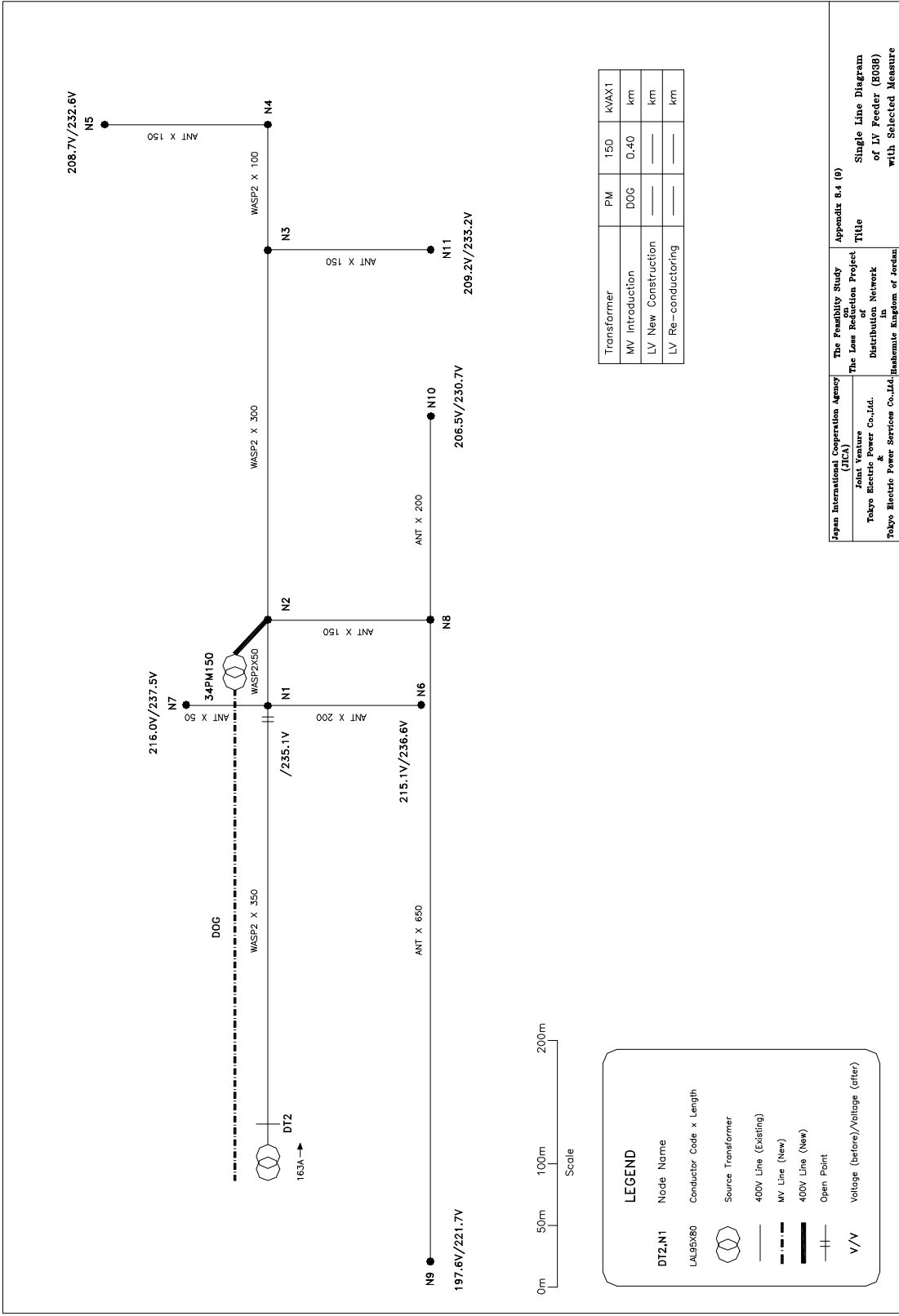


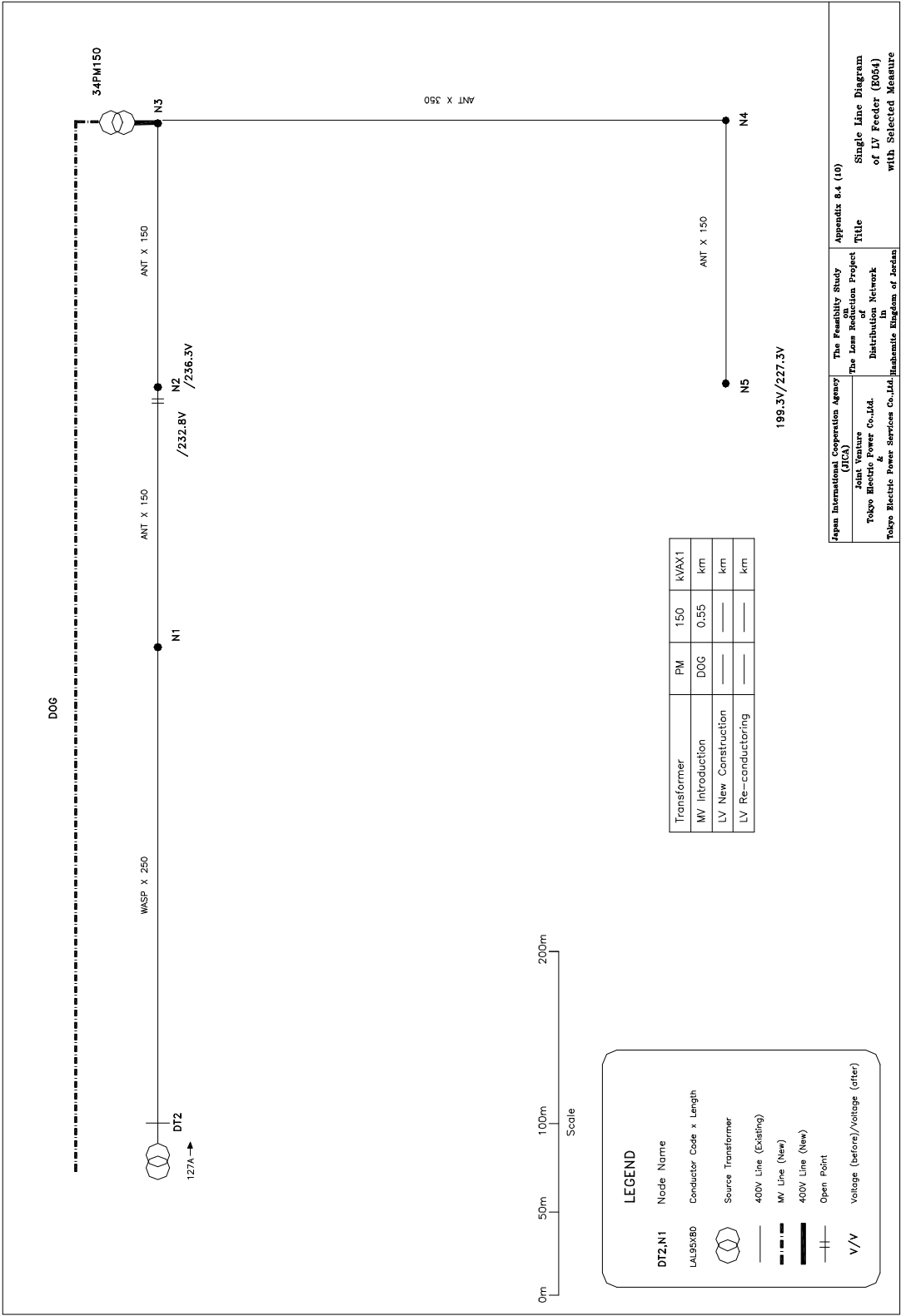


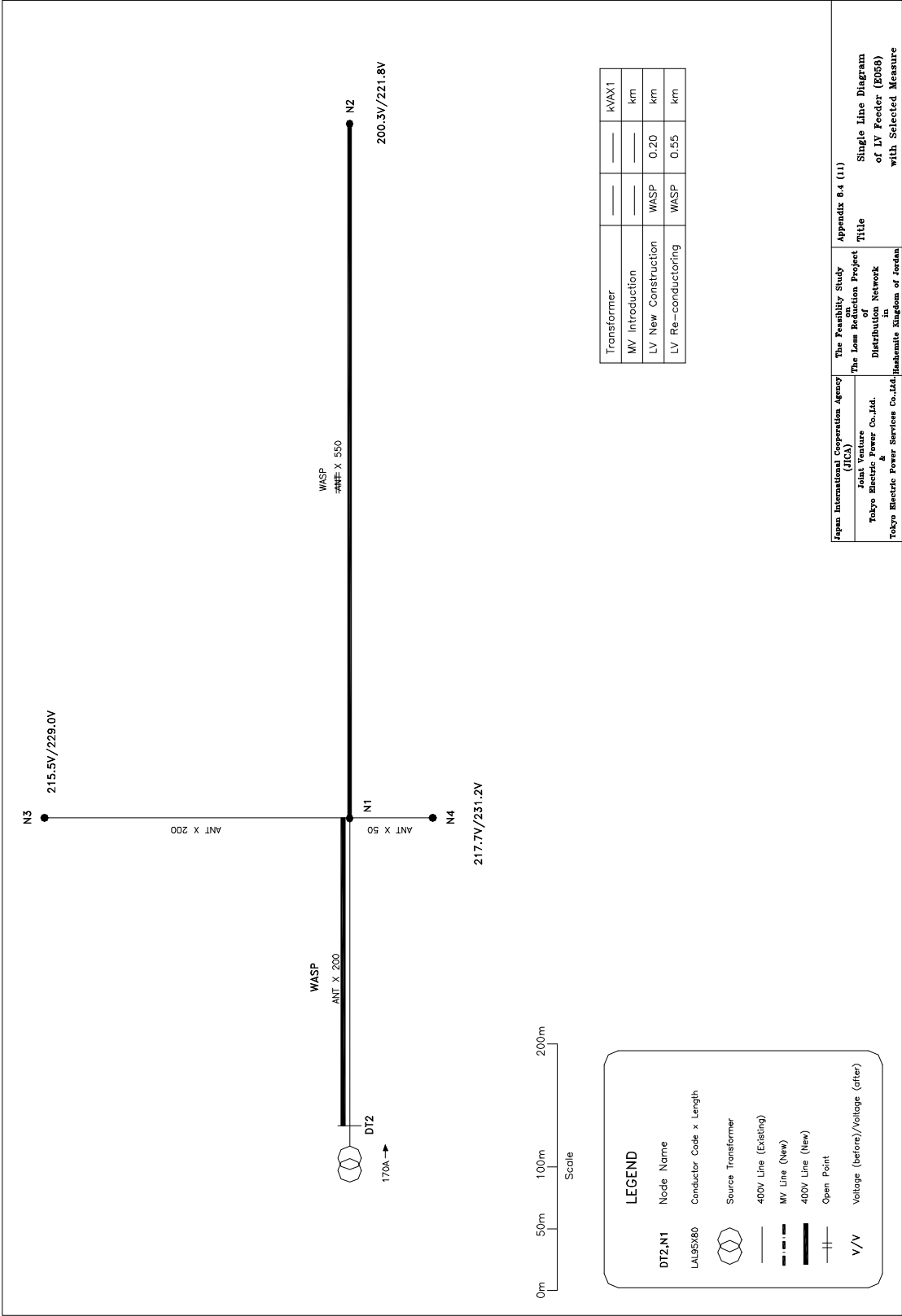


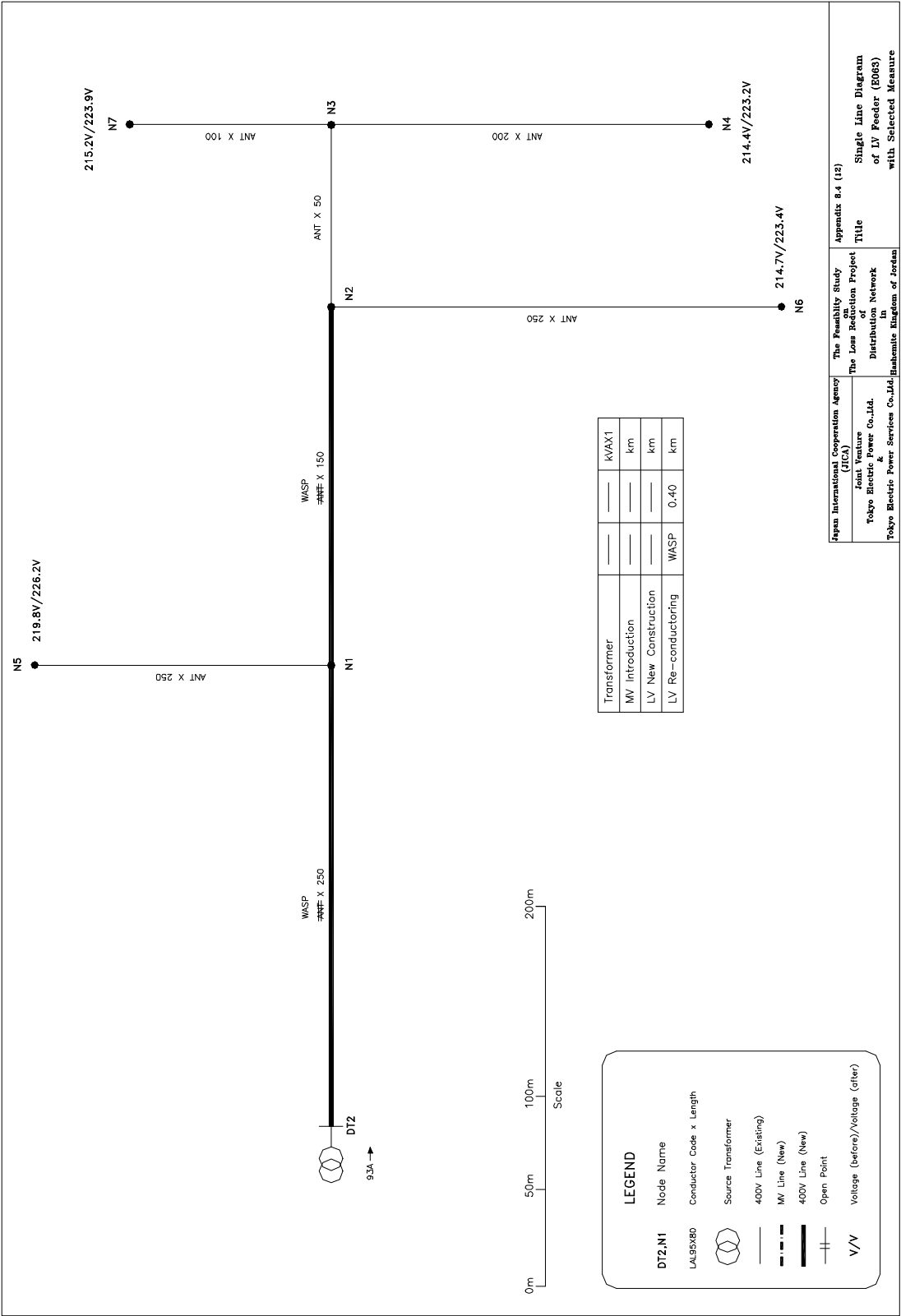


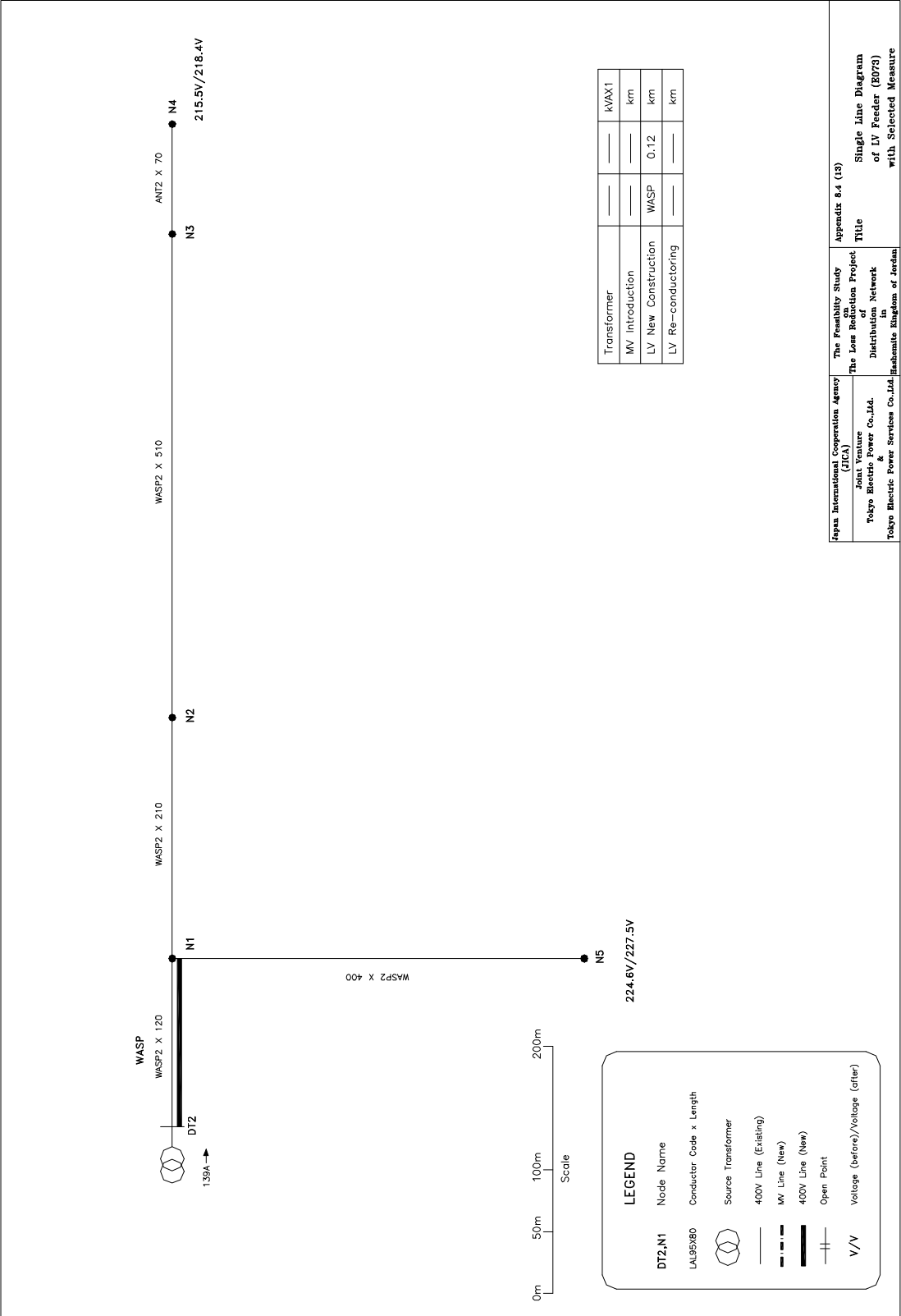


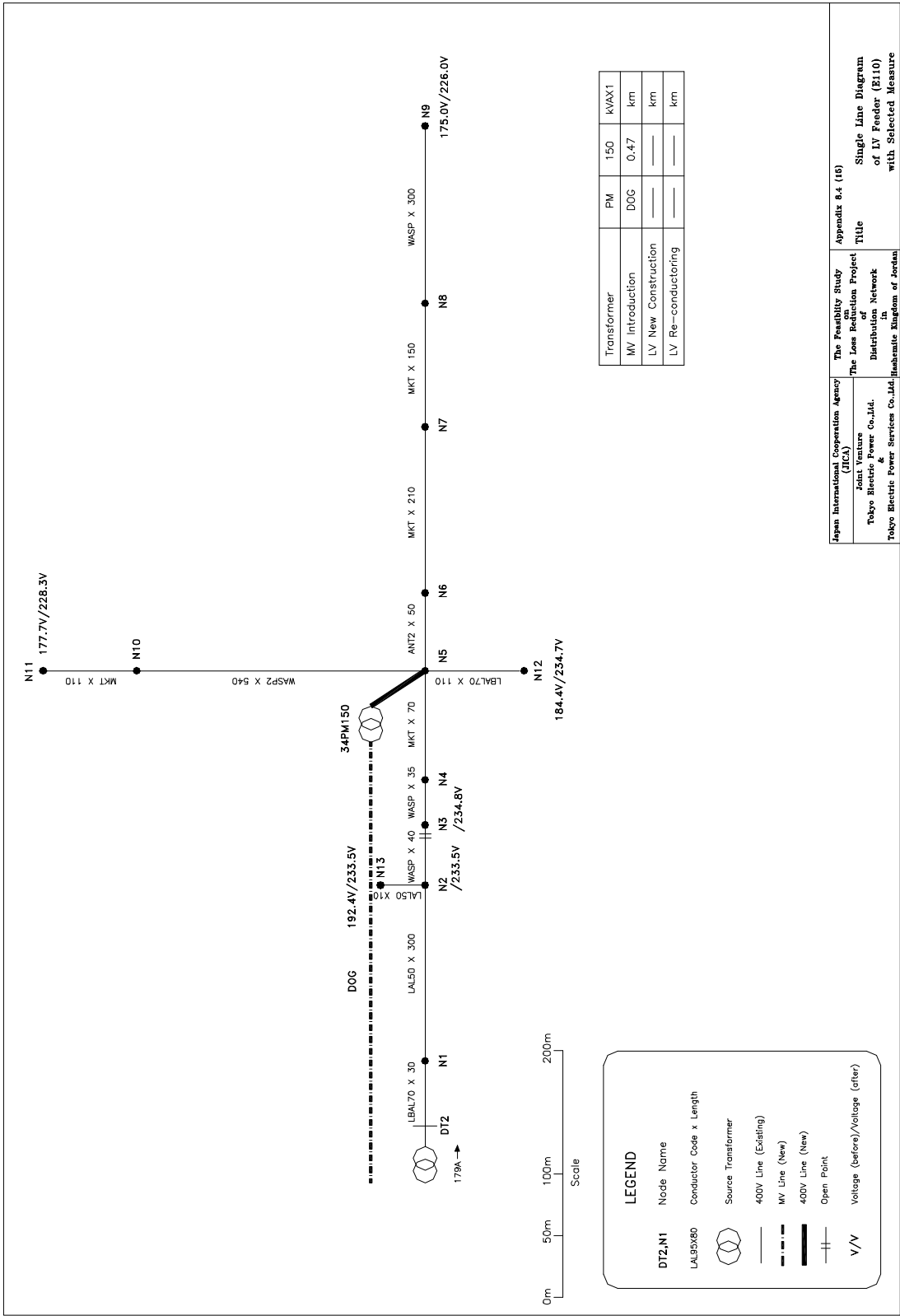


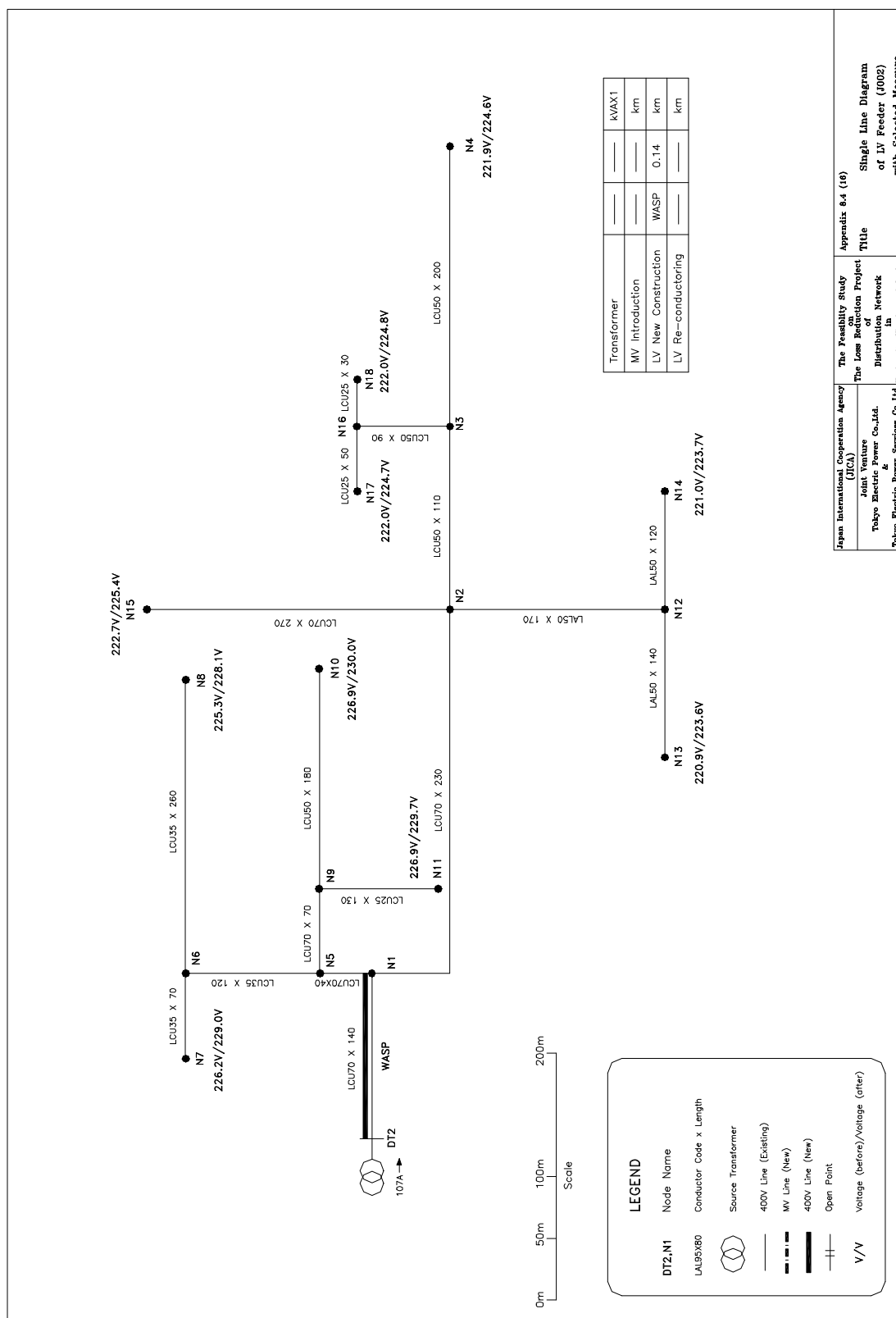


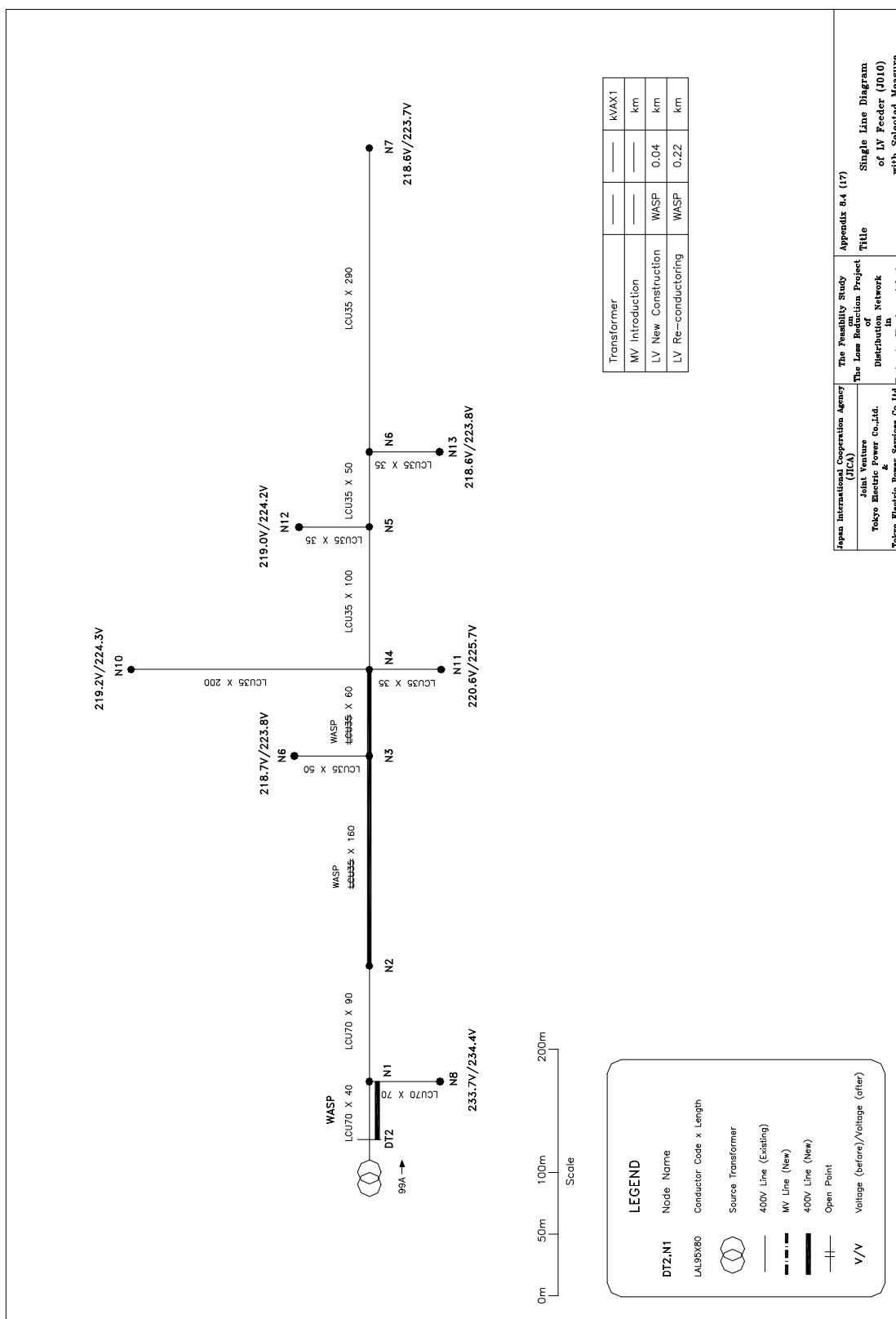


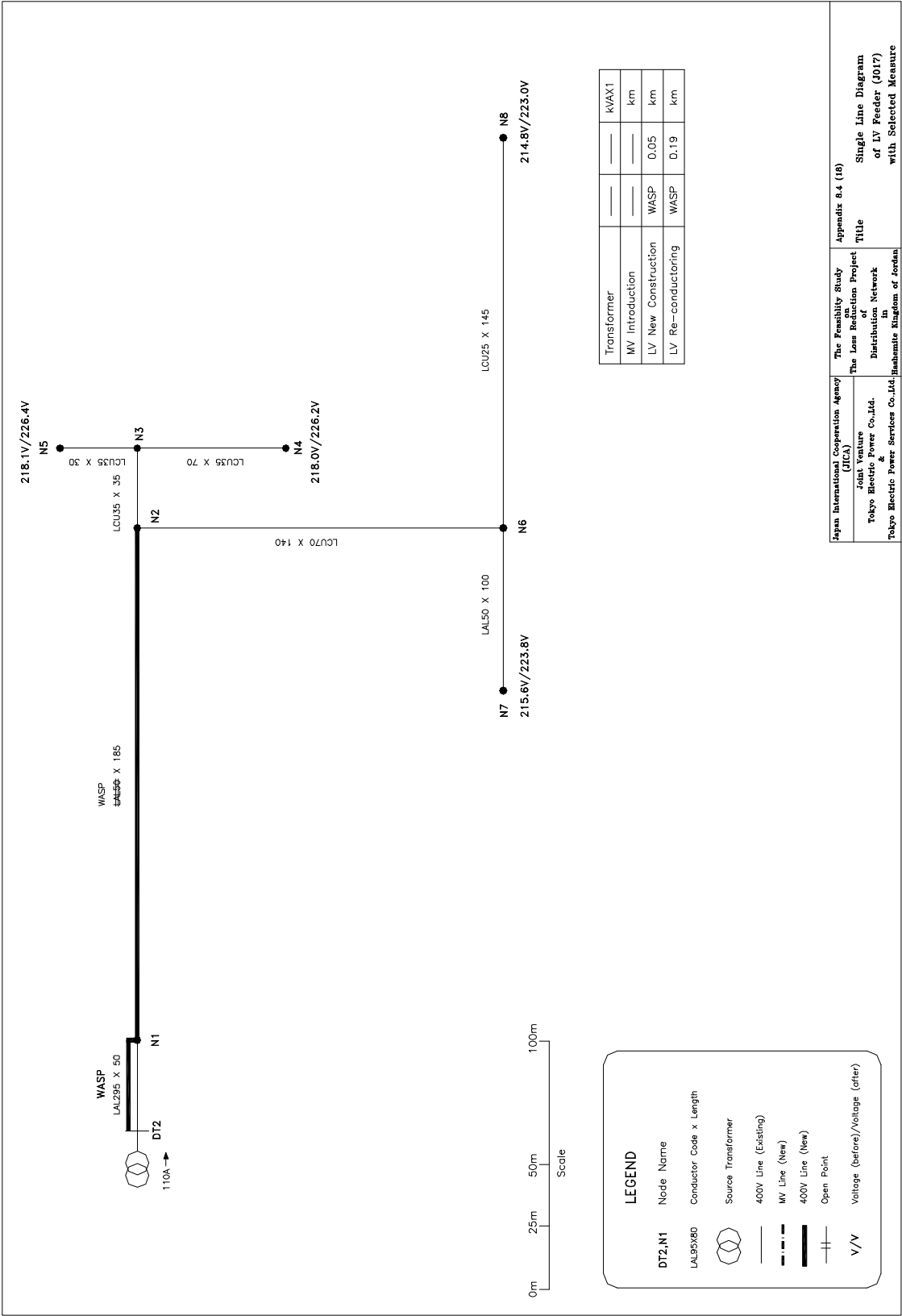


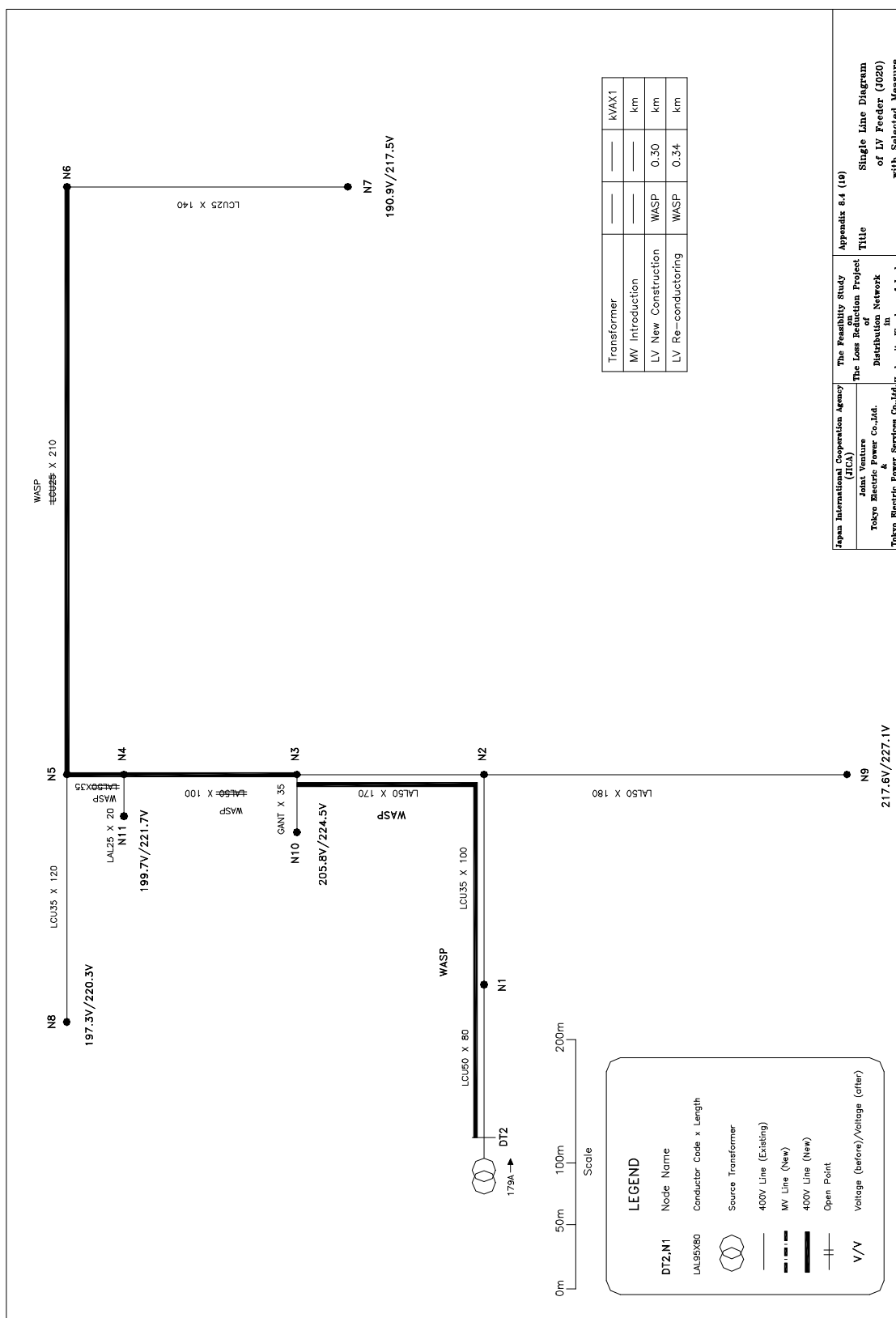


