



Part of Energy Queensland

ERGON ENERGY CORPORATION LIMITED

SPECIFICATION

FOR

DISTRIBUTION DESIGN DRAFTING STANDARD

Specification for Distribution Design Drafting Standard

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Specification for Distribution Design Drafting Standard

PURPOSE AND SCOPE

To describe a minimum set of standards to be adhered to by Ergon Energy Line Design staff and External Designers for the production of a construction plan associated with the development and or maintenance of the distribution network.

The standard format included in this standard has been developed for use on distribution construction plans and agreed to by the Mapping & Design Operational Forum. All future amendments to this standard are to be presented to the Forum for consideration.

The need for standardisation is driven by the following business requirements:

- A standard format is necessary for training purposes;
- A standard format can be understood by all Ergon Energy Line Design and
- Construction staff who may be required to work across all regions;
- A standard format is required by Contractors and Consultants who may work across all
- regions.

This document details the required standard format for construction plan presentation to Constructors, both internal and external. It does not attempt to stipulate standard design or construction processes or practices.

1. TYPES OF DISTRIBUTION & SUBTRANSMISSION DESIGNS

This standard applies to the presentation of the following designs:

- All overhead network distribution designs up to and including 66kV;
- All underground network distribution designs up to and including 66kV;
- All public lighting designs for the lighting layout design.

2. CONSTRUCTION PLAN

A 'construction plan' is prepared for all additions and alterations to the Distribution & Sub Transmission Network.

A construction plan provides a structured and consistent presentation of information required for estimating, construction, statutory approvals and asset identification for updating of the GIS and subsequently Ellipse – Asset Management Program. The following construction plans are detailed:

- Overhead electrical reticulation
- Underground electrical reticulation
- Conduit Plan required for the installation of underground conduit and associated works
- Street Lighting.

Hard copies are to be printed in colour for clarity.

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3. EXPLANATION

3.1 Project Numbers

The Ellipse Work Request Number for each project is to be used to register a construction plan and the following format is to be used - **12345**.

3.2 Standard Title Block

The title block of a construction plan provides information for identification of the proposed works and status of the construction plan.

The title block should be placed at the bottom of the construction plan and the format depicted in Appendix A is recommended.

Mandatory information to be included by Designer:

- Project Number
- Sheet size
- Scale
- Issue
- Description standard format:
 - Location of project
 - Description of work – and type of plan e.g. ‘Conduit Construction Plan’
 - Customer’s details
- Reference drawings
- Construction plan revisions
- ‘As Constructed’ Stamp (refer below for example of stamp)

ON COMPLETION, MARK UP THIS
PRINT CLEARLY WITH ALL FINAL
CHANGES AND RETURN TO NETWORK
DATA GROUP FOR REGION

CHANGES Yes/No

COMPLETION DATE.....

PRINT NAME.....

POSITION.....

SIGNATURE.....

DATE.....

.....

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3.3 Revised Construction Plan

For Energy Services, the Designer must be consulted about all required changes to the construction plan. The Designer will perform a design check to determine if the requested change will alter either of the structural/civil, technical design or lighting design. If it does, this will be a major change; however, if it doesn't alter the design, it is a minor change.

For a major change a new revision of the construction plan is to be issued but for a minor change a verbal approval will be followed up with an email confirmation.

NB. All approved changes to the Construction Plan are to be marked up in **RED, in a neat and legible manner allowing the amendments to be clearly understood.**

3.4 Standard Notes

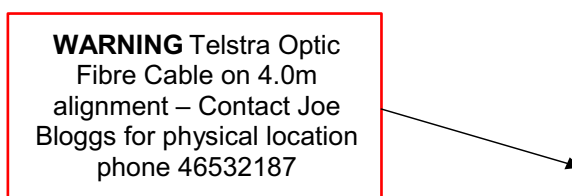
The Mapping and Design Forum have approved a standard set of notes to be included on construction plans. They are located on the shared drive - these are to be copied and pasted to the construction plan.

Requests for additional notes or modification to existing notes are to be approved by the Mapping and Design forum, the Design Support Co-ordinator and the Senior Design Support Officer shall have administration rights to this folder.

3.5 Work Specific Notes

Work Specific Notes are notes/instructions that are necessary to highlight particular **high risk** features within the construction plan. These are to be large enough to be clearly visible and easily attract the attention of construction staff. The boxes should be located as close as practical, and with an arrow pointing to the affected site.

