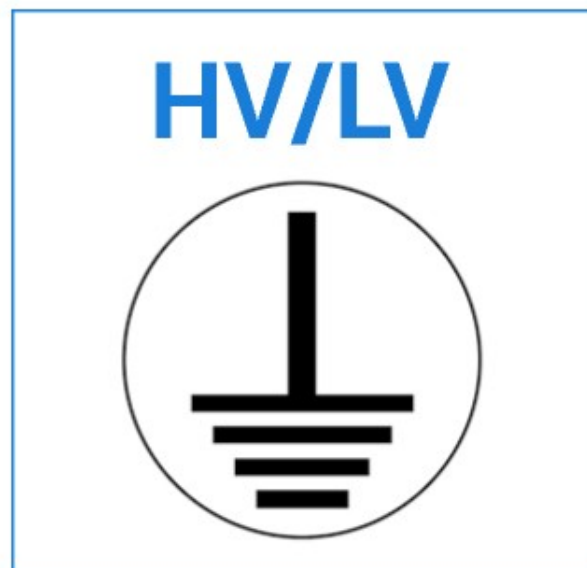


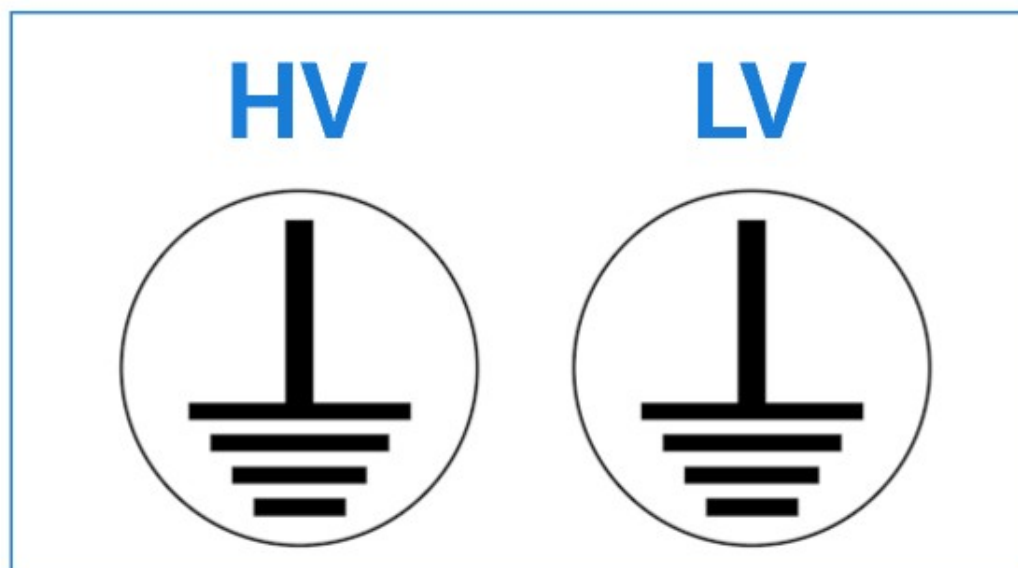


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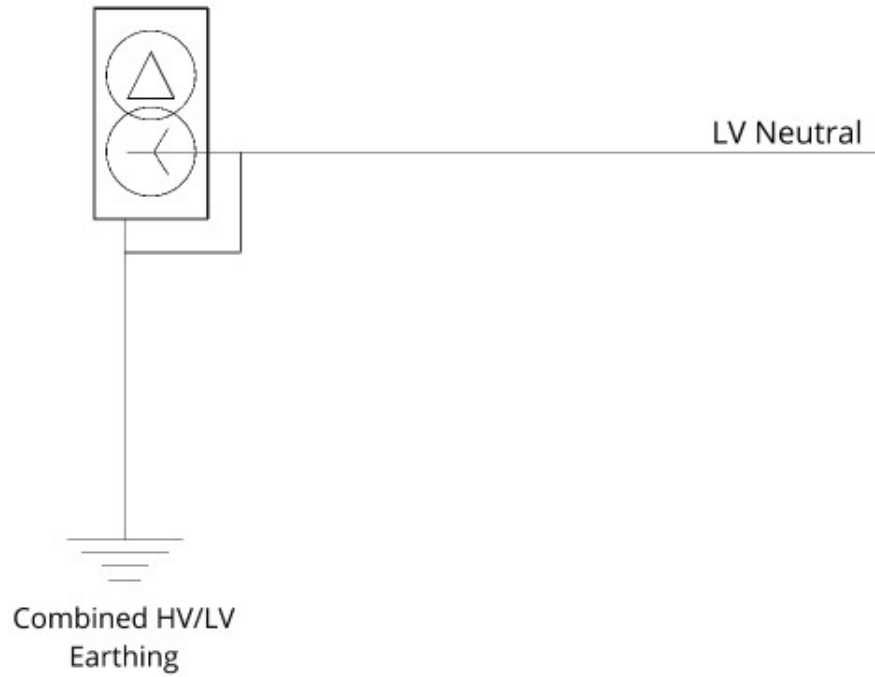


