



WORKS PLAN STANDARD (Electricity)

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Amendment Record

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Amended by Damien Pyne

Section 1 - Policy

This document provides details of the standard works plan requirements to be utilised by ENERGEX and external consultants for submission of manual or electronic works plans to ENERGEX.

This standard has been compiled to ensure that the information required by construction and data entry personnel is accurate, consistent and allows the work to be constructed and the data to be processed without ambiguity.

Adherence to this standard ensures that the requirements of the Regulated Line of Business Information strategy are met. Compliance with this standard is mandatory and subject to audit inspection.

Section 2 - Preamble

The ENERGEX electrical network is made up of numerous sites where equipment is installed to supply, support and deliver electrical energy. The purpose of a works plan is to describe a task and provide information on what GIS to graphically represent ENERGEX's transmission and distribution electrical network.

Section 3 - Scope

This standard applies to all ENERGEX staff and external consultants submitting designs that may require construction/modification/decommissioning of ENERGEX's electrical network. It is the intention of this standard to provide a basis for the uniform preparation of all electronic and paper copy records presented for construction and data entry purposes. The standard does not review design or construction practices.

This standard does not apply for work carried out on non-ENERGEX assets, although it may be used as a guide.

Section 4 - Philosophy

A standard is a published document which sets out specifications and procedures designed to ensure that a material, product, method or service is fit for its purpose and consistently performs the way it was intended.

Works plans use drawings, line diagrams, schematics and schedules as the primary form of relaying a large amount of information concerning any alteration on ENERGEX's electricity network assets to construction and data entry personnel. What is produced must be clear, consistent and easily interpreted.

This standard has been compiled to ensure that the information required by construction and data entry personnel is accurate, consistent and allows the work to be constructed and the data to be processed without ambiguity. It will be incorporated within the accepted drawing packages. A comprehensive works plan standard will lead to –

- greater understanding of what is required
- more effective training of staff
- complete understanding by construction staff who may be required to work in different locations across ENERGEX
- unambiguous interpretation of plans and schedules by office personnel to enhance data entry accuracy
- a standard necessary for computer based drawing packages

Section 5 - Policy Review

These standards will be reviewed on a regular basis. Any reviews will incorporate input and requests from relevant stakeholders and will be coordinated by Network Data Services.

Section 6 - Safety and Work Practices

Designs must allow for optimal utilisation of readily available plant/equipment as well as standard work practices routinely employed in construction and maintenance activities including the application of live-line working procedures where appropriate.

All works shall be in accordance with:

- ENERGEX BMS 01983 – Safety Assurance Standard
- ENERGEX BMS 01984 – Safe Working Principles
- ENERGEX BMS 01999 – Guide to Accident Prevention (Vol2) GAP

Section 7 - Works Plan Presentation

The works plan is intended to provide direction for the construction personnel and facilitate the updating of ENERGEX's corporate database encompassing the electrical transmission and distribution network. The maximum size of a hard copy works plan will be A1 (841mm x 594mm). Hard copies are to be printed in black on white for maximum clarity.

7.1 *Standard for Folding Works Plans*

All works plans are to be folded into **A4** size with the title block shown in the bottom right hand corner. All sheets are to be stapled in the top left-hand corner.

If unsure how to fold works plans neatly please contact Network Data Services.

7.2 *Schedules*

Schedules provide a structured layout of information relative to the job and can act as a design aid. Schedules accompany works plans and contain details relating to the works plan. Each schedules purpose is to reduce the amount of detail and congestion on the works plan, thereby making them clearer and easier to read. Works plan schedules are not intended to be comprehensive material schedules for estimating or stores issue purposes. It is preferable that the works 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. The order of columns is to be standard although the column widths may be varied to suit required information.

The following schedules have been identified:

- Overhead Works Schedule
- Overhead Conductor Schedule
- Overhead LV Service Conductor Schedule
- Streetlight Schedule
- Underground Civil Works Schedule
- Underground Cable Schedule
- URD Civil Works Schedule
- Equipment Schedule
- Overhead Sundry Summary Schedule
- Underground Sundry Summary Schedule
- Overhead Sundry Details Schedule
- Underground Sundry Details Schedule

Appendices A to J show examples of the relevant schedules to be used for each type of works plan subject.

7.3 **Title Block**

The title block of a works plan provides information for identification of the work, construction and other service information and filing and recording data.

The title block should be placed at the bottom of the works plan and the format depicted in Appendix J is recommended. It states the ENERGEX project number, name and brief description of the works and names and signatures of persons associated with the design. The ENERGEX project number and location must be positioned in the bottom right hand corner of the drawing sheet, within the title block as represented in the Appendix.

7.4 **System Diagrams**

System diagrams take the form of either geographical schematics or panel operating diagrams. Some works plans require system diagrams for operational purposes. Geographical schematics are the preferred system diagram requirement. Panel operating diagrams are used where the extent of the new works is such that it is impractical to draw a clear geographical schematic. Geographical schematics should be drawn to identify how new works fit into the existing network, ie, as a minimum, for HV - up to the first approved switching point; for LV – up to and including all the open points.

Conventions for use of these diagrams are –

- Geographic schematics or panel operating diagrams are both acceptable as system diagrams
- System diagrams are used for operational work associated with the works plan
- System diagrams are to be shown for all system voltage levels affected by the works
- Existing and proposed LV system diagrams must designate all open points of the affected circuit
- Existing and proposed system diagrams are to be shown separately
- Complex streetlighting circuits and communication routes should have separate system diagrams
- System diagrams are to be located near the plan drawing and usually on the front sheet
- System diagrams are to use symbols from the tables of this document
- Proposed new works are shown in dark print, including the first and last site of new circuits

In cases where no transformer is within the bounds of the worksplan, the LV system diagram must have an arrow pointing in the general direction of supply with text stating where the LV is supplied from, eg, "Supplied from SP12345".

7.5 **Scaling**

Each drawing must have the appropriate scale selected to ensure it is clear and not cluttered to the point of risking ambiguity. The following scales are recommended:

<u>Plan</u>	<u>HV Schematic</u>	<u>LV Schematic</u>	<u>Details</u>
1:500	1:5000	1:2500	1:100 or
1:1000			as required
1:2500			

A scale bar is to be drawn in an appropriate position, usually beneath the plan, to confirm scaled distances in an enlarged or reduced-copied drawing.

7.6 ***Warning/Caution Boxes***

Warning and caution boxes are necessary to highlight particular features within a worksplan. These are to be large enough to be clearly visible and easily attract the attention of construction staff. The boxes should be located near the affected site. If this is impractical, an arrow pointing to the affected site/area should be included. Where excavation of any type is to be part of the worksplan, reference to the Dial Before You Dig service must be included.

Examples of some appropriate warning and caution notices appear in Appendix M. These examples are indicative only and by no means limit the choice or wording needed to ensure the safety of staff and the general public.

7.7 ***Electronic Layers***

Electronic layers are available with the capability of being active (turned on) or inactive (turned off), depending on what information needs to be displayed at the time.

At the time of the publishing of this standard, ENERGEX's primary drawing tool is a customisation of AutoCAD2000 and is named WorksPlan2000. Appendix L is a tabular representation of the layers outlining the uses of each individual layer available in WorksPlan 2000.

7.8 *Overhead Reticulation*

Information required on works plans and work schedules involving overhead is as follows:

7.8.1 **Works Plan**

DCDB Plan (Digital Cadastre Data Base)

- streets and roads (named)
- allotment boundaries and numbers
- easements, wayleaves
- north indicator

Electrical Installation

- poles (numbered)
- substations eg, pole transformers (numbered)
- airbreak switches (numbered)
- conductors (single line representation only)
- transpositions
- shackle points
- LV disconnect links, tie bridging
- phasing of services (See section 5.10)
- stays
- HV phasing
- earthing electrodes
- streetlights
- existing mains, etc, at points of connection
- service connections (particularly around LV open points)
- obstructions (eg, sewers, water mains)

HV Schematic

(Geographic, not necessarily with street outline)

- new HV mains (single line representation only)
- substations eg, pole transformers (numbered)
- existing HV mains to first switch in each direction

LV Schematic

(Geographic, not necessarily with street outline)

- new LV mains (single line representation only)
- street names
- substations eg, pole transformers (numbered)
- disconnect links
- new open points
- existing open points that are to be closed

Labels

- remote connection point
- transformer connections

7.8.2 Schedules

Pole Schedule

- location (address)
- station numbers
- pole numbers (existing, new)
- deviation angles and tensions
- pole sizes (existing, recovered, new)
- sinking depths, pole foundation details
- constructions (existing, recovered, new) (see Appendix B)

Conductor Schedule

- location (address)
- to & from station numbers
- voltages
- conductors (existing, recovered, new, transferred)
- number of spans
- total lengths (span & cable)
- stringing table (or sag)

LV Service Conductor Schedule

- location (address)
- station numbers
- service existing, recovered, installed, transferred
- number of spans
- conductor length
- fittings

Equipment Schedule

- location (address)
- station numbers
- site id (not mandatory if another schedule can associate the station number with the site id on the same drawing)
- equipment installed, recovered, existing
- description of equipment
- other details of equipment

Streetlight Schedule

- location (address)
- station numbers
- site id
- pole details
- luminaries (existing, recovered, new)
- rate and customer
- bracket/outreach details

Sundry Schedules (if applicable)

7.9 *Underground Reticulation*

Information required on works plans and work schedules involving underground is as follows:

7.9.1 **Works Plan**

DCDB Plan (Digital Cadastre Data Base)

- streets and roads (named)
- allotment boundaries and numbers
- easements, wayleaves
- north indicator

Electrical Installation

- substations eg, kiosk (padmount) transformers (numbered)
- service pillars (numbered)
- link pillars (numbered)
- cables (single line representation only)
- cable joints (numbered)
- trench cross sections & pipe occupations (see section 8.8)
- phasing of services
- earthing electrodes
- jointing to existing mains
- external overhead works
- streetlights
- obstructions (eg, sewers, water mains)

