



Ergon Energy Corporation Limited

Technical Specification for Power Installed Screw Anchors

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1. Purpose and Scope

This specification sets out the technical requirements for the manufacture, testing at works, supply and delivery of power installed screw anchors for use on overhead electricity distribution systems in a totally exposed environment.

The items covered by the specification are listed below:

ITEM NUMBER	STOCK CODE NUMBER	DESCRIPTION
1	1766621	Screw anchor Single Helix Hexagonal 200mm
2	1766613	Screw anchor Single Helix Hexagonal 250mm
3	2404443	Screw anchor Single Helix Hexagonal 300mm
4	1766609	Screw anchor Double Helix Hexagonal 100mm
5	1766605	Screw anchor Double Helix Hexagonal 250mm
6	1766591	Screw anchor Double Helix Hexagonal 300mm

2. References

2.1 Applicable Standards

Anchors shall be manufactured and tested in accordance with the relevant parts of the following Standards and all amendments issued from time to time except where varied by this specification.

STANDARD	TITLE
AS 1554	Structural steel welding
AS/NZS 3678	Structural steel - Hot-rolled plates, floor plates and slabs
AS/NZS	3679- Structural steel - Hot-rolled bars and sections

3. Drawings

3.1 Drawings by the Purchaser

There are no drawings attached to this specification.

3.2 Drawings by the Tenderer

The Tenderer shall supply with the tender, detailed drawings or pamphlets of the items tendered.

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4. Service Conditions

The exposed parts of the screw anchor supplied under this specification will be subject to the following service conditions:

Solar radiation intensity of 1000W/m ² .
Tropical summer storms with gust wind speeds above 160km/h and an annual rainfall in excess of 1 500mm.
Temperatures between -5 ⁰ C(winter night time)and 45 ⁰ C(summer day time)
Extended periods of humidity in excess of 90%
Areas of coastal salt spray and/or industrial pollution with equivalent salt deposits densities in the range of 2.0 - 3.0g/m ² .

Below ground parts of the screw anchor will be exposed to a range of soil types, including (but not limited to) the following:

- Marine mud
- Clay - soft and compacted
- Granite and gravel;
- Rock, shale and sandstone;
- Sand and Alluvial sediments

Across these ground conditions, the moisture content and the corrosive properties of the soils vary markedly.

5. Design and Construction

5.1 Screw Anchors

Screw anchors shall have an installation torque rating of 8.1kN.m (6000 ft.Lbs) and be suitable for installation with a 2.13m (7 ft) long Kelly Bar to suit a 35mm square hub/shaft driven by a Pendulum Borer. The 35mm square hub/shaft of the anchor shall have an M24 threaded hole to enable the attachment of an M24 stay rod.

Screw anchors shall be designed and manufactured to withstand the following loads when tested in accordance with the tests specified in clause 7 below.

Screw Anchor Type	Minimum Torsional Failing Load (kN-m)
Screw anchor single helix 200mm	8.4
Screw anchor single helix 250mm	8.4
Screw anchor single helix 300mm	8.4
Screw anchor double helix 100 mm	8.4
Screw anchor double helix 250mm	8.4
Screw anchor double helix 300mm	8.4

Both cast steel and fabricated type anchors are acceptable. Anchors shall be provided with a sloped lead point. The profile of the anchor helix shall be designed to assist in penetrating rocky soils and to reduce damage during installation. Anchors shall not contain sharp edges that may cause injury to personnel.

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The anchors shall be painted with an anti corrosive paint.

6. Technical Details

Technical details of the screw anchors tendered are to be set out in **Attachment 1**. The technical details should also include charts showing the predicted anchor holding capacity/installing torques under different soil classifications.

7. Performance and Testing

7.1 Testing

The screw anchors shall be tested as follows:

7.2 Torque Test

- a) The screw anchor shall be mounted on a test rig such that the hub is rigidly locked preventing rotation. Helix is then subjected to a rotating force evenly applied along the leading edge. Commence with an initial torque of 3.0kNm, mark the anchor so that any permanent deformation could be measured. Increase the torque to 6kNm and hold it for 1 minute and then reduce it to 3kNm and measure the permanent set. The maximum deflection should be 3 degrees.
- b) Then increase the torque in steps of 0.5 kNm, measure and record the deflection until failure of the shaft occurs. Record the results.
- c) A minimum of three samples each shall be subjected to the above test. The results of the tests shall be included in the tender documentation.

8. Risk Assessment

There is no requirement for manufacturer provided safety risk assessments for the items covered in this specification.

9. Quality Assurance

9.1 Purchasers Policy

It is the Purchaser's policy to procure materials from sources that demonstrate the ability to supply quality products.

9.2 Documentary Evidence

Documentary evidence shall be provided concerning the level of quality system certification associated with the supplier and /or the manufacturer. This documentation shall include the Capability Statement associated with the Quality System Certification.