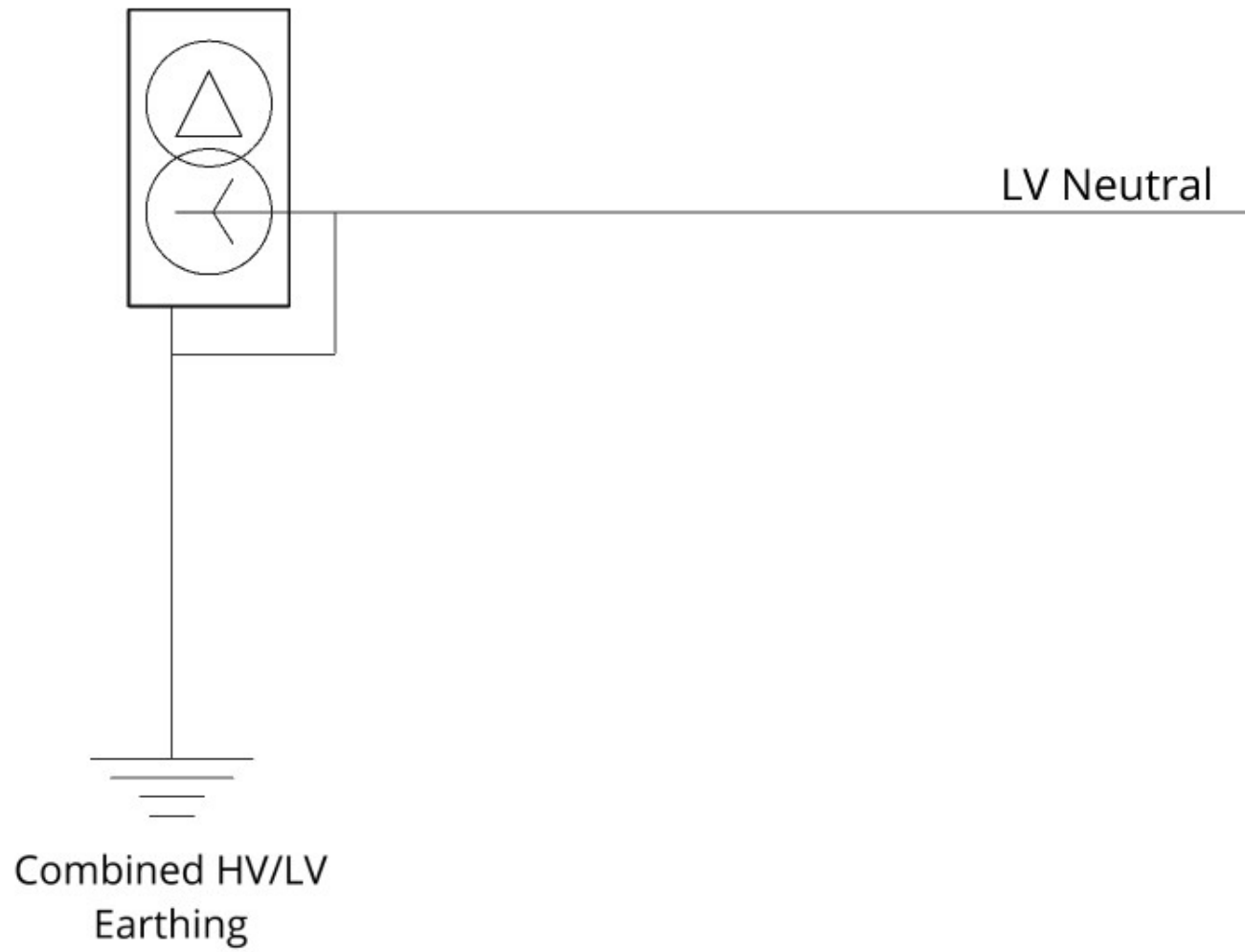
VS

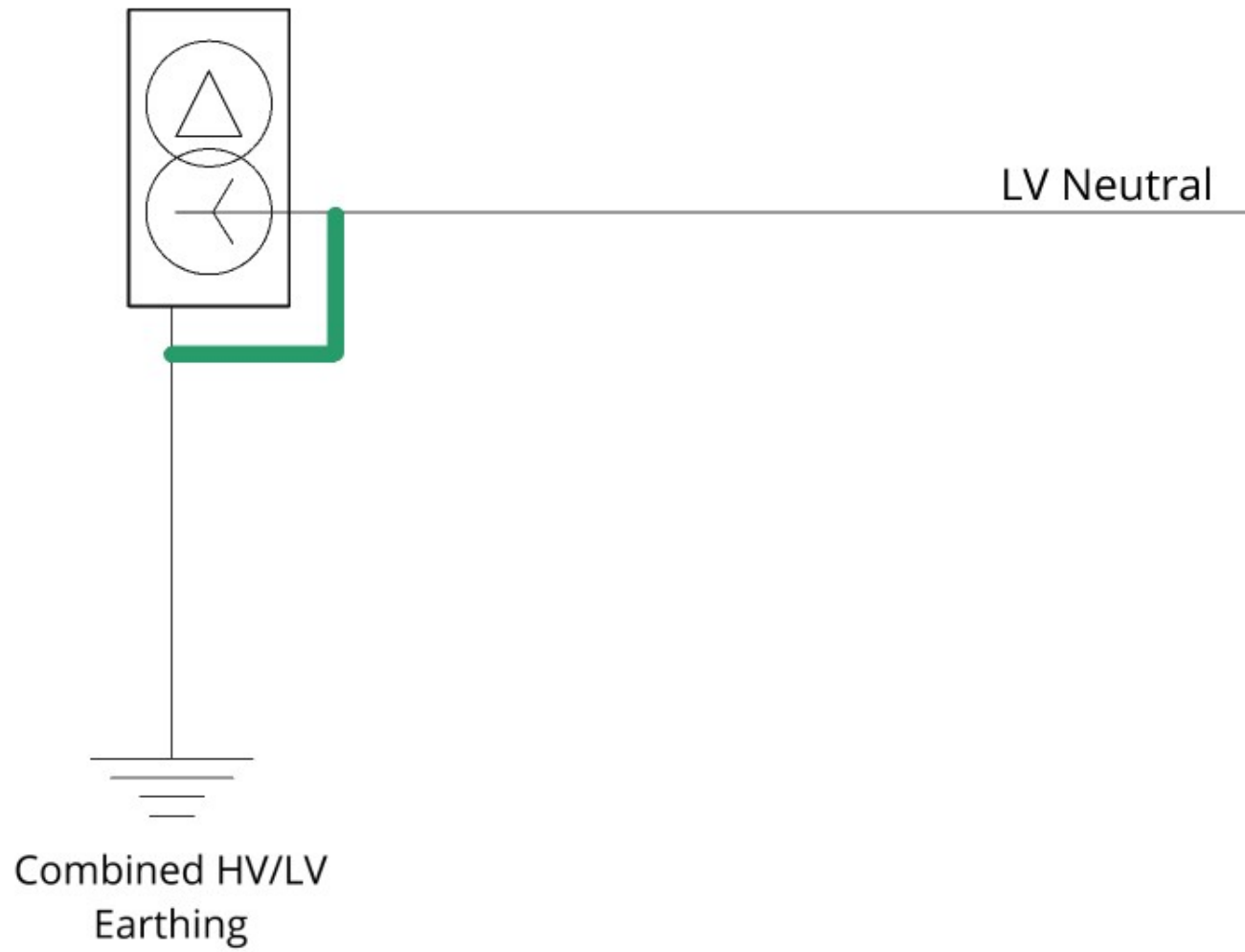




Combined HV/LV Earthing



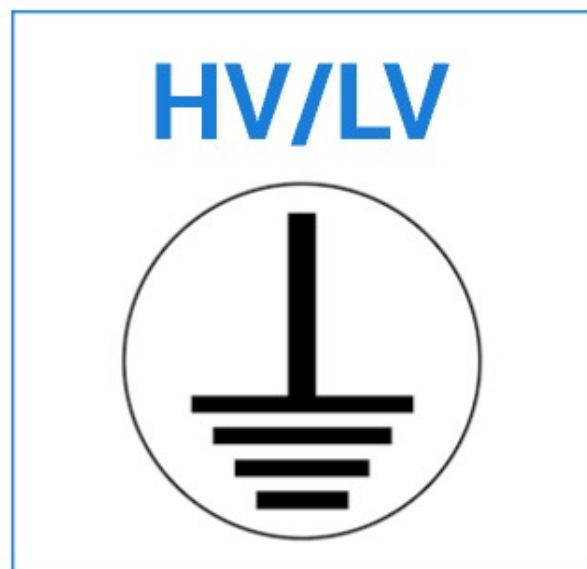




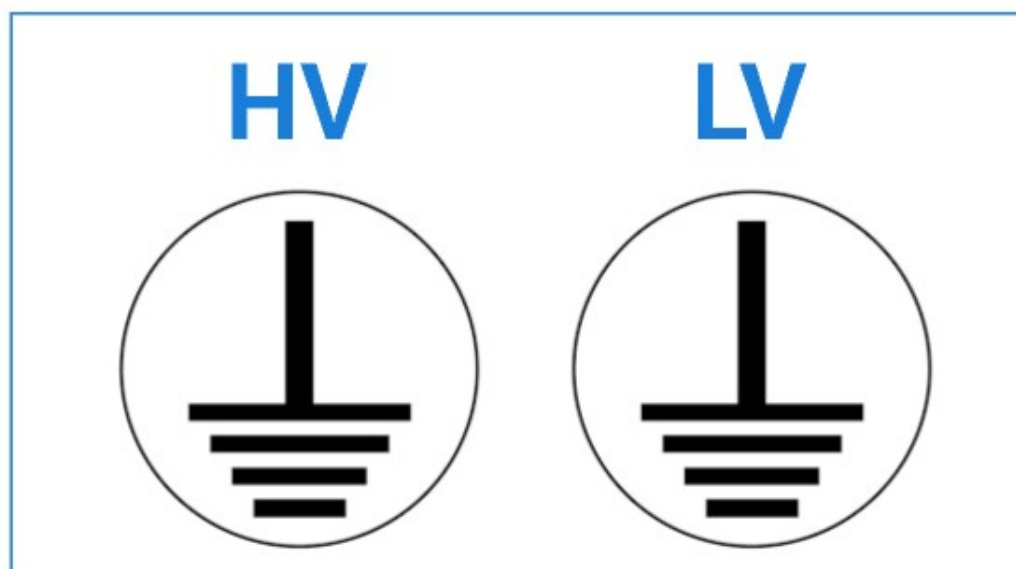


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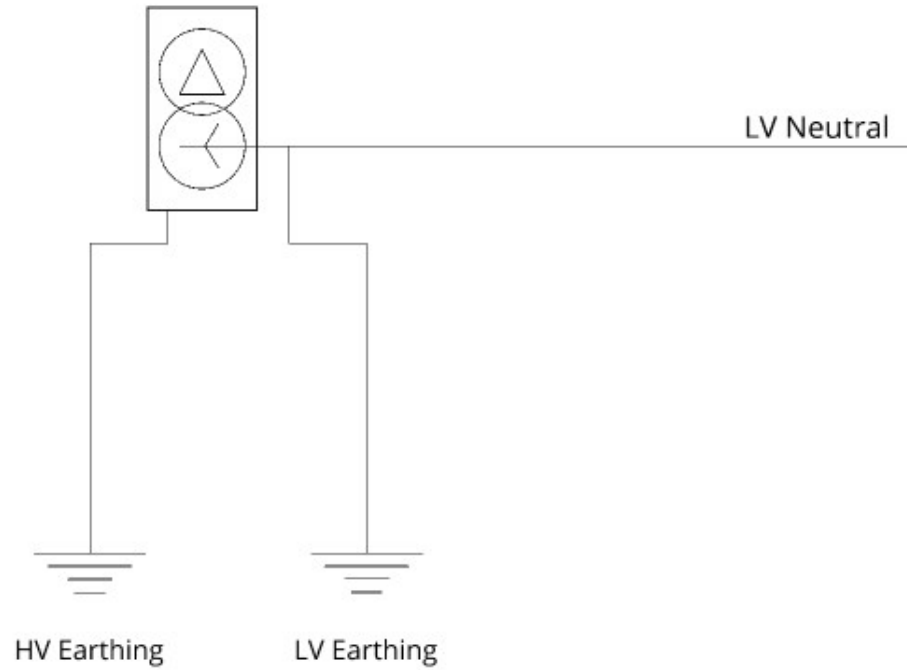


