

Company Directive

ENGINEERING SPECIFICATION EE SPEC : 133

Steel Mast Supports for High Voltage Overhead Lines

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Implementation Date **January 2017**

Approved by



Policy Manager

Date

5 January 2017

All references to Western Power Distribution or WPD must be read as National Grid Electricity Distribution or NGED

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Implementation Plan

Introduction

This specification details WPD's requirements for steel masts to be used at 33kV or above, specifically for the purpose of effecting tee-off connections to lattice tower main lines.

Main Changes

None – new document

Impact of Changes

The use of steel masts for tee off connections has the potential to provide a small-footprint solution which minimizes additional loads on towers.

Implementation Actions

This specification may be used when considering point-of-connection applications.

Implementation Timetable

This specification may be implemented immediately.

| Document Revision & Review Table | | |
|---|-----------------|---------------|
| Date | Comments | Author |
| January 2017 | New Document | Sven Hoffmann |
| | | |

1.0 SCOPE

This specification deals with Western Power Distribution (WPD's) requirements for steel mast supports for use on the overhead line network at 33kV and above.

2.0 GENERAL

Masts shall be tapered, tubular steel and the cross section may be of either circular or regular polygon shape.

Masts may comprise a single length or multiple sections, and shall be designed to attach to a foundation by means of a bolted external flange. Where multiple mast sections are used, these shall utilize slip joints for assembly.

The mast top shall be capped to prevent ingress of rainwater, and ventilation shall be provided to the interior of the mast to avoid the build-up of moisture.

Foundations shall comprise a base section to extend no more than 1500mm above ground level. The base section may be embedded in concrete or make use of an anchor arrangement.

Where stand-off insulators or other fittings are required to be attached to the mast, brackets shall be provided. These brackets shall be welded to the mast. Fixings shall not be made through the wall of the mast.

Masts shall be provided with a suitable attachment point for temporary earths, and where masts comprise multiple sections each joint shall be bridged by an external bond to ensure earth continuity.

The minimum thickness of all plate steel shall be 5mm.

On completion of fabrication, the mast (or the individual sections of the mast) shall be hot dip galvanized to BS EN 1461 in order to provide a service life of not less than 40 years.

3.0 MECHANICAL DESIGN

Masts and their foundations shall be designed on a site specific basis according to the General Approach of BS EN 50341-1 2012 and BS EN 50341-2-9.

All design calculations shall be based on the Ultimate Limit State being the minimum yield stress of the material.

Partial safety factors shall be based on Reliability Level 2 ($\gamma_v = 1.1$) as a minimum.

4.0 COMPONENT SPECIFICATIONS

All components attached to the mast shall comply with the relevant WPD specification. Where a WPD specification is not available, the relevant Energy Networks Association Technical Specification (ENATS) shall be used.

Insulators shall be composite / polymeric.

APPENDIX A

SUPERSEDED DOCUMENTATION

None

APPENDIX B

ASSOCIATED DOCUMENTATION

| | |
|-----------------|--|
| BS EN 50341-1 | Overhead Electrical Lines Exceeding AC 1kV Part 1 General Requirements – Common Specifications. |
| BS EN 50341-2-9 | Overhead Electrical Lines Exceeding AC 1kV Part 2-9 National Normative Aspects (NNA) for Great Britain and Northern Ireland. |
| BS EN 1461 | Hot Dip Galvanised Coatings on Fabricated Iron and Steel Articles – Specifications and Test Methods. |
| EE SPEC 54 | Polymeric Insulators for use on 132kV Overhead Lines |
| EE SPEC 59/1 | Specification for Composite Insulators |

APPENDIX C

KEY WORDS

Steel, Masts