Ergon Energy Corporation Limited

Specification for Transport and Erection of Tower Structures

This material is made available on the basis that it may be necessary for a Registered Professional Engineer of Queensland (RPEQ) to undertake or oversee the engineering services to meet statutory obligations.

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Ergon Energy Queensland Pty Ltd ABN 11 121 177 802

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1. Purpose and Scope

This section covers the field assembly and erection of lattice steel tower structures. All costs related to this section shall be deemed to be included in the Schedule of Rates for Structure Erection.

2. References

SWMS005 : Working at Heights - Substations, Structures and Towers

3. Definitions, Acronyms, and Abbreviations

Nil

4. Security

Nil

5. Safety, Environmental and Ergonomic Considerations

As per Ergon Energy's Safety, Environmental & Ergonomic Policies.

6. Handling, Transport and Storage

The Contractor shall ensure that materials supplied by him do not suffer damage or deterioration during handling, transport and storage. Steel shall be stacked clear of the ground and the surrounding area cleared of all grass and other combustible matter to prevent damage by fires. Tower members shall be kept clean and free of rust or foreign matter.

7. Tower Erection

The Contractor shall erect all towers complete with step bolts, ladders, platforms, anti-climbing devices, number plates, identification plates, warning plates and other fixtures.

Towers shall be stayed or braced sufficiently to ensure safe erection and to ensure tower security against wind or other loads until erection of each tower is complete. Adequate precautions shall be taken to ensure that no parts of the tower are strained or damaged during erection. Drifting of bolt holes shall be minimised and carried out so as not to damage galvanising.

Where structures are being erected within fifty metres of an existing high voltage line, all equipment associated with the lifting or support of structural steel elements or sub-assemblies shall be provided with a connection to earth. The lifting and support equipment shall also provide a metallic conducting path from the structural element or sub-assembly to this earth connection.

Immediately before erection, all members shall be checked for straightness and any member deviating from the straight by more than 1 in 500 shall be replaced. Ladders and step bolts within 4.5 m of ground level shall be permitted only whilst erection is in progress.

The towers shall be erected so that before and after all the conductors have been installed, the true deviation from the vertical at the top of the tower shall not exceed 1/200th part of the height of the tower. Before and after all the conductors have been installed, the torsional deflection of strain

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towers measured at the extremity of the crossarm shall not exceed1/200th part of the distance measured from the centre line of the tower to the crossarm tip.

8. Tightening of Bolts

The Superintendent reserves the right to demand of the Contractor the use of torsion wrenches for the purpose of tightening all nuts, but this will not be exercised if the Contractor satisfies the Superintendent that he can correctly tighten the nuts without the use of such wrenches to an effective torque of at least 30 Nm for 16 mm diameter bolts and 60 Nm for 20 mm and 24 mm diameter bolts.

Where 12 mm bolts are used, care shall be taken to limit tightening torque to 15 Nm.

All bolts shall be fitted with galvanised heavy duty spring washers and nuts.

Bolts in tension shall be also fitted with lock nuts or stainless steel split pins.

9. Repair of Damaged Galvanising

After erection all towers shall be cleaned of all foreign matter, surplus paint and inked temporary markings.

Special care shall be taken not to injure the skin of galvanising or specially treated surfaces during erection. Care shall be taken to remove any rust streaks or foreign matter deposited on galvanised surfaces during storage, transport or after erection.

Minor damage, minor field revisions, and minor defects to galvanising may be repaired at site, subject to the approval of the Superintendent, by the application of at least two coats of approved quality zinc rich paint to rust free steel. Damaged areas in excess of 100 mm^2 shall be regalvanised.

10. Groundline Protection

Where nominated tower legs shall have an approved corrosion protect applied from the top of the concrete foundation to a one metre above concrete.

11. Loose Steelwork

Care shall be taken to ensure that all metal planking is adequately fixed in place to prevent vibration or noise problems.

12. Anti-climbing Devices

Anti-climbing devices in accordance with the Drawings shall be attached to all legs of each tower in a position to inhibit access.

13. Number and Tower Identification Plates and Warning Signs

13.1 Ground Visible Plates

Number and Tower Identification Plates shall be supplied by the Contractor and shall be installed by the Contractor on one face of each tower.

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The cost of supply and installation of this item, including transport to site, shall be included in the Schedule of Rates for Structure Erection.

13.2 Aerial Identification Plates

Aerial number plates shall be supplied ex store by the Contractor and shall be installed by the contractor on the earthwire peak of every tenth tower.

The cost of supply and installation of this item, including transport to site and supply of the fittings, shall be included in the Schedule of Rates for Structure Erection.

13.3 Circuit Identification Plates

Circuit Identification Plates will be supplied by the Contractor and shall be installed by the Contractor to mark each circuit on every tower. The cost of supply and installation of this item, including transport to site and the supply of the fittings, shall be included in the Schedule of Rates for Structure Erection.

13.4 Warning Signs

Metal-backed warning signs will be supplied by the Contractor and shall be installed on one face of every tower as directed by the Superintendent. Tower Leg warning signs will also be supplied by the Contractor and shall be installed by the Contractor on one face of each leg of every tower.

The cost of installation of these items, including transport to site and supply of the fittings, shall be included in the Schedule of Rates for Structure Erection.

14. Leg Extensions

The Superintendent may require the use of -1 m, +1 m, -2 m or +2 m leg extensions on any tower height. The cost of erection of these leg variations shall be included in the Schedule of Rates for each tower type and height.

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