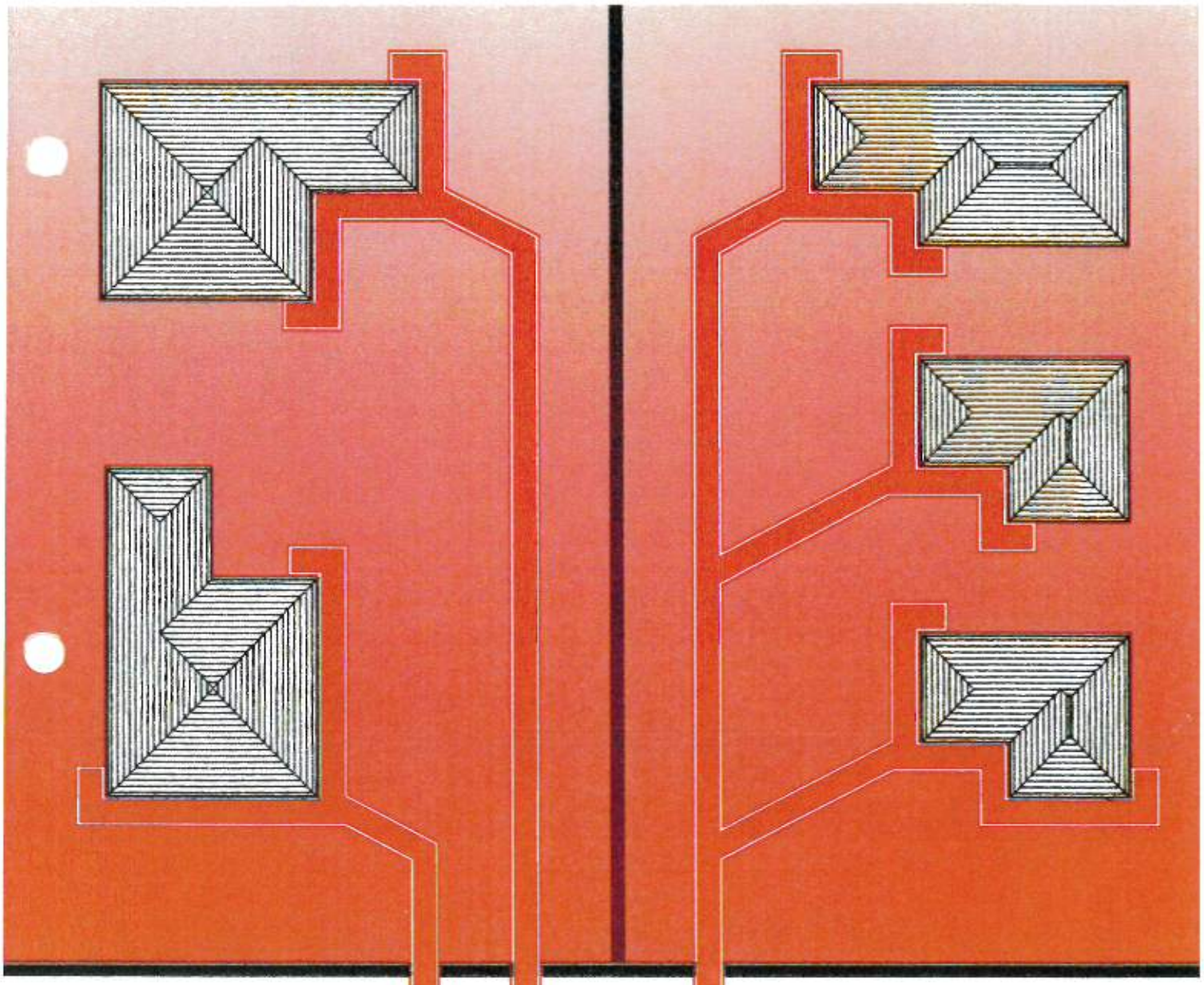


LGESA

LOCAL GOVERNMENT
ELECTRICITY SUPPLY
ASSOCIATION (VIC)

SERVICE & INSTALLATION RULES

CODE OF PRACTICE FOR THE CONNECTION OF ELECTRICAL INSTALLATIONS TO SUPPLY MAINS

1994

FOREWORD

This document has been jointly compiled by Electricity Services Victoria and member Councils of the Local Government Electricity Supply Association. It is intended for the use of electrical contractors, licensed electrical mechanics, consulting engineers, architects and those people directly concerned with electrical installations to be connected to supply mains throughout Victoria. Some metropolitan areas are supplied by Local Government Electricity Supply Authorities and variations as determined by the City Electrical Engineer may apply in those areas.

The Rules embrace requirements for customers' installations regarding supply arrangements, provision for service cables and consumers mains, metering, multiple installations and high voltage installations.

The information has been arranged so that the tables and drawings are included within the body of the document and assembled to reflect specific topics to assist users of the document.

It should be noted that these Rules supersede all previously existing "Supply Authority Requirements" relating to similar matters in customers' installations throughout Victoria.

Words and expressions defined in the Wiring Regulations have the same meaning when used in these Rules.

Any revision of this document shall be carried out by a Joint Review Committee comprising representatives of Electricity Services Victoria and member Councils of the Local Government Electricity Supply Association.

S.A. Breheny
Chief Executive Officer
Electricity Services Victoria

F.E. Ingham
Secretary
LGESA

NOTE:-Electricity supply publications are revised when necessary by the issue either of revised pages or complete new editions. It is important that users of such publications ascertain that they are in possession of the latest issues.

Address all inquiries to –
Supply Liaison Officer, Distribution Services Department
Electricity Services Victoria
Box 2765Y
GPO Melbourne 3001

7810 231 6116 / 592 (R3) 10k

LIST OF CONTENTS

INTRODUCTORY INFORMATION

SERVICE AND INSTALLATION RULES

5 PROVISIONS FOR SERVICE CABLES AND CONSUMER'S MAINS

6 METERING

APPENDICES

REFERENCE DOCUMENTS

- ELECTRICITY INDUSTRY ACT 1993
- STATE ELECTRICITY COMMISSION ACT (VICTORIA) 1958
- ELECTRIC LIGHT AND POWER ACT 1958
- STATE ELECTRICITY COMMISSION WIRING REGULATIONS
- AUSTRALIAN STANDARD 3000
- #SEC – STANDARD SERVICE PRICES
- #SEC – CODE OF PRACTICE FOR TREE CLEARING
- #SEC – SPECIFICATION FOR THE DESIGN, CONSTRUCTION AND MAINTENANCE OF PRIVATE OVERHEAD ELECTRIC LINES
- #SEC – REQUIREMENTS FOR LOW VOLTAGE CURRENT TRANSFORMER METERING
- #SEC – CUSTOMER HIGH VOLTAGE INSTALLATIONS
- #SEC – REQUIREMENTS FOR HIGH VOLTAGE METERING
- #SEC – SPECIFICATION FOR INDOOR SUBSTATION ON CUSTOMER'S PROPERTY
- #SEC – A TECHNICAL GUIDE TO NEW DIMENSION ELECTRIC DOMESTIC HOT WATER

Documents marked "#" are obtainable from local SEC offices, equivalent information for LGESA areas should be obtained from the relevant Authority.

A AREA OF SUPPLY

Electricity Services Victoria Trading as SEC supplies electricity directly to customers throughout the State of Victoria with the exception of a number of areas each supplied separately by a Local Government Electricity Supply Authority [LGESA]. Areas not supplied directly by the SEC include Melbourne, Box Hill [including Nunawading], Brunswick, Coburg, Doncaster and Templestowe, Footscray, Heidelberg, Northcote, Port Melbourne, Preston and Williamstown.