Example: Caution and Warning flags indicating possible conflict with other utilities' major assets – to be in a **RED** text box with a pointer and with black text.



3.6 Conduit Schematic Diagrams (where applicable)

Conduit Schematic Diagrams are to be geographical and include the following objects:

- Ducts
- Station numbers
- Padmount transformer (if allocated)
- HV Isolating Devices (if required)
- Termination pole or existing asset
- Pillars
- Pits (if required)
- Street Lights

Cadastre information is not required.

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3.7 Location Map

If required, a Location Map can be included as a separate sheet or as an inset on the construction plan.

3.8 Standard Drawing Sheets

The Drawing Sheets are limited to the following sizes:

- A1 Landscape
- A2 Landscape
- A2 Portrait
- A3 Landscape
- A4 Landscape
- A4 Portrait

3.9 Smallworld Footprint

All footprints should be reviewed and updated to encompass only the work area required with a suggested additional 50m buffer for rural and 10m buffer for urban.

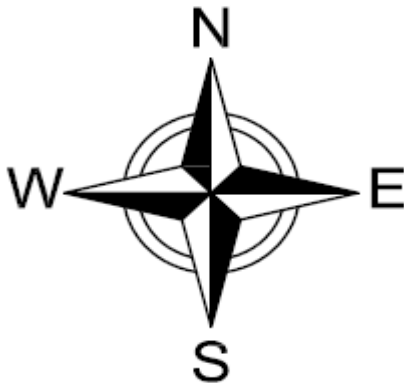
3.10 Standard Scales

The Standard Scales are:

- 1:500
- 1:750
- 1:1000
- 1:1250
- 1:1500
- 1:2000
- 1:2500
- 1:3000 for large OH, UG or Comms works plan
- 1:4000 for large OH, UG or Comms works plan
- 1:5000 for large OH, UG or Comms works plan
- 1:10000 for large OH, UG or Comms works plan
- 1:20000
- 1:25000

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3.11 North Sign Standard Symbol



3.12 Design Approval Check

The approver of all Smallworld designs must check the design against this document for compliance to the standard.

3.13 Design Approval Matrix

	Internal Design Approval	External Design Acceptance
Using all Standard Assemblies	Peer Check Design Approver (Checked)	Peer Check Design Approver (Checked)
Using any Non-Standard Assemblies	Peer Check Designer Approver (Checked) Design Engineer / Principal Engineer Line Standards	Peer Check Designer Approver (Checked) Design Engineer / Principal Engineer Line Standards

If the design is using all standard assemblies, the authorised design approver can approve the design. However, if it is of a complex nature, the authorised design approver can request for a Design Engineer / Principal Engineer Line Standards to approve it.

If the design is using any non-standard assemblies, the design is to be approved by a Design Engineer / Principal Engineer Line Standards.

4. CONDUIT CONSTRUCTION PLAN

A conduit construction plan is required to allow civil construction to be performed. It will indicate the route, number and size of conduits to be installed to allow for the underground reticulation for new residential/rural subdivisions.

4.1 Standard Format

The standard format is to include:

- DCDB Plan (Digital Cadastre Data Base) – street and roads (if available) – allotment boundaries and numbers - easements
- Station numbers
- Pillar locations
- Padmount transformer location
- Free standing HV switch location
- Trench cross sections indicators
- Conduit schedule
- Street Light schedule (with footing identification in remarks)
- Standard notes to include street light column alignment
- Work specific notes if required
- Conduit schematic – when required to clearly identify the individual conduit runs
- Scale
- North sign
- Title block (standard)
- Proposed cable easements where required
- ‘As constructed’ stamp
- Development stage boundary if required
- Pits (if required)
- All station numbers are to be sequential

4.2 Sample Construction Plan

The following sample construction plan is included to illustrate as closely as possible the correct completion of schedules and construction plan format:

If the link to the embedded document is broken please request a copy of the sample construction plan.