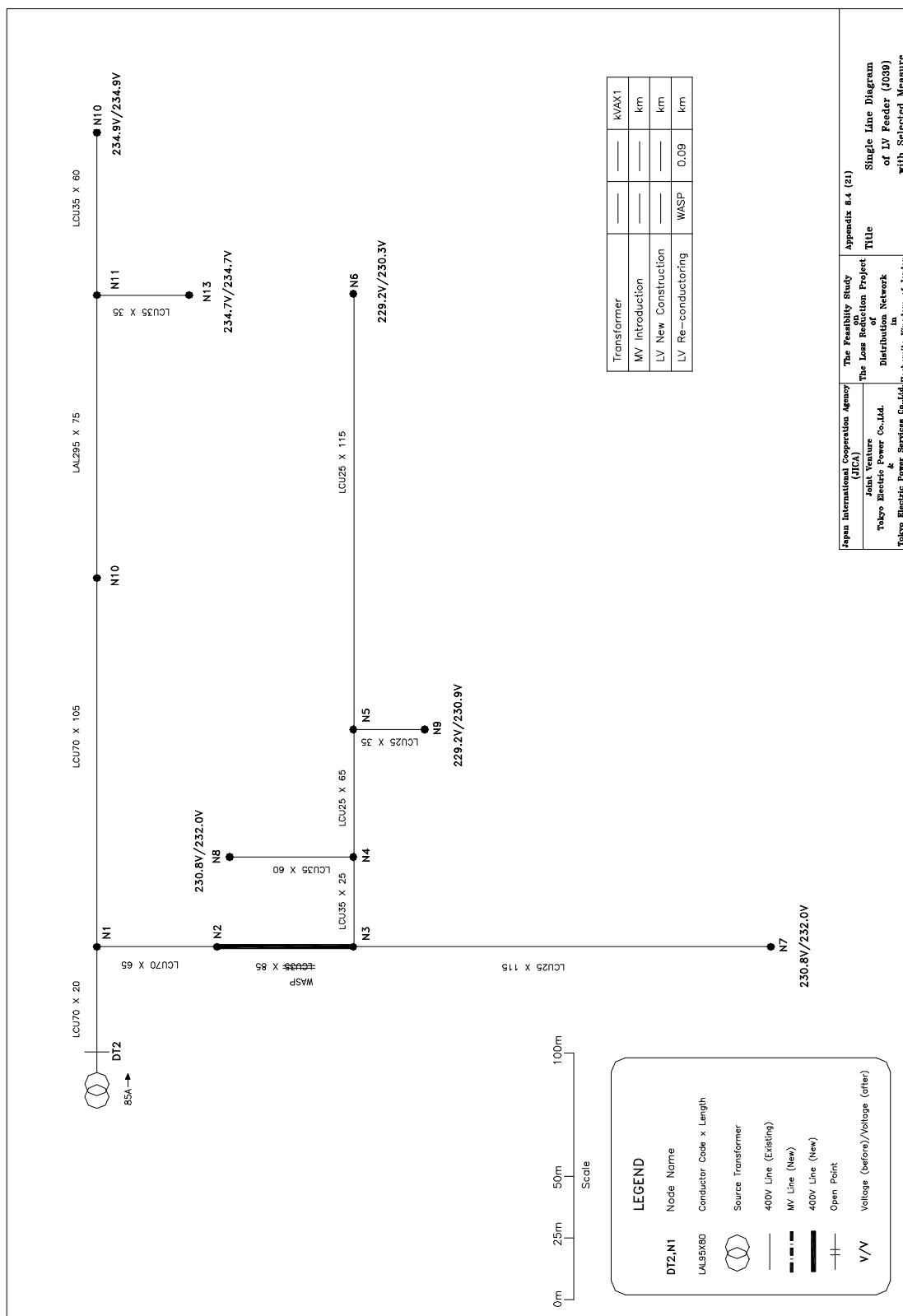


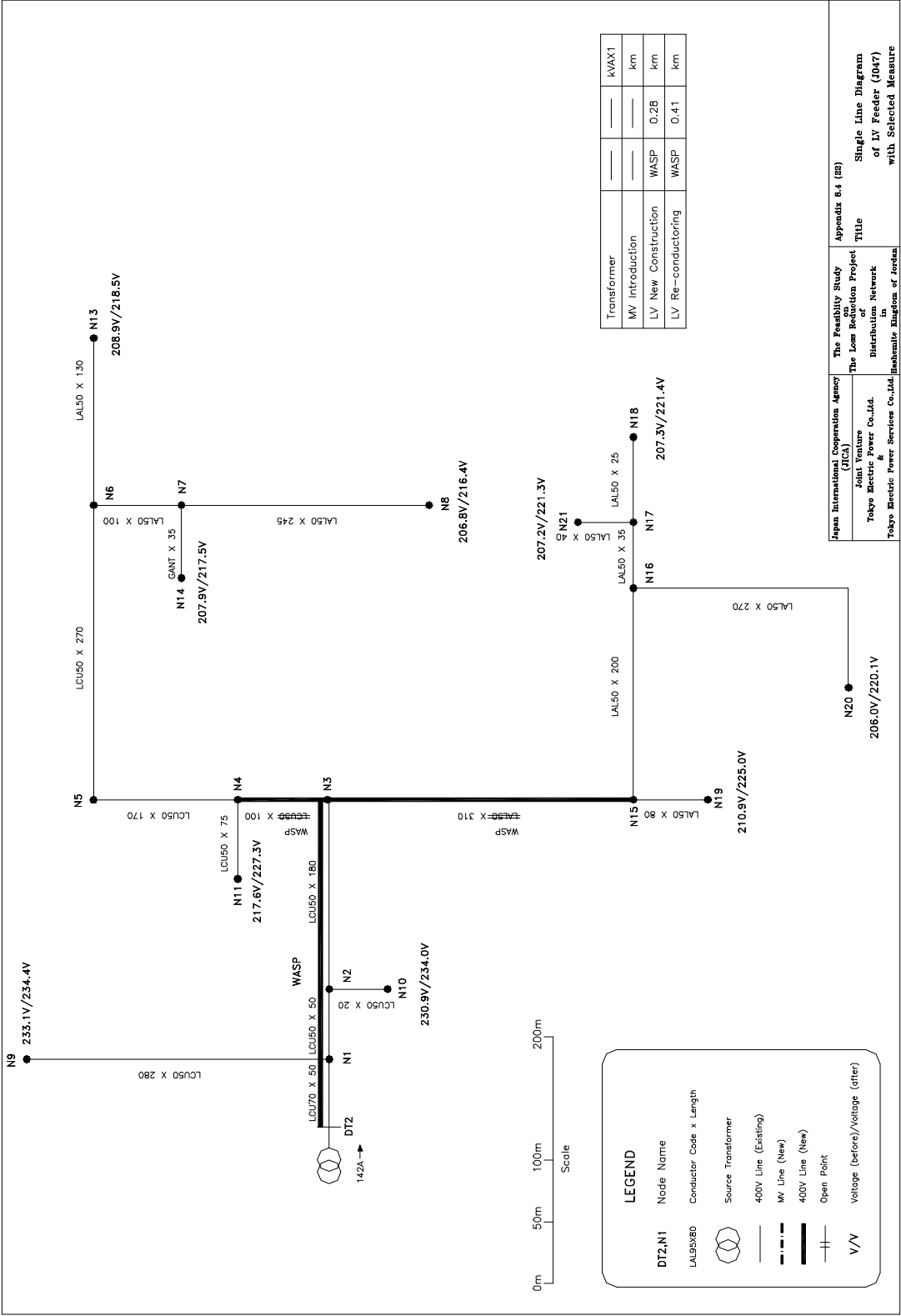


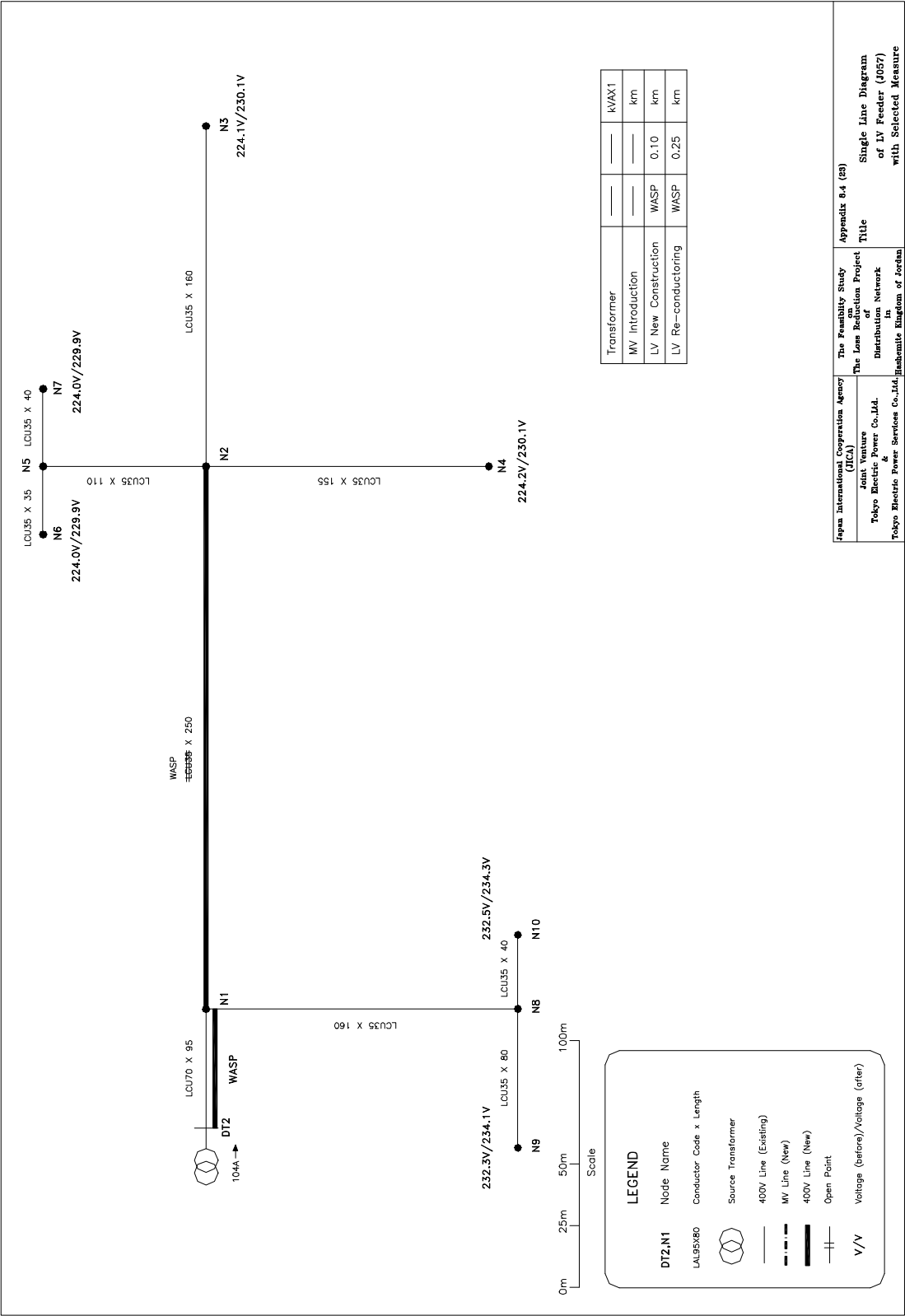


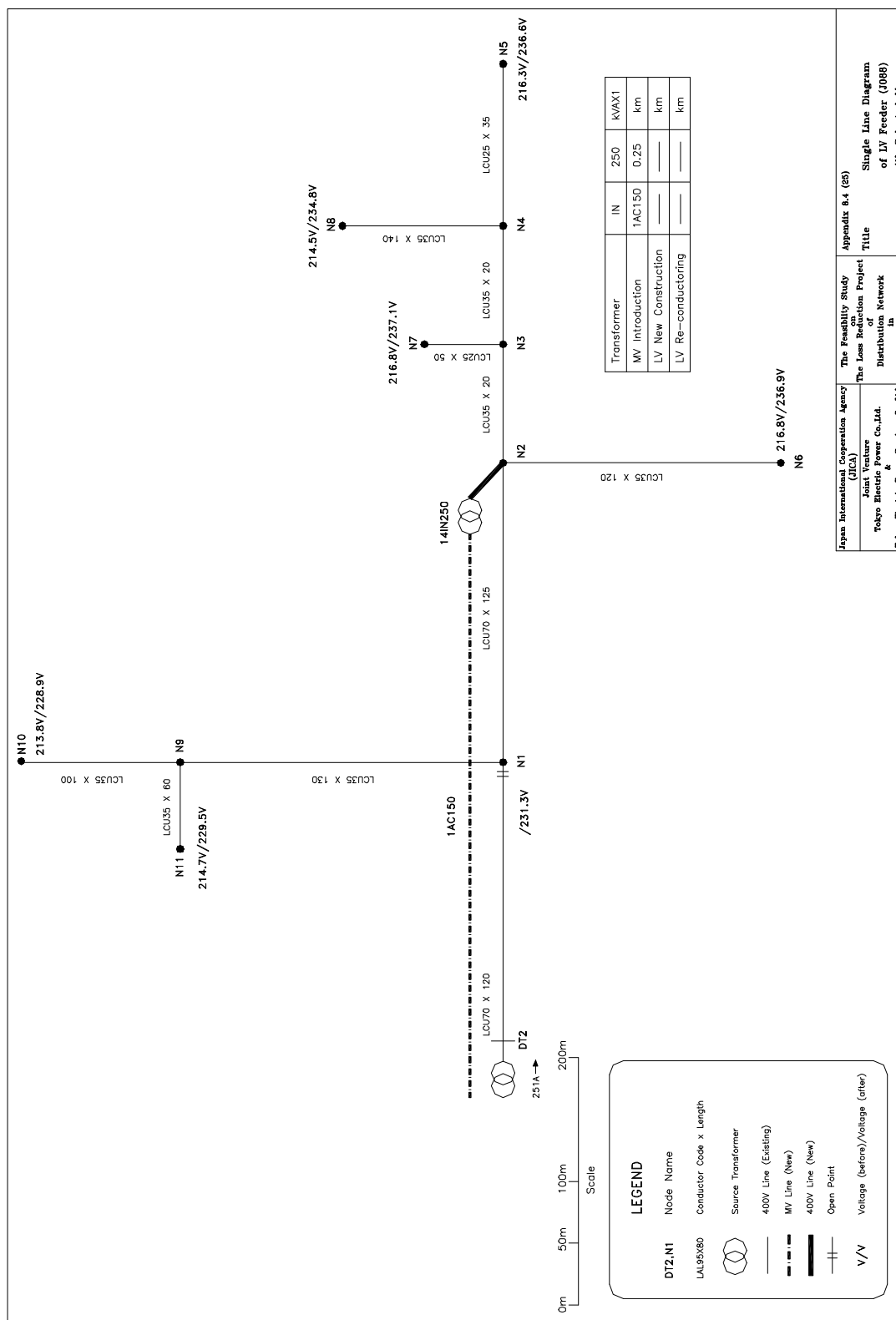


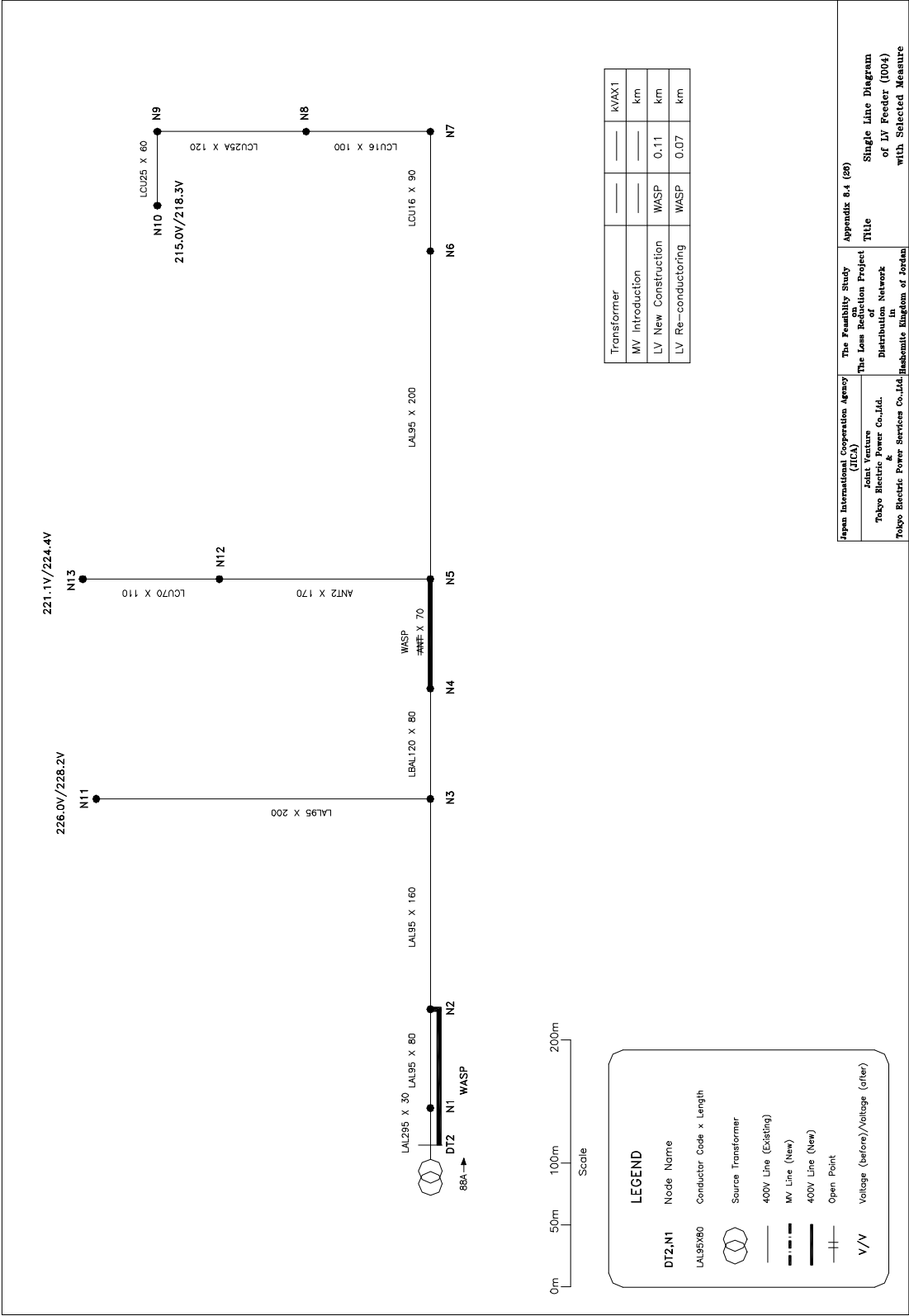


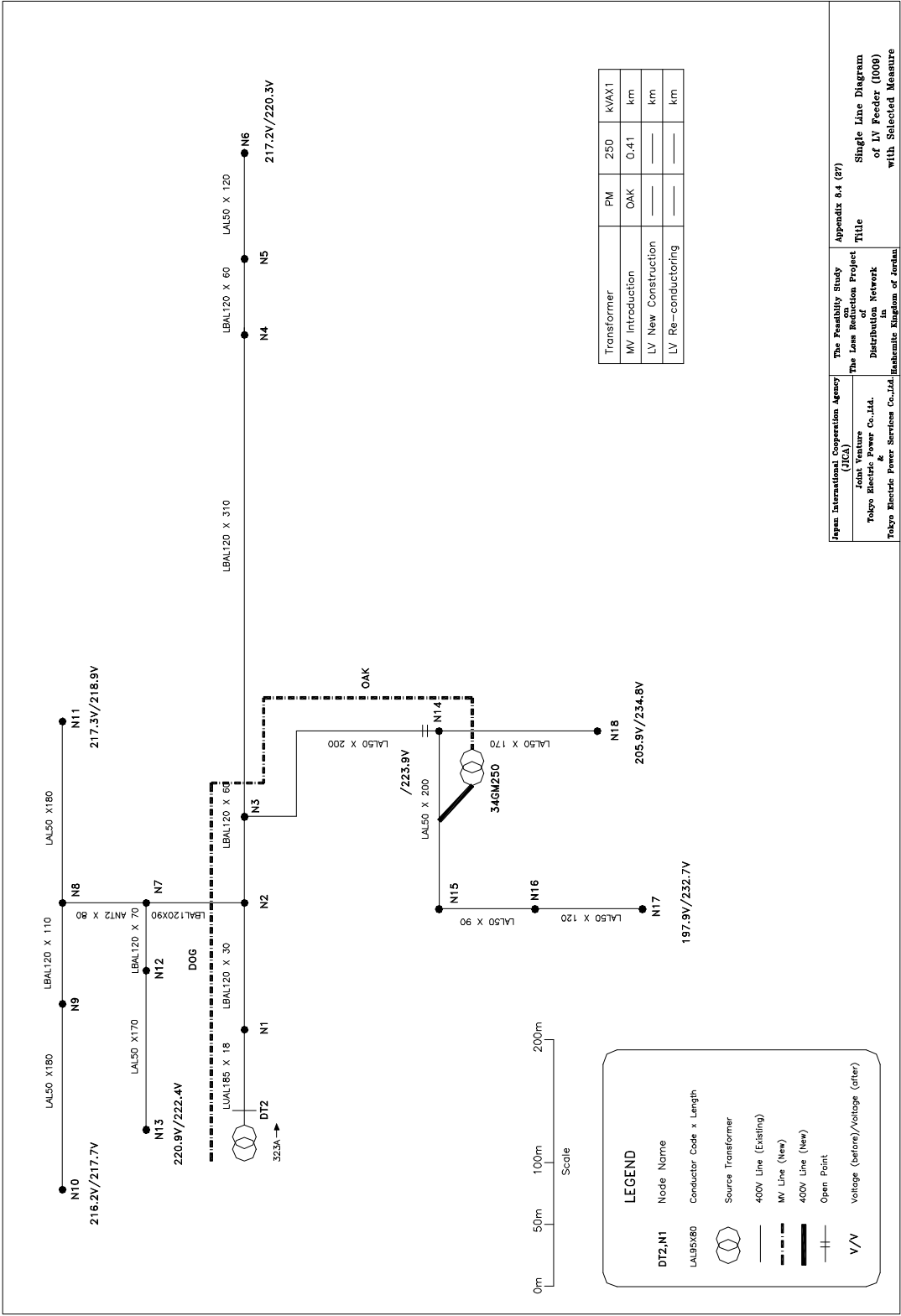


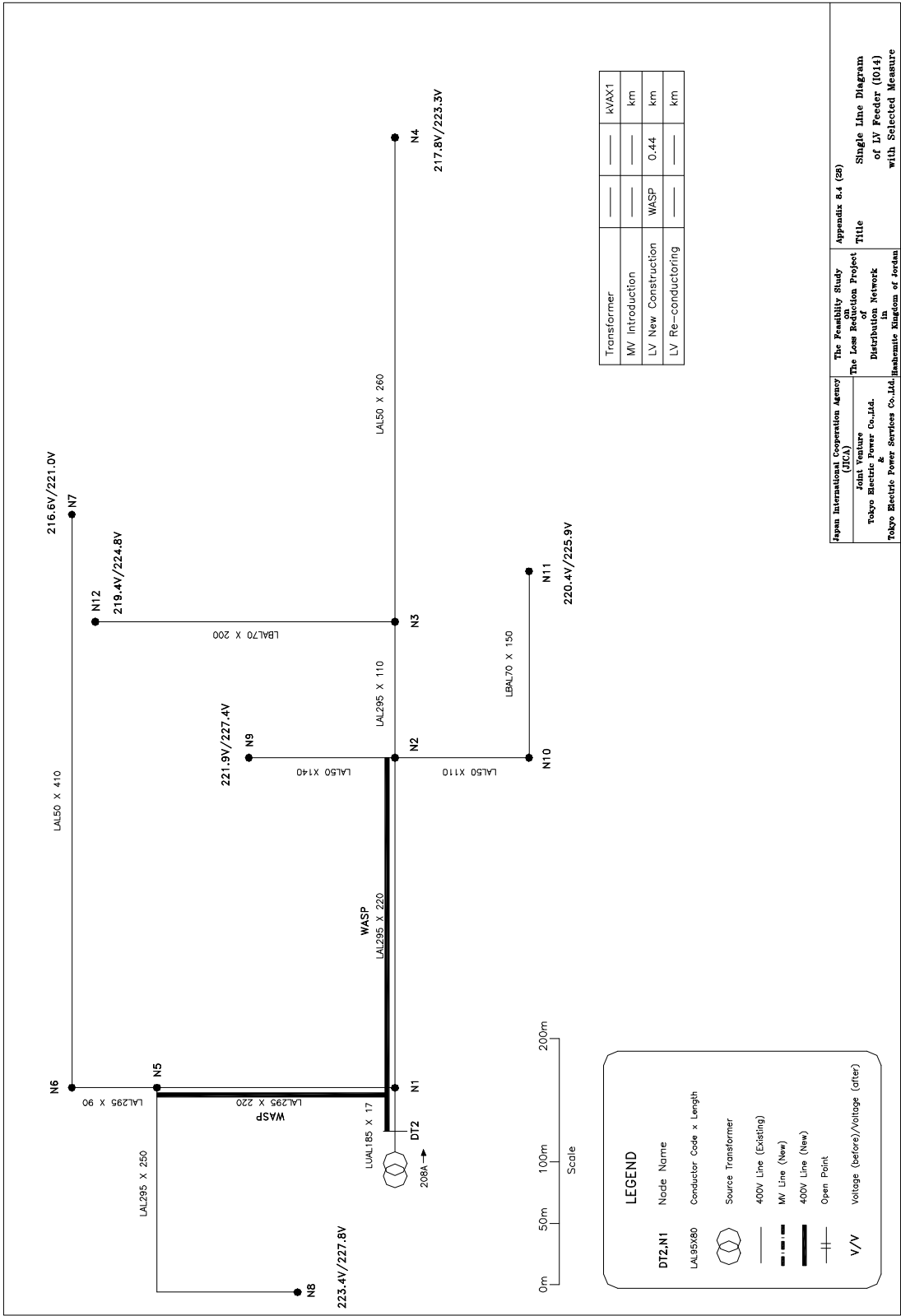


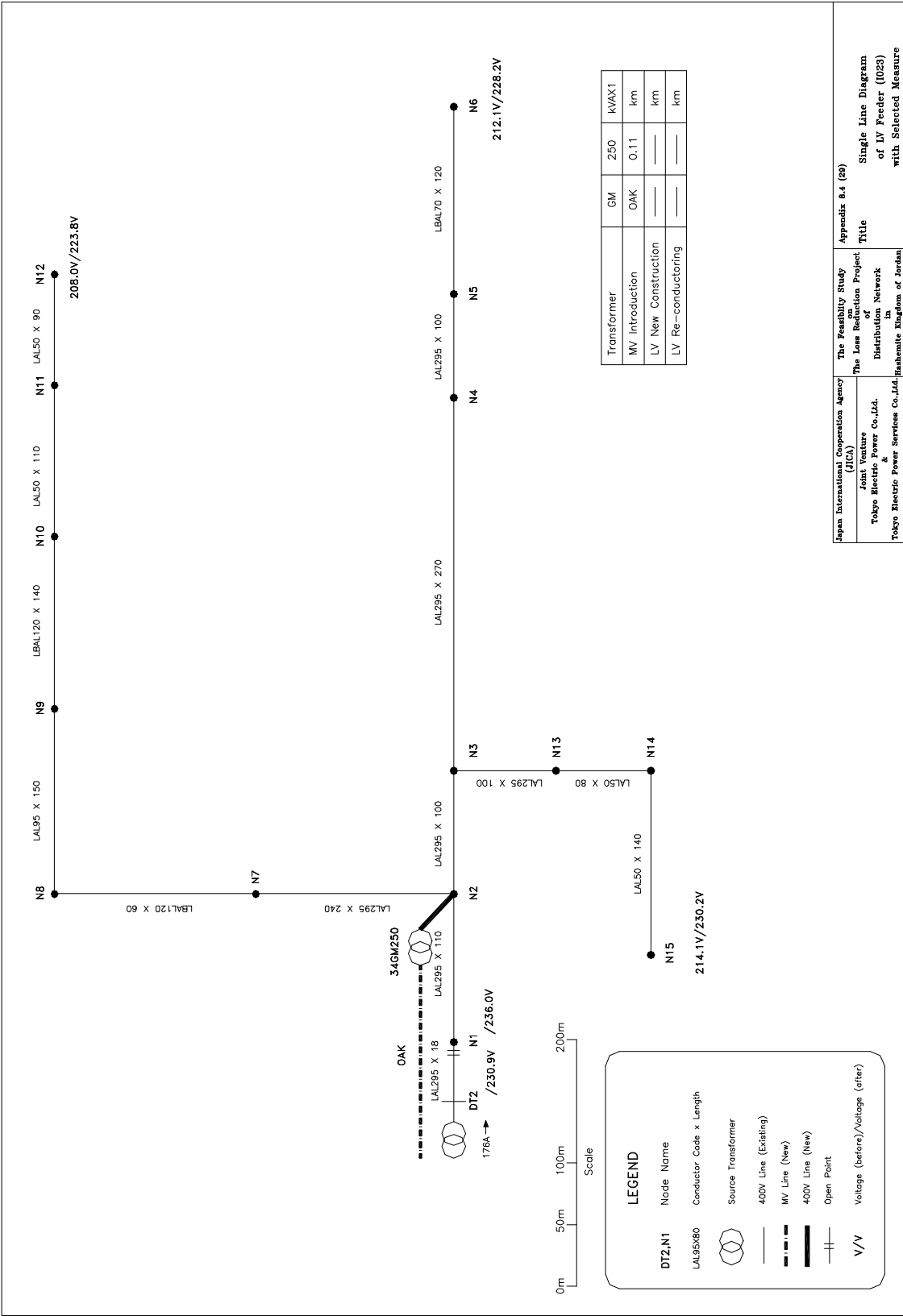


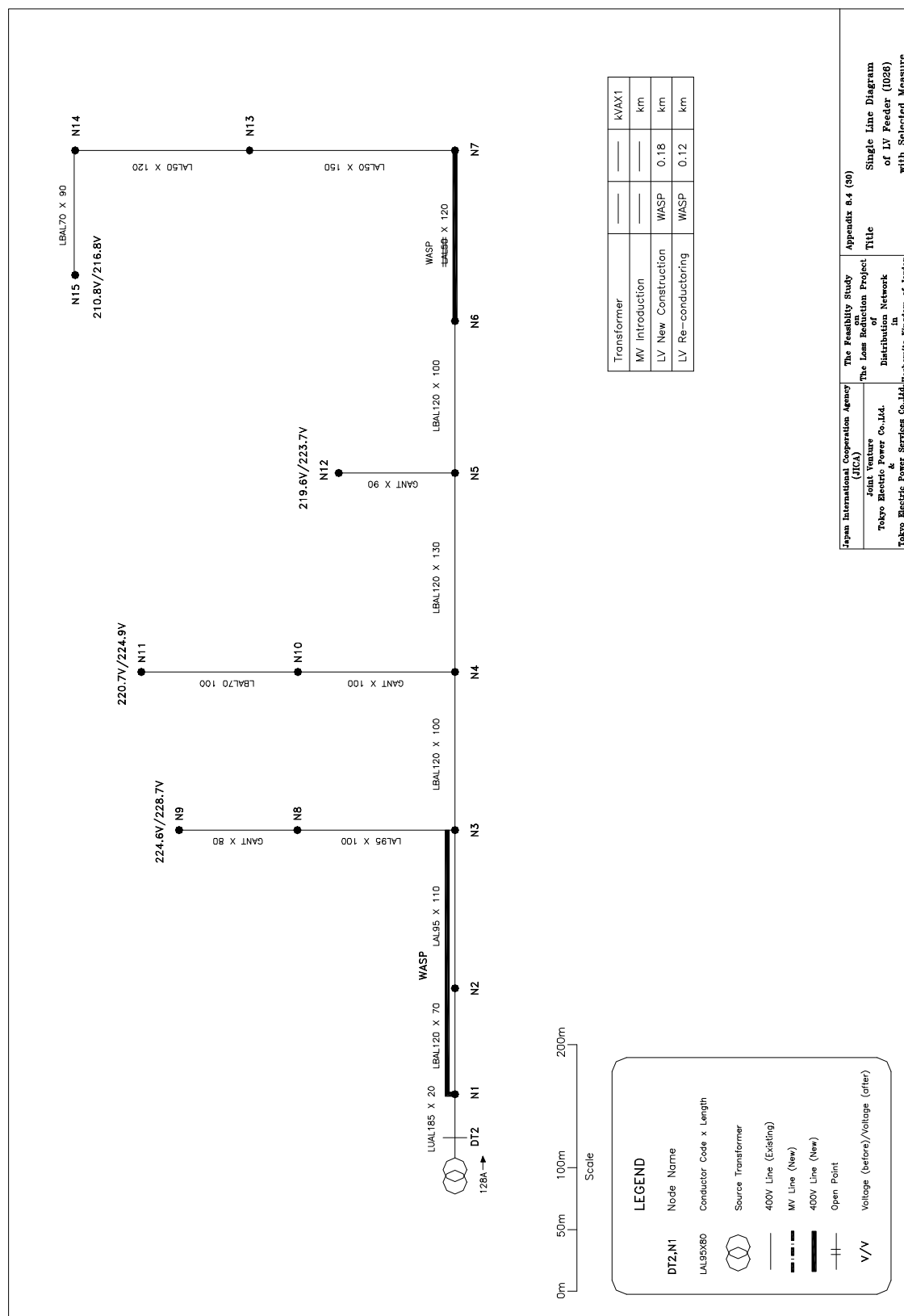


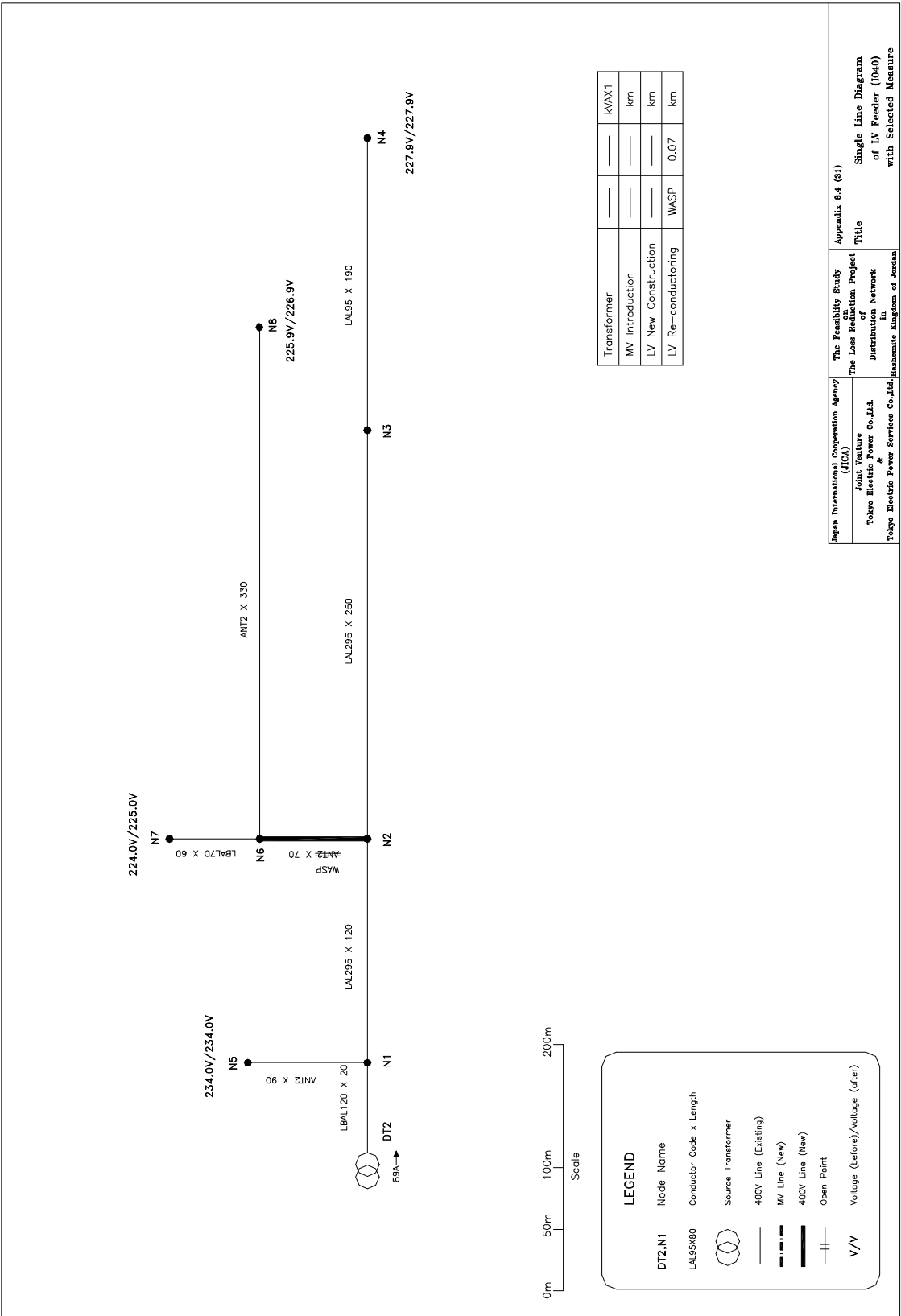


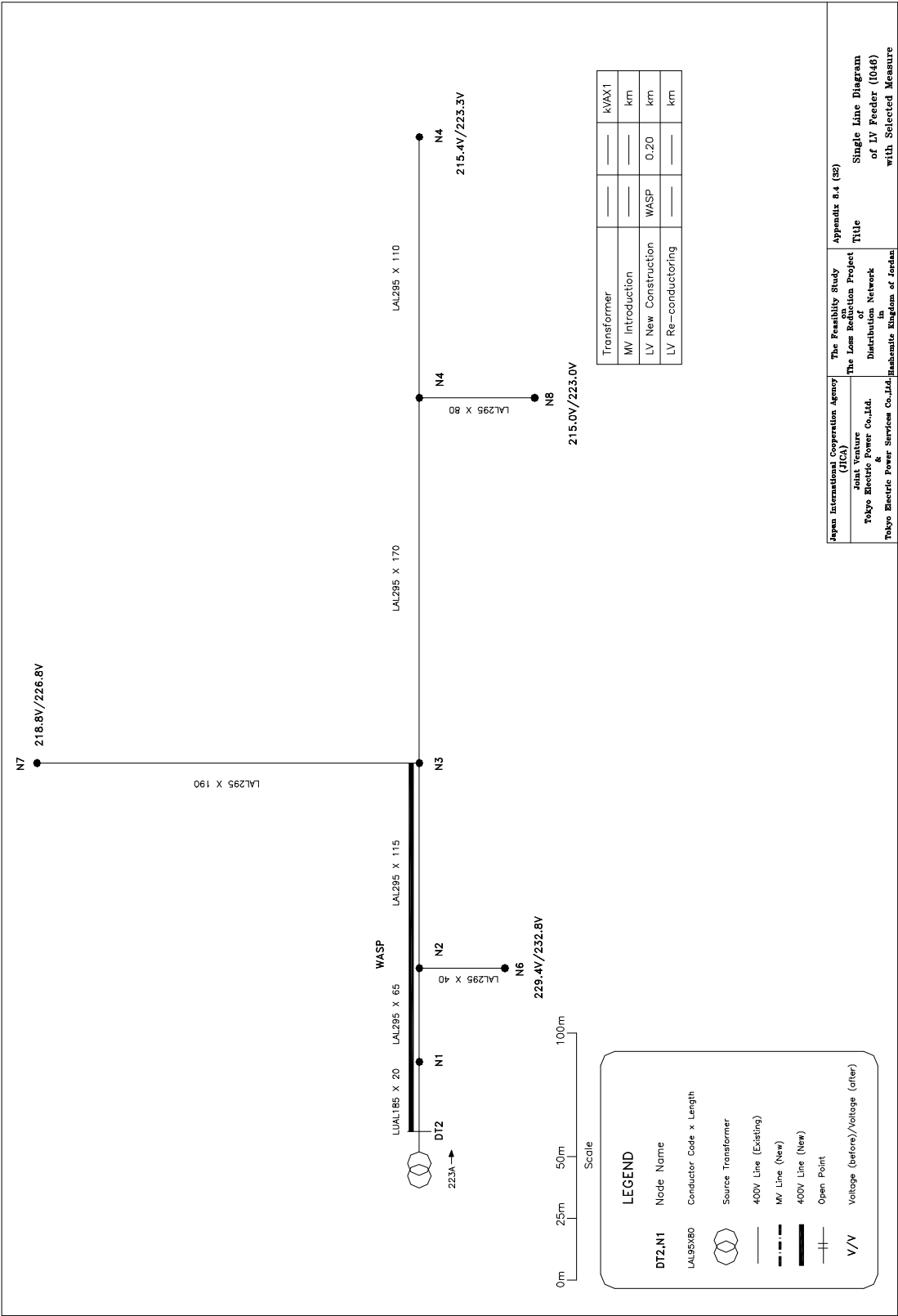