Substation Site Details

- transformer and switchgear location
- cables (pipe occupations – see section 8.8)
- foundation details

Substation LV Panel Arrangement

- LV schematic (see section 5.9)
- fuse sizes
- nameplate and label details

11kV Ring Main Unit Nameplates & Labels

- at existing and new substations eg, kiosk (padmount) transformers

HV Schematic

(Geographic, but with no street outline)

- new HV mains (single line representation only)
- substations eg, kiosk (padmount) transformers (numbered)
- isolators (numbered)
- switch fuses (numbered)
- existing HV mains to first switch in each direction

LV Schematic

(Geographic, but with no street outline)

- new LV mains (single line representation only)
- street names
- substations eg, kiosk (padmount) transformers (numbered)
- link pillars (numbered)
- new open points
- existing open points that are to be closed
- LV switchboards (for new transformers) (see section 5.9)

7.9.2 Schedules

Civil Works Schedule

- location (address)
- to & from station numbers
- trench dimensions
- conduits (size, number, lengths)
- bends
- backfill
- protection
- reinstatement

Cable Schedule

- location (address)
- to & from station numbers
- voltages
- cable size (cross section)
- model number
- lengths

Equipment Schedule

- location (address)
- station numbers
- site id (not mandatory if another schedule can associate the station number with the site id on the same drawing)
- equipment installed, recovered, existing
- description of equipment
- other details of equipment

Streetlight Schedule

- location (address)
- station numbers
- site id
- pole details
- luminaries (existing, recovered, new)
- rate and customer
- bracket/outreach details

Sundry Schedules (if applicable)

7.10 *Installation Specifications*

All installations shall conform to ENERGEX specifications. These include, but are not limited to:

- Overhead Design Manual
- Overhead Construction Manual
- Underground Distribution Construction Manual
- Underground Design Manual
- Underground Jointing Manual
- Resource Estimation Guide
- Public Lighting Construction Manual
- Commercial and Industrial Substation Manual
- Network Labelling and Signage Manual

Section 8 - Drafting Standards

Drafting is to be in accordance with Australian Standard AS1100-401.

The following are not necessarily covered by the above standard.

8.1 *Precision*

The precision shall be such that any difference between the actual position of the compiled detail and its position on the source material (hard copy or electronic) shall be not more than 0.5mm at the nominated scale of the source material. For example, a site on a 1:1000 scaled drawing must be located within 0.5 mm of its actual exact location, effectively a tolerance of ± 0.5 metres.

8.2 *Information Recording*

All information depicted on the relevant drawing will be in accordance with symbology as set down under heading 8.3. Details concerning changes to the electrical network are recorded in ENERGEX's corporate database. All installations shall conform to ENERGEX specifications.

Electronic submitted drawings will contain all the standard requirements of ENERGEX with the added feature of supplying this information in a layered structure. Appendix K illustrates the purpose of each layer along with the colour and line weighting associated with that layer.

Information not required to be recorded by ENERGEX, eg, consumer mains, must be in a separate layer and turned off when submitted.

Submission of electronic drawings will be in accordance with ENERGEX's requirements and processes.

8.3 *Symbology*

Standard symbols for use on works plans are documented in tables 1 to 7 and are based on Australian Standard AS1100.401 – Engineering Survey and Engineering Survey Design Drawing – where applicable. All symbology relevant to the production of a works plan must conform to that stipulated in these tables. Symbols are to be appropriately proportional to the scale of the drawing.

It is possible that not every combination of equipment may be covered in the symbology shown in the tables. These exceptions may be overcome by combining two or more of the existing standard symbols. If a combination of the standard symbols is required, the symbol will be depicted in descending order using the following principles:

- when individual items of equipment are mounted at different levels, the symbol will be depicted consecutively from the top in descending order.
- when individual items are mounted at the same level, they are to be depicted starting with the equipment immediately above or to the left when observing the site number, proceeding from left to right around the site.

If no appropriate symbol can be formulated then consultation with Network Data Services is recommended.

Note: An optional symbol has been supplied for some equipment. In this case the first symbol shown is the Australian Standard symbol, and the second is an accepted and preferred symbol for ENERGEX drawings.

8.4 *Arrangement of Dimensions*

Dimensions shall be arranged so as to be readable from the bottom or right hand side of the drawing sheet. Contour values shall be expressed to be read in the direction of ascending height. All underground joint positions are to be dimensioned on the works plan.

8.5 *Site Numbering*

A site is a geographic location where equipment may be installed. All sites of ENERGEX's transmission and distribution electrical network are numbered for operational and maintenance purposes. These numbers are allocated in blocks and are unique to the entire system. All number blocks are arranged by ENERGEX's Planet custodian and allocated to hub design coordinators who distribute these numbers to relevant external consultants. The predominant type of equipment installed at a site determines the site grade code prefix. When a site has equipment installed or removed the prefix code may change, eg:

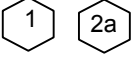
- P12345 is altered to SP12345 when a pole transformer is installed at the site
- X24680 is altered to the pole alias P52486 when a switch is removed from the top of the pole, leaving only the pole on site
- X13579 is altered to SR13579 when a regulator transformer is installed at the site, even though the switch is still present

Renumbering of sites may lead to inaccuracies and ambiguity and is only necessary when the need arises. The practical implications of renumbering pole sites need to be considered on a case by case basis.

It is not necessary to renumber a site for a pole that has been relocated within the span length. If a pole is relocated across the road or if spans are to be relocated due to a road widening for example, and the relocated spans are to be energised before the original spans are removed, then renumbering will be necessary.

Numerous cable joints can be located at the one site, eg in a concrete pit. Joints not sharing the same pit must be given their own site number, eg greenfield earth pits where more than one excavation is necessary to install or relocate individual joints. Where joints overlap, only one site number is necessary.

8.6 **Drawing Annotations**

1. Station numbers -  Hexagonal, positioned adjacent to each site of interest, sized to suit works plan. These numbers are unique within each works plan and are necessary for reference to corresponding details in the schedules. The station number may have a suffix of a or b for example to associate a site with the main site, such as service poles. The suffix l may be used for a street light associated with the site.
2. Conductors – Existing mains (not shown in schedule) shown at commencement and end of mains and along the mains if long run, using the following conductor codes format:

eg. 1 - 7/3.75 (OHEW)
3 - 19/3.75 (33)
3 - 7/4.75 (11)
4 - 7/4.75 (LV)

The number preceding the dash indicates the number of conductors. The numbers after the dash represent the conductor type. Parenthesis following the conductor type indicates the voltage level the particular overhead line is designed at.

3. Span distance – between stations to the nearest metre (if > 0.4m, round up).
4. Street names – as required. Size to be legible and proportional to drawing.
5. RP Desc and lot/house numbers – as required. Size to be legible and proportional to drawing.
6. North point and scale - size to be legible and proportional to drawing. North point should be placed adjacent to section of drawing to which it refers.
7. The side of a pole to which a transformer is mounted is shown by the position of the transformer symbol relative to the pole symbol.
8. Phasing of 11kV overhead conductors to be shown adjacent to mains to clearly indicate changes in phasing arrangements that may occur typically at bridging points, isolation points and terminations.
9. Services and LV schematics – should indicate which side of the open point the service is connected to.

8.7 **Line Types**

8.7.1 **Overhead**

New overhead mains (including pilot cable, streetlight mains and optic fibre).

Thick black continuous line – 0.7mm. 

Existing overhead mains (including pilot cable, streetlight mains and optic fibre).

Black continuous line – 0.35mm. 

New overhead services – only those affected by works are shown.


Thick black continuous line – 0.7mm. 

Existing overhead service – only those affected by works are shown.


Black continuous line – 0.35mm. 

8.7.2 **Underground**

New underground mains (including pilot cable, streetlight mains, optic fibre and conduits).


Broken thick black continuous line – 0.7mm. 

Existing underground mains (including pilot cable, streetlight mains, optic fibre and conduits).

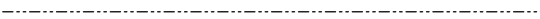
Broken black continuous line – 0.35mm. 

8.7.3 **Miscellaneous**

Property line –

Continuous black line – 0.25mm. 

Kerb line (when needed)

Broken/dotted – 0.25mm. 

Underground services –

Sewerage

Gas

Stormwater

Water

Communications (Telstra etc)



As per symbols for other utilities

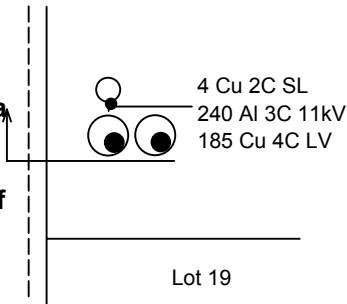


0.25mm

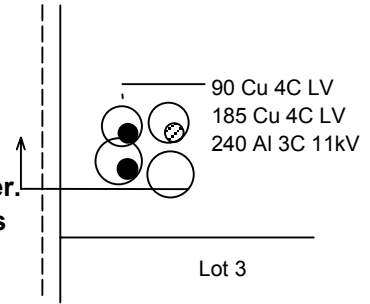
8.8 **Underground Cross-Sections**

Cross sections of underground cables must be designated in accordance with the underground reticulation specification, eg:

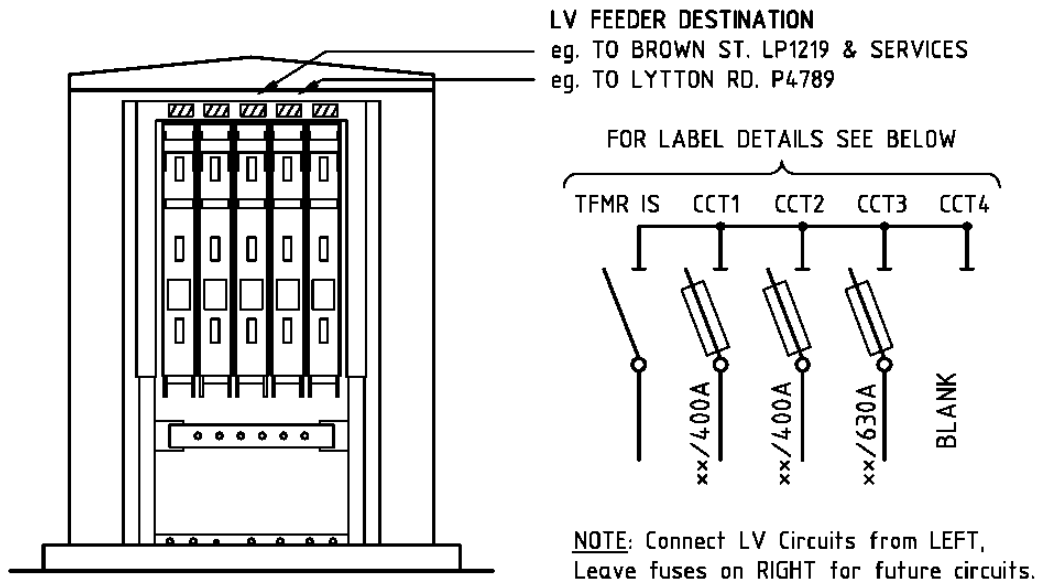
This indicates three conduits with cable installed in two and a streetlight main in another. The arrow indicates direction of view.