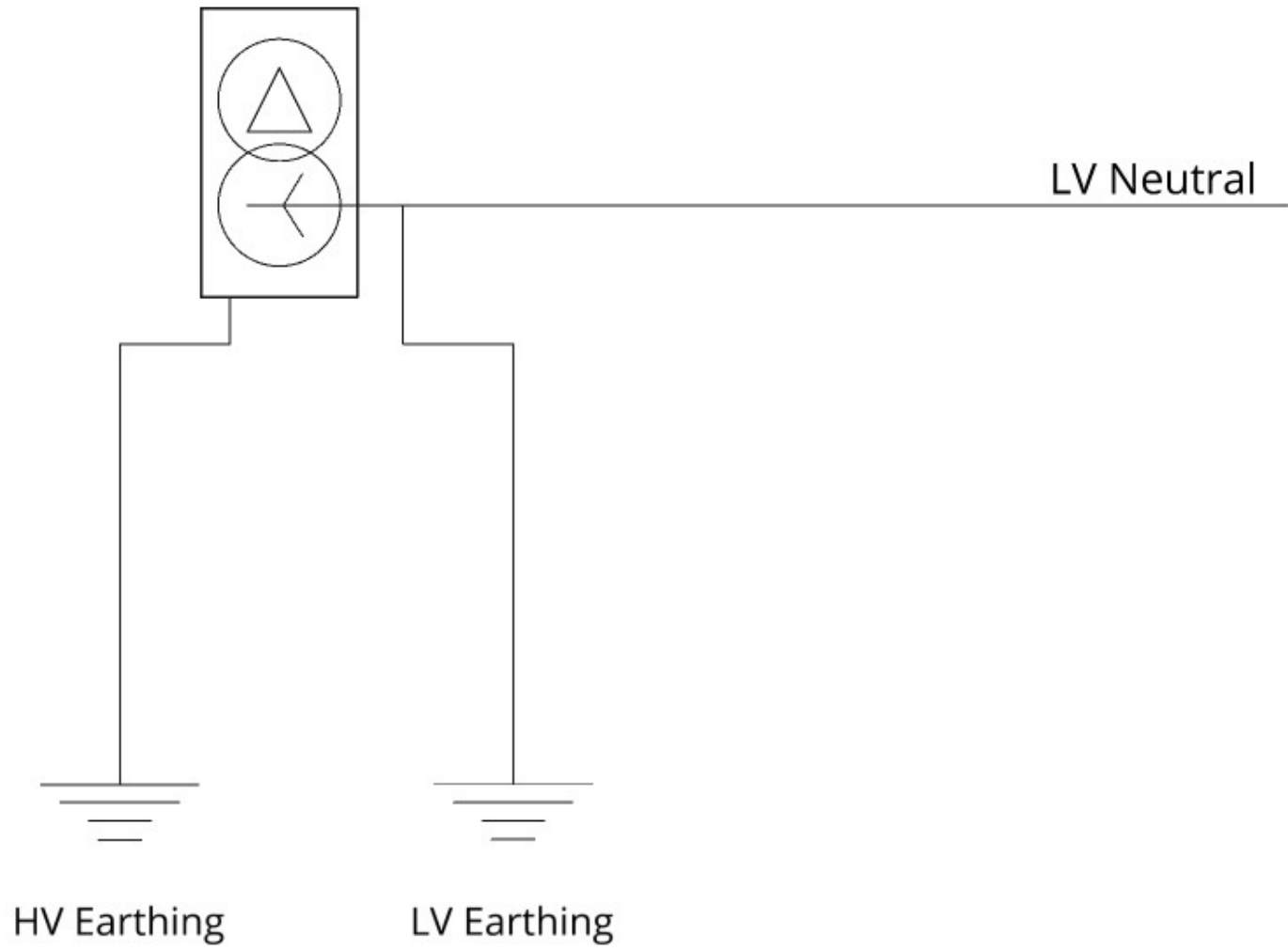
VS





Segregated HV/LV Earthing

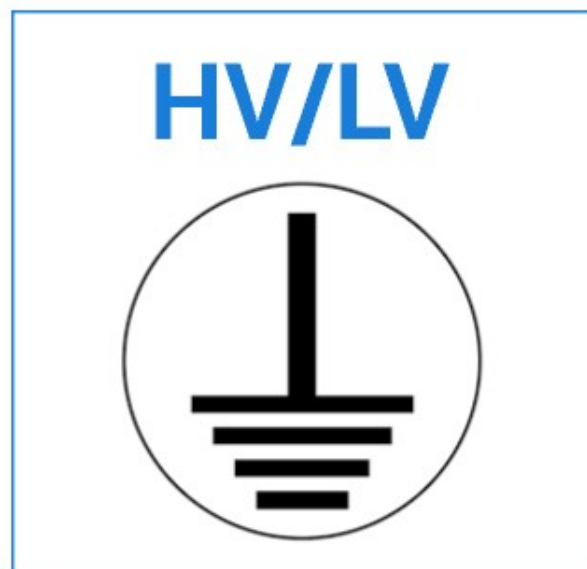




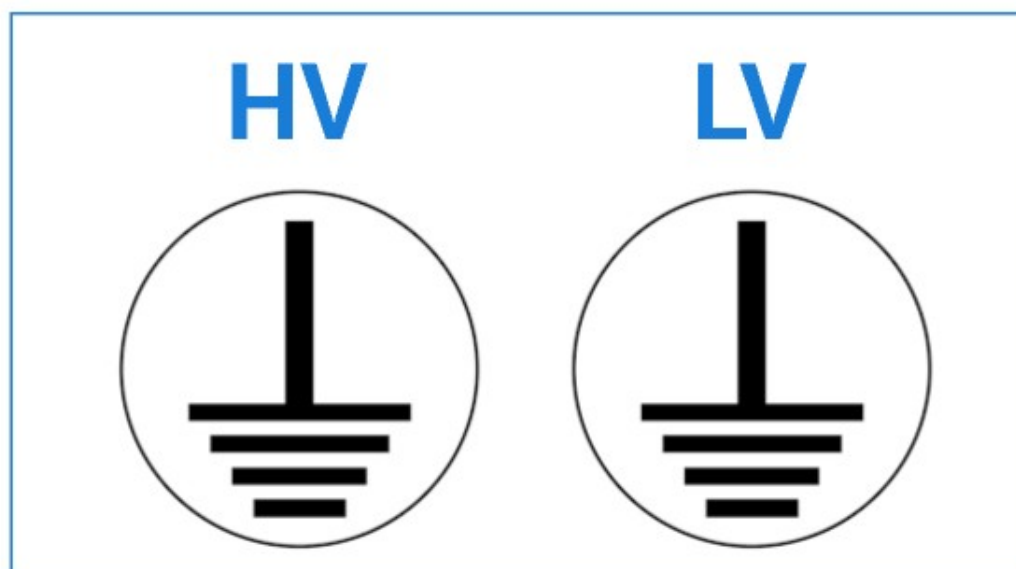


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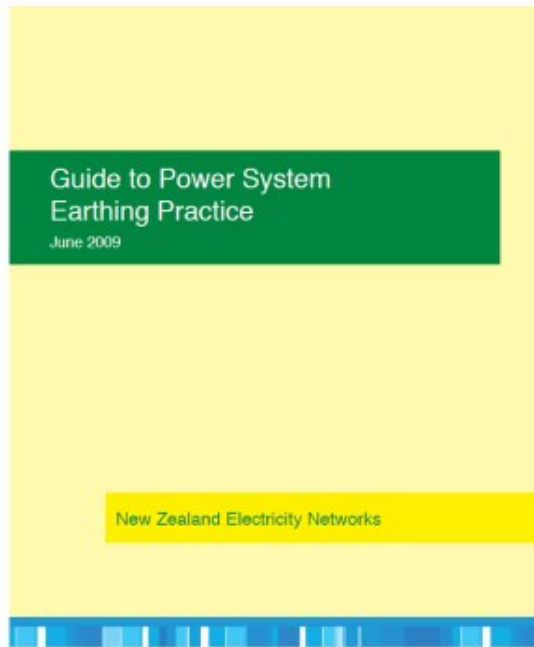


VS





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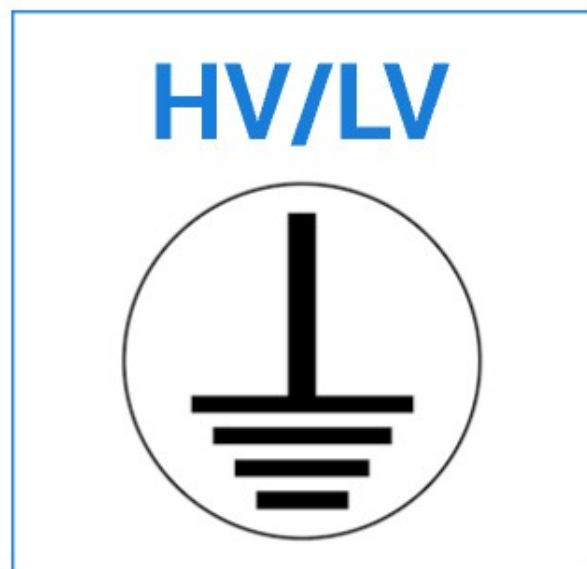
Electricity Engineers'
Association



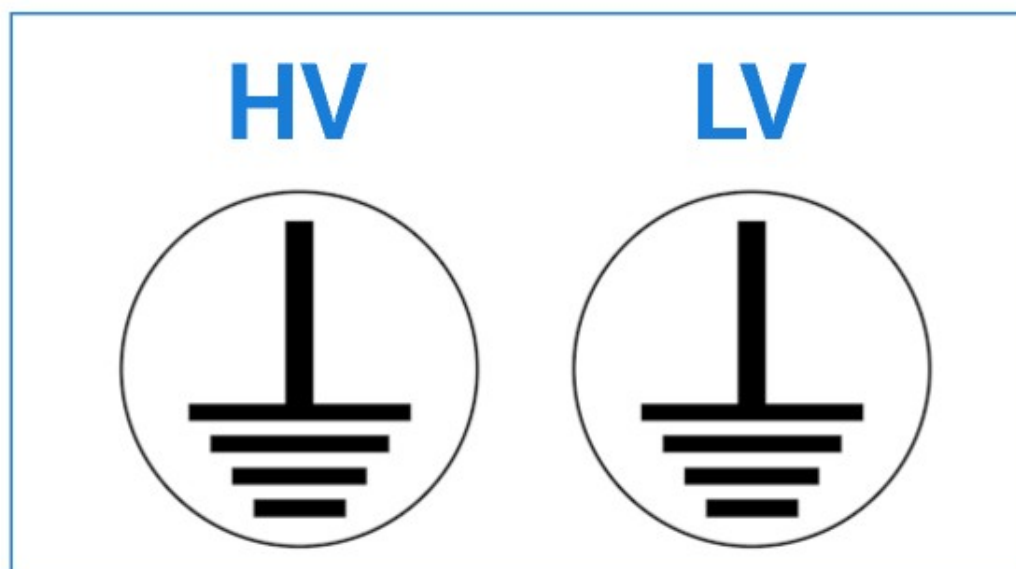


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Assessment Overview

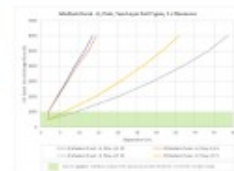


Table 9: Typical Minimum Separation Distances between HV and LV Earths for 11 kV Distribution Transformers

Size of MEN system	Size of HV earth electrode ^{NOTE 1}	Minimum separation distance (m)
Medium to large MEN system (> 50 customer earths)	Small	2
	Large	5
Small MEN system (5 to 50 customer earths)	Small	2
	Medium	5
Very small MEN system (< 5 customer earths)	Large	10 ^{NOTE 2}
	Small	10
	Medium	30 ^{NOTE 2}
	Large	50 ^{NOTE 2}



