EMF Layout Design Recommendations Quick Reference Guide

Purpose and Scope

To provide distances, from Electricity infrastructure, at which point it can be expected that magnetic field strength levels will fall below the recommended levels for continuous exposure.

This applies to electrical infrastructure in the Ergon Energy network and relates to extremely low frequency (under 3 kHz), electric and magnetic fields.

Typical Clearances for Overhead and Underground Constructions

These figures define the desirable minimum design clearances from buildings, for which human occupation can be expected for significant periods of time. Other regulatory clearance requirements or design practices will override these values in many cases. The figures are based on maximum generally accepted plant rating practice and in most cases the magnetic field strength levels will be less, however these recommendations will allow for future load growth.

Situations which differ from the standard cases listed below, or have higher than usual loads will require an engineering review and should be submitted for approval to the Ergon Energy contact person, in the case of designs carried out externally, or Ergon Energy Asset Management staff for designs carried out internally. Installations such as, multiple cable installations in a common trench, and Indoor Substations with LV Distribution Boards may come into this category.

Notes:

- Minimum ground clearance of 7m for HV and 5.8m for LV was assumed to be the height of the lowest conductor in overhead constructions.
- For lines, the distances are transversely out from the centreline
- For Padmount transformers, the distances are a radius from the front corner of the enclosure adjacent to the LV switchgear
- The EMF clearance levels are at a height of 1m above ground level
- *No Limit means the maximum magnetic field strength level for a construction does not exceed the limit
- Magnetic fields in the vicinity of pole transformer installations will generally be dominated by fields from the associated overhead mains
- For LV Open Wire the load is assumed to be 315kVA for residential and 500kVA for commercial split in two directions.
- Due to the fact that Delta/Wishbone construction was used in both rural and urban areas in the past, there may still be some of these structures in urban area today, even though the current standard specifies the use of Post Insulator for urban constructions.

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Construction Type	Clearance from Centre Line/Radius (m)	Construction Type	Clearance from Centre Line/Radius (m)
RESIDENTIAL			
Overhead		***Underground***	
11kV Overhead Flat	6.5	11kV Underground	*No Limit
11kV Overhead Trident	*No Limit	22kV Underground	*No Limit
11kv Overhead Delta	6.0	33kV Underground	*No Limit
22kV Overhead Flat	6.5	315kVA Padmount Sub	3.0
22kV Overhead Trident	3.0	240mm Underground LV Cable	*No Limit
22kV Overhead Delta	6.0		
33kV Overhead Flat	6.5		
33kV Overhead Delta	6.0		
33kV Post Insulator	3.0		
LV Open Wire	8.0		
95mm LV ABC	*No Limit		
315kVA Pole Transformer	Refer Note 6		
COMMERCIAL			
Overhead		***Underground***	
11kV Overhead Flat	11.0	11kV Underground	*No Limit
11kV Overhead Trident	6.0	22kV Underground	*No Limit
11kv Overhead Delta	10.5	33kV Underground	*No Limit
22kV Overhead Flat	11.0	315kVA Padmount Sub	4.0
22kV Overhead Trident	7.0	500kVA Padmount Sub	5.0
22kV Overhead Delta	10.5	240mm Underground LV Cable	*No Limit
33kV Overhead Flat	11.0		
33kV Overhead Delta	10.5		
33kV Post Insulator	8.0		
500kVA Pole Transformer	Refer Note 6		
LV Open Wire	16.0		
95mm LV ABC	*No Limit		
SCHOOL			
315 Padmount – School	4.5		
500 Padmount – School	5.5		
1000 Padmount - School	8		
SUB-TRANSMISSION			
66kV Delta/Wishbone (200)	11.5		
66kV Delta/Wishbone (300)	14.5		
66kV Post Insulator (300)	6.5		

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