



**Ergon Energy Corporation Limited**

**Specification for Engagement of  
External Distribution Line Design  
Resource**

# Specification for Engagement of External Distribution Line Design Resource



## Contents

<b>1. Purpose and Scope</b>	<b>1</b>
<b>2. References</b>	<b>1</b>
2.1 Ergon Energy controlled documents	1
2.2 Other sources	1
<b>3. Definitions, Acronyms, and Abbreviations</b>	<b>2</b>
3.1 Definitions	2
3.2 Acronyms and Abbreviations	2
<b>4. Security</b>	<b>2</b>
<b>5. Safety, Environmental and Ergonomic Considerations</b>	<b>2</b>
5.1 General Work Health and Safety and Electrical Safety Requirements	2
5.2 Safety Management Plan	2
<b>6. Acts Regulations and Requirements</b>	<b>2</b>
<b>7. Extent of Work</b>	<b>3</b>
7.1 Standard Inclusions	3
7.2 Standard Exclusions	4
7.3 Applicable Standards	4
7.4 Deliverables	5
7.5 Site Preparation	5
7.6 Design Faults Identified During Construction	6
7.7 Defect Liability	6
<b>8. Facilities and Equipment</b>	<b>6</b>
8.1 All equipment shall be properly maintained and tested at the required intervals.	6
8.2 It is expected that Ergon Energy would provide, as required:	6
<b>9. Competencies</b>	<b>7</b>
<b>10. Safety Requirements</b>	<b>7</b>
<b>11. Environmental and Cultural Heritage Requirements</b>	<b>8</b>
<b>12. Ergon Energy Interaction</b>	<b>8</b>
12.1 Request for Quotation	8
12.2 Submission of Quotation	8
12.3 Design Progress	8

# Specification for Engagement of External Distribution Line Design Resource



## 1. Purpose and Scope

This specification details Ergon Energy's requirements for the engagement of external Distribution Line Design Resource to assist regional design teams complete their works delivery program on schedule.

This standard applies to the design and the preparation of a construction plan for extensions to Ergon Energy's network for the following:

- All overhead network up to and including 33kV
- All underground network up to and including 22kV
- All public lighting designs for a lighting layout

All engagements of external Design Resource will be from Ergon Energy's Preferred Contractor Panel (PCP100).

## 2. References

### 2.1 Ergon Energy controlled documents

- Underground Construction Manual
- Overhead Construction Manual
- Queensland Public Lighting Construction Manual
- Distribution Design Manual
- Working on Roadway Manual
- Tunnel Boring Specification - [RSC09](#).
- Standard Specification Clearing and Access Works for Overhead Powerlines - [RSC04](#).
- Standard Distribution OH Conductors and UG Cables - [RSC11](#)
- Power Coordination Guidelines Agreement between Ergon Energy and Telstra
- Network Lines Standards Guidelines for Adoption of CMEN Earthing Systems
- Network Lines Standards Distribution Line Layout Example
- Main Specification for Commercial Industrial Civil Works - [RSC12](#).
- Indoor Distribution Substation Design Standard [CI001001R100](#).
- Guidelines Use Pegs for Line Survey
- Guidelines for Overhead Line Design
- External Design Resource Checklist
- EMF Layout Design Recommendations
- Distribution System Earthing Guidelines
- Distribution Design Drafting Standard - [RSD04](#).
- Native Title Notification Request Form
- Identify Native Title Impacts on Works (Reference)
- UDC Civil Works Specification - [RSC07](#). (Located in "Developers' toolkit")
- [Workplace Health and Safety and Electrical Safety Conditions Guideline - MP000903R110](#).