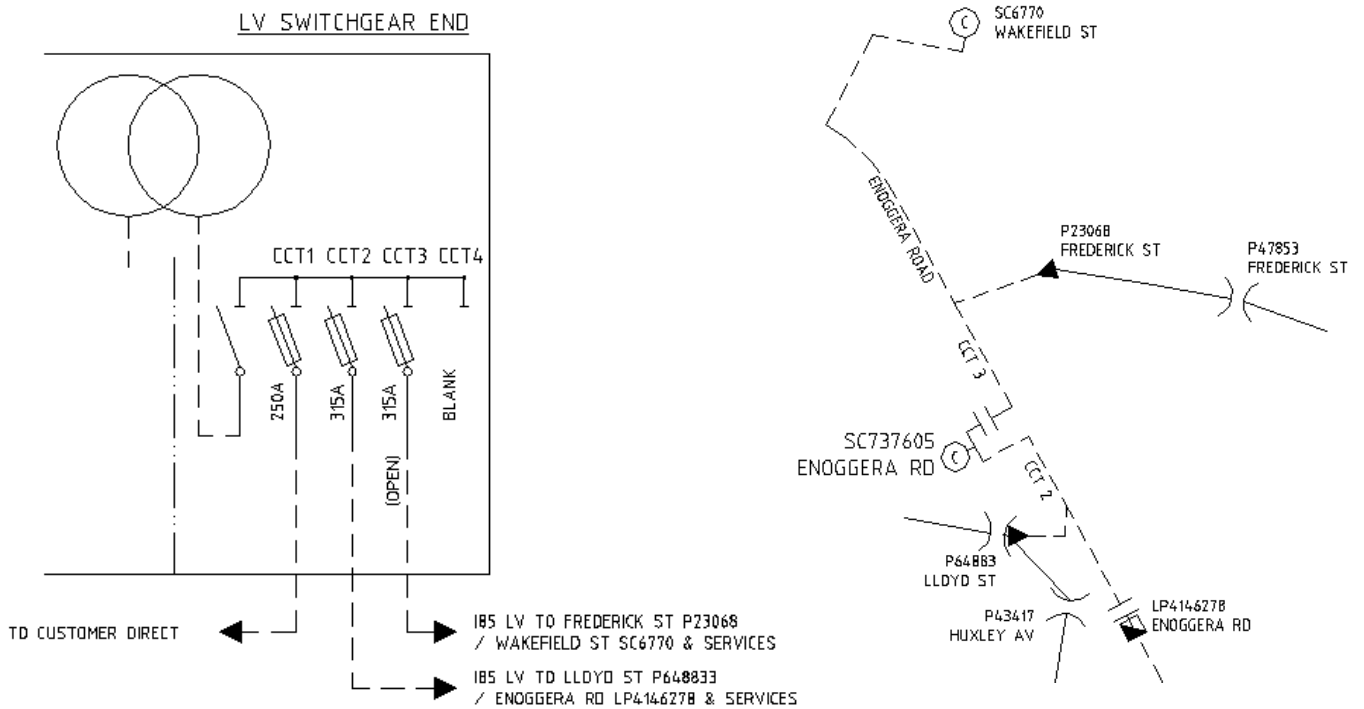
This indicates four conduits with existing cable installed in two and proposed LV cable for another. The arrow indicates direction of view.



8.9 LV Switchboards

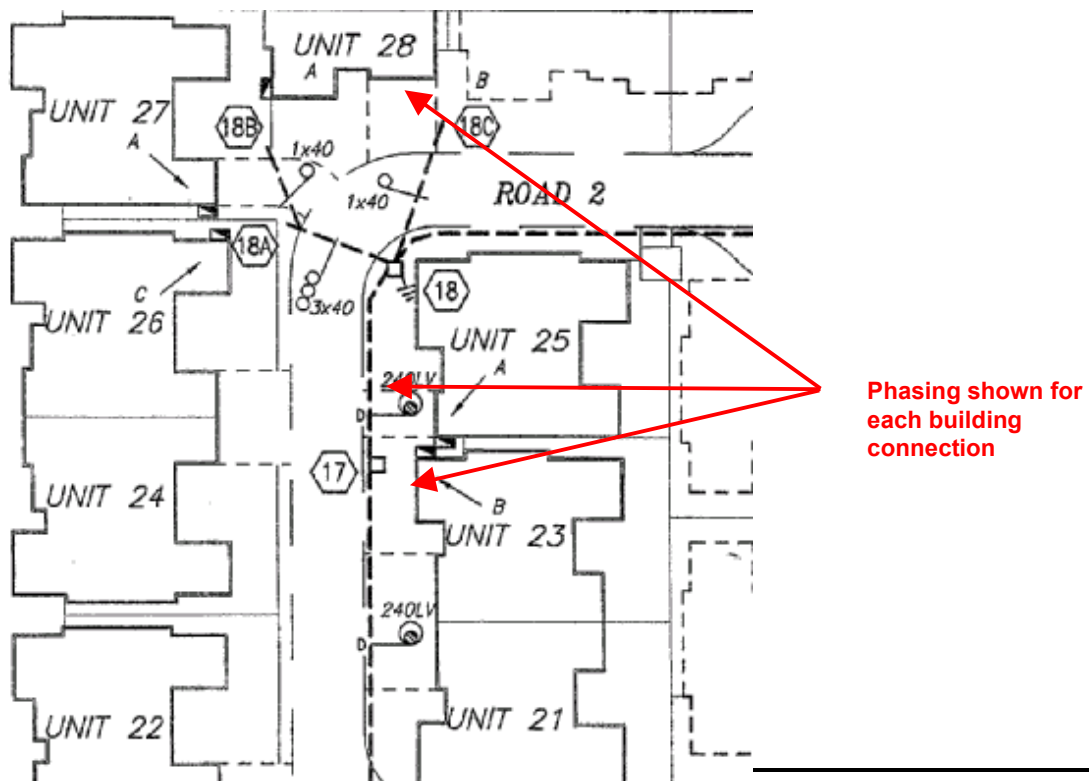
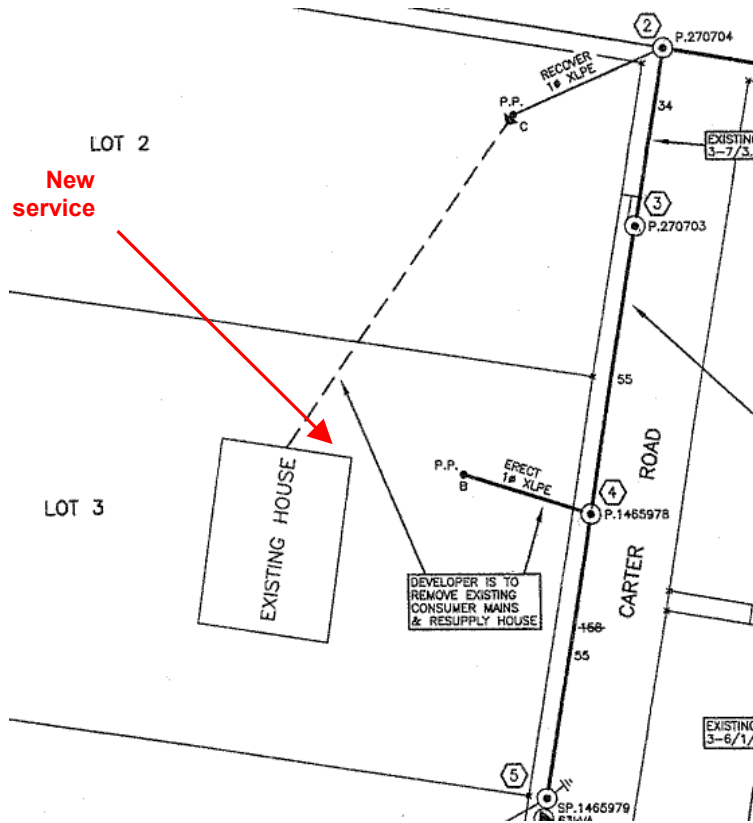


LV switchboards need to show the same information on the schematic as the LV switchboard labels. As shown above the fuses are to be labelled with the appropriate circuit number, fuse size and provision has been made for the other information, ie cable size and label information. Where there is space, all of this information should be shown on the schematic. At a minimum each circuit should be numbered on the schematic for clarity as shown below.



8.10 **Phasing for subdivisions and allotments**

Phasing is required to be shown for any new or modified connection to a property. These are extremely important when designing new subdivisions for use in FACOM and NAP (Network Attachment Points). For new group title or town house developments a connections needs to be shown from the pillar to the relevant building or unit.