Inputs



Fault Data

Magnitude - 5 kA and 13 kA

Duration - 0.5 s, 1.0 s and 1.5 s

Fault Frequency - 1 in 30 years

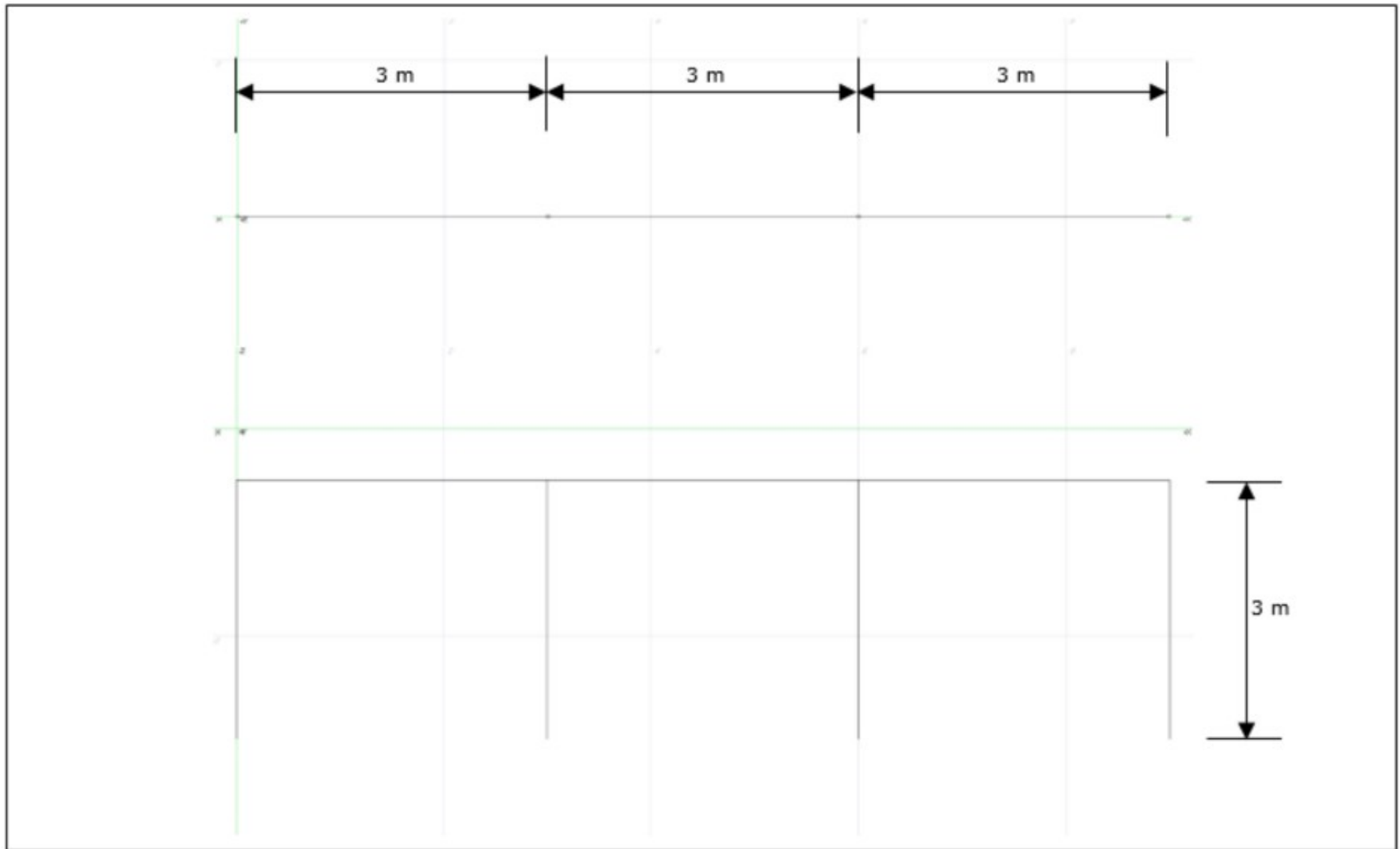


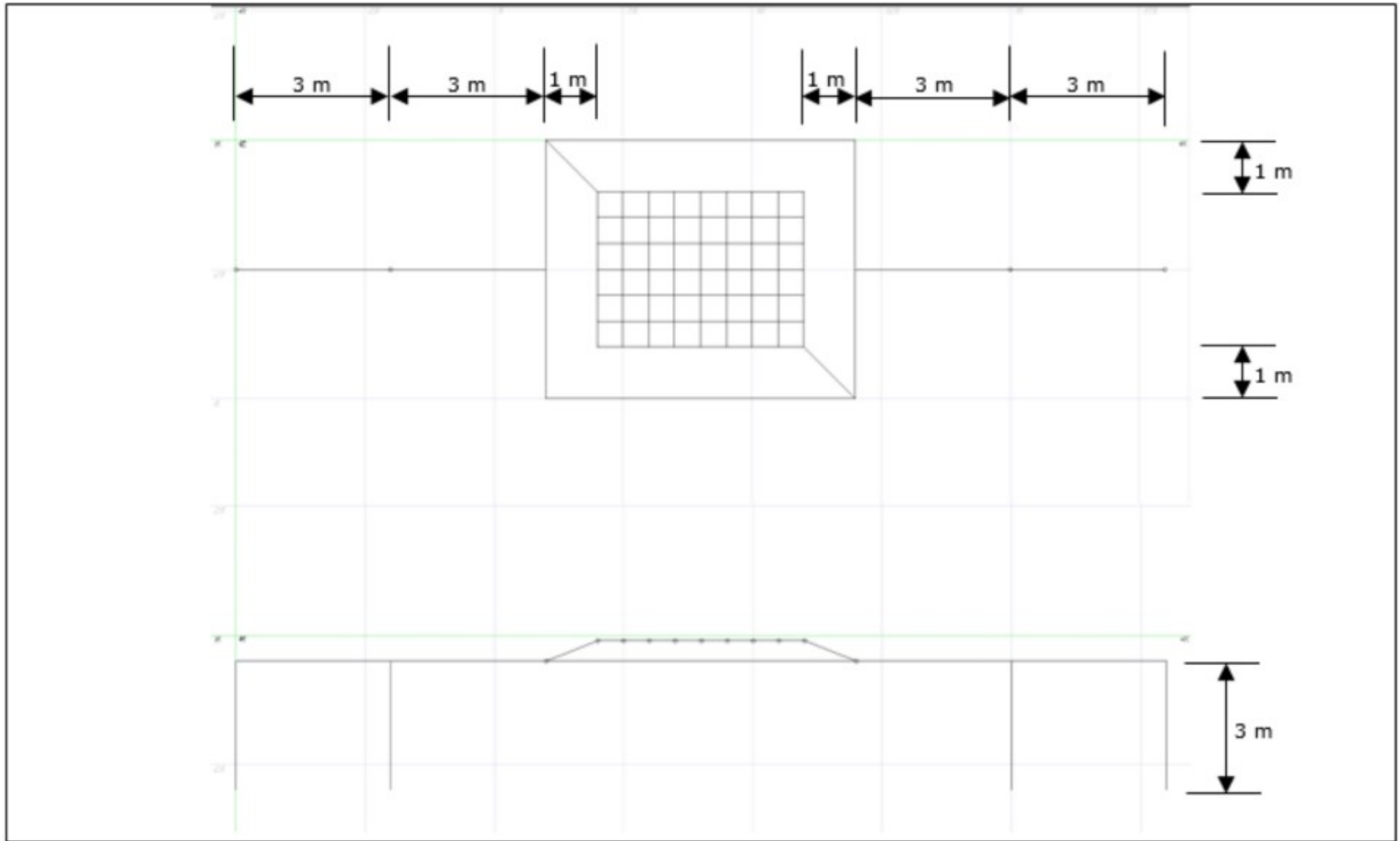
Soil Resistivity - Regional representation



Earthing Systems - Steering Group Guidance

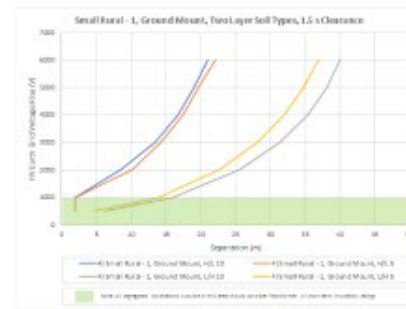
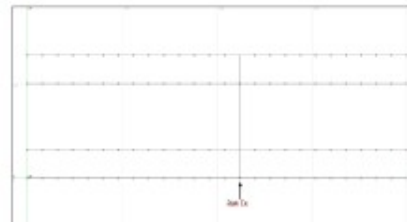
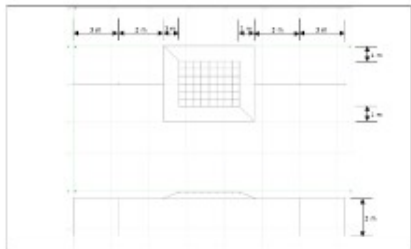
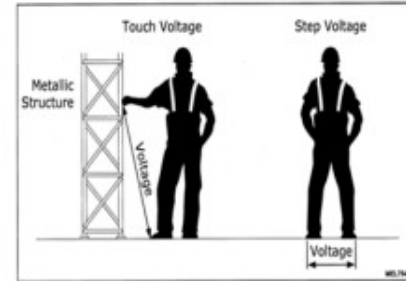
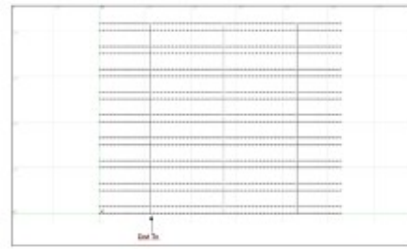
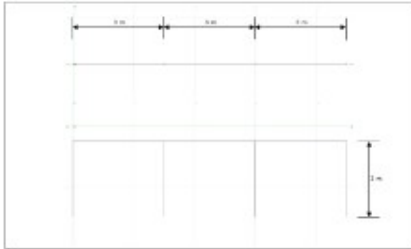