### 2.2 Other sources

- Electricity Act 1994
- Electricity Regulation 2006
- Electricity Safety Act 2002
- Electricity Safety Regulation 2002
- AS/NZS 1158 for Lighting Designs

# Specification for Engagement of External Distribution Line Design Resource

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## 3. Definitions, Acronyms, and Abbreviations

### 3.1 Definitions

**3.1.1 Contract Supervisor:** The nominated Ergon Energy Officer responsible for administering the contract, acting as the point of contact for all enquiries and correspondence

**3.1.2 LVDrop:** Software package for modelling LV networks

### 3.2 Acronyms and Abbreviations

**3.2.1 CAD** Computer Aided Drafting

**3.2.2 EPIRB** Emergency Position Indicating Radio Beacon

**3.2.3 EPW** Environmental Planning for Work

**3.2.4 GIS** Geographic Information System

**3.2.5 PCP** Preferred Contractor Panel

**3.2.6 PPE** Personal Protective Equipment

**3.2.7 RPEQ** Registered Professional Engineer of Queensland

**3.2.8 SMP** Safety Management Plan

**3.2.9 SWER** Single Wire Earth Return

## 4. Security

Nil

## 5. Safety, Environmental and Ergonomic Considerations

### 5.1 General Work Health and Safety and Electrical Safety Requirements

The Contractor must comply with Ergon Energy's 'Workplace Health and Safety and Electrical Safety Conditions' document [MP000903R110](#).

### 5.2 Safety Management Plan

The Contractor must develop and maintain a SMP for the duration of the contract.

## 6. Acts Regulations and Requirements

All work shall be carried out in accordance with all relevant legislation.

# Specification for Engagement of External Distribution Line Design Resource



## 7. Extent of Work

### 7.1 Standard Inclusions

- 7.1.1 Site visit(s) to record details of existing network and site topography
- 7.1.2 Reporting any significant defects observed on the Ergon Energy network or consumer installations recording the site identifier, address, description of defect and photograph
- 7.1.3 Reporting any significant discrepancies observed between Ergon Energy data records and actual site detail
- 7.1.4 Making arrangements for any necessary survey work to establish boundaries, high water levels, precise positions in remote areas etc. (actual survey work shall be an optional inclusion in the Contractor's tender)
- 7.1.5 Final Line route selection.
- 7.1.6 Preparing design drawing/s ('Construction Plans') as per RSD04, nominating suitable standard types and positions of equipment, structures, streetlights, conductors and cables
- 7.1.7 RPEQ (Registered Professional Engineer of Queensland) certification for all designs
- 7.1.8 Preparation of suitable & accurate line profiles
- 7.1.9 Calculating pole tip loads and other structural checks using the latest versions Ergon Energy Overhead Line Design Programs
- 7.1.10 Performing basic electrical calculations — load assessments, current checks, voltage drop checks (advanced studies shall be an optional inclusion)
- 7.1.11 Preparation of spacing tables or isolux contours for lighting designs
- 7.1.12 Performing underground services checks by obtaining 'Dial Before You Dig' or similar information and observing surface indications of underground services
- 7.1.13 Preparation of bill of quantities, i.e. materials/ labour/ equipment resource estimate listing in a format agreed by Ergon Energy
- 7.1.14 Basic liaison with property owners/ occupiers affected by works, including negotiating and obtaining wayleaves, easements or substation/metering locations. **It shall be noted that no financial or personal customer issues to be discussed with any person other than the applicant or his approved liaison person. This includes advice to neighbours or kin. All inquiries are to be directed to Ergon Energy's customer service, ph 131046"**
- 7.1.15 Basic liaison with Subject Matter Experts, e.g. Ergon Energy Environmental Officers, environmental or cultural heritage consultants, planners, substation or communications system designers
- 7.1.16 Consideration of operational issues associated with outages, switching or provision of generators
- 7.1.17 Obtaining statutory authority approvals, negotiating any special alignments where necessary
- 7.1.18 General design advice concerning the project to constructors and assistance with resolution of construction issues
- 7.1.19 Prepare a project specific main specification using Ergon Energy's standard templates. The main specification may only be prepared when the necessary approvals and permits have been suitably progressed. The invitation to quote will be sent to suitable Contractors or Land Owners. The return name and address will be the Ergon Energy Contract Supervisor. Refer to clause 7.5
- 7.1.20 Amending plans based upon comments received from statutory authorities, Ergon Energy, land owners or other stakeholders (allowance for minor changes as required and one major round of changes as required)
- 7.1.21 Completing standard Ergon Energy forms associated with the project, including checklists
- 7.1.22 Obtaining operational numbers from the Contract Supervisor