Section 9 - Streetlighting

Streetlighting is varied with different luminaries used for many different situations. Representation of streetlights on works plans are to be in accordance with ENERGEX's 'Public Lighting Construction Manual'. If the works involve streetlight alterations, a station number only, as per paragraph 8.6, will be placed next to the streetlight symbol. Information concerning the streetlight will be available in the streetlight schedule. Variations to the alignment information on the streetlight schedule, such as northing and easting references, are acceptable subject to ENERGEX approval. Existing streetlights not involved in the works may be drawn in for completeness, but will not be referenced in the streetlight schedule. Streetlight symbology shall be as represented in Table 7: Symbols for Miscellaneous Uses.

Streetlights that are to be installed or altered are drawn bold (0.7mm thickness), streetlights that exist requiring no action are drawn as standard (0.35mm thickness) and streetlights that are to be removed are drawn in light grey (ghosted) – 0.35mm thickness.

Section 10 - Signs & Labelling

Any labelling or signs referred to on a standard works plan are to be in accordance with ENERGEX's 'Network Labelling and Signage Manual', BMS 01610.

Copies may be obtained by contacting ENERGEX's Technical Standards Department, City Office.

Where HV and LV underground cables connect to overhead mains, ring main units, circuit breakers, transformers and other associated equipment, all new or altered labelling data must be shown on the same page as the HV, LV and SL schematics. Ring main unit, isolator and switch-fuse numbering must also be shown on the HV schematic.

Section 11 - Fast Track Works Plans

Fast track work plans (or Speedy works plans) are quick, simple drawings that include single site projects where the work can be completed within 32 construction hours and does not require any additional design parameters other than the relevant fast track sheet. These works plans must still provide full information as supplied in a conventional works plan.

ENERGEX BMS procedure 01550 (Extension of the Electricity Network – Fast Track Process) outlines the guidelines for using this type of works plan.

Section 12 - As Constructed Drawings

There are limitations to what can be determined within the design office. Certain elements of the installation may be best left to the construction crew to determine on site. It is sometimes necessary to deviate from the original design during the construction phase of a project. All changes and additional information must be 'marked up' in red on a copy of the issued construction plan to create an 'As Constructed' drawing. At the completion of all work, all 'As Constructed' drawings must be submitted to ENERGEX as per ENERGEX's 'As Constructed Drawing Standard', along with a certificate of completion. All relevant documentation must be returned regardless if any changes were made or not.

**Table 1: Representation of Electricity Transmission and Distribution
Conductors and Cables**

SYMBOL	MEANING
—————	Power cable (HV or LV) Overhead
-----	Power cable (HV or LV) Underground

When multiple cables of different functions are on the same route alignment, the route is represented only by the predominant function of the route. Table 1 represents the hierarchy order with the highest voltage being the predominant function.

Table 2: Symbols for Overhead Electricity Works Plans

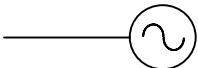






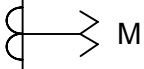
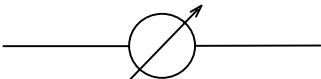





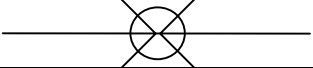
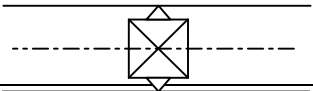

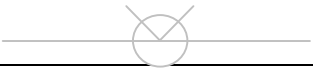


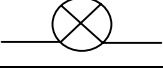
SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Generator
		Ground transformer
		Cubicle transformer (kiosk, padmount)
		Pole transformer
		Metering unit
		Voltage regulating station
		Overhead line support – tower
		Suspension tower
		Heavy strain tower
		Light strain tower
		Transposition tower
		HV transposition tower
		Tower showing conductor spacing (Variations can occur)
		HV pole
		Closed HV switch pole (Closed air break switch)
		Open HV switch pole (Open air break switch)

Table 2: Symbols for Overhead Electricity Works Plans

SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		HV and LV pole
		HV pole with provision for LV
		LV pole with provision for HV
		LV pole
		HV 'H' structure
		HV and LV 'H' structure
		HV pole with HV cable terminal box
		HV overhead termination pole with HV cable termination box
		HV and LV pole with LV cable terminal box
		LV pole with LV cable terminal box
		HV and LV pole with HV and LV cable terminal boxes
		HV and LV pole carrying provision for switchgear
		LV pole with open break in conductors (Open disc link)
		LV pole with closed break in conductors (Closed disc link)
		LV pole with open break in conductors (Open cutouts)

Table 2: Symbols for Overhead Electricity Works Plans

SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		LV pole with closed break in conductors (Closed cutouts)
		Ganged Drop Out fuse
		Drop Out fuse
		Closed tie bridging
		Open tie bridging (cutouts not included)
		Three way flying bridge
		Four way flying bridge
		HV pole mounted circuit breaker (or recloser) Open point is to be shown on that side of pole, where
		LV pole mounted circuit breaker Open point is to be shown on that side of pole where electrically the conductor break occurs
		HV and LV pole with only HV mounted CB Open point is to be shown on that side of pole where electrically the conductor break occurs
		HV and LV pole with only LV mounted CB Open point is to be shown on that side of pole where electrically the conductor break occurs
		HV and LV pole with HV and LV mounted CB Open point is to be shown on that side of pole where
		LV pole showing fused branch line
		HV pole with ground stay
		HV pole with aerial stay to stay pole
		HV pole with aerial stay pole and ground (or back) stay
		HV and LV pole with aerial stay to next line pole
		HV pole struttet

Table 3: Symbols for Underground Electricity Works Plans

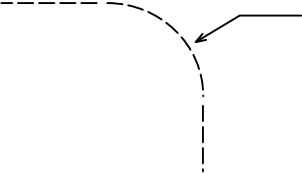



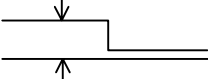

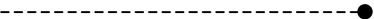


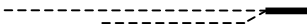
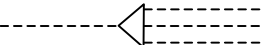



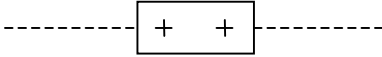
SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Radius of cable bend (shown in metres)
		Depth to top of cable (in metres) (Shown only where not typical)
		Cable location marker
		Cable offsets (shown where in excess of one metre)
		Insulated end
		Sealed end
		Straight through joint
		Tee joint
		Vee joint or trouser joint / branch joint
		Trifurcating joint (3-core cable to 3 single-core cables)
		Earth
		Earthing electrode plate
		Earthing test link
		Major underground pit – to be numbered if known and if applicable (Crosses represent number of lids)

Table 3: Symbols for Underground Electricity Works Plans

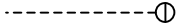
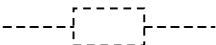
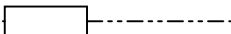
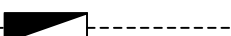

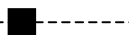
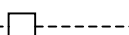
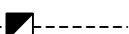









SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Service pit
		Underground traffic or streetlight pit
		Distribution cabinet without fuses (eg. Pilot cable jointing cubicle)
		Distribution cabinet with fuses (eg. LV switchboards)
		Ring Main Unit
		Existing service pillar (or turret)
		Proposed service pillar (or turret)
		Link pillar
		C&I pillar (CFS – Combination Fuse Switch)
		Proposed cable to be laid in conduit (To be used on works plan <u>only</u>)
		Proposed cable to be direct laid (To be used on works plan <u>only</u>)
		Cable laid in conduit (If more than one cable in the same conduit, major cable to be described)
		Direct laid cable
		Spare pipe or conduit
		Spare existing HV conduit
		Proposed conduit

Table 3: Symbols for Underground Electricity Works Plans





SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Spare proposed HV conduit
		Directional drill conduit
		Concrete encased conduit
		Conduit with concrete protection slab

Table 4: Symbols for Electricity System Schematics

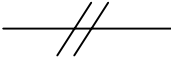
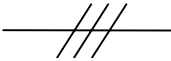
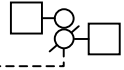
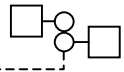




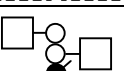
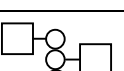
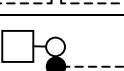
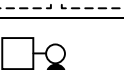

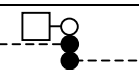


SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Underslung links
		110kV crossing
		Double tee-off fuse unit Single phase isolation
		Double tee-off fuse unit Three phase isolation
		Single tee-off fuse unit Single phase isolation
		Single tee-off fuse unit Three phase isolation
		Single tee-off ring main unit Single phase isolation
		Single tee-off ring main unit Three phase isolation
		Double tee-off ring main unit Single phase isolation
		Double tee-off ring main unit Three phase isolation
		Single tee-off fuse unit Three way isolator Single phase isolation
		Single tee-off fuse unit Three way isolator Three phase isolation
		Single tee-off fuse unit Four way isolator Single phase isolation
		Single tee-off fuse unit Four way isolator Three phase isolation
		Three way isolator Single phase isolation
		Three way isolator Three phase isolation

Table 4: Symbols for Electricity System Schematics



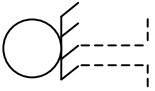

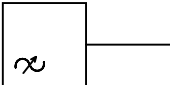

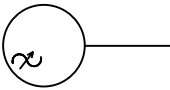
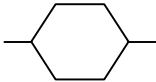
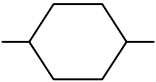

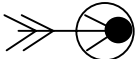

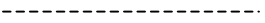























SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Four way cross mains connected
		Three way cross mains connected
		LV circuit facility ie, cubicle (kiosk, padmount) transformer with 2 LV circuits and 2 spare
		Audio frequency injection unit (static)
		Audio frequency injection unit (rotating)
		Line fault indicator
		Cable fault indicator
		Load transfer switch
		Open load transfer switch

Table 5: Symbols for Other Utilities

SYMBOL		MEANING
Above	Below	
		Line or pipe
		Service duct (ends as indicated)
		Compressed air
		Drain
		Power (electricity) line
		Fuel line
		Gas line
		Sewer
		Telephone line
		Water
		Basic symbol indicating appliance or feature on line of pipe
		Valve – large scale
		Valve – small scale

NOTES:


- Appropriate notation of utility details should be shown when available. These details may include the following:
 - Conduit/cable size (diameter/dimensions in millimetres)
 - Conduit/cable material (appropriate abbreviation)
 - Other significant details, eg, service
 For example – a 300-mm diameter high-pressure underground gas service in polyvinylchloride pipe should be drawn as -  -
- The utilities shown in the above table have been selected as those that particularly require identification for use on general-purpose drawings.
- Further details on particular utilities may be obtained by reference to section 3 of AS1100-401.
- The symbols depicted above should not be used for location plans and diagrams for electrical and communication services and systems.