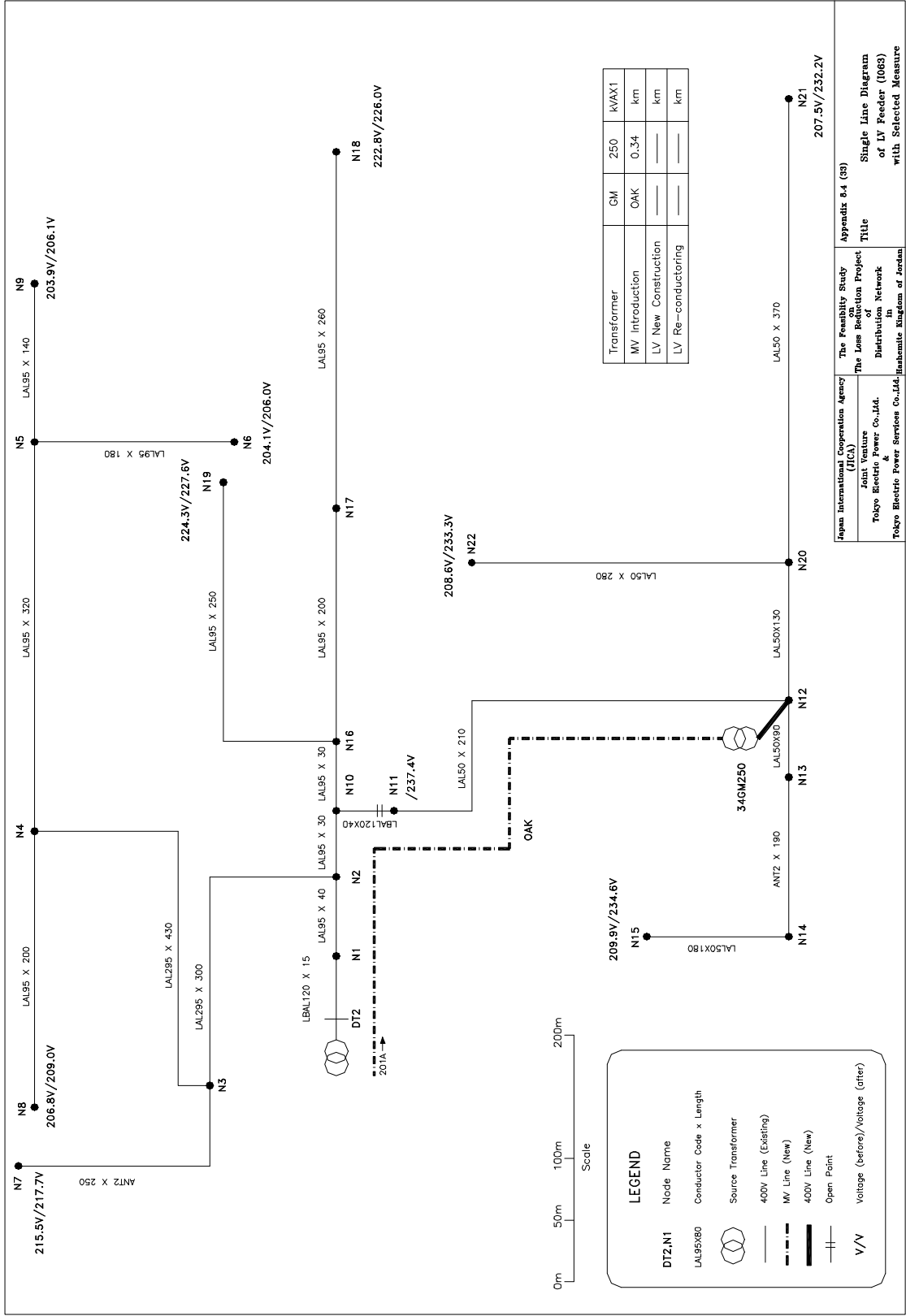


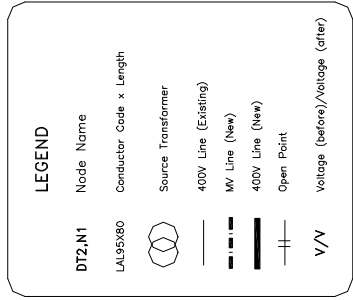


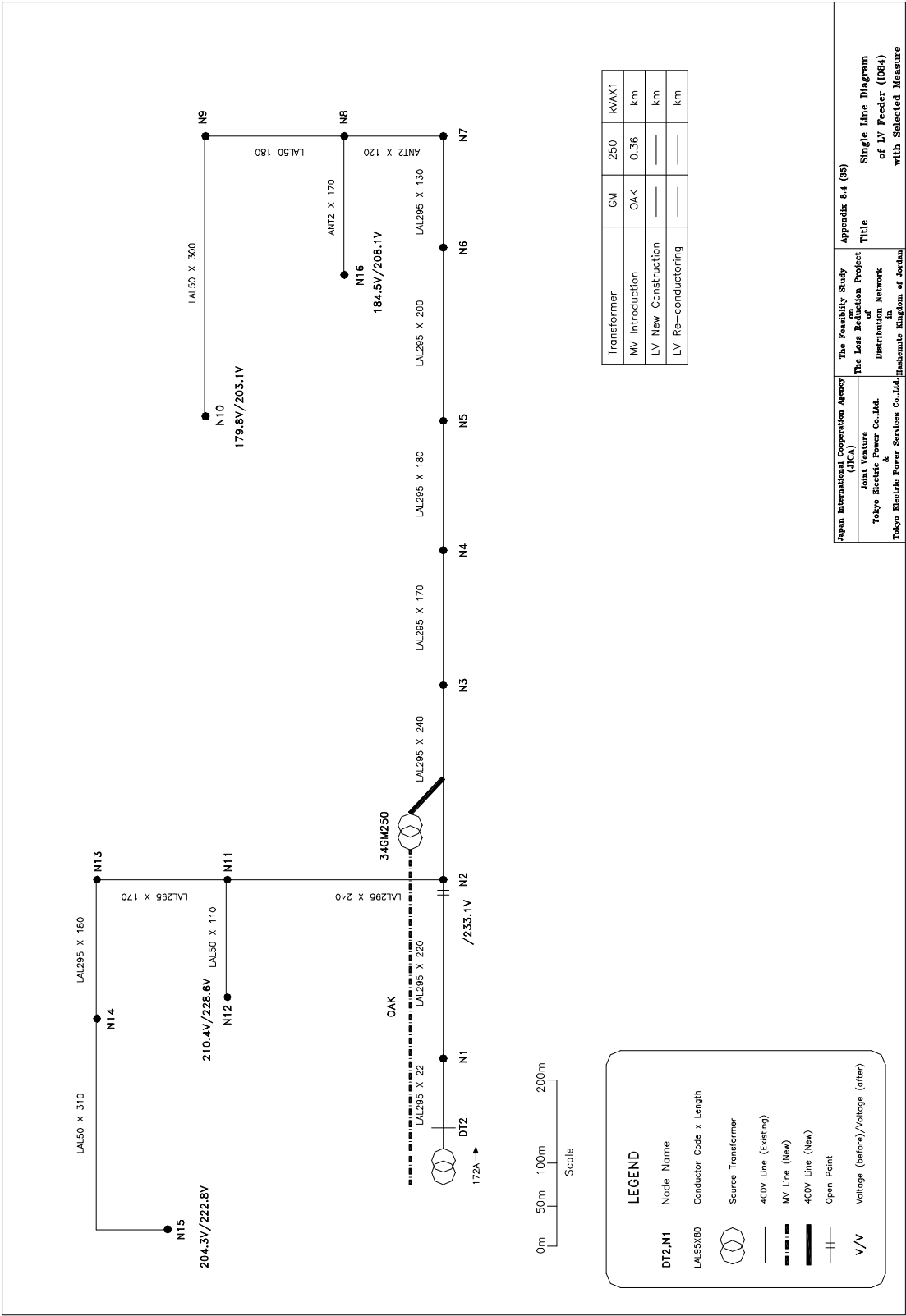


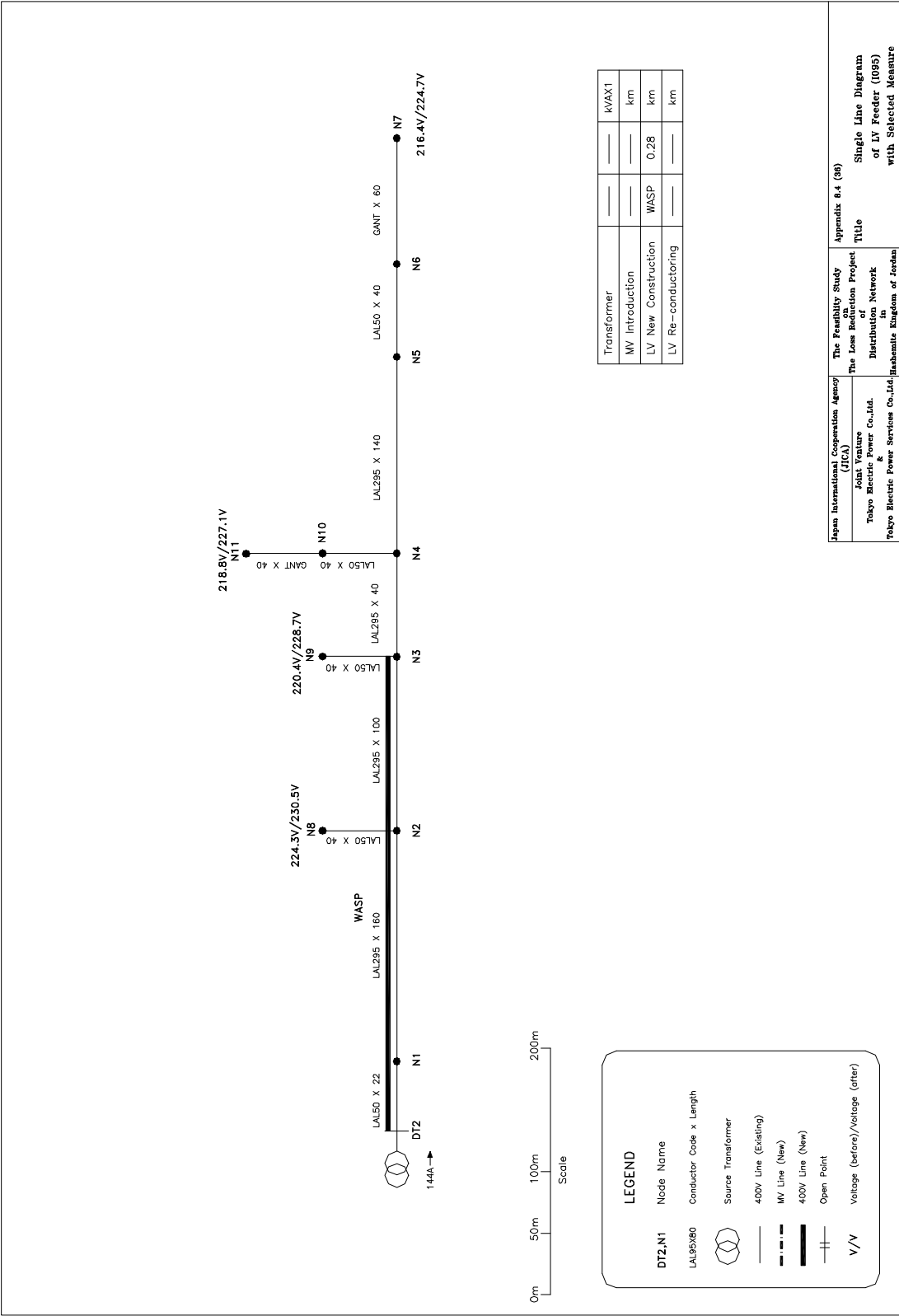


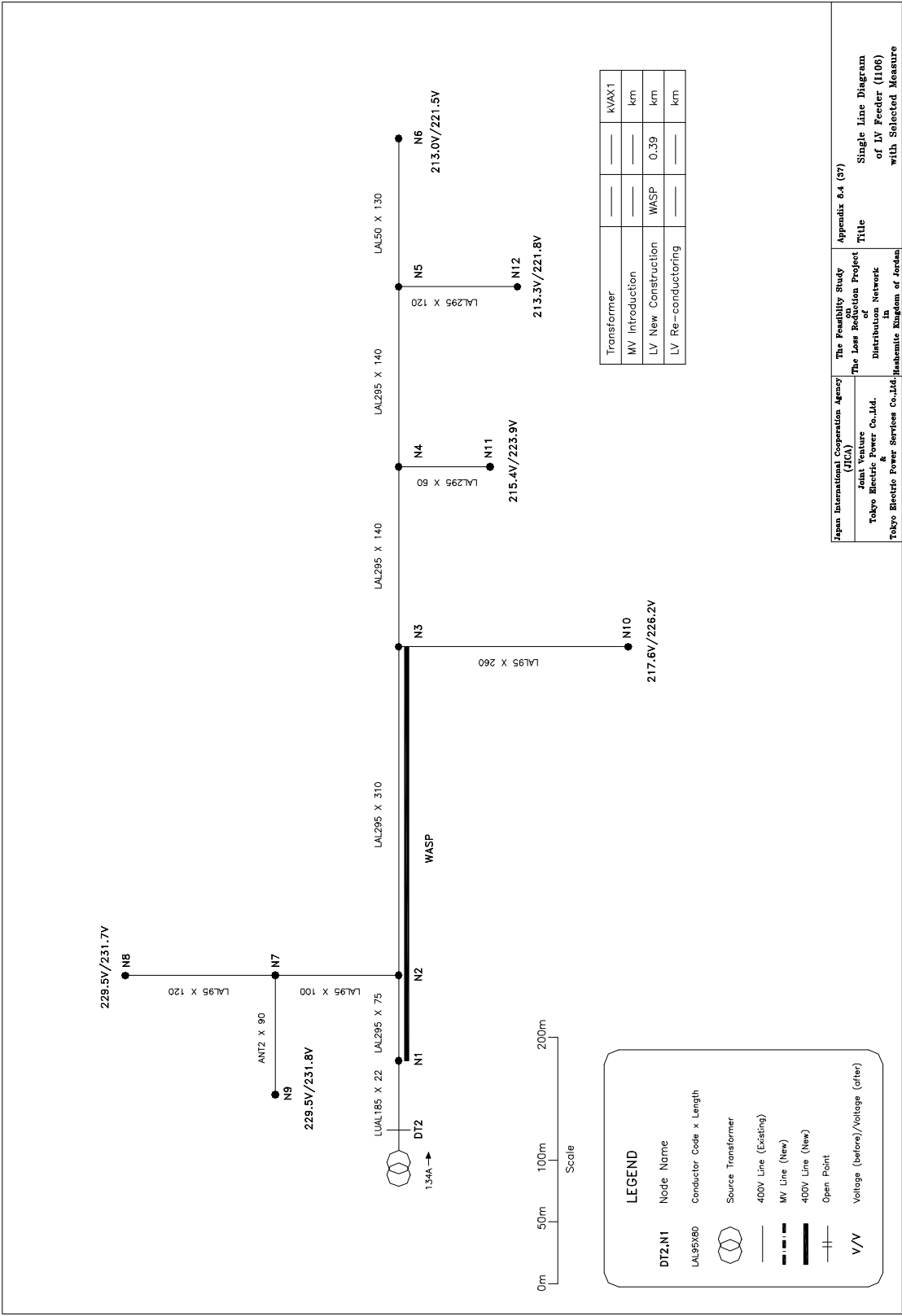


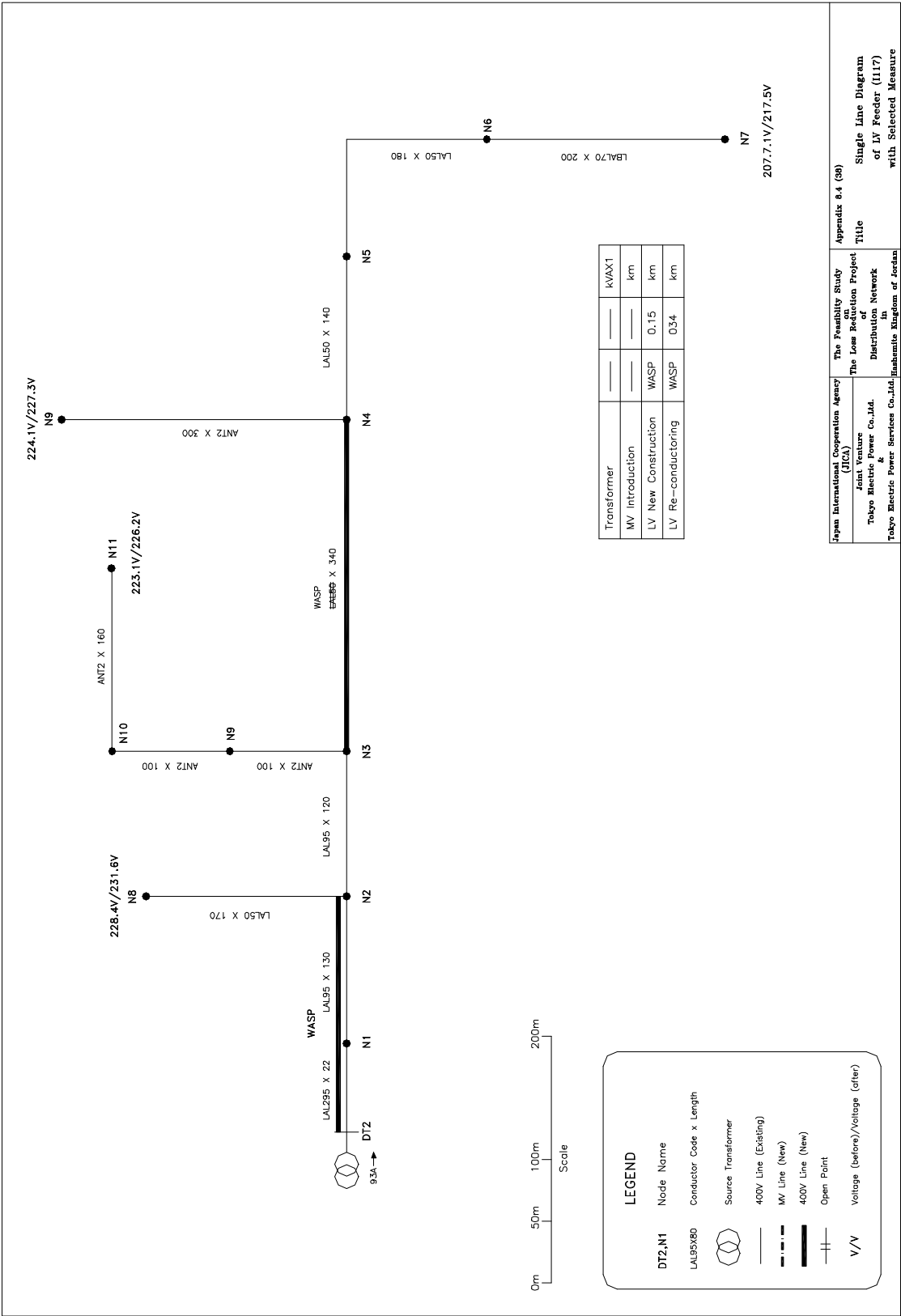


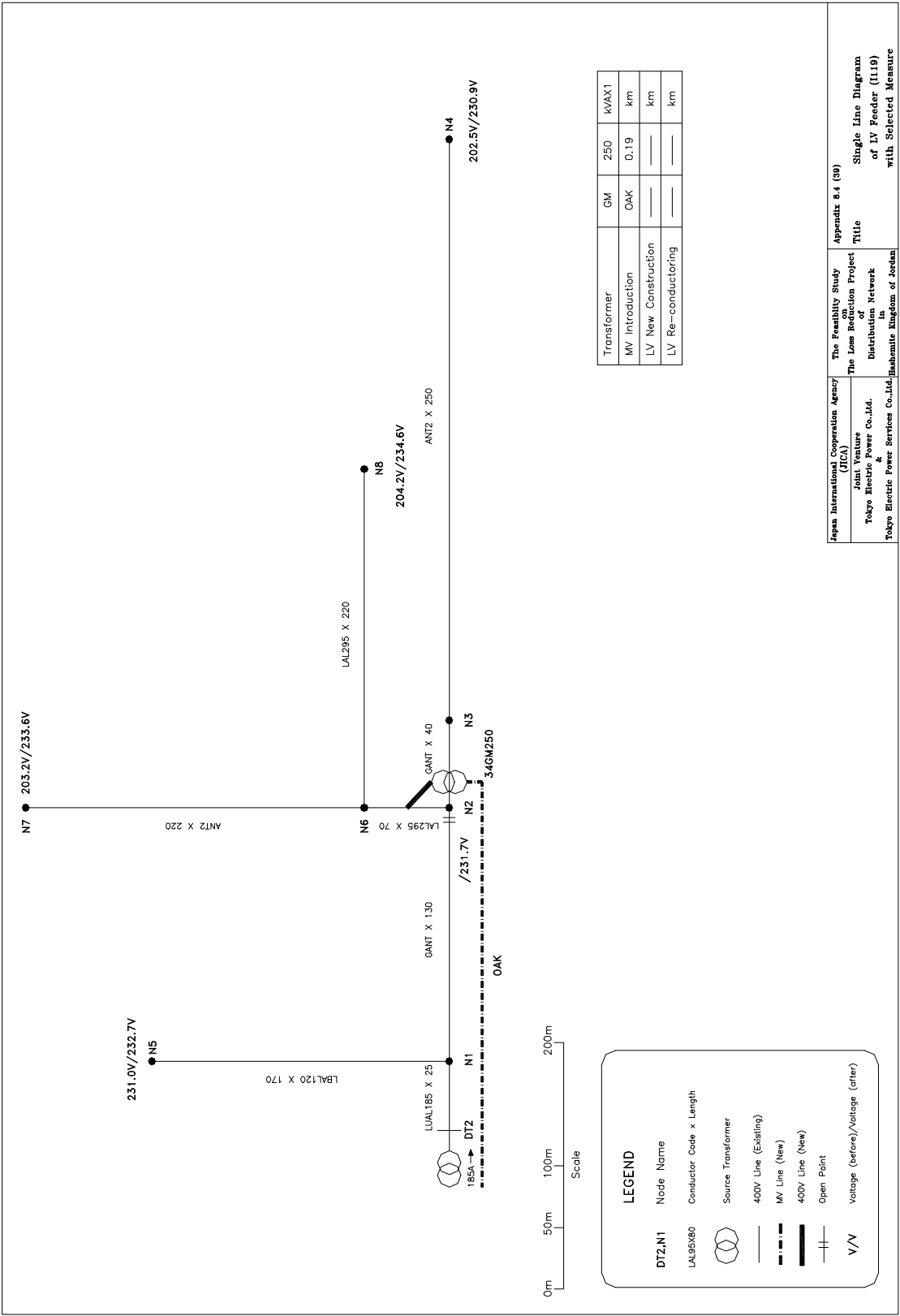


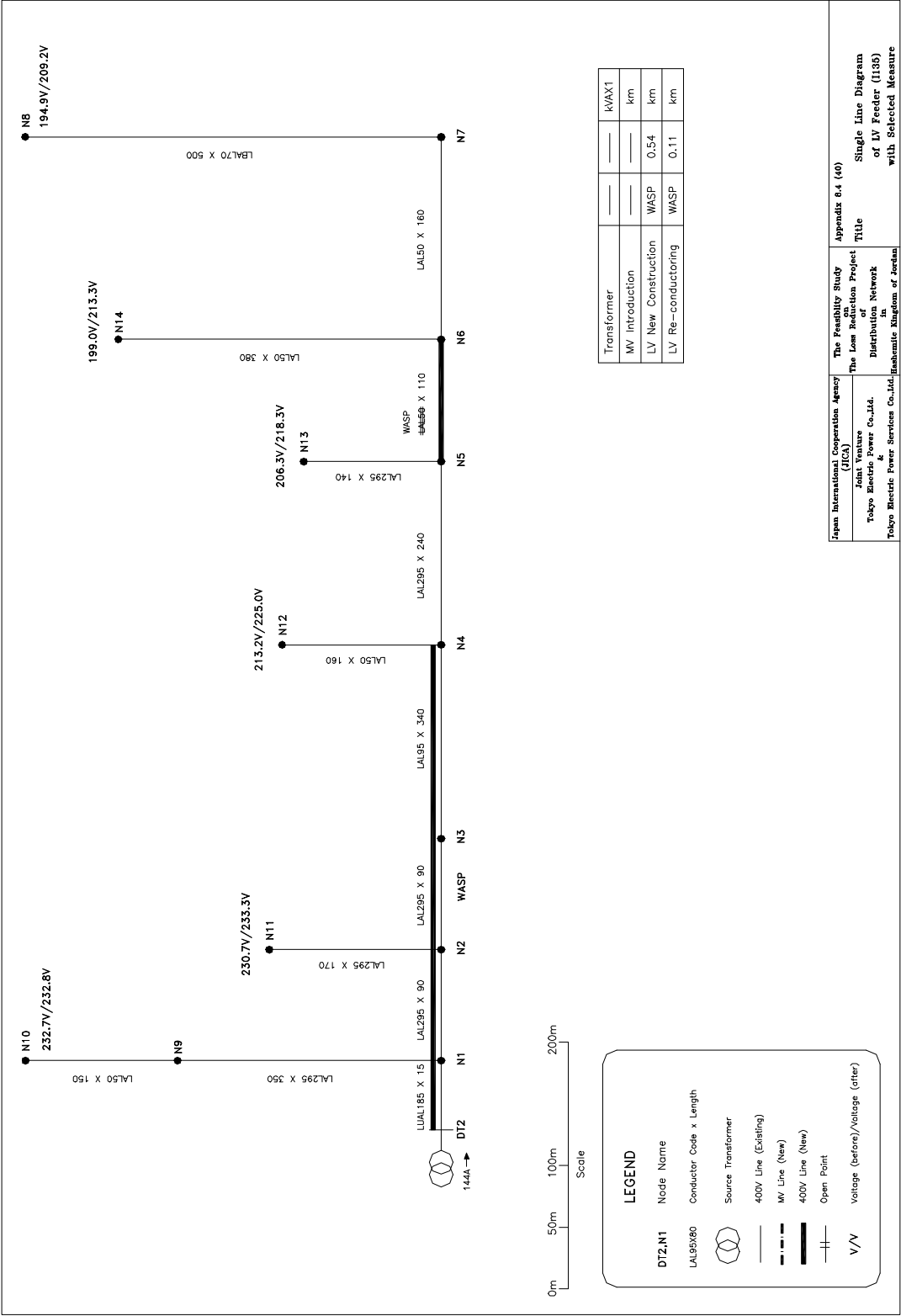












Appendix 8.5 Comparison of Voltage Profile of WASP and Bundled Conductor