# Specification for Engagement of External Distribution Line Design Resource



- 7.1.23 Maintaining readily accessible records of all key correspondence, meetings and conversations, risk assessments, design calculations, design rationale, conduit plans and construction plans (all issues/revisions)
- 7.1.24 Line route including all Stations to be pegged for clear identification to the Construction Crews, as per “PW000702R103 – Guidelines for pegs used by distribution designers”
- 7.1.25 Designer to confirm with the customer the acceptance/agreement of any required easements as detailed within the initial offer letter sent to the customer.
- 7.1.26 Outage Management issues relating to Ergon Energy Projects are to be given due consideration after discussions with the local WGL (Work Group Leader) or the local T.O. (Technical Officer) in that work area. Where necessary your design should reflect any of these outage management issues.

## 7.2 Standard Exclusions

The following items would generally be excluded from the scope of the Contractor's work, but *may be offered by the Contractor, subsequent to the Contract Supervisor's approval*:

- 7.2.1 Detailed surveying of site by qualified surveyors for the purpose of establishing property boundaries or pegging offsets from these, high water levels, positions in remote areas etc.
- 7.2.2 Providing detailed specialist advice on matters such as environment, tree clearing, cultural heritage, pole inspection, condition of wooden crossarms, location of pipes/ cables by potholing or using electronic cable locators or ground-penetrating radar, substation circuitry design, ground conditions pertaining to foundation design or earth resistivity beyond visual inspection of surface, complex metering or communications equipment
- 7.2.3 Payment of any fees for specialist advisors
- 7.2.4 Payment of any fees to statutory bodies for approvals
- 7.2.5 Protracted negotiations with landowners or statutory bodies to obtain approvals where approvals have not been forthcoming within 28 days of request — where encountered these should be referred to the Contract Supervisor in order to seek a variation to Contract price and timing
- 7.2.6 Construction supervision or providing extensive guidance to constructors
- 7.2.7 Reinstatement of pegs that have been disturbed, or multiple trips to site for pegging/marking where the removal of pegs was not the “fault” of the Contractor
- 7.2.8 Obtaining cadastral information or Ergon Energy network details from the Ergon Energy computer system *Smallworld* GIS facility—normally these will be provided by the Contract Supervisor
- 7.2.9 Preparing or entering a design into the Ergon Energy computer system *Smallworld* GIS facility
- 7.2.10 Entering resource estimates (bills of quantity) into the Ergon Energy computer system
- 7.2.11 Performing planning studies, load flow simulations, fault studies, protection coordination calculations, motor starting calculations, harmonic studies, earthing network design.

## 7.3 Applicable Standards

Design work shall be carried out in accordance with:

- 7.3.1 Sound engineering principles and practices
- 7.3.2 Applicable codes and standards
- 7.3.3 Relevant Ergon Energy manuals and guidelines

A number of these standards are listed in the ‘References’ section of this document. Refer also to Ergon Energy Website for the latest versions. ([www.ergon.com.au](http://www.ergon.com.au))

# Specification for Engagement of External Distribution Line Design Resource



The design shall provide an economic, safe and reliable solution to the supply problem and be practical to construct, operate and maintain. It shall make sensible, but not excessive, provision for future development at the site utilising requirements of the Distribution Design Manual where provided.

The design shall be undertaken in an organised, timely fashion, requesting any necessary information and obtaining critical approvals early in the process wherever possible to expedite completion.

## 7.4 Deliverables

Contractors shall supply Ergon Energy with the following as applicable:

- 7.4.1 Weekly/fortnightly progress reports which detail start and finish dates or the reason why the design may be delayed. Wayleave Agreements are to be in place before any detailed design work, including line profiles, is completed.
- 7.4.2 Data maintenance will be provided on a marked up site sketch – one (1) copy. This is required immediately after site visit has been completed – Ergon Energy will supply new DXF export from Smallworld upon completion of design maintenance in Smallworld
- 7.4.3 Conduit Plan - one (1) electronic copy (as required)
- 7.4.4 Construction Plan – one (1) electronic copy of preliminary design
- 7.4.5 Construction Plan - one (1) electronic copy and one (1) paper copy of final design, with original RPEQ signature (when required)
- 7.4.6 Resource Estimate/ Bill of Quantities spreadsheet or list in the required format
- 7.4.7 Line profiles plans detailing long section in an accurate format that reflects the onsite conditions and terrain
- 7.4.8 Copies of relevant design calculations, e.g. voltage drop, isolux contour plots, spacing tables.
- 7.4.9 Copies of 3<sup>rd</sup> party approvals from statutory authorities and land owners, including wayleaves/easements
- 7.4.10 Copies of any key correspondence with external parties including email correspondence
- 7.4.11 Copies of underground services checks results, e.g. 'Dial Before You Dig' records from various authorities
- 7.4.12 Completed Ergon Energy External Design Resource Checklist (PW000801F101) and associated forms
- 7.4.13 SME reports for environment; cultural heritage; and other
- 7.4.14 Site-specific risk assessments
- 7.4.15 Pegging/ marking of positions shall be carried out by the Contractor
- 7.4.16 **Present an industry compliant design that satisfies all legal requirements, and is achievable and buildable. It will be assumed all contract deliverables and work instructions have been incorporated into the final design.**

**NB.** Electronic sources of Construction Plan (*pdf* and *dgn/ dxf/ dwg*) to be forwarded on CD-ROM (or by e-mail if size permits)

## 7.5 Site Preparation

The main specification establishes Ergon Energy's site preparation requirements for a project from invitation to quote through to auditing and acceptance of site preparation work undertaken by

# Specification for Engagement of External Distribution Line Design Resource



Contractors or Land Owners. Information unique to each project must be advised via a 'Main Specification' and/ or drawing as appropriate.

The main specification is accompanied by an Ergon Energy Standard Specification (either RSC04; RSC07; RSC09 or RSC12) and forms part of the invitation to quote.

## 7.6 Design Faults Identified During Construction

Should Ergon Energy incur additional costs during the construction of the network assets, because of faults not detected during the final audit of the electrical system design, the Contractor is liable for such additional costs.

Note - for all overhead designs where final audits are not done, it is the responsibility of the design contractor to ensure the line is pegged as an accurate replica of the approved plan. Minor onsite approved adjustments are acceptable.

## 7.7 Defect Liability

The defects liability period for externally provided design is 12 months from Ergon Energy's acceptance audit of the electrical system design or until the designed network assets are tested and commissioned.

Unless specifically directed otherwise in writing by Ergon Energy faults found during the defects liability period shall be rectified by Ergon Energy and all costs shall be recovered from the Contractor. Ergon Energy may at its discretion undertake such works at overtime rates. Should Ergon Energy direct the Contractor to undertake rectification of defects such rectification shall be undertaken at a time and in a manner directed by the Contract Supervisor at no cost to Ergon Energy.

A Representative from each engaged Design Contractor must attend all Designer deployments which are held quarterly.

## 8. Facilities and Equipment

The Design Contractor shall provide the following facilities and equipment, as applicable:

- (a) PPE to be of a standard not less than that used by Ergon Energy. Refer clause 5.1
- (b) Suitable vehicle for accessing site, with current registration and in good working order
- (c) Appropriate survey instruments to deliver required Standards of Accuracy (refer RSD04 – Specification for Distribution Line Design Drafting Standard)
- (d) Traffic control equipment, roadway warning signs, barricades, flashing light on vehicle
- (e) Next G Network mobile telephone system (Regional Areas)
- (f) Office, computer, facsimile/email facilities, plotter, printer, filing system
- (g) Copies of relevant codes, standards and manuals
- (h) Software—CAD, LVDROP, line profiling, tip load calculations, Microsoft Excel spreadsheet, word processing, Adobe Acrobat Reader.

### 8.1 All equipment shall be properly maintained and tested at the required intervals.

### 8.2 It is expected that Ergon Energy would provide, as required:

- Magnetic vehicle signs/ decals 'Ergon Contractor'
- Background information such as planning reports, sketches, maps, correspondence, contact information to fully brief the Design Contractor



# Specification for Engagement of External Distribution Line Design Resource



- Digital cadastre and Ergon Energy network information in vicinity of site in electronic format
- Contractor identity cards where access to private property is required
- Copies of Ergon Energy manuals and standards on CD-ROM
- Templates for any forms to be completed
- Desk space in the local office (or other location nominated by the Contract Supervisor) for occasional use when obtaining information or similar.