Table 6: Symbols for Topographic Features – Artificial and Natural

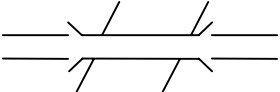
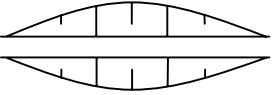
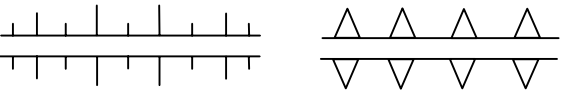

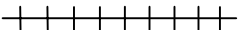
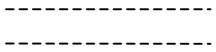
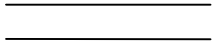

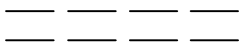
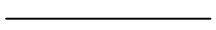
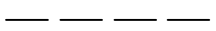
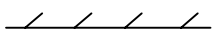
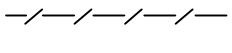
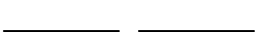
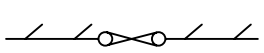
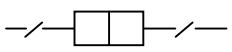
SYMBOL	MEANING
	Bridge
	Cutting
	Embankment or bund
	Ford
	Railway or tramway
	Road (unsealed)
	Road (sealed)
	Track or footpath
	Easement (Type of easement may be identified by annotation. Width of easement to be indicated)
	Existing or approved road or property boundary
	Proposed road boundary or property boundary
	Fence on boundary
	Fence not on boundary or location relative to boundary not known. NOTE: Type of fence to be identified by suitable annotation on drawing
	Edge of prepared areas, eg kerb line
	Gate
	Cattle grid

Table 6: Symbols for Topographic Features – Artificial and Natural

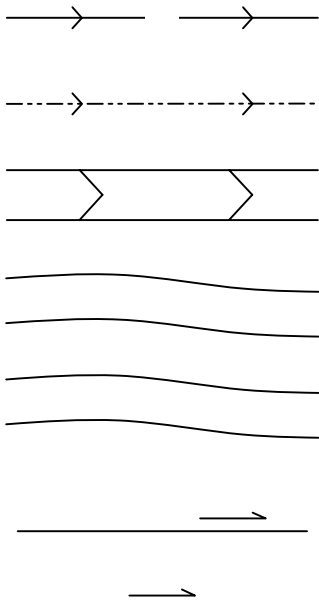
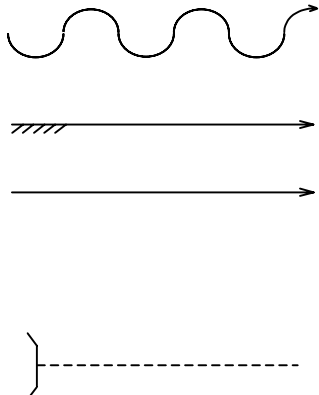
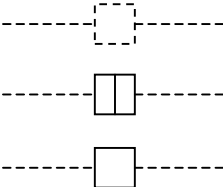
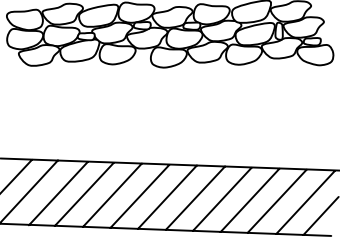
SYMBOL	MEANING
	<p>Drains – Catch drain or cut-off drain</p> <p>Subsoil drain</p> <p>Dish drain</p> <p>Open drain, unlined</p> <p>Open drain, lined (width indicated)</p> <p>Kerb and gutter, median kerb</p> <p>Direction of flow (alongside feature)</p>
	<p>Current (with rate) eg. 1kn (knot)</p> <p>Flood tide stream (with rate) eg. 5 kn (knots)</p> <p>Ebb tide stream (with rate) eg. 5kn (knots)</p> <p>NOTE: Symbols and abbreviations used on special purpose engineering survey and engineering design drawing for hydrographic work shall be in accordance with Chart 5011.</p>
	<p>Sump, gully pit, junction box or silt trap –</p> <p>Underground</p> <p>On surface, with grid or grating</p> <p>On surface</p>
	<p>Pitching/rip rap</p> <p>Retaining wall (height to be given) eg. 2m</p>

Table 7: Symbols for Miscellaneous Uses

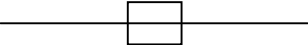
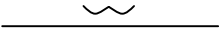
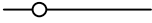

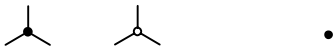











SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Special tower (details to be written along side)
		Submarine cable
		Pole stayed or guyed to ground
		Pole stayed or guyed to bollard or pole
	(Draw)	Masts and towers (state type of mast or tower and height)
	See Table 8 for energex symbols	Streetlight standard
		Traffic light standard
		Windpump (point of location at base of symbol)
		Chimney – large scale (state height of top) Chimney – small scale (state height of top)
		Street sign
		Dipstick
		Earthing point
		Fire alarm
		Hydrant
		Telephone box
		Transformer

Table 7: Symbols for Miscellaneous Uses




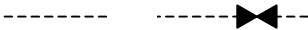






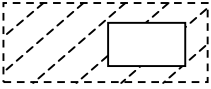
SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Vent
		Fuel main with size and material Below ground Above ground
		Filling point (fuel)
		Stop valve (fuel)
		Fuel hydrant point
		Fuel vent line (underground)
		Underground fuel tank (show capacity in kilolitres eg. 50 kL)
		Static water (show capacity in kilolitres eg. 50 kL)
		Building – Open covered area
		Covered area over substantial building – wall position uncertain
		Covered area over building – wall position known NOTE: Buildings to be constructed or demolished to be identified by suitable annotation on drawing. On small-scale

Table 7: Symbols for Miscellaneous Uses






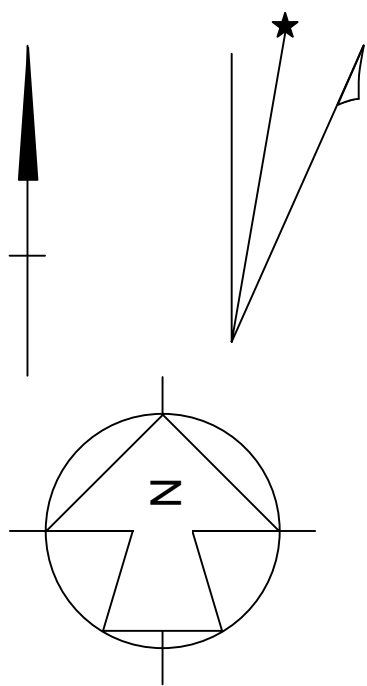
SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		<p>Heights – Base/top height of a feature (in this example, a windpump) above height datum</p>
	20.3	
	HT	<p>Height of the top of the feature above the ground line (in this example, a windpump)</p>
	HT	<p>Top height of a feature (in this example, a windpump) above height datum</p>
		<p>Floor height above height datum</p>
		<p>North indicator (Any combination may be used as required as per example)</p>

Table 7: Symbols for Miscellaneous Uses

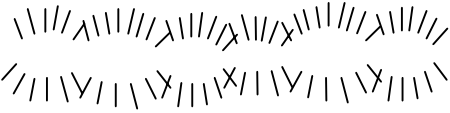
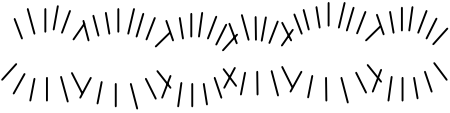
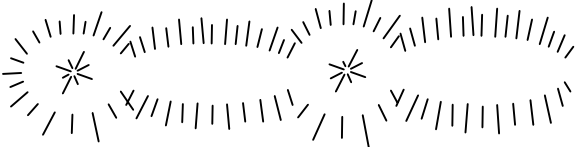
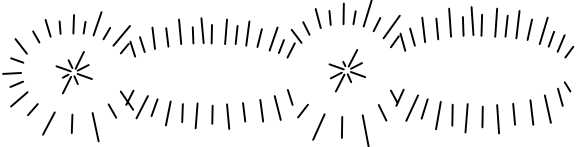






SYMBOL		MEANING
Australian Standard	ENERGEX Preferred	
		Ridge of hills with spot heights
		Hills with peaks located, with spot heights
		Isolated peak, with spot height
		Vegetation (with applicable description)
		Tree

Table 8: Symbols for Street Lighting

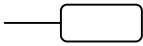
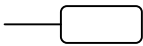

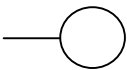
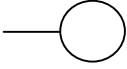


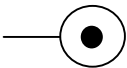
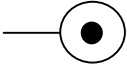
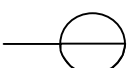





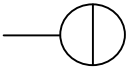
SYMBOL	DESCRIPTION	CODE
	Fluorescent 18W	F3 x 18
	Fluorescent 18W	F2 x 18
	Fluorescent 36W	F1 x 36
	Mercury Vapour 50W	M50
	Mercury Vapour 50W (Aero)	M50A
	Mercury Vapour 80W	M80
	Mercury Vapour 80W (Aero)	M80A
	Mercury Vapour 125W	M125
	Mercury Vapour 125W (Aero)	M125A
	Mercury Vapour 250W	M250
	Mercury Vapour 250W (Aero)	M250A
	Mercury Vapour 400W	M400
	Mercury Vapour 400W (Aero)	M400A
	Mercury Vapour 700W	M700
	Mercury Vapour 1000W	M1000
	Metal Halide 400W	H400