9.3 Quality Certification Program

Tenderers shall provide details of their program to upgrade their Quality Certification to meet the requirements of ISO 9001.

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10. Samples

10.1 Production Samples

The Tenderer must submit, when requested, one (1) production sample of each item tendered to assist in the evaluation of the Tender. Samples shall be delivered to the address nominated within five (5) working days of the request. The Tenderer shall allow the cost of supply and delivery of samples in the Tendered prices.

Each sample shall be suitably packaged and labelled with the following information:

Name of Supplier and this Contract No.
Contract Item Numbers
Any supporting data on features or characteristics

11. Packaging and Marking

11.1 General

Each packaged lot shall be marked with the following information:

Manufacturers Name
Purchase Order Number
Contract No.
Ergon Stock Code
Item Description
Pack Size
Pack Weight

12. Service Performance

Suppliers shall state:

- (a) the period of service achieved by the items tendered within Australian service conditions;
- (b) Australian electricity supply authorities who have a service history of the items tendered; AND
- (c) Contact names and phone numbers of relevant employees of those supply authorities who can verify the service performance claimed.

13. Reliability

13.1 Service Life

Suppliers are required to comment on the reliability of the equipment and the performance of the materials tendered for a service life of 35 years under the specified system and environmental conditions.

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13.2 Evidence in Support of Reliability

Such comments shall include evidence in support of the reliability and performance claimed including information on Failure Mode and Effect Analysis.

14. Training

14.1 Training Material

Training material in the form of drawings, instructions and/or audio visuals (in CD format) are required to be provided for the items accepted under the tender. The Tenderers shall allow the cost of production and delivery of training material in the tendered prices.

The training materials should include but not be limited to the following topics:

- Handling
- Storage
- Application (particularly in areas of heavy coastal pollution)
- Installation
- Maintenance
- Environmental performance
- Electrical performance
- Mechanical performance
- Disposal

14.2 Training Audio Visuals

The successful Tenderer is required to provide training audio visuals for the Purchaser's staff/contractors in the correct use of all items to be supplied under the contract. Training audio visuals are to be supplied BEFORE the 1st deliveries are made under the contract.

The format and content of the audio visuals will be subject to negotiation between the Purchaser and the successful tenderer concerned. It is expected that as a minimum, the audio visuals will detail the correct installation practice for all items covered by the contract. The number of audio visuals required, in CD format, is thirty (30). Permission shall be given to the Purchaser to make additional copies if required.

In the production of the audio visuals, the Purchaser will make available suitable staff and equipment to demonstrate the recommended installation techniques.

15. Environmental Considerations

Suppliers are required to comment on the environmental soundness of the design and the materials used in the manufacture of the items Tendered. In particular, comments should address such issues as recycling and disposal at the end of service life.

16. Information to be Provided

16.1 Specific Technical Requirements

The specific technical requirements for the items Tendered shall be as stated in **Attachment 1** of this specification. The supplier shall provide all details requested by **Attachment 1** and shall guarantee such data.

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16.2 Checklist of Supporting Documentation

Attachment 2 details a checklist of supporting technical documentation which is required to be submitted with the Tender.

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17. Attachment 1 – Technical Details

NOTE: A separate schedule is to be provided for each item tendered except where information common to all items which only needs to be provided once.

Particulars	Units	Tenderer's Response
Manufacturer's Name & Address		
Place of Manufacture		
Manufacturer's Product Catalogue Number		
Manufacturer's Drawing Number		
Type Test Report/Certificate No.		
Anchor Diameter	(mm)	
Single or Twin Helix		
Anchor Installation Torque Rating	(kN.m)/(ft.lbs)	
Charts for installation torque/holding capacity.		To be included in tender
Anchor Hub/Shaft size	(mm)/(in)	
Are the anchors painted with anti corrosive paint. (yes/no)		
Pack Size		
Pack Weight	(kg)	

SIGNATURE OF TENDERER: _____

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18. Attachment 2 – Technical Document Checklist

Clause Ref.	Particulars	Tenderer's Response
Have full and comprehensive details been submitted WITH the Tender documents associated with each of the following items?		
3.2	Drawings of item Tendered	Yes/No
5.1	Installation torque/holding capacity charts	Yes/No
7	Type Test Certificate	Yes/No
8.2	Documentary evidence of the Quality System Certification of BOTH the SUPPLIER and the MANUFACTURER (including Capability Statement)	Yes/No
8.3	Program to upgrade Quality Certification to meet the requirements of AS 9001	Yes/No
12	Service Performance	Yes/No
13	Reliability	Yes/No
14	Training materials	Yes/No
15	Environmental considerations	Yes/No
16	Information to be Provided: Completed Attachment 1 & 2	Yes/No

NAME OF TENDERER:

ADDRESS OF TENDERER: _____

SIGNATURE: _____ FOR AND ON BEHALF OF TENDERER

DATE: _____