## 9. Competencies

The Contractor shall have appropriate and current competencies/ authorisations to carry out the assigned work and shall not perform work for which they are not trained, experienced, authorised or otherwise qualified.

Competencies include as applicable:

- General Construction Induction (previously 'blue card')
- Electricity Officer – (Ergon Energy Contractor ID card)
- Environmental awareness – (Ergon Energy Specific – Environmental Planning for Work)
- Electrical awareness
- Resuscitation
- Electrical or illumination engineering
- Drafting with CAD

Ergon Energy at the discretion of the Contract Supervisor may:

- recognize prior learning/ experience or competencies held with other authorities
- arrange training through Ergon Energy Technical Training & Development Group at the Contractor's expense

## 10. Safety Requirements

The Contractor shall be alert to hazards pertaining to both design activities and construction activities. The designer shall ensure that all work designs can be safely constructed, operated and maintained in accordance with statutory obligations, Ergon Energy and industry standards and equipment manufacturer's instructions. Works plans and conduit plans shall clearly indicate any particular hazards, work methods required or other extraordinary issues affecting construction or commissioning.

Contractors shall perform and maintain records of site-specific risk assessments and complete Ergon Energy's "Simple Project Risk Management Plan" (PW000702F100). Some areas of particular concern for design activities include, but are not limited to:

- Field work on busy roadways
- Snake bite
- Work in remote locations

Any injuries or safety incidents occurring when working on Ergon Energy projects shall be promptly reported to the Contract Supervisor.

All vehicles used for site work shall be equipped with first aid kits and carry any safety gear appropriate for the tasks being undertaken.

# Specification for Engagement of External Distribution Line Design Resource



Design staff working in remote areas shall take appropriate precautions such as carrying sufficient water, an EPIRB or satellite telephone and working in pairs.

## 11. Environmental and Cultural Heritage Requirements

The Contractor shall be alert to any environmental and cultural heritage issues associated with either field work for design or construction at the site. Works plans and conduit plans shall clearly indicate any particular hazards, work methods required or other extraordinary issues affecting construction. These issues include, but are not limited to:

- declared plants
- soil erosion
- protected and environmentally-sensitive areas and obtaining permits for work
- acid sulphate soils
- local flora and fauna
- vegetation clearing or pruning—initial and ongoing
- visual amenity
- disruption to residents and businesses
- management of minor fuel and oil spills

## 12. Ergon Energy Interaction

### 12.1 Request for Quotation

Ergon Energy may request quotations from Contractors to undertake design work for a particular project or group of projects by letter or by e-mail. The request will be accompanied by a schedule for completion by the Contractor along with background information such as planning reports, maps and descriptions of work required. The provisions of this general design specification shall apply, except where set out otherwise in the schedule provided by Ergon Energy.

*It should be noted that supplied plans and concepts generally are desktop appraisals only, and subject to change by the contractor should on-site condition or land profiles warrant, any changes are to be discussed with relevant Ergon Energy supervisor.*

### 12.2 Submission of Quotation

Contractors shall complete the schedule provided and append any special additional conditions, departures, exclusions, allowances, alternate completion dates or clarifications that they wish to apply to their offer. These offers shall be submitted by letter or e-mail to the nominated Ergon Energy Officer by the required date.

### 12.3 Design Progress

Throughout the design process, Contractors shall keep the Contract Supervisor informed of their weekly progress and supply actual start and finish dates, any relevant issues, any key design decisions (such as line route) and any factors likely to affect the agreed scope of design or construction work. Any approvals which are proving problematic to obtain should be reported.

**Important Note:** The contract design target for “Design On-Time” is > 80%; the Contractor must ensure that Contract Supervisor is made aware of any occurrences that have/will impact on the agreed delivery date of the design. Failure to deliver designs by the agreed dates will have a negative impact on Ergon Energy’s capital works program for Customer Initiated Capital Works.