Table 8: Symbols for Street Lighting

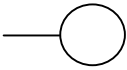
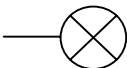
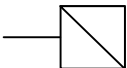

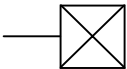
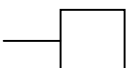
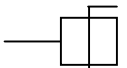

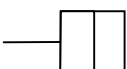


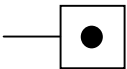
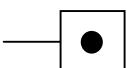
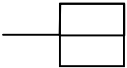
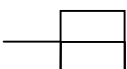


SYMBOL	DESCRIPTION	CODE
	Metal Halide 1000W	H1000
	Metal Halide 1500W	H1500
	Low Pressure Sodium 55W	L55
	Low Pressure Sodium 90W	L90
	Low Pressure Sodium 135W	L135
	High Pressure Sodium 35W	S35
	High Pressure Sodium 50W	S50
	High Pressure Sodium 70W	S70
	High Pressure Sodium 70W (Aero)	S70A
	High Pressure Sodium 100W	S100
	High Pressure Sodium 100W (Aero)	S100A
	High Pressure Sodium 150W	S150
	High Pressure Sodium 150W (Aero)	S150A
	High Pressure Sodium 250W	S250
	High Pressure Sodium 250W (Aero)	S250A
	High Pressure Sodium 400W	S400
	High Pressure Sodium 400W (Aero)	S400A

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Appendix A – Overhead Work Schedule

This schedule contains all information relevant to the design construction and recording of the overhead structures associated with the works plan. This schedule must be used where overhead works are to be affected.

OVERHEAD WORK SCHEDULE																		
LOCATION	STN No.	SITE ID (POLE No)	MWT ANG	EDT kN	MWT kN	EXISTING	RECOVER	ERECT	SINK	FOOT	COMP ID	CONSTRUCTIONS (Note: KBS is top KB to top KB)			REMARKS			
												EXISTING	RECOVER	ERECT		No	KBS	ANG
Smith St cnr Jones Rd	1	P56789		5.5	2.7	P12.5/12	P12.5/12	P14/12	2.25	NAEF	PO1	11A	11A	11SUAH	1	150	45	
												LVA	LVA	LVSUA	1	2500	45	

LOCATION - Physical address of the site.

STN No - Station number that is the reference number for the plan site ID.

SITE ID (POLE No) - ENERGEX's site identification number.

POLES

MWT ANG - Mean Working Tension angle: direction of net force of **all** conductors on pole (360° measure clockwise - 0° Nth, 90° East, etc)

EDT kN - Everyday tension: Sustained loading on pole under no wind conditions in kN.

MWT kN - Mean Working Tension: maximum loading on the pole under wind conditions in kN.

EXISTING - Description of existing pole at this station.

RECOVER - Description of existing pole to be recovered from this station.

ERECT - Description of new pole to be erected at this station.

SINK - Required depth of pole hole in metres.

FOOT - Pole foundation type.

COMP ID - Individual number of component at the site

ALIGN - Distance from the centre of pole to a reference point (m) nominated by the local authority or other Statutory Authority.

CONSTRUCTIONS

EXISTING - Description of existing pole top configurations. Description as per O/H Construction Manual.

RECOVER - Description of existing pole top configurations to be recovered. Description as per O/H Construction Manual.

ERECT - Description of the new pole top configuration, including construction type, insulator type, etc

KBS - Distance (mm) from top of pole to the first attachment point and thereafter the distance between attachment points.

No - The total number of new constructions of one particular type (eg Page7-53-3), erected at this KBS

ANG - Deviation angle of conductors for each construction.

NOTE: All constructions at the site (ie earths) are to be shown in the constructions columns and not in the remarks column.

REMARKS - Any other details/descriptions not covered by the schedule.

Appendix B – Overhead Works Schedule - Constructions

Only one construction is required to be shown in the constructions column, even if this construction contains multiple components. Eg. Page7-53-3. These are now to be shown in the No column. Examples of the old and new styles are shown below.

LOCATION	STN No.	SITE ID (POLE No)	OVERHEAD WORK SCHEDULE										REMARKS						
			MWT ANG	EDT kN	MWT kN	EXISTING	RECOVER	ERECT	SINK	FOOT	COMP ID	ALIGN		EXISTING	RECOVER	ERECT	No	KBS	ANG
Smith St cnr Jones Rd		SP9224				14m H 52 CCA	14m H 52 CCA			NAEF		3.2	11S/NMOS	11S/NMOS	PCPF 11TDSL/NMOS 5984 7327	1	150	0	NEW POLE TO BE RELOCATED 1m SOUTH
														PAGE7-53-3 11EDO3	PAGE7-53-3 11EDO3C	3	EX		
														LVPTU/NMOS SET57-1/3	LVPTU/NMOS SET57-1/3	9	EX		
														LVPTU/NMOS SET57-1/3	LVPTU/NMOS SET57-2/3 LVBR240/AOH LV14C240/HV	1	EX	0	
														PTCOM	PTCOM	PTCOMC	1	EX	

Correct construction display

Appendix C – Overhead Conductor Schedule

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 to be affected.

OVERHEAD CONDUCTOR SCHEDULE															
LOCATION	STATIONS FROM-TO	VOLTS	EXISTING	TRANSFER	RECOVER	ERECT	No OF SPANS	DIST (m)	STRING TABLE	M.E.S.	SAG SPAN FROM-TO	SAG (m)		TOTAL CONDUCTOR LENGTH (m)	REMARKS
												15°	30°		
Jones Rd, Teviotville	1 – 2 2 – 4	11kV LV	3MA		3MA	3MO	1 2	51 58	440 440	50.4 39.4	1-2 2-3	1.12 0.71	1.25 0.84	159 65	(Via 3)

LOCATION

- Physical address of the sites

STATIONS FROM-TO

- Plan station numbers of each site between which the works are to take place.

VOLTS

- Nominal voltage the conductors will be energised at, eg 11kV, LV.

EXISTING

- Description of existing conductors between the stations numbers. Number of conductors and code listed, eg 3MA

TRANSFER

- Description of the conductors to be moved from one site to another. Number of conductors and code listed, eg 3PL

RECOVER

- Description of the conductors to be recovered. Number of conductors and code listed, eg 3PL

ERECT

- Description of the conductors to be erected. Number of conductors and code listed, eg 3MO

No OF SPANS

- Number of spans between station numbers.

DIST (m)

- Sum of the span lengths between station numbers in meters.

STRING TABLE

- Conductor stringing tension table number as per Overhead Design Manual.

M.E.S.

- Mean equivalent span as calculated in accordance with the Overhead Design Manual.

SAG SPAN (FROM-TO)

- Nominated station numbers where sagging is to occur.

SAG (m)

- The calculated sag for the selected span at the various temperatures – 15°C and 30°C.

15°C and 30°C

NOTE: Allow 5°C for inelastic stretch where applicable.

REMARKS

- Any other details/descriptions not covered by the schedule.

Appendix D – Overhead LV Service Conductor Schedule

This schedule is used primarily for the design of and alterations to existing services, and contains all relevant information for the services associated with the works plan.

LV OVERHEAD SERVICE CONDUCTOR SCHEDULE																	
LOCATION	STN No.	HOUSE No.	EXISTING	TRANSFER	RECOVER	ERECT	No OF SPANS	DIST (m)	SAG (m)		TOTAL CONDUCTOR LENGTH (m)	FITTINGS			REMARKS		
									15°	25°		MAINS CHANGE BOX	FUSE SIZE	Ø		SERVICE FITTING CODE or IIN	
Main St, Beenleigh	2-2a	51	1ph Open		1ph Open	PW/16	1	29	2-2a	0.6	0.65	30	N	50	AN	N2B25WCN50	

LOCATION

- Physical address of the site eg street name
- Station number that is the reference number for the plan site ID.
- HOUSE No
- EXISTING
- TRANSFER
- RECOVER
- ERECT
- No OF SPANS
- DIST (m)
- SAG SPAN
- SAG (m)
- TOTAL CONDUCTOR LENGTH (m)

FITTINGS

- MAINS BOX
- CHANGE P.O.A.
- FUSE SIZE
- Ø
- SERVICE FITTING CODE or IIN

REMARKS

- Any other details/descriptions not covered by the schedule.

Appendix E – Streetlight Schedule

This schedule contains all information relevant to the design, construction and recording of streetlight works associated with the works plan. This schedule must be used when any streetlights are to be affected. Street light schedules are to be listed directly below one another.

RATE 2																							
STREETLIGHT SCHEDULE																							
LOCATION	STN No	SITE ID (POLE No)	POLE or COMPONENTS			LUMINAIRE						OUTREACH BRACKET			MOUNT HEIGHT (m)	REMARKS							
			COMP ID	EXIST	REC	ERECT	ALIGN	COMP ID	EXIST	RECOVER LUMIN	RECOVER CUST	DATE DE-ENERG	ERECT LUMIN	ERECT CUST			DATE ENERG	SLM or IIN	EXIST (m)	REC (m)	ERECT	SLM or IIN	
Jones Rd. Coorparoo	2	24880	PO1		5.5		SLM15530	3.27	SL1		M50DI-1	BCWK			M50DI-2	BCWK				1.5	SLM5733	6.5	

RATE

- Rate to be displayed in the table title as well as Luminaire section of the table. When replacing the luminaire and changing the rate, (eg from rate 1 to rate 2), these are to be shown in the schedule for the erected rate, not the recovered rate as shown above.

Note: A different schedule should be used to identify the different rates being erected

LOCATION

- Physical address of the site eg street name

STN No

- Station number that is the reference number for the plan site ID.