The SEC also operates a Remote Area Power Supply Incentive Scheme (RAPSIS) which may provide assistance for customers choosing to install their own Remote Area Power Supply (RAPS) system.

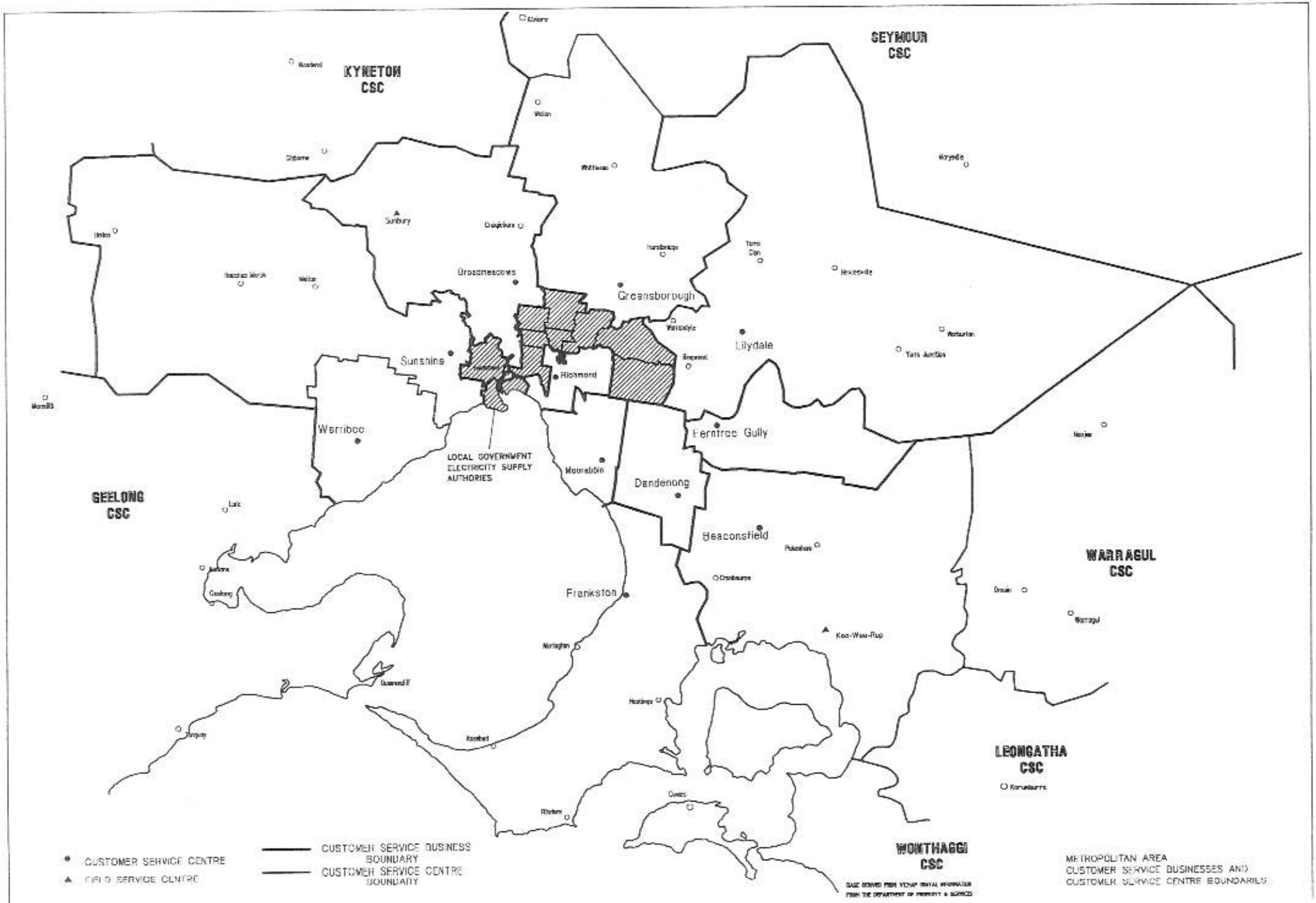
OFFICES FOR CONTACT REGARDING ELECTRICITY SUPPLY ARRANGEMENTS

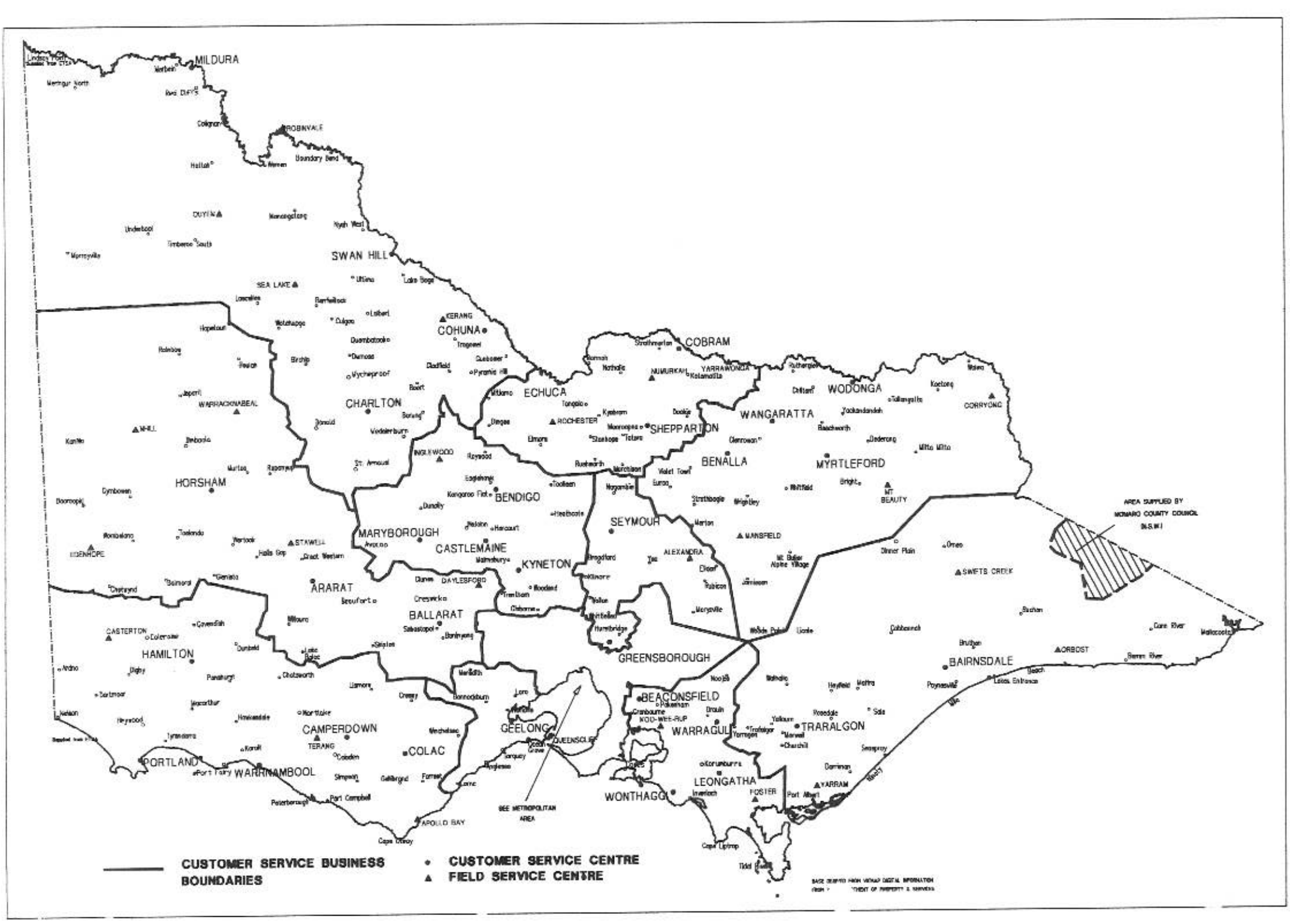
SEC CUSTOMER SERVICE CENTRE OFFICES

OFFICE	ADDRESS	POST CODE	TELEPHONE NUMBER	FACSIMILE NUMBER
ARARAT	103 Barkly St	3377	053 521 257	053 522 554
BAIRNSDALE	180 Princes Hwy	3875	051 531 522	051 521 130
BALLARAT	Norman St, Wendouree	3350	053 338 111	053 338 221
BEACONSFIELD	Beaconsfield Ave	3807	03 709 1200	03 709 1207
BENALLA	122 East Bridge St	3672	057 611 411	057 611 498
BENDIGO	601 Napier St, Epsom	3550	054 448 411	054 448 433
BROADMEADOWS	34–40 King William St	3047	03 301 2211	03 301 2223
CAMPERDOWN	140 Manifold St	3260	055 931 533	055 932 267
CASTLEMAINE	50 Mostyn St	3450	054 705 244	054 724 402
CHARLTON	9A High St	3525	054 911 388	054 911 311
COBRAM	Karook St	3644	058 711 800	058 722 764
COHUNA	3 King George St	3568	054 564 011	054 563 133
COLAC	119 Murray St	3250	052 335 211	052 312 245
DANDENONG	6 Abbots Rd	3175	03 794 4000	03 794 4711
ECHUCA	39 Cornelia Creek Rd	3625	054 807 211	054 824 850
FERNTREE GULLY	75 Acacia Rd	3156	03 752 3303	03 752 3190
FRANKSTON	4 Baxter St	3199	03 784 9200	03 784 9229
GEELONG	125 Malop St	3220	052 264 211	052 264 326
GREENSBOROUGH	276 Greenwood Drv Bundoora	3083	03 432 2877	03 433 3300
HAMILTON	57 Hammond St	3300	055 712 363	055 725 675
HORSHAM	17 McLachlan St	3400	053 829 411	053 829 481

SEC CUSTOMER SERVICE CENTRE OFFICES (Cont'd)

OFFICE	ADDRESS	POST CODE	TELEPHONE NUMBER	FACSIMILE NUMBER
KYNETON	47 High St	3444	054 223 966	054 223 411
LEONGATHA	50 Bair St	3953	056 625 444	056 623 877
LILYDALE	Melba Ave	3140	03 735 6222	03 735 6293
MARYBOROUGH	88 High St	3465	054 604 177	054 613 611