A study on the voltage profile was conducted for low voltage feeders with WASP and Bundled conductors (AL95mm², 120mm²). The line length of the feeder was 1,000m and load was unified –distributed along the line with the power factor of 0.7 and 1.0.

1. Study cases

Case A : WASP

Case B : MKT (Bundled Conductors of 95mm²)

Case C : LBAL120 (Bundled Conductors of 120mm²)

2. Conditions of Study

Current at sending end: 140A

Secondary terminal voltage of transformer : 1p.u.

Power factor of unified distributed load: 0.70, 1.00

The outgoing portion from the transformer was modeled as 15m, 185mm² underground cable.

3. Line Constant

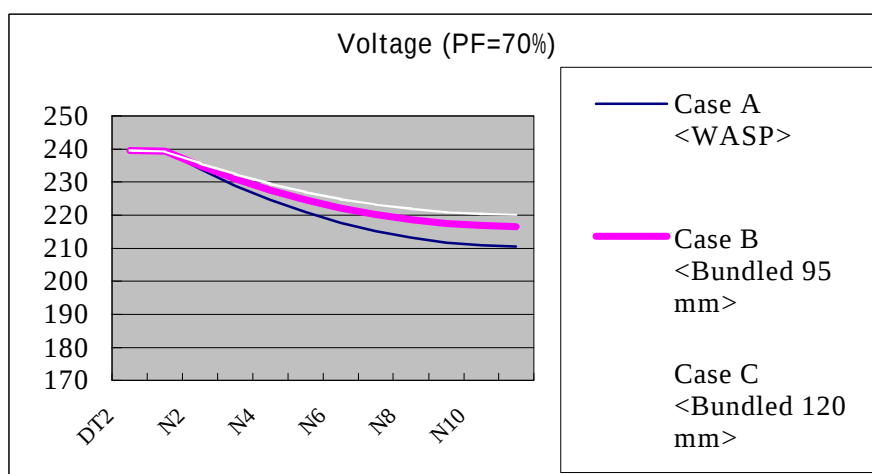
(1MVA base, %)

Conductor	Resistance	Reactance
WASP	181.786	159.149
MKT	215.45	60.232
LBAL120	170.34	60.118

4. Results of the Study

The results are summarized in Figure A8.5-1 and A8.5-2. In case of 