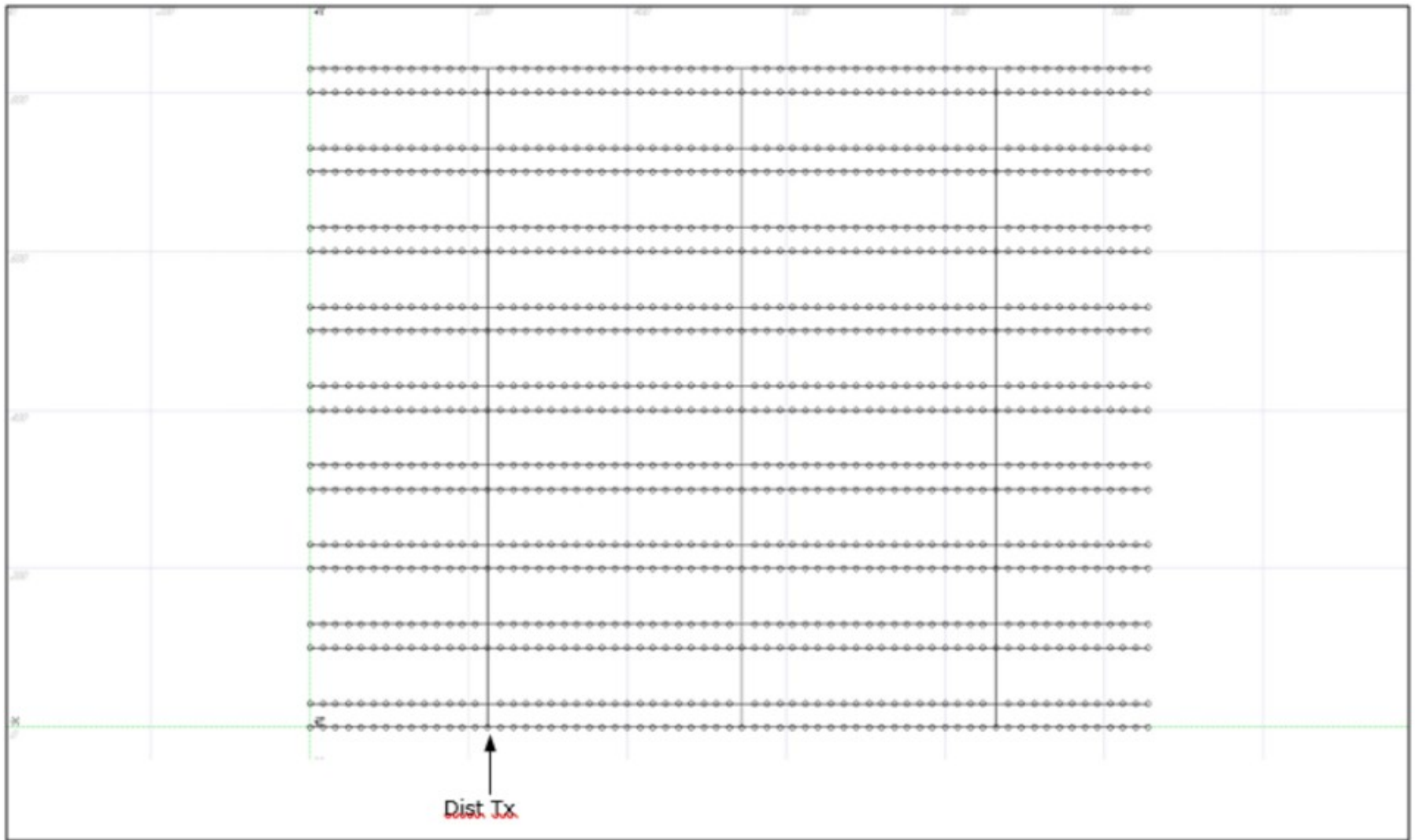






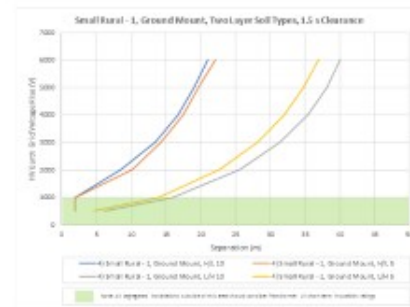
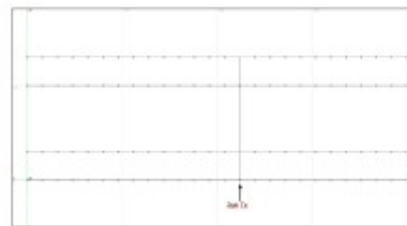
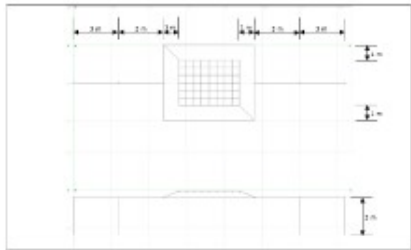
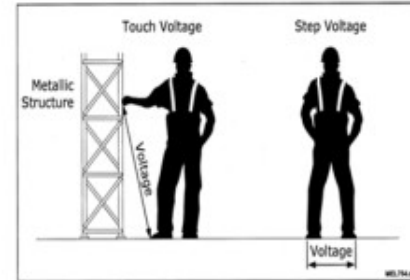
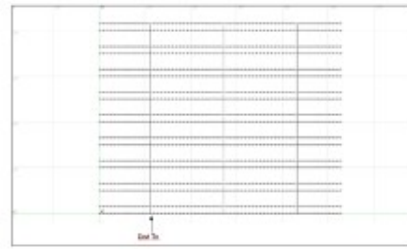
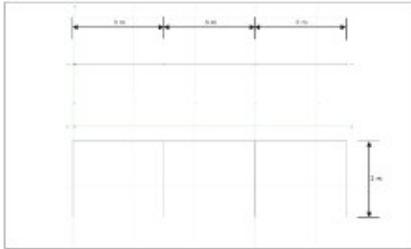
Methodology