MILDURA	108 Madden Ave	3500	050 239 411	050 230 988
MOORABBIN	422 Warrigal Rd	3189	03 265 7700	03 265 7701
MYRTLEFORD	165 Myrtle St	3737	057 511 122	057 522 707
PORTLAND	31 Percy St	3305	055 217 363	055 233 394
RICHMOND	630 Church St	3121	03 295 8500	03 295 8282
SEYMOUR	67 Anzac Ave	3660	057 991 966	057 991 079
SHEPPARTON	217 Maude St	3630	058 313 733	058 219 246
SUNSHINE	20 Hertford Rd	3020	03 313 6200	03 313 6216
SWAN HILL	353 Campbell St	3585	050 329 231	050 323 727
TRARALGON	108 Franklin St	3844	051 711 411	051 711 530
WANGARATTA	53 Reid St	3677	057 222 011	057 219 209
WARRAGUL	41 Smith St	3820	056 232 838	056 232 136
WARRNAMBOOL	7 Strong St	3280	055 632 522	055 632 511
WERRIBEE	201 Watton St	3030	03 741 9053	03 741 1639
WODONGA	149 High St	3690	060 561 722	060 561 327
WONTHAGGI	9 McBride Ave	3995	056 724 100	056 721 200


KYNETON CSC
SEYMOUR CSC
GEELONG CSC
WARRAGUL CSC
LEONGATHA CSC
WONTHAGGI CSC
Kilmore
Woodend
Wallan
Whittlesea
Kinglake
Sunbury
Diggers Rest
Broadmeadows
Greensborough
Lilydale
Yarra Junction
Sunshine
Richmond
Werribee
Ferntree Gully
Moorabbin
Dandenong
Beaconsfield
Frankston
Cranbourne
Koo-Wee-Rup
Warragul
Drouin
Korumburra
LOCAL GOVERNMENT ELECTRICITY SUPPLY AUTHORITIES
CUSTOMER SERVICE CENTRE
FIELD SERVICE CENTRE
CUSTOMER SERVICE BUSINESS BOUNDARY
CUSTOMER SERVICE CENTRE BOUNDARY
METROPOLITAN AREA
CUSTOMER SERVICE BUSINESSES AND
CUSTOMER SERVICE CENTRE BOUNDARIES


MILDURA
ROBINVALE
SWAN HILL
COHUNA
COBRAM
ECHUCA
WODONGA
WANGARATTA
SHEPPARTON
BENALLA
MYRTLEFORD
CHARLTON
HORSHAM
BENDIGO
MARYBOROUGH
CASTLEMAINE
KYNETON
SEYMOUR
ARARAT
BALLARAT
GREENSBOROUGH
BEACONSFIELD
WARRAGUL
TRARALGON
BAIRNSDALE
HAMILTON
CAMPERDOWN
COLAC
GEELONG
PORTLAND
WARRNAMBOOL
LEONGATHA
WONTHAGGI
AREA SUPPLIED BY MONARO COUNTY COUNCIL (N.S.W.)
CUSTOMER SERVICE BUSINESS BOUNDARIES
CUSTOMER SERVICE CENTRE
FIELD SERVICE CENTRE