SITE ID (POLE No)

- ENERGEX's site identification number.

POLE or COMPONENTS

COMP ID

- Individual number of component at the site

EXIST (m)

- Description of existing pole at this station.

REC (m)

- Description of existing pole to be recovered from this station.

ERECT (m)

- Description of new pole to be erected at this station.

SLM or IIN

- Streetlight model or Stock code

ALIGN (m)

- Distance from the centre of pole to a reference point (m) nominated by the local authority, Department of Transport or other Statutory Authority. This may be a northing and easting reference if the area is greenfield.

LUMINAIRE

COMP ID

- Individual number of component at the site

EXIST

- Description of existing luminaire rate, type and size (In accordance with ENERGEX Public Lighting Manual)

RECOVER

- LUMIN - Description of luminaire rate, type and size to be recovered (In accordance with ENERGEX Public Lighting Manual)

- CUST - The customer who is billed for this light

Appendix E – Streetlight Schedule (contd)

DATE DE_ENERG	- Date that supply to light removed (typically the as constructed date)
ERECT	-LUMIN
	- CUST
DATE ENERG	- Description of luminaire rate, type and size to be erected (In accordance with ENERGEX Public Lighting Manual)
SLM or IIN	- The customer who is to be billed for this light
	- Date that supply to light connected (typically the as constructed date)
	- Streetlight model or Stock code
OUTREACH BRACKET	
EXIST (m)	- Description of existing outreach or bracket type (In accordance with ENERGEX Public Lighting Manual)
REC (m)	- Description of existing outreach or bracket type to be recovered from this station (In accordance with ENERGEX Public Lighting Manual)
ERECT (m)	- Description of new outreach or bracket type to be erected at this station (In accordance with ENERGEX Public Lighting Manual)
SLM or IIN	- Streetlight model or Stock code
MOUNT HEIGHT (m) - Nominal-mounting height of the streetlight ((In accordance with ENERGEX Public Lighting Manual)	
REMARKS	- Any other details/descriptions not covered by the schedule.

Appendix F – Underground Civil Works Schedule

This schedule contains all information relevant to the design, construction and recording of excavation, backfill and laying of conduits in trenches for underground works (other than URD estates), associated with the works plan.

UNDERGROUND CIVIL WORKS SCHEDULE																	
LOCATION	STATION FROM-TO		TRENCH (m)			CONDUITS			BENDS		BACKFILL		PROTECTION		REINSTATEMENT		REMARKS
	L	W	D	SIZE/ TYPE	No	TOTAL LENGTH	SIZExANGxRAD	No	TYPE	(m ³)	D	TYPE	No	TYPE	(m ²)		
Welsby St, Geebung	2	3	0.3	0.75	100FC	2	44 m	100x30x2000	6	EXSPOIL	5				GRASS	33	

LOCATION

- Physical address of the sites

STATIONS FROM-TO

- Plan station numbers of each site between which the works are to take place.

TRENCH (m)

- L - Length of the trench in metres
- W - Width of the trench in metres
- D - Depth of the trench in metres

CONDUITS

- SIZE/TYPE - A description of the diameter and type of conduit
- No - The number of conduits in the trench
- TOTAL LENGTH - The total length of the conduits being installed

BENDS

- SIZExANGxRAD - A description of the conduit bend diameter, angle of the bend and radius of the bend
- No - The number of bends required

BACKFILL

- TYPE - A description of the backfill type
- (m³) - Volume of backfill required in cubic metres (m³)
- D - Depth of backfill

PROTECTION

- TYPE - A description of the protection required
- No - The number of these protection types required

Appendix F – Underground Civil Works Schedule (contd)

REINSTATEMENT

TYPE
(m²)

- A description of the type of reinstatement required, eg concrete, bitumen or grass
- The area of the surface to be reinstated in square metres (m²)

REMARKS

- Any other details/descriptions not covered by the schedule.

Appendix G – Underground Cable Schedule

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

LOCATION	STATIONS FROM-TO	VOLTS	EXIST	REC	INSTALL	UNDERGROUND CABLE SCHEDULE					REMARKS
						CABLE SIZE/MODEL/LENGTH (m)					
						240mm ² 3C AL XLPE	11kV CABLE	LV CABLE	S/L CABLE		
Welsby St, Geebung	1 - 4	11kV			✓	95mm ² 3C AL XLPE	120mm ² 4C AL XLPE	16mm ² 4C AL XLPE	4mm ² 2C PVC/PVC		
	4 - 6	LV			✓	55					
	6 - 7	SL			✓		73			12	
TOTALS						0	55	73	0	12	

LOCATION

- Physical address of the sites

STATIONS (FROM-TO)

- Plan station numbers of each site between which the works are to take place.

VOLTS

- Nominal voltage the cables will be energised at, eg 11kV, LV.

EXIST

- Tick if existing cables between the station numbers.

REC

- Tick if cable is to be recovered.

INSTALL

- Tick if cable is to be installed.

CABLE SIZE/MODEL/LENGTH

- A description of the cable size, model and length.

- Compatible unit as per underground standards for appropriate voltage level and the total length of cable between station numbers required including allowance for pole terminations, joints, loops, etc.

- Total length of designated cable to be installed (optional).

- Any other details/descriptions not covered by the schedule.

TOTALS

REMARKS

Appendix H – URD Civil Works Schedule

This schedule contains all information relevant to the design, construction and recording of civil works for URD subdivisions associated with the works plan. This schedule must be used on all URD subdivision works plans.

LOCATION	STATIONS FROM-TO	URD CIVIL WORKS SCHEDULE										DRAW WIRE	KERB MARK	REMARKS		
		CONDUIT LENGTH (m)			BENDS (x°/No)			X-SECTION (m)								
		40mm No	80mm	125mm No	40mm	80mm	125mm	EXCAV/ TAPE	TRENCH DETAIL							
Smith St, Springfield	3 - 8		64	1	64	1		30	1	30	1	64	A	128		
	8 - 11		58	2			60	2				58	B		1	Along footpath
	11 - 12		41	2								41	E	81	1	x - Street
	12 - 13	12		1									C	12		
TOTALS		12	262		64		0	3		1		163		221	2	

LOCATION

- Physical address of the sites

STATIONS (FROM-TO)

- Plan station numbers of each site between which the works are to take place.

CONDUIT LENGTH (m)

- Required length and number of the relevant size conduit

BENDS (x°/No)

- Required number and angle of relevant size bends

X-SECTION (m)

EXCAV/TAPE

- Length of trench excavation and marker tape required

TRENCH DETAIL

- Description of trench cross section as per specification URD

DRAW WIRE

- Length of draw wire required

KERB MARK

- Number of kerb markers required

TOTALS

- Total length/ number of components required (optional).

REMARKS

- Any other details/descriptions not covered by the schedule.

Appendix I – Equipment Schedule

This schedule contains all information relevant to the design, construction and recording of equipment to be installed (not included in other schedules, eg ground transformers, RMUs, etc) as associated with the works plan.

This schedule must be used when equipment is to be affected.

EQUIPMENT SCHEDULE												
LOCATION	ST NN O	SITE ID	EXIST	REC	INSTALL	SIZE & DESCRIPTION	IIN	COMPI D	PLANTN O	MODEL ID	QTY	REMARKS
Forbes Crt. Sunnybank	1	SG1234			✓	LV Distribution board Type S1250/4F		LB1		LVBSF1250	1	
Forbes Crt. Sunnybank	2	U2468024			✓	Service Pillar 2 Way		PI1		LVSP4-6SL	1	

LOCATION

- Physical address of the site eg street name

STN No

- Station number that is the reference number for the plan site ID.

- ENERGEX's site identification number. This is not mandatory if another schedule can associate the station number with the site id on the same drawing)

EXIST

- Tick if existing equipment item.

REC

- Tick if existing equipment item is to be recovered.

INSTALL

- Tick if existing equipment item is to be installed.

SIZE & DESCRIPTION

- A description of the equipment item, including number required.

IIN

- ENERGEX stores item identification number for the equipment item.

COMP ID

- Individual number of component at the site

PLANT No

- Allocated ENERGEX number for items of plant.

MODEL No

- Compatible unit as per ENERGEX standards

QTY

- The number of equipment items being installed.

REMARKS

- Any other details/descriptions not covered by the schedule.

Appendix J – Sundry Schedules

This schedule contains all information relevant to the design, construction and recording of work not included in any other schedules associated with the works plan.

This schedule must be used when sundry items are to be affected.

OVERHEAD SUNDRY SUMMARY SCHEDULE		
SUNDRY SPEC	DESCRIPTION	REMARKS

UNDERGROUND SUNDRY SUMMARY SCHEDULE		
SUNDRY SPEC	DESCRIPTION	REMARKS

- SUNDRY SPEC
DESCRIPTION
QUANTITY
REMARKS
- Compatible unit or Stock code of sundry item
 - Brief description of sundry item
 - Number of this sundry item required
 - Any other details/descriptions not covered by the schedule.

OVERHEAD SUNDRY DETAILS SCHEDULE			
LOCATION	STATIONS FROM-TO	SUNDRY SPEC	REMARKS

UNDERGROUND SUNDRY DETAILS SCHEDULE			
LOCATION	STATIONS FROM-TO	SUNDRY SPEC	REMARKS

- LOCATION
STATIONS FROM-TO
SUNDRY SPEC
DESCRIPTION
QUANTITY
REMARKS
- Physical address of the site eg street name
 - Plan station numbers of each site between which the works are to take place.
 - Compatible unit or Stock code of sundry item
 - Brief description of sundry item
 - Number of this sundry item required
 - Any other details/descriptions not covered by the schedule.

Appendix K – Title Block

The title block provides information on the identification of the works, the designers, services information and recording data, all associated with the works plan. Segments are completed only when they are applicable to the works. This style of title block is recommended. The project number itself must be located in a position where its identification may be ascertained without unfolding the paper works plan, preferably on the bottom right hand corner. A title block is to be used on all works plans.