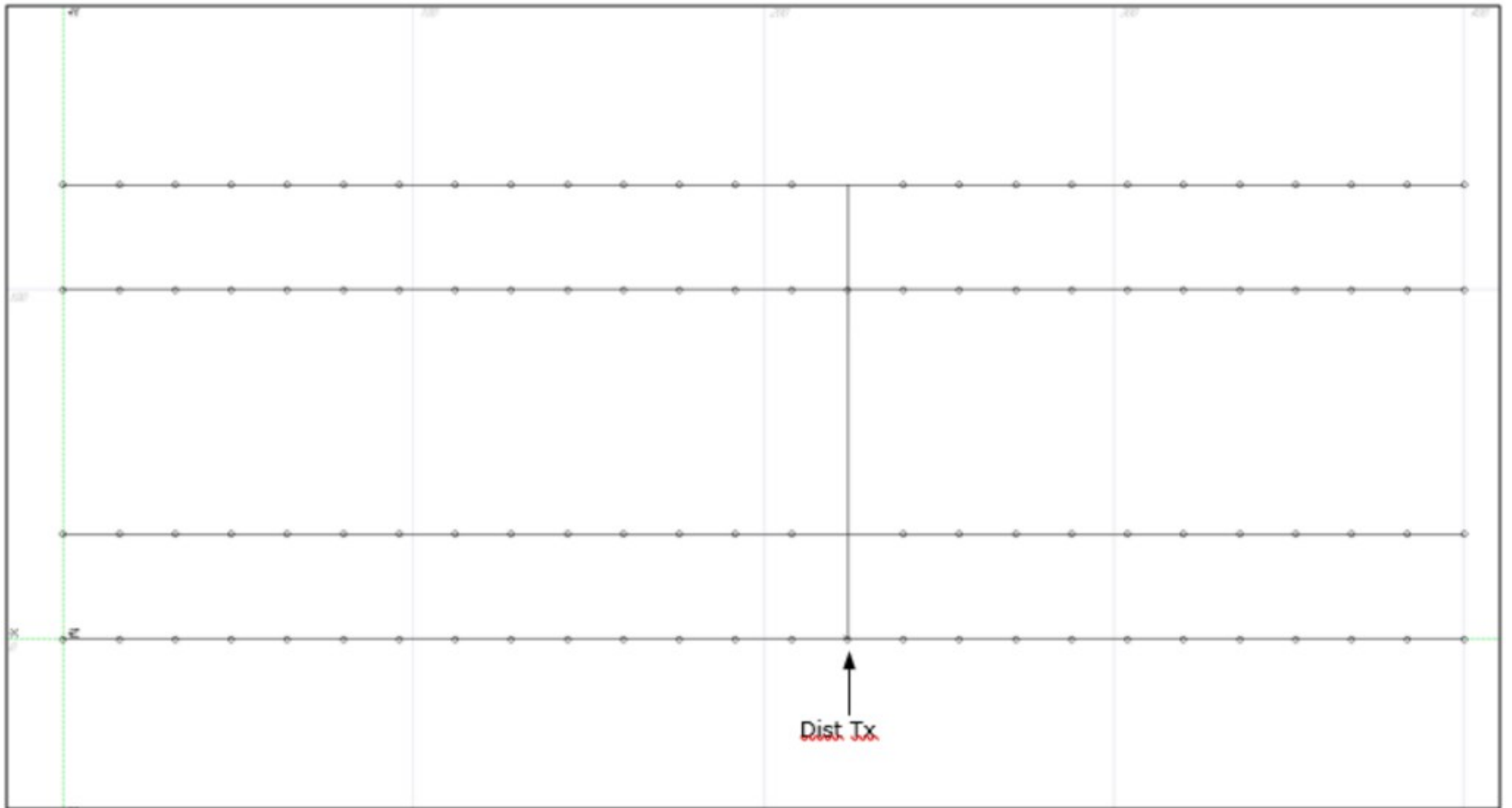


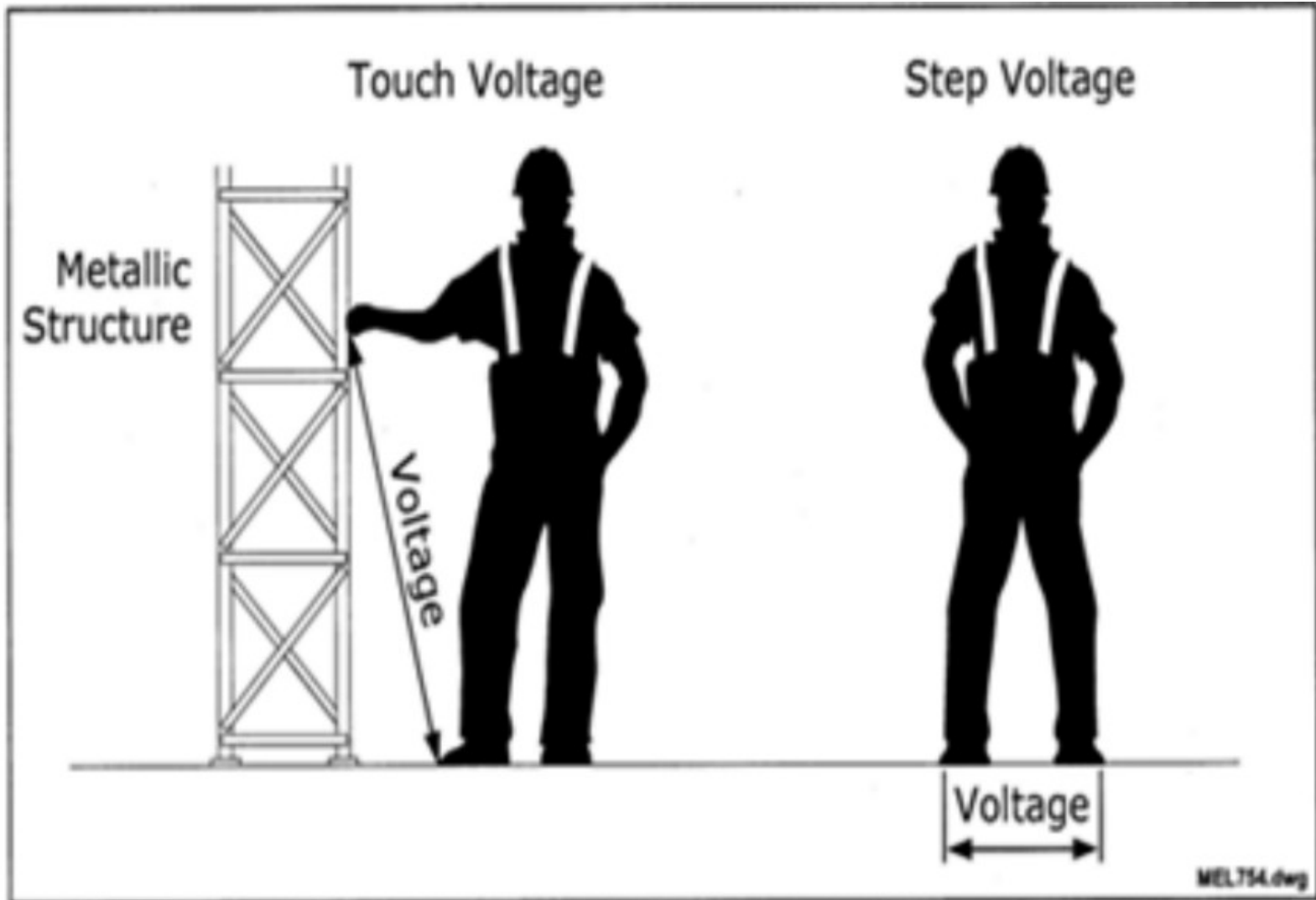


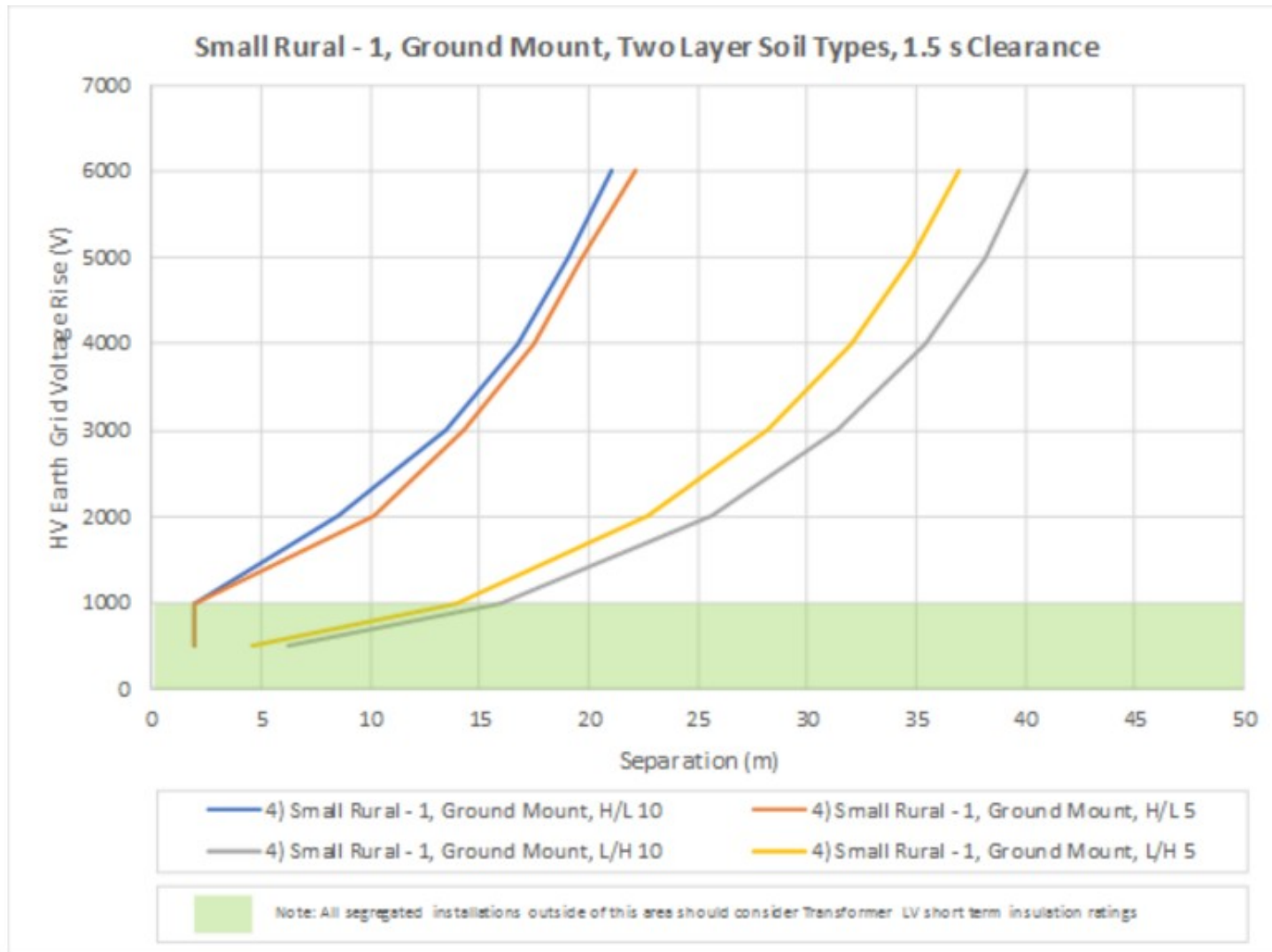


Methodology



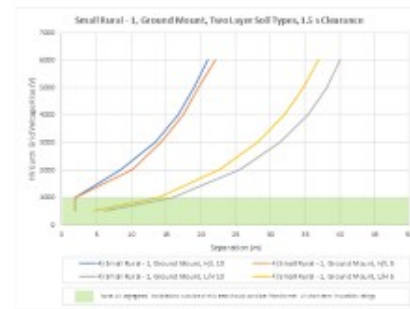
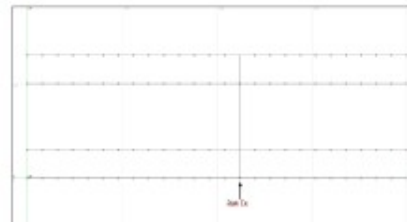
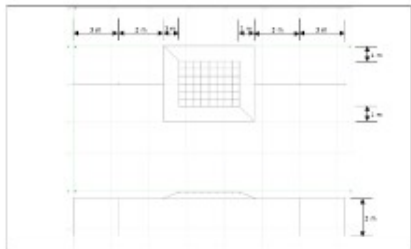
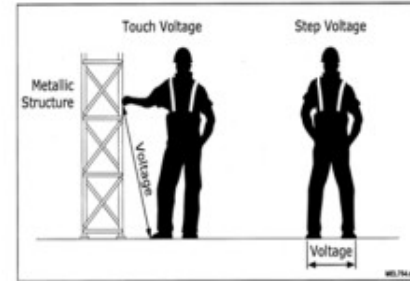
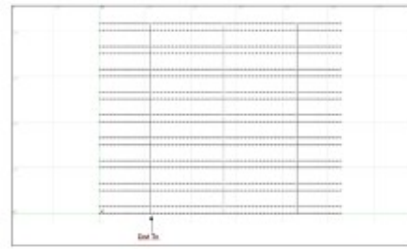
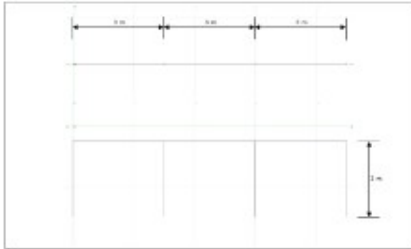