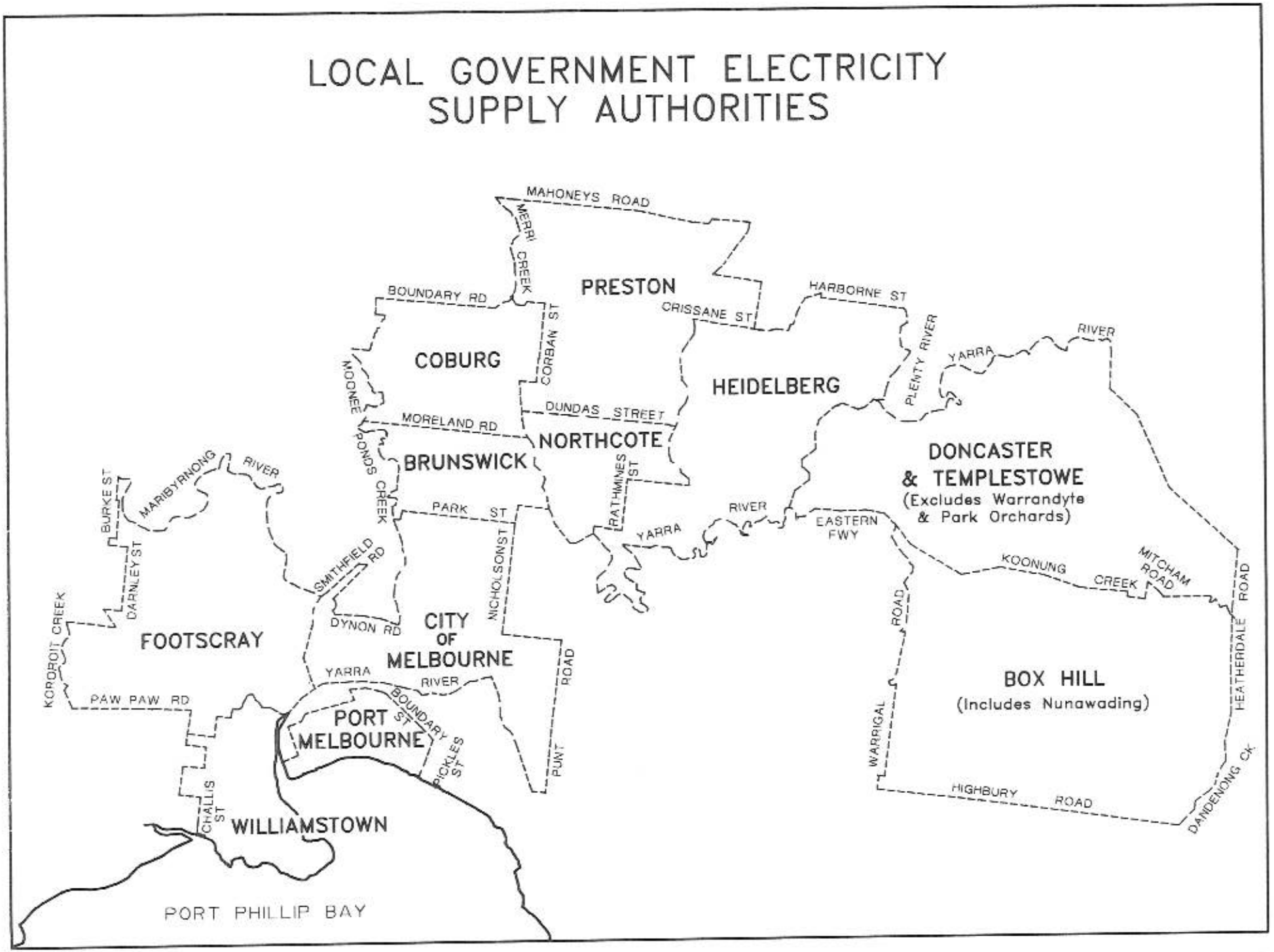
LOCAL GOVERNMENT ELECTRICITY SUPPLY AUTHORITIES

For information regarding electricity supply in areas listed below, contact should be made with the relevant Local Government Electricity Supply Authority [LGESA]. Note that the municipal council boundary may not align precisely with the LGESA boundary.

LGESA OFFICES

SUPPLY AUTHORITY	ADDRESS	POST CODE	TELEPHONE NUMBER	FACSIMILE NUMBER
Box Hill City Council	200 Burwood Hwy, Burwood	3125	805 2555	808 8934
Brunswick City Council	209 Stewart St, East Brunswick	3057	389 4100	388 0476
Coburg City Council	133 Bakers Rd, Coburg North	3058	354 4611	350 5459
Doncaster and Templestowe City Council	666 Doncaster Rd, Doncaster	3108	840 9222	840 1064
Footscray City Council	Cnr Napier & Hyde Sts, Footscray	3011	688 0279	687 7793
Heidelberg City Council	60 Sheehan Rd, Heidelberg	3081	457 9700	457 6070
Melbourne City Council	200 Little Collins St, Melbourne	3000	658 9000	650 1326
Northcote City Council	200 Beavers Rd, Northcote	3070	482 2733	489 6275
Port Melbourne City Council	42 Stokes St, Port Melbourne	3207	647 9570	646 5950
Preston City Council	25 Kurnai Ave, Reservoir	3073	479 4507	462 3370
Williamstown City Council	208 Hall St, Spotswood	3015	392 1800	399 1334

LOCAL GOVERNMENT ELECTRICITY SUPPLY AUTHORITIES



B CONDITIONS OF SUPPLY

The "Standard Conditions for Supply of Electricity" under which a Supply Authority supplies electricity are available upon request from the relevant Supply Authority. Supplementary Conditions may apply in addition to the "Standard Conditions for Supply of Electricity".

C TARIFFS FOR SUPPLY OF ELECTRICITY

Electricity is supplied at various standard tariffs. Details of tariffs, tariff conditions and advice on the selection of appropriate tariffs is available on request from any Supply Authority office. At all times the customer remains responsible for selecting the particular tariff most appropriate for their requirements.

D APPLICATION FOR SUPPLY

Application for supply to a new installation, or to an addition to or alteration of an existing installation should be made to the local Supply Authority office as soon as the decision to proceed is made to allow sufficient time for the Supply Authority to consider, and if necessary alter, existing supply arrangements. In many cases in SEC areas of supply and in all cases in LGESA areas of supply, this application must be made in writing.

E WARNING AGAINST PREMATURE EXPENDITURE

No expense should be incurred by a prospective customer until an application for supply has been made to the Supply Authority and advice received as to the conditions under which the Supply Authority would agree to the connection of the load and the provisions to be made by the customer for the installation of the Supply Authority's equipment on the premises.

Adequate written notice of the customer's requirements should be given, particularly where the load is relatively large or the supply is required in a remote location, as considerable time may be necessary for negotiations and construction. In addition the customer may be required to meet costs involved.

Matters which may affect the design of a building project, such as the determination of the "Point of Supply", the positioning of metering and servicing equipment, the point of attachment of the aerial service cable or the point of entry of an underground cable, and the position of any substation on the premises should be resolved with the Responsible Officer at an early stage of planning.

When contemplating the connection of equipment such as described in Clause 2.6 or 2.7 particular care should be taken to ascertain the Supply Authority's requirements relating to the prevention of interference with the supply to other customers.

F NECESSITY FOR EMPLOYING A LICENSED PERSON

The [Victorian] State Electricity Commission Act requires that all electrical wiring work be carried out by a person as prescribed and, in addition, places restrictions on persons other than registered electrical contractors from undertaking to carry out such work. Therefore, where the customer is responsible for electrical wiring work under these Rules, a registered electrical contractor shall act as the agent for the customer. An electrical mechanic being the holder of an appropriate licence may carry out electrical wiring work, without being registered as an electrical contractor, in any premises of which the holder of such licence is the owner or bona fide occupier.

Inquiries regarding licensing and registration matters should be referred to the Officer in Charge of Electrical Licensing, Office of the Chief Electrical Inspector, 29 Market Street, Melbourne, Telephone [03] 6914450.

1 GENERAL

1.1 Scope

These Service and Installation Rules, hereafter referred to as "Rules", apply in respect of electricity supply to premises in urban and rural areas throughout Victoria. Where premises are in isolated or undeveloped areas, these requirements may vary. In such circumstances, the customer will be informed when an application for supply is made.

Further detail regarding the matters covered by these Rules is available at Supply Authority Offices.

1.2 Definitions

Unless otherwise stated, the terms used in these Rules are as defined in the [Victorian] State Electricity Commission Act and the Wiring Regulations. Current and voltage are expressed as the r.m.s. value.

Authorised Person – the person in charge of the premises, or the registered electrical contractor or licensed electrical mechanic or other person appointed or selected by the person in charge of the premises, to perform certain duties associated with the electrical installation on the premises.

City Electrical Engineer – means the officer appointed by a LGESA to manage all matters related to electricity supply in the appropriate LGESA area of supply.

Common Mains – means Consumer's Mains or unmetered Submains which provide supply to a point of distribution for two or more separately metered occupancies

Consumer's Terminals – are defined in the Wiring Rules and are the junction of the Supply Authority's conductors with the Consumer's Mains.

Customer – means the person or body which requires electricity to be made available to an electrical installation on a property, and includes the owner, occupier or tenant as the case may require or a group of bodies acting as one in the provision of electricity to their property.

Customer Service Manager (CSM) – means the officer appointed either permanently or temporarily by the SEC to manage all matters related to electricity supply in the appropriate Customer Service Business of the SEC.