5. UNDERGROUND CONSTRUCTION PLAN

5.1 Standard Format

The standard format is to include:

- DCDB Plan (Digital Cadastre Data Base) – street and roads (if available) allotment boundaries and numbers - easements
- Station numbers
- Pillar locations
- Padmount transformer location (if required)
- Free standing HV switch location (if required)
- Schedules (as per Section 8)
 - Construction Schedule
 - Underground Cable Schedule
 - Public Lighting Schedule
 - Conduit Ducting Schedule
- Standard notes as required
- Work specific notes as required
- Scale
- North sign
- Title block (standard)
- Proposed cable easements
- 'As constructed' stamp
- Development stage boundary
- Zone substation number
- Feeder number
- Indicate relevant phase for each lot – R, W or B
- Location map as required
- Cable Joints
- All station numbers are to be sequential

5.2 Sample Construction Plan

The following sample construction plan is included to illustrate as closely as possible the correct completion of schedules and construction plans format:

If the link to the embedded document is broken please request a copy of the sample construction plan.

6. OVERHEAD CONSTRUCTION PLAN

An Overhead construction plan is prepared for the erection of overhead electrical reticulation.

6.1 Standard Format

The standard format is to include:

- DCDB Plan (Digital Cadastre Data Base) – street and roads (if available) – allotment boundaries and numbers - easements
- Station numbers
- Pole Locations
- Schedules (as per Section 8)
 - Construction Schedule
 - Overhead Conductor Schedule
 - Public Lighting Schedule
- Standard notes as required
- Work specific notes as required
- Scale
- North sign
- Title block (standard)
- Zone substation number
- Feeder number
- Location map if required
- Span lengths – (Note: span lengths shown in Smallworld may not be true due to cadastre shift)
- All station numbers are to be sequential

6.2 Sample Construction Plan

The following sample construction plans are included to illustrate as closely as possible the correct completion of schedules and construction plan format:

If the link to the embedded document is broken please request a copy of the sample construction plan.

7. STREET LIGHT CONSTRUCTION PLAN

A Streetlight Construction Plan is prepared for erection/ installation of public lighting.

7.1 Standard Format

The standard format is to include:

- DCDB Plan (Digital Cadastre Data Base) – street and roads (if available) – allotment boundaries and numbers - easements
- Station numbers
- Pole Locations
- Schedules (as per Section 8)
 - Construction Schedule
 - Overhead Conductor Schedule
 - Public Lighting Schedule
- Standard notes as required
- Work specific notes as required
- Scale
- North sign
- Title block (standard)
- Zone substation number
- Feeder number
- Location map if required
- 'As Constructed' stamp
- A statement of Compliance with the requirements of AS/NZ 1158 (in accordance with
- AS/NZS 158.1.1:2005 Clause 2.11 and Appendix D)
- All station numbers are to be sequential

7.2 Sample Construction Plan

The following sample construction plan is included to illustrate as closely as possible the correct completion of schedules and construction plan format:

If the link to the embedded document is broken please request a copy of the sample construction plan.

8. SCHEDULES

8.1 Sample Construction Plan

Schedules provide an ordered layout of information relevant to any modification to the Energy Services network. Schedules are to accompany all construction plans. It is preferable that the construction plan and its associated schedules be presented on the same sheet. If this is not practical, then schedules may be grouped on a separate sheet.

Data entered onto schedules to be limited to one item per line, for each column.

Modification of the schedules is permitted but limited to turning off columns that do not contain data, from being displayed within the drawing. This is the default setting.

Schedule font size is free text, default settings:

- Schedule data text 2mm;
- Schedule column heading text 1.8mm;
- Schedule title 137% of column heading text.

The schedule headings word-wrap as standard default.

The following schedules are detailed, including definitions for column entries:

- Construction Schedule – applicable to OH and UG works including distribution substations.
- Overhead Conductor Schedule – applicable to OH conductor works, including LV Services.
- Public Lighting Schedule – applicable to all public lighting works, excluding watchman lighting.
- Underground Cable Schedule – applicable to all underground cabling activities.
- Conduit Ducting Schedule – applicable for all runs of underground conduits, including bends where required.

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8.2 Construction Schedule

CONSTRUCTION SCHEDULE									
STN NO	SITE LABEL	POLE ALIGNMENT	POLE SETTING DEPTH	ACTION	CONSTRUCTION CLASS	CONSTRUCTION CODE	DRAWING NUMBER	POSITION ON POLE	REMARKS

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Purpose

This schedule contains all information relevant to the construction of overhead, underground, street light and substation structures associated with the design construction plan. This schedule must be used where overhead, underground, street light or substation works are affected.