Section A

DATE 7/5/03	ORIGINAL	SITE CONTACT DETAILS		ALIGNMENTS		WORKS COORDINATOR		Joseph Bloggs
		NAME Richard Green	ENERGEX OH 3.2m	ENERGEX UG N/A	PARENT PROJECT NO.	WORKS COORDINATOR		
		COMPANY Electrical Enterprises	TELSTRA Joint Use		WORK REQUEST NO.			
		PHONE 3311 1234	GAS 0.6m		LOTS		1 to 40 on SP168248	
		MOBILE 0430 444 123	HP GAS N/A		CANCELLING LOTS		23 & 24 on RP52478	
		FAX 3311 2468	WATER N/A		LOCAL AUTHORITY		BCC	
			STORMWATER N/A		UBD REF		139 F-15	
			SEWERAGE N/A		PEGGED?		Yes	
			OTHER N/A					

Section B

APPROVED: <i>Signature</i>	ENERGEX	WORKSPANS VERSION 4.2.0
CHECKED: <i>Signature</i>		SCALE: 1:1000
DESIGNER: John Smith	11KV & LV EXTENSION REMOVAL OF EXISTING 100KVA SP TO NEW SITE	PROJECT/SUB PROJECT NO.
PHONE: 3404 1234		C0011738
PLANNER: David Brown	11KV & LV EXTENSION BARWOOD STREET NEWMARKET	A1 Landscape of 1
PHONE: 3407 2468		ISSUE NO: A
ISSUE DATE: 07 May 2003		A1

Appendix K - Title Block

Section A

- A
- Issue number of this works plan (A – Z is used)
 - What was changed to initiate this issue (Issue A will be original)
 - Date of this issue

Site Contact Details – (these details must appear in the title block only)

- Name of the person to contact on site, eg. project manager, coordinator
- Company this person represents
- Landline phone number of the contact person on site
- Mobile phone number of the contact person on site
- Facsimile phone number of the contact person on site

Alignments

- Expected alignments of utility assets
 - Name of person responsible for works
 - Project number generated from ENERGEX ellipse system (expected to be the same as the primary Project Number)
 - Work group works order numbers
 - The new lot numbers and plan number for URD subdivisions
 - The cancelled lot(s) and plan number(s) for URD subdivisions
 - Council or Shire where the works will occur
 - Location of works using the UBD map reference number and grid coordinates
 - A comment depending upon whether the sites have been pegged
- Works Coordinator
Parent Project No
Work Request No
Lots
Cancelling Lots
Local Authority
UBD Ref
Pegged?





























Section B

- Approved
Checked
Designer }
Phone }
Planner }
Phone }
Issue Date
- Signature of the person approving the technical accuracy of the design
 - Signature of the person checking the technical accuracy of the design
 - Name and phone number of the person who designed the works on the works plan
 - Name and phone number of the person who planned the works on the works plan
 - Issue date of the works plan































Title Box –

- Upper section
Middle section
Lower section
- Name of company designing the works on the works plan
 - Description of the works
 - Name and address of the works plan worksite
- Worksplans Version
Scale
Project/Sub Project Number
Sheet
Issue No
- Valid only for ENERGEX's AutoCAD based drawing package
 - Drawing scale of the works plan
 - Allocated primary ENERGEX number of the works plan or sub project as with substation works
 - Sheet number of the total number of sheets associated with the works plan
 - Issue of this works plan (A – Z is used)

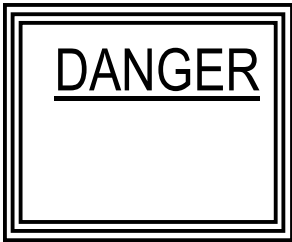
Appendix L – AutoCAD Map 2000 Layer Properties

Layer Name	Description	Colour	Line Type	A/CAD Colour Number
0	Standard AutoCAD layer	White 	Continuous	Color_7
25	Standard AutoCAD layer	White 	Continuous	Color_7
35	Standard AutoCAD layer	50 	Continuous	Color_50
5	Standard AutoCAD layer	11 	Continuous	Color_11
7	Standard AutoCAD layer	140 	Continuous	Color_140
ASBUILT	Current network U/G & O/H	Yellow 	Continuous	Color_2
ASBUILTREMOVED	Proposed network removal	Red 	Continuous	Color_1
ASBUILTUPDATED	Proposed network modification	Green 	Continuous	Color_3
BASEVIEWS		Red 	Continuous	Color_1
BOUNDING		Magenta 	Continuous	Color_6
CROSSSECTIONS		131 	Continuous	Color_131
DCNetwork	Related to QuickView only	White 	Continuous	Color_7
DCNetwork_110kV	Related to QuickView only	Red 	Continuous	Color_1
DCNetwork_110kV_txt	Related to QuickView only	Red 	Continuous	Color_1
DCNetwork_11kV	Related to QuickView only	Yellow 	Continuous	Color_2
DCNetwork_11kV_txt	Related to QuickView only	Yellow 	Continuous	Color_2
DCNetwork_132kV	Related to QuickView only	14 	Continuous	Color_14
DCNetwork_132kV_txt	Related to QuickView only	14 	Continuous	Color_14
DCNetwork_19kV	Related to QuickView only	Yellow 	Continuous	Color_2
DCNetwork_19kV_txt	Related to QuickView only	Yellow 	Continuous	Color_2
DCNetwork_275kV	Related to QuickView only	14 	Continuous	Color_14
DCNetwork_275kV_txt	Related to QuickView only	14 	Continuous	Color_14
DCNetwork_33kV	Related to QuickView only	112 	Continuous	Color_112
DCNetwork_33kV_txt	Related to QuickView only	112 	Continuous	Color_112
DCNetwork_415V	Related to QuickView only	14 	Continuous	Color_14
DCNetwork_415V_txt	Related to QuickView only	14 	Continuous	Color_14
DCNetwork_DE-ENG	Related to QuickView only	White 	Continuous	Color_7
DCNetwork_DE-ENG_txt	Related to QuickView only	White 	Continuous	Color_7

Appendix L – AutoCAD Map 2000 Layer Properties (contd)

Layer Name	Description	Colour	Line Weight	A/CAD Colour Number
DCNetwork_EARTH	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_EARTH_txt	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_LV	Related to QuickView only	Blue 	Continuous	Color_5
DCNetwork_LV_txt	Related to QuickView only	Blue 	Continuous	Color_5
DCNetwork_OHEW	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_OHEW_txt	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_OHEW+P	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_OHEW_P_txt	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_P	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_P_txt	Related to QuickView only	Green 	Continuous	Color_3
DCNetwork_SL	Related to QuickView only	192 	Continuous	Color_192
DCNetwork_SL_txt	Related to QuickView only	192 	Continuous	Color_192
DCNetwork_Stay	Related to QuickView only	39 	Continuous	Color_39
DCNetwork_Stay_txt	Related to QuickView only	39 	Continuous	Color_39
DCNetwork_txt	Related to QuickView only	White 	Continuous	Color_7
Defpoints		White 	Continuous	Color_7
GHOST		8 	Continuous	Color_8
HISTORY		White 	Continuous	Color_7
NEW		140 	Continuous	Color_140
NOTETEXT	Defining network eg, conduit configs	White 	Continuous	Color_7
REMOVED		Yellow 	Continuous	Color_2
STATIONS		50 	Continuous	Color_50
ROAD_CL		White 	Continuous	Color_7
ROADNAME		White 	Continuous	Color_7
ROUTES		41 	Continuous	Color_41
TX_18_BOLD		141 	Continuous	Color_141
UPDATED		Yellow 	Continuous	Color_2
viewport		White 	Continuous	Color_7
WOPOLYGON		Cyan 	DASHED2	Color_4
CONSUMER MAINS		Purple 	DASHED	Color_?

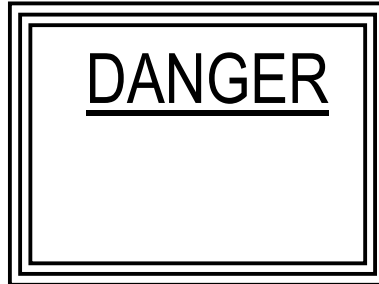
Appendix M – Examples of Warning/Caution Boxes



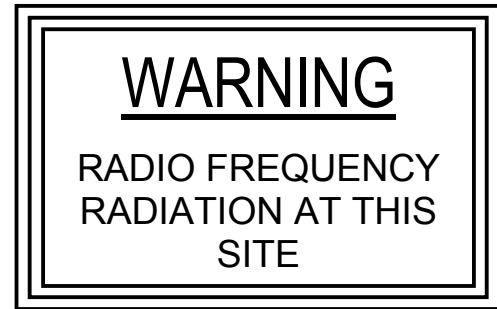
Live cables are in the vicinity



Underground assets are in the vicinity. Hand excavation is required.



Gas pipelines are in the vicinity. Location confirmation with the appropriate gas organisation is to be organised before any excavation is commenced.



RFR units are installed at this site and appropriate safety procedures must be adhered to.



State of pole is of concern and precautions are to be taken before certain works are commenced.



Arrangements for control of traffic are to be done before commencement of work.



Location of underground services are to be confirmed before commencement of work.

Section 13 - Deployment List

RESOURCE CO-ORDINATORS

SOUTH COAST

NORTH COAST

METRO NORTH

METRO SOUTH

WESTERN

PLANNING & DESIGN CO-ORDINATORS

SOUTH COAST

NORTH COAST

METRO NORTH

METRO SOUTH

WESTERN

CBD

PUBLIC LIGHTING

PRINCIPAL MAINS DESIGN ENGINEER

PRINCIPAL IMPROVEMENT CO-ORDINATOR

SENIOR TRANSMISSION DESIGN PROJECT OFFICER

DESIGN MANAGER

SUBDIVISIONS CO-ORDINATOR