Determined Maximum Demand – means the demand imposed on the Supply Authority's supply system as assessed by the Responsible Officer. This demand may, but need not necessarily, align with that calculated in accordance with the Wiring Regulations for the consumer's mains.

LEM – means Licensed Electrical Mechanic.

LGESA – means "Local Government Electricity Supply Authority"; an electricity distribution undertaking operated by a Municipal Council pursuant to an Order–In–Council issued in accordance with the [Victorian] Electric Light and Power Act.

Point of Supply – In general terms 'Point of Supply' means the point at which electric energy is delivered by the Supply Authority to an electrical installation and at which responsibility for the conveyance of electricity within the property passes from the Supply Authority to the customer. The Point of Supply for installations in SEC areas of supply is specifically defined in the [Victorian] State Electricity Commission Act.

Private Electric Line – means any L.V. electric line intended to convey energy from the "Point of Supply" for a property to consuming apparatus within the property, including consumer's mains, sub–mains and final sub–circuits. (Defined in the SEC Act).

Property – means a parcel of freehold or leasehold land, or Crown Land held under lease or licence, which may be traversed within its boundaries without crossing a public reserve [including road reserve] or land occupied by a separate person or body.

A single property may include several contiguous titles or leaseholds under the control of a single person or body or it may contain one or more structures or occupancies. Such titles or structures shall be ignored when considering the limits of a single property.

NOTE:-An applicant for supply would be prudent to consider the likely future title holdings as change of ownership may invalidate the arrangement of the installation and thus require expensive modifications. Private electric wiring shall not extend beyond the boundary of a property. [Refer Section 6, Electric Light and Power Act 1958].

"For the purpose of determining the "point of supply", where a subdivision comprises lots and common property which provides access to the lots, the Supply Authority may regard all lots and common property as constituting the one property. Under these circumstances, any common or individual mains or submains leading from the point of supply to lots shall run through the common property."

Land vested in a public authority such as a Municipal Council, other than a road reserve, is regarded as private property for the purpose of these Rules.

REC – means Registered Electrical Contractor.

Responsible Officer – means the officer appointed by the SEC or LGESA and responsible for the administration of requirements detailed in these Rules.

Service Equipment – means Supply Authority owned equipment including all such equipment installed within the premises of a customer.

SEC – is the Trading name of Electricity Services Victoria

Shall – is to be understood as mandatory.

Should – is to be understood as non–mandatory, i.e. advisory or recommended.

Underground Residential Distribution (URD) – is defined as an underground cable network used in residential areas and where no electrical protective device is provided at –

(a) the point of connection between the Supply Authority's underground mains cable and the underground service cable; or

(b) the Consumer's Terminals.

Wiring Regulations – means the [Victorian] State Electricity Commission Wiring Regulations and any duly authorised amendment, addition to or alteration thereof.

Wiring Rules – means the Australian Standard 3000 – SAA Wiring Rules

1.3 Exceptional Circumstances

In exceptional circumstances the stated requirements contained in these Rules may be waived or modified. Any request in this regard shall be addressed in writing to the Chairman, Service and Installation Rules Joint Review Committee [SEC] or City Electrical Engineer [LGESA].

Every request shall be accompanied by a detailed statement of the reasons why non–compliance with these Rules is sought.

No action shall be taken unless a reply in writing has been received granting the request.

1.4 Failure to Comply with These Rules

In the event of the customer or REC failing to comply with the requirements of these Rules, the Supply Authority may refuse to supply or may disconnect the supply to the installation or any portion thereof. A charge may be made for subsequent visits for the connection or reconnection of supply.

1.5 Point of Supply

1.5.1 SEC Areas of Supply

Where low voltage [L.V.] electricity is provided to a property, the Point of Supply for installations in SEC areas of supply shall be as defined in the SEC Act. This means the Point of Supply in SEC areas of supply shall normally be one of the following points, as appropriate to the particular property.

In the case of supply by means of –

- an underground cable – at the point at which the cable crosses the boundary of the property.
- an aerial service cable – at the first point of attachment of that service cable within the property.
- a high voltage line and substation within the property – at the l.v. terminals of that substation.

For supplies to properties in existence at the date of this publication, the Point of Supply for an l.v. line [located on an easement in favour of the SEC] within the property shall be at the l.v. terminals established on the SEC line.

Where electricity is provided at other voltages or to an installation not located on a property [e.g. Traffic signals on a road reserve] the Point of Supply shall be determined by the Responsible Officer.

NOTE:-For electricity supply beyond property boundaries, reference should be made to the Electric Light and Power Act.

1.5.2 LGESA Areas of Supply

The Point of Supply in an LGESA area of supply shall be determined by the Responsible Officer in accordance with the conditions under which electricity is made available by the relevant LGESA.

NOTE: The Consumers Terminals may not coincide with the Point of Supply. This will depend upon the practicability of effecting the physical connection of the Supply Authority's and customers wiring at that point.

1.6 Alterations and Additions

The customer should ascertain that the required supply is available before incurring any expense; as indicated in the introductory information. If an alteration or addition to an existing installation makes it necessary to alter or install additional Supply Authority equipment, the customer shall make provision for mounting and connection of that equipment to the satisfaction of the Responsible Officer.

Where additional metering and control devices can be accommodated on an existing meter board or panel which has been approved by the Supply Authority, the Responsible Officer will arrange the fixing of such equipment to the board or panel and connection to suitable wiring provided by the customer.

NOTE:-See Clause 3.2 regarding Charges Applicable.

1.7 Offences

A person, other than a person authorised by the Supply Authority to carry out such work, shall not insert or remove a fuse–link of a service protective device, make or break any connection, dismantle any component part of the Supply Authority's equipment or detach such equipment from its fixing point.

NOTE:-Attention is directed to Clause 7.1.2 regarding Main Switch/es.

2 STATUTORY REGULATIONS

2.1 General

2.1.1 Safety

All persons and contractors are responsible for all aspects of safety related to work performed by the said persons or contractors and employees or agents thereof.

NOTES:

1. Attention is directed to the Occupational Health and Safety Act 1985 and the Regulations and Codes of Practices under the jurisdiction of the said Act.
2. Attention is directed to Clause 5.2.3.1 regarding safety aspects for underground cables.

2.1.2 Compliance with Regulations and Rules

Every new installation or addition to an installation to be connected to supply mains shall comply with the current edition of the Wiring Regulations and with these Rules.

NOTE:-Attention is directed to Section F of the Introductory Information regarding the necessity for employing a licensed person.

2.1.3 Submission of Notices

The LEM in charge of carrying out electrical installation work shall submit Notices of Installation Work and Completion of Electrical Installation Work (NIW and NOC) or any other notice as required by the Wiring Regulations.

2.1.4 Testing

The LEM in charge of carrying out electrical installation work shall perform all necessary tests as required by the Wiring Regulations. The necessary tests include the following –

(a) the insulation resistance of wiring and equipment;

(b) the resistance of the earthing system;

(c) a test to verify that the conductor switching operation of switches and circuit breakers satisfies the requirements of the Wiring Regulations; and

(d) a test to verify that the resistance between every neutral bar or link which is directly connected to earth and the neutral conductor of the consumer's mains at the point of supply does not exceed one ohm.

2.2 Inspection of Installation

2.2.1 General

The Supply Authority may make an inspection of the installation or portion of the installation after the installation has been completed and is therefore limited in its scope, hence neither the inspection nor the connection of the installation to supply shall be deemed as giving assurance of compliance with the Wiring Regulations or these Rules and no certificate of inspection or compliance will be issued by the Supply Authority.

Furthermore, the inspection and connection shall not be regarded as implying compliance with any specification, nor in any way as giving an assurance of quality.

If inspection or testing shows that the installation does not comply with the Wiring Regulations or these Rules, the Supply Authority may refuse to supply, or may disconnect, the whole or any portion of the installation.