COLUMN	DESCRIPTION AND USAGE
STATION (STN)	The station number is the reference for the asset on the works plan
SITE LABEL	Ergon Energy's official site identifier for the site at which an asset is located – e.g. pole, service pillar, etc.
POLE ALIGNMENT	This identifies the distance the pole centre line is offset from the nearest property boundary. It is to be used for showing offsets to gain Statutory approvals.
POLE SETTING DEPTH	Pole setting depth is the depth the pole is to be set in the ground.
ACTION	Description of the action to be performed i.e. Install – Recover – Upgrade – Relocate, on that asset, on that line in the schedule.
CONSTRUCTION CLASS	The class of the nominated construction as listed in Ergon Energy's Standard Overhead, Underground, and Public Lighting Construction manuals for the construction to be actioned. This field lists the folder of the construction manual the construction can be found.
CONSTRUCTION CODE	A coded description of the assembly to be actioned. Codes used to describe constructions to be in accordance with the overhead, underground, and public lighting standard construction manuals. Pole mounted constructions, are to be listed from the top of the pole down.
DRAWING NUMBER	This is the drawing number in the overhead, underground and lighting standard construction manuals for the nominated construction.
POSITION ON POLE	This is the order in which the nominated constructions are added to the pole. The position 1 is at the head of the pole and subsequent numbers move the constructions down the pole.
REMARKS	To be utilised for construction notes only. Details of all constructions to be worked on are to be detailed in the construction column. These remarks are being stored against each object and auto populated into the schedule.

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8.3 Overhead Conductor Schedule

OVERHEAD CONDUCTOR SCHEDULE										
STN FROM	STN TO	ACTION	VOLTAGE	CONDUCTOR CODE	NUMBER OF CONDUCTORS	ROUTE LENGTH (m)	MES (M)	%NBL	WIND PRESSURE (pa)	REMARKS

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Purpose

This schedule contains all information relevant to the design, construction and recording of work on overhead conductors associated with the works plan. This schedule must be used when overhead conductors are affected by the works.

COLUMN	DESCRIPTION AND USAGE
STN FROM	The works plan station numbers at which a particular strain section commences. A separate line is to be used for each strain section as indicated on the works plan.
STN TO	The works plan station numbers at which a particular strain section terminates. A separate line is to be used for each strain section as indicated on the works plan.
ACTION	Description of the action to be performed on the conductors on the same line in the schedule.
VOLTAGE	The nominal voltage type of the conductors. e.g. 11 kV, LV.
CONDUCTOR CODE	A description of the conductors or cables to be worked on. The conductor code is listed. Refer to the Energy Services Design manual – Standard Conductor Applications Dwg 3053 sheet 2.
ROUTE LENGTH	The sum of the span lengths between station numbers in metres.
NUMBER OF CONDUCTORS	This is the number of individual conductors that make up the each run of mains between the nominated station numbers.
MES	Mean effective span in metres as calculated in accordance with the Design Manual, for the spans in a single strain section between the nominated station numbers.
%NBL	Percentage Nominal Breaking Load. The design tension limit which is not to be exceeded under the specified loading conditions.
WIND PRESSURE	This is the wind pressure in Pascals to which the conductor stringing calculations were performed.
REMARKS	To be utilised for construction notes only. Details of all conductors to be worked on are to be detailed in the conductor column.

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8.4 Public Lighting Schedule

PUBLIC LIGHTING SCHEDULE								
STN NO.	SITE LABEL	ACTION	CONSTRUCTION CODE	RATE	OWNER	MOUNTING HEIGHT	ORIENTATION	REMARKS

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Purpose

This schedule contains all information relevant to the construction of street lighting works associated with the construction plan. This schedule must be used where any streetlights are affected by the works.

COLUMN	DESCRIPTION AND USAGE
STN NO	The station numbers that are the reference for the plan site ID.
SITE LABEL	Ergon Energy's official site identifier for the site. e.g. pole number.
ACTION	Description of the action to be performed on the construction on the same line in the schedule.
CONSTRUCTION CODE	A coded description of the street lighting asset to be actioned. Codes used to describe street lighting constructions to be in accordance with the Ergon Energy Public Lighting Construction manual.
RATE	The street lighting tariff (rate) associated with the luminaire. 1, 2, or 3.
OWNER	This is the name of the customer who is responsible for payment of the lighting tariff
MOUNTING HEIGHT	Nominal mounting height of luminaire as defined in the Ergon Energy Public Lighting Manual.
ORIENTATION	Magnetic Bearing from Smallworld
REMARKS	To be utilised for construction notes only, and to identify the required footing for street light columns i.e. Major or Minor. Details of all public lighting works are to be detailed in the schedule columns.