Methodology





Outcomes

No definitive result

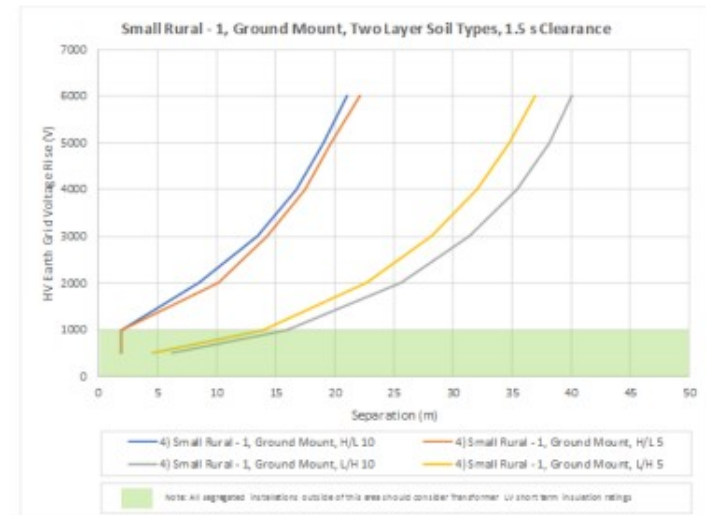
Scenario specific decisions

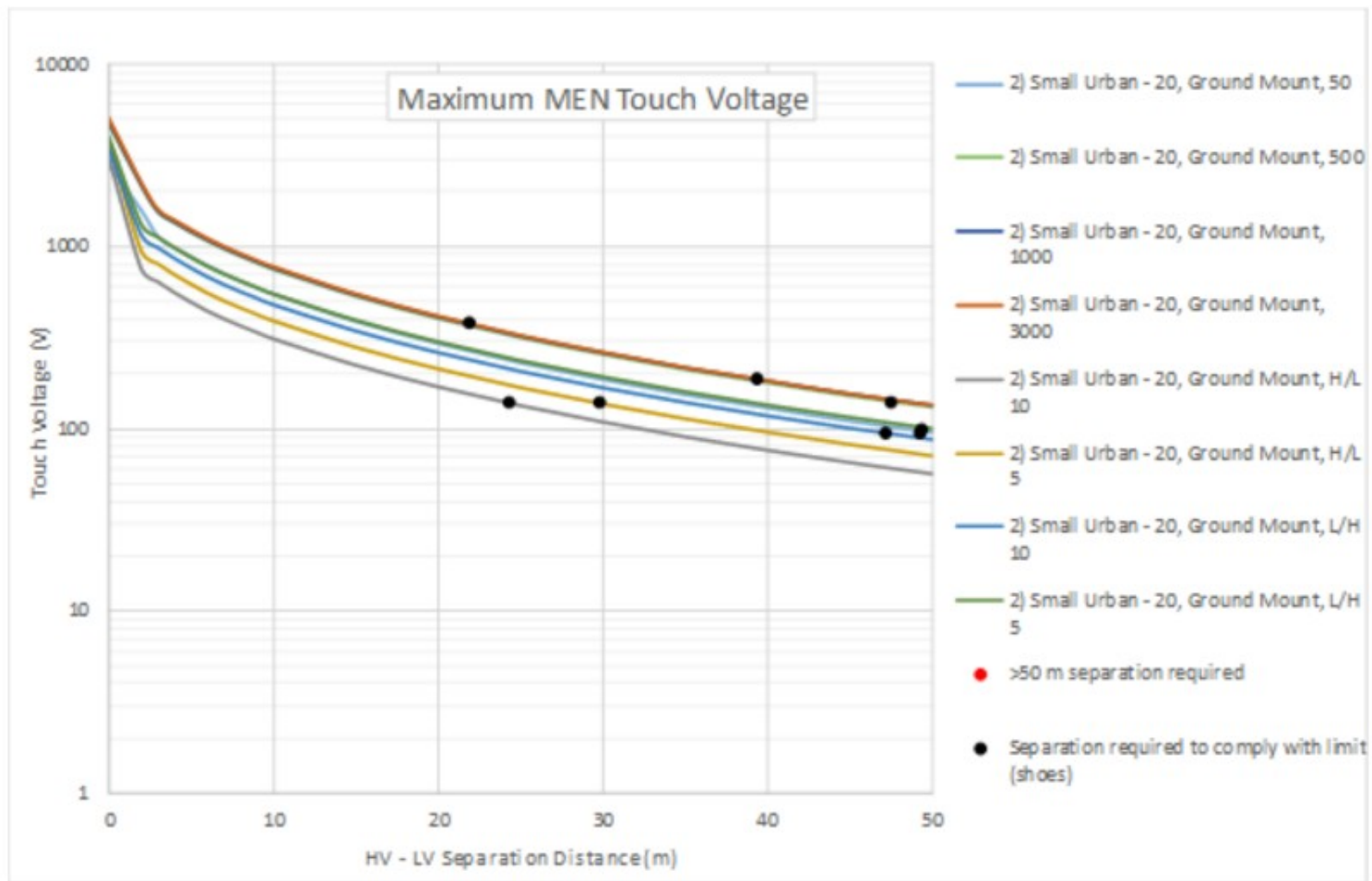
In General:

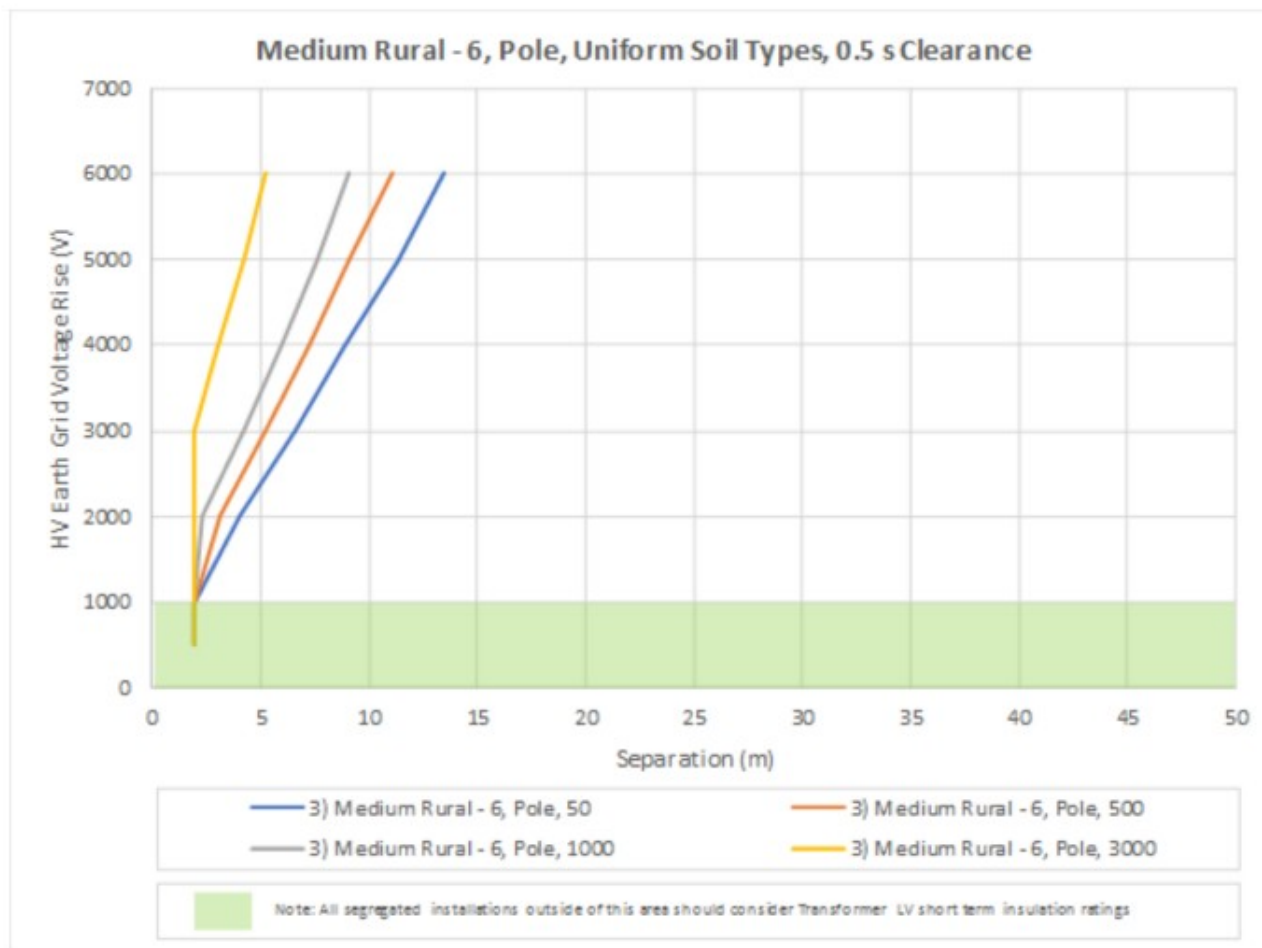
- Small Rural MEN - Segregated
- Urban - Combined