70% load power factor, voltage drops at the receiving end in Case A are larger than Case B. On the other hand, Case B turned out to be the worst in the case of 100% power factor. As shown in the line constant table, WASP has smaller resistance and larger reactance than those of Bundle 95mm². Reactance voltage drops become larger as power factor becomes worse as shown in the low power factor case, while resistance voltage drops become smaller as power factor is improved. Power factor of load is improved by installation of a power factor for loss reduction and the difference in voltage reduction between bare and bundled conductor becomes smaller as shown in this study.

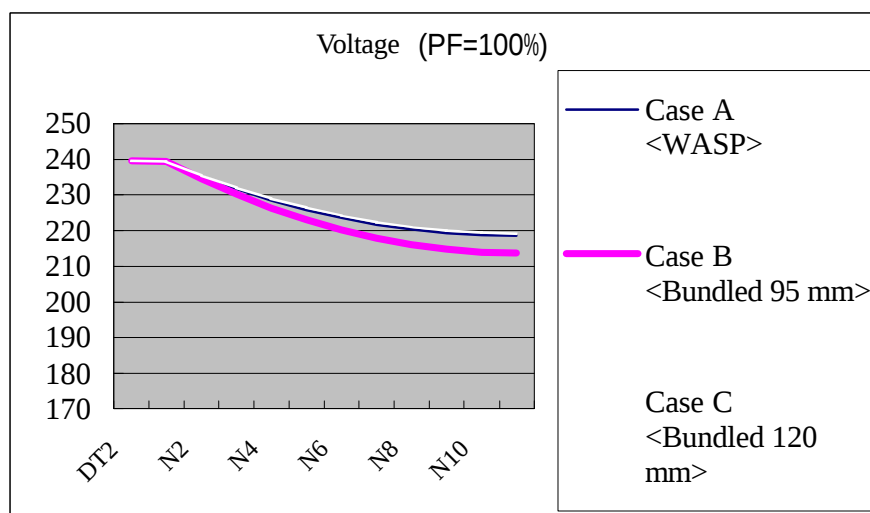
Figure 8.5-1: Results of Voltage Drop (PF=70%)



Voltage Drops (PF=70%)

	Case A	Case B	Case C
Voltage drops at the middle of the feeder	9.1%	7.3%	6.1%
Voltage drops at the end of the feeder	12.1%	9.6%	8.1%
Voltage at the end of the feeder	210.58 V < 0.6 deg.	216.61 V < 3.6 deg.	220.18 V < 2.5 deg.

Figure 8.5-2: Results of Voltage Drop (PF=100%)



Voltage Drops (PF=100%)

Voltage Reduction		Case A	Case B	Case C
Voltage Drop	at the middle of the feeder	6.7%	8.1%	6.4%
	at the end of the feeder	8.8%	10.8%	8.5%
Voltage	at the end of the feeder	218.47 V < -5.0 deg.	213.74 V < -2.0 deg.	219.12 V < -1.9 deg.