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8.5 Underground Cable Schedule

UNDERGROUND CABLE SCHEDULE							
STN FROM	STN TO	ACTION	VOLTAGE	CONSTRUCTION CODE	ROUTE LENGTH	CABLE LENGTH	REMARKS

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Purpose

This schedule contains all information relevant to the design, construction and recording works on underground cabling associated with the construction plan. This schedule must be used where any underground cabling is affected.

COLUMN	DESCRIPTION AND USAGE
STN FROM	The works plan station number at which the cable run is to commence.
STN TO	The works plan station number at which the cable run is to terminate.
ACTION	Description of the action to be performed on the construction on the same line in the schedule
VOLTAGE	The nominal voltage type of the cables, e.g. 11 kV, LV.
CONSTRUCTION CODE	A description of the cable size and type.
ROUTE LENGTH	The total length of cable as measured off the plan between terminations , etc.
CABLE LENGTH	The total length of cable required including allowance for end lengths (terminations, joints) etc.
REMARKS	To be utilised for construction notes only, including proposed HV joint locations. Details of all underground cabling works are to be detailed in the schedule columns.

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8.6 Conduit Ducting Schedule

CONDUIT DUCTING SCHEDULE						
STN FROM	STN TO	ACTION	CONSTRUCTION CODE	LENGTH (m)	BENDS	REMARKS

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Purpose

This schedule contains all information relevant to the laying of conduit ducts in trenches for underground works. This schedule shall be used for all underground construction plans.

The station numbers are the sites the conduits run between. These sites include,

- Poles
- Pillars
- Distribution Cabinets
- Joints/end cap
- Pits
- Ground Mounted Switches (GMS)
- Towers

COLUMN	DESCRIPTION AND USAGE
STN FROM	The works plan station number at which the conduit run is to commence.
STN TO	The works plan station number at which the conduit run is to terminate.
ACTION	Description of the action to be performed i.e. Install - Recover – Upgrade – Relocate, on the asset, on the same line in the schedule.
CONSTRUCTION CODE	A coded description of the assembly to be actioned. Codes used to describe constructions to be in accordance with the overhead, underground, and public lighting standard construction manuals.
LENGTH	The length of the duct run between the nominated station numbers
BENDS	This is a text field and information to be inserted manually, where required.
REMARKS	To be utilised for construction notes only. Details of all civil works are to be detailed in the schedule columns.

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APPENDIX A - TITLE BLOCK

The title block provides information on the identification of the proposed works, the Designer, the drawings status, the drawings approval information and the plan type. This style of title block is recommended. The project number itself must be located in a position where its identification maybe ascertained without unfolding the works plan, preferably at the bottom right hand corner. A title block is to be used on all works plans.

The title block displayed has been reproduced from Ergon Energy’s standard drawing sheet template.

Join A

AMENDMENTS
OA ORIGINAL ISSUE
Rev B – Sin 3 Moved 2
metre north 7/9/05

Works Plan revisions are to be noted here.

Legend will be included in this section automatically by Smallworld

Join A

REFERENCE DRAWINGS

11kV Windemere Feeder EB-D
Innes Park Town Map Sheet 1

HV Schematic 9348/D-1



ERGON ENERGY CORPORATION LTD

Created Date/Time:
Created By:

Name:
Checked Date:

Approved Date:
Approved By:

Perseverance Dam Road – Innes Park

URD Subdivision – Electrical Plan

Garrisha Pty Ltd Walker Family Trust

Project Number:

Drawing State:

Contract / Quote Number:

Business Approved Date:
Name:

A1

SCALE: 1:2500

SD01254

NEXT
SHEET

ISSUE B

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APPENDIX B - SYSTEM DESIGNER - FIELD MEASUREMENT GUIDELINES

The Designer responsible for the design and pegging of projects shall use a measuring instrument with a precision to enable all linear and angular measurements to be read with an accuracy that will ensure that the design will comply with all applicable Ergon Energy standards, policies and procedures.

The accuracy of the selected instrument will be reflected by the complexities/ risk of the project.