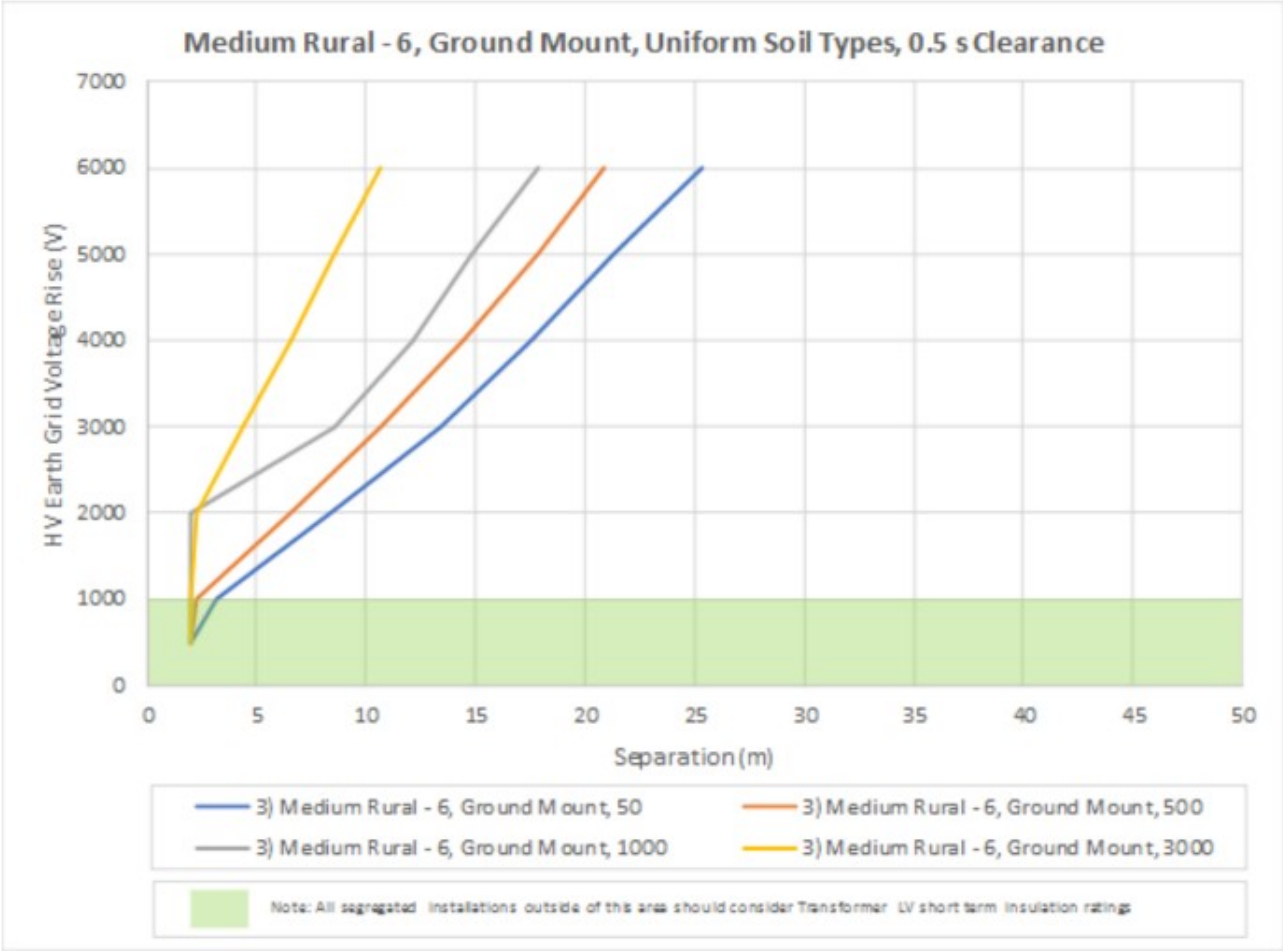
Required separation - 2 m to >50 m

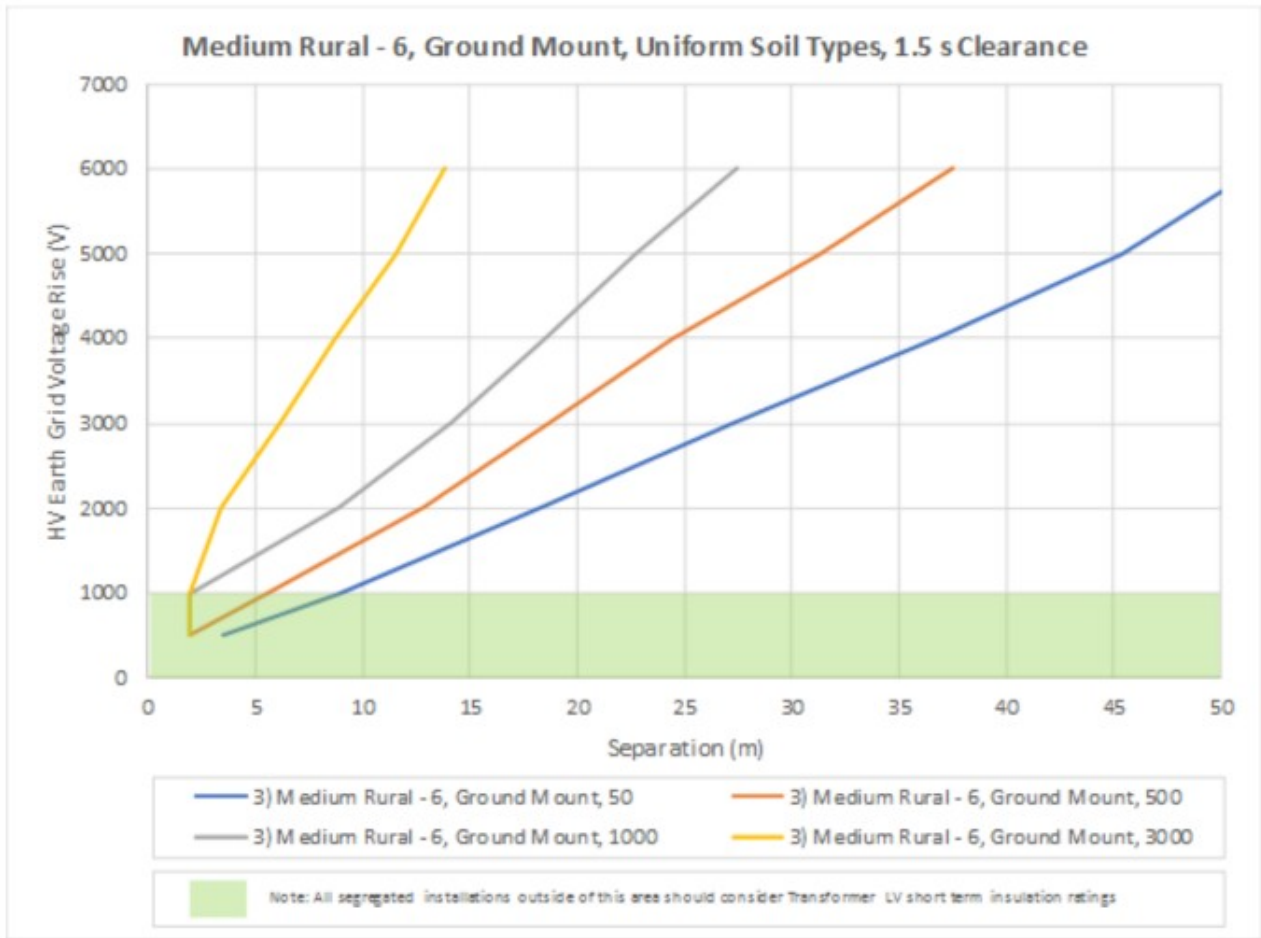
HV Earth - High EGVR

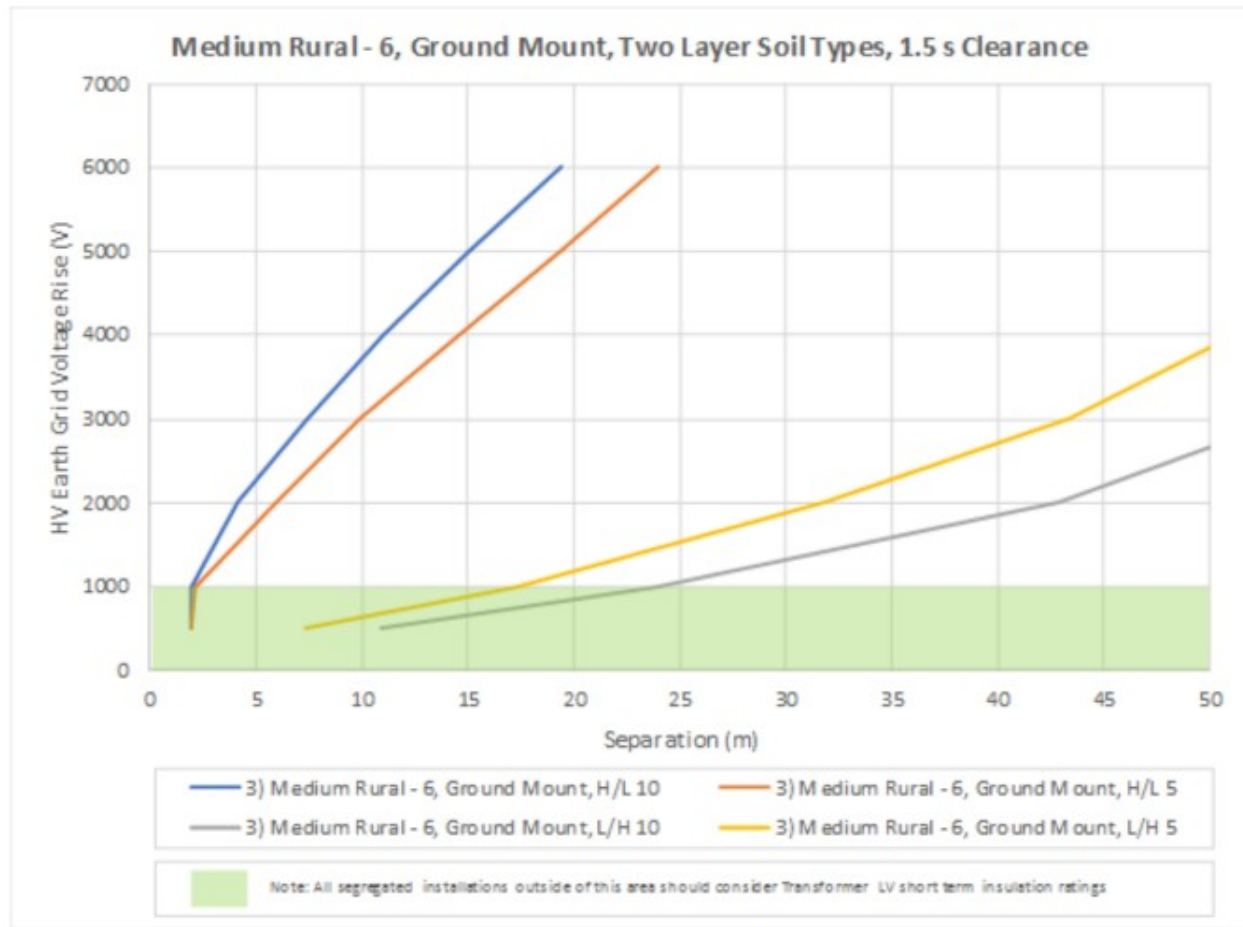














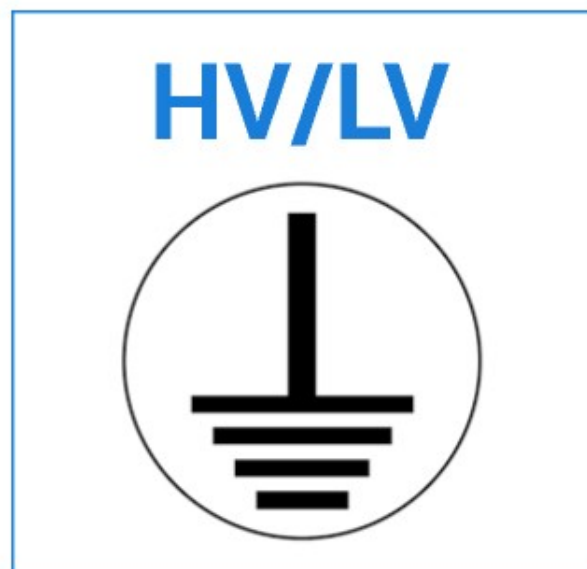
Recommendations and Considerations

1. Extent of HV/LV earthing
2. Transformer LV winding insulation ratings
3. Fault duration
4. Soil resistivity structure
5. HV earthing connections
6. Transformer location
7. Separate conductive items
8. Overhead considerations
9. HV to LV clash
10. Lightning strikes
11. LV Faults on tank
12. Maintenance of separation



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