2.2.2 Re–inspection

Following written notification of defects found in an installation and before the installation is re–inspected, the REC shall give notice in writing to the Supply Authority that the defects have been rectified. A charge may be made for any re–inspection carried out.

NOTE: In special circumstances, providing advice is given by telephone, this notice may be left attached to the main switchboard for the installation.

2.3 Voltage Drop

The voltage drop from the Consumer's Terminals to any point on the installation shall be calculated in accordance with the requirements of the Wiring Regulations. Where an installation is supplied directly from a Supply Authority transformer on the property, the voltage drop from the Consumer's Terminals to any point on the installation may be increased to, but shall not exceed 7% of the nominal supply voltage. However, the Customer Service Manager (SEC) or City Electrical Engineer (LGESA) may, upon written application and where engineering considerations permit, further increase this value, provided that the voltage drop from the transformer terminals to any point on the installation shall not exceed 10% of the nominal supply voltage.

NOTE: Attention is drawn to Clause 5.2.1.1 regarding minimum load capacity of Consumer's Mains.

2.4 Earthing

2.4.1 General

In general, all installations required to be earthed shall conform to the requirements for the Multiple Earthed Neutral (MEN) System of Earthing as detailed in the Wiring Rules, however, in some remote rural areas the Direct Earthing System is employed.

Any existing installation which is required to be earthed, but is not earthed by the MEN system shall be converted to this system when any addition or alteration is being carried out on an installation, except where the Direct Earthing System has been specified by the Supply Authority.

2.4.2 Multiple Installations

In multiple occupancy installations, the MEN connection to the incoming neutral conductor shall be located –

(a) with the permission of the Supply Authority at the Supply Authority's neutral bar or link; or

(b) in a section of the switchboard enclosure which is common to all separately metered occupiers associated with that connection. In this case, the connection shall be clearly and permanently marked "MEN CONNECTION".

2.4.3 Connection of Active Conductors to Earth

No active conductor in an installation shall be connected to earth with the exception of a suitable radio interference suppressor installed in accordance with the Wiring Rules or an acceptable surge diverter.

2.5 Power Factor

The customer shall continuously maintain the power factor of the installation between 0.8 lagging and 1.0 (up to 22 kV supply voltage). Failure to do so will require the customer to develop and undertake a remedial program over a reasonable time period or the Supply Authority will be obliged to apply a regular charge in addition to the electricity bill to recover costs sustained.

Higher minimum power factors are required at supply voltages above 22 kV (details are available from the Supply Authority).

2.6 Interference with Supply to Other Customers

2.6.1 General

If, in the opinion of the Supply Authority, a person should use or deal with electricity supplied in such a manner as to cause undue interference with the supply to other customers or to any third party, the Supply Authority may direct the customer to take corrective action and, in the event of failure to comply with such directions, the Supply Authority may discontinue the supply of electricity to the premises. The fact that the Supply Authority may have permitted connection of the apparatus or equipment causing the interference shall not exempt the customer from the operation of this Clause.

2.6.2 Equipment Requiring Special Consideration

The Supply Authority may refuse to permit or apply conditions for the connection of equipment in the following categories if it considers that by such connection, the supply to other customers would be adversely affected –

(a) Equipment which would cause excessive fluctuation of voltage on the Supply Authority's system as a result of its large or fluctuating demand, e.g. arc furnaces, welding machines, X–ray units, frequently–started large motors, etc.

(b) Equipment which would cause excessive distortion of the wave shape of the Supply Authority's system voltage, e.g. rectifiers, frequency converters, load control devices using thyristors or saturable reactors, etc.

No expense should be incurred by any customer or prospective customer until preliminary application has been made to the Supply Authority and advice has been received that the supply will be given and upon what terms and conditions it will be given.

NOTE:-Further information regarding general limits may be obtained from Australian Standard 2279 "Disturbances in Mains Supply Networks", however, in the case of item (b) above, individual customers are limited to one third of the general limit.

2.6.3 Rectifiers

Alternating to direct current rectifying equipment shall not be connected to the Supply Authority's system unless–

(a) the rectifier is of the full–wave type; or

(b) a double–wound transformer is interposed between the rectifier and the supply system; or

(c) the rectifier is used in conjunction with an electrical measuring instrument or in similar applications where the rectified current does not exceed 100 milli amperes.

2.6.4 Switching of Apparatus

Individually switched loads rated in excess of the value specified below shall not be connected between an active and the neutral conductor unless the approval of the Responsible Officer has first been obtained.

Single Phase 480/240 Volt areas of supply – 20 Amperes

Three Phase 415/240 Volt areas of supply – 25 Amperes

2.7 Starting Current of Motors

2.7.1 General

The current taken by a motor of a type mentioned in this Clause under the conditions of starting shall not exceed the values in Clauses 2.7.1.1 and 2.7.1.2 when measured by the methods outlined in Clause 2.7.2.

2.7.1.2 Three Phase Motors 415 Volts

Motors not exceeding 1.5 kW – 26 Amperes.

Motors exceeding 1.5 kW but not exceeding 3.75 kW – (kW x 17.5) Amperes.

Motors exceeding 3.75 kW –

(a) (kW x 3.5) plus 53 Amperes; or

(b) total kW output of motors installed x 1.1 Amperes; or

(c) the starting current of the largest of the other motors installed calculated in accordance with sub–clause (a) whichever is the greatest.

The kW output of motors installed refers to the motors connected to the particular installation from which the proposed motor is to be supplied and includes the proposed motor, provided that no limitation need be placed on the starting current of any three phase motor which is not frequently started and the rating of which does not exceed 10 per cent of the total motor load installed.

In installations which are supplied directly from a substation or where special supply conditions exist, starting currents in excess of those set out in (b) and (c) above may be permitted if permission has been obtained from the Responsible Officer.

2.7.1.3 Single Phase Motors –

(a) 240 Volt Motors – 45 Amperes.

(b) 480 Volt Motors

Motors not exceeding 1.5 kW – 45 Amperes.

Motors exceeding 1.5 kW but not exceeding 3.75 kW – (kW x 9.5) plus 26 Amperes.

Motors exceeding 3.75 kW but not exceeding 30 kW – (kW x 6.5) plus 35 Amperes.

Motors exceeding 30 kW – (kW x 7.4) plus 15 Amperes.

2.7.2 Test Method of Measurement of Motor Starting Current

The starting currents of alternating current motors shall be determined by either of the following methods –

(a) Fall in Voltage Method

The starting current shall not cause a fall in voltage of more than 5 per cent for more than 0.02 seconds when connected to a typical 415/240 volt, three phase, 50 Hz supply having a supply system impedance of –

0.2 + j 0.2 ohms (phase–neutral)

0.1 + j 0.1 ohms (line impedance per phase)

The fall in voltage shall be determined by the oscillographic method or any other method considered appropriate by the Supply Authority.

(b) Current Measurement Method

The starting current may be determined by the locked rotor method with low voltage, 50 Hz, as appropriate, applied to the terminals of the motor. In the case of motors having rotors which cannot readily be locked, the current may be measured with a back–stopped ammeter or by other methods approved by the Supply Authority.

3 CHARGES AND TARIFFS

3.1 Agreement to Pay Charges

Where the customer is required to pay a charge for work carried out by the Supply Authority, the customer shall, if requested, sign an agreement in a form acceptable to the Supply Authority before the work is commenced.

The customer may be required to pay in advance of the commencement of works.

A copy of the Standard Service Prices is available from Supply Authority offices on request.

NOTE:-Attention is drawn to Sections C and E of the Introductory Information regarding tariffs for supply of electricity and warning against premature expenditure by a customer.

3.2 Charges Applicable

The customer may be required to pay, in accordance with the SEC Standard Service Prices or a charge as determined by the Customer Service Manager (SEC) or City Electrical Engineer (LGESA), in respect of the provision of service and/or metering equipment in certain circumstances. Some examples of these charges are as follows, where –

- a temporary supply is provided;
- a customer requests that service or metering equipment other than that proposed by the Supply Authority be installed;
- a customer requests that existing service or metering equipment be changed or relocated;
- the service or metering equipment is considered by the Customer Service Manager (SEC) or City Electrical Engineer (LGESA) to be special or additional;
- the Supply Authority provides a service protection device in accordance with Clause 5.4;
- an underground service cable is installed within the customer's premises;
- work is requested to be performed outside normal hours; and
- where the customer fails to complete essential preparations or excessive delay in preparations after arrival of a service truck.

The customer shall pay all costs involved in any alteration to the supply arrangements which may be required as a result of failure of the customer to comply with these Rules and the conditions under which the supply is made available.

3.3 Load Control Equipment

3.3.1 Prescribed Hours Tariffs

Where, in accordance with the provisions of any tariff published by the SEC, electricity is to be supplied only during certain hours, the Supply Authority will provide and install a control device having a rating up to 30 Amperes.

Where the controlled load exceeds the capacity of the control device, the customer shall supply and install a suitable contactor in a position approved by the Responsible Officer. The contactor will be operated by the Supply Authority's control device. Refer to **Figures 3.1 or 3.2,** for the appropriate prescribed hours load control.

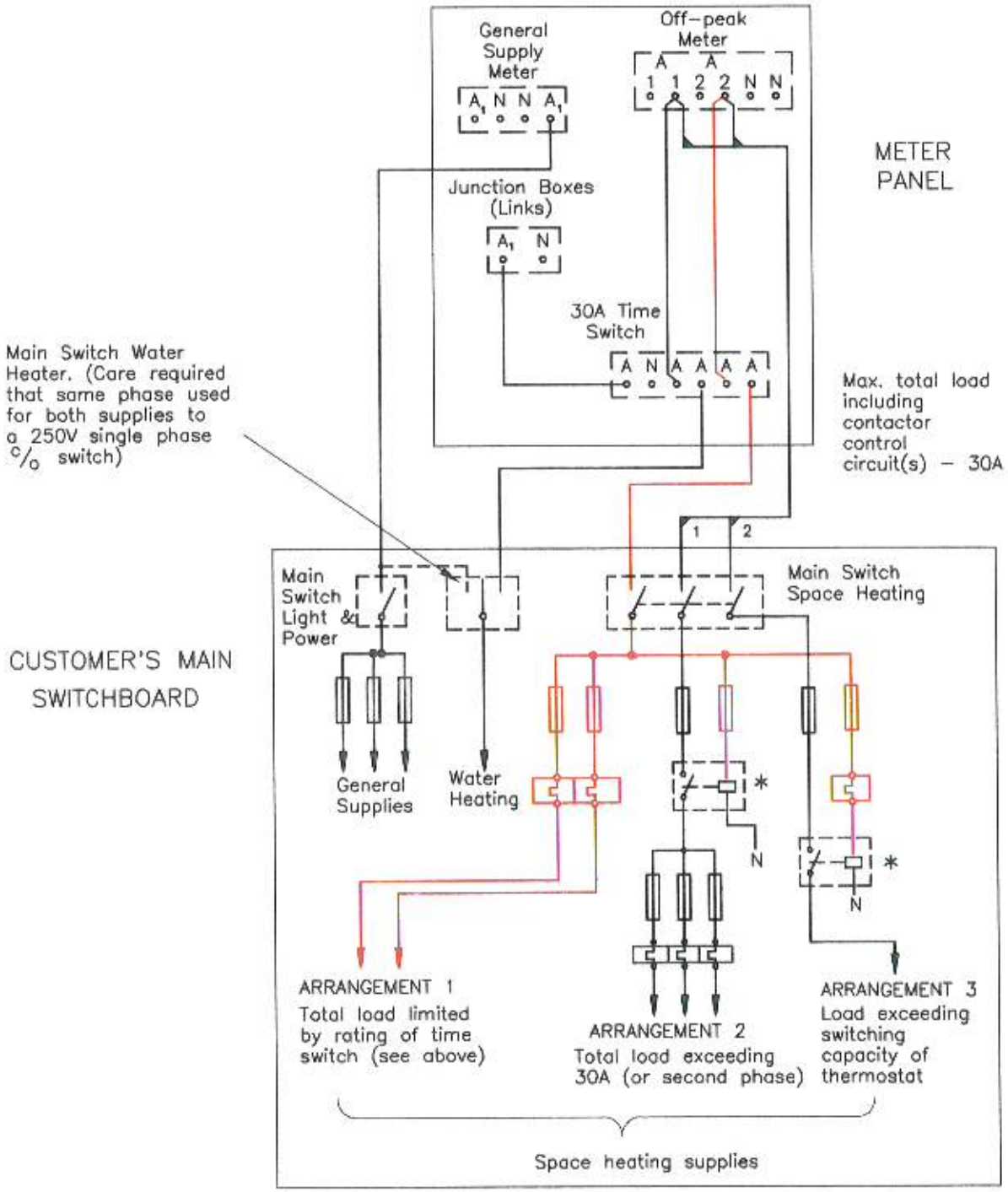
3.3.2 Time–Of–Use (L.V.) Energy Tariffs

Where (L.V.) electricity is supplied continuously but at different prices during certain hours under a Time–Of–Use tariff, the Supply Authority may provide and install at the customer's request and expense, a control device called a "Switching Service", having a rating up to 30 Amperes for control of the customer's apparatus. Refer to Figures 3.3, 3.4 or 3.5, "Switching Service", "Off Peak Load Control" and "Standard Service Prices".

This Switching Service is not available in conjunction with a prescribed hours tariff.

3.3.3 Demand Tariffs

Time and energy pulses for the control of Energy Management Systems may be available on a chargeable basis to customers taking supply under a maximum or contract demand type tariff. Customers will be advised of specific services available and the costs involved on request to the Supply Authority.



NOTES:

1. Space heating control circuit arrangements shown may be used as alternatives (or in combination) subject to loading conditions.
2. Thermostats shown are located remote from switchboard.
3. The circuits shown may be arranged for connection to a single phase, two wire supply by deleting one pole of the main switch.
4. For a 3 phase arrangement refer fig. 3.2

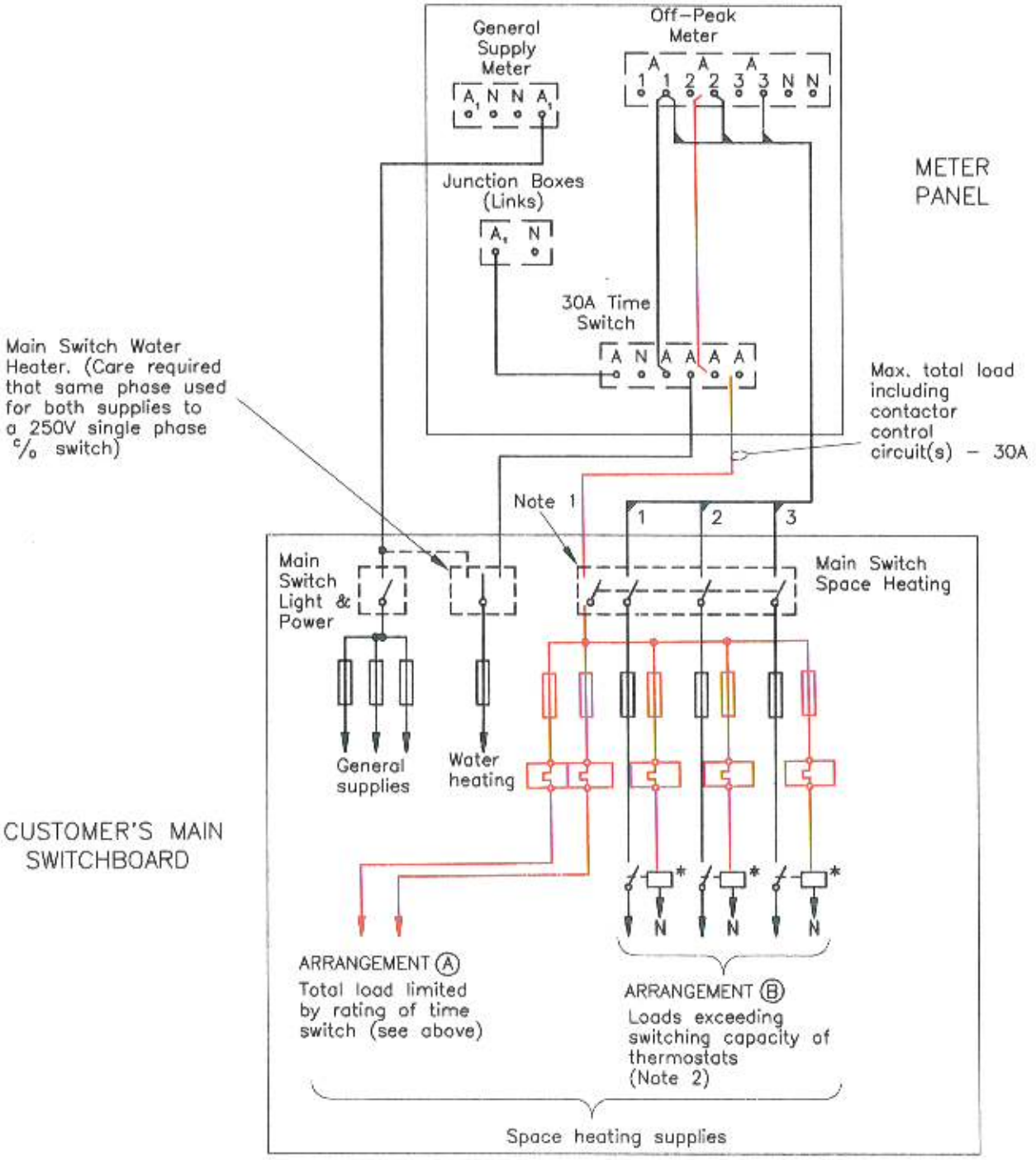
* 5. 240V Coils must be used.

6. Consumers metered mains tails to be marked to indicate section of load and phase connection.

SPECIAL NOTE:
Each contactor must be grouped with associated fuses & labelled to indicate supply arrangement and method of isolation of contactor.

OFFPEAK LOAD CONTROL DIRECT METERING ONE OR TWO PHASES TYPICAL WIRING DIAGRAM

FIG. 3.1



NOTES:

1. For surface mounting applications either a four-pole non-auto circuit breaker may be used as the main switch for space hesting (eg. Up to 100A Heinemann CF4 plus shroud: or equiv.) or a combination of a single pole & three pole switch arrangement may be used to control the space heating installation.
2. Arrangement 2 Fig 3.1 may also be used as an alternative (or in combination) where appropriate.
3. For 1 or 2 phase arrangement refer to Fig. 3.1
4. Thermostats shown are located remote from switchboard.

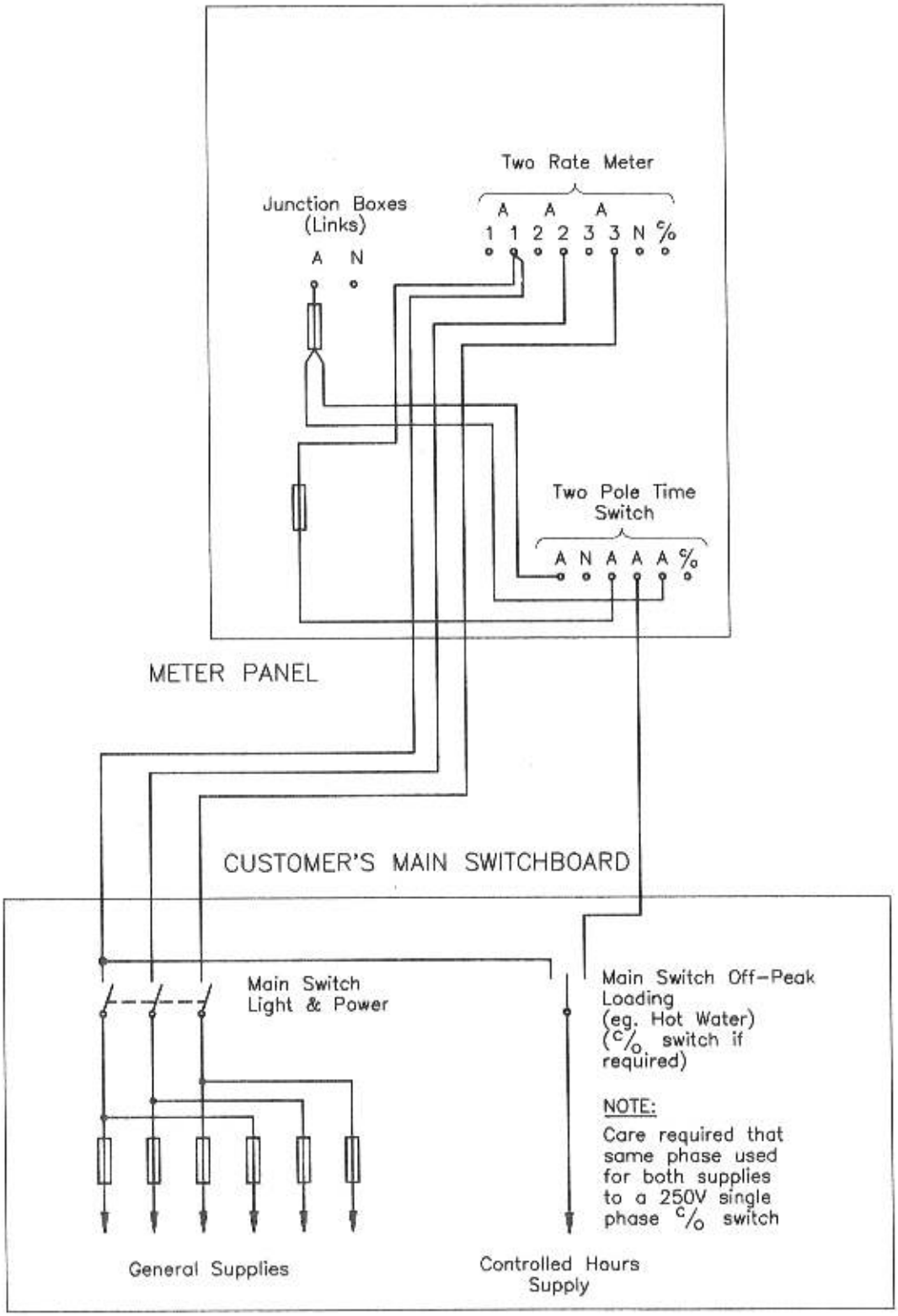
* 5. 240V Coils must be used.

6. Consumers metered mains tails to be marked to indicate section of load and phase connection.

SPECIAL NOTE:
Each contactor must be grouped with associated fuses & labelled to indicate supply arrangement and method of isolation of contactor.

OFFPEAK LOAD CONTROL DIRECT METERING
THREE PHASES
TYPICAL WIRING DIAGRAM

FIG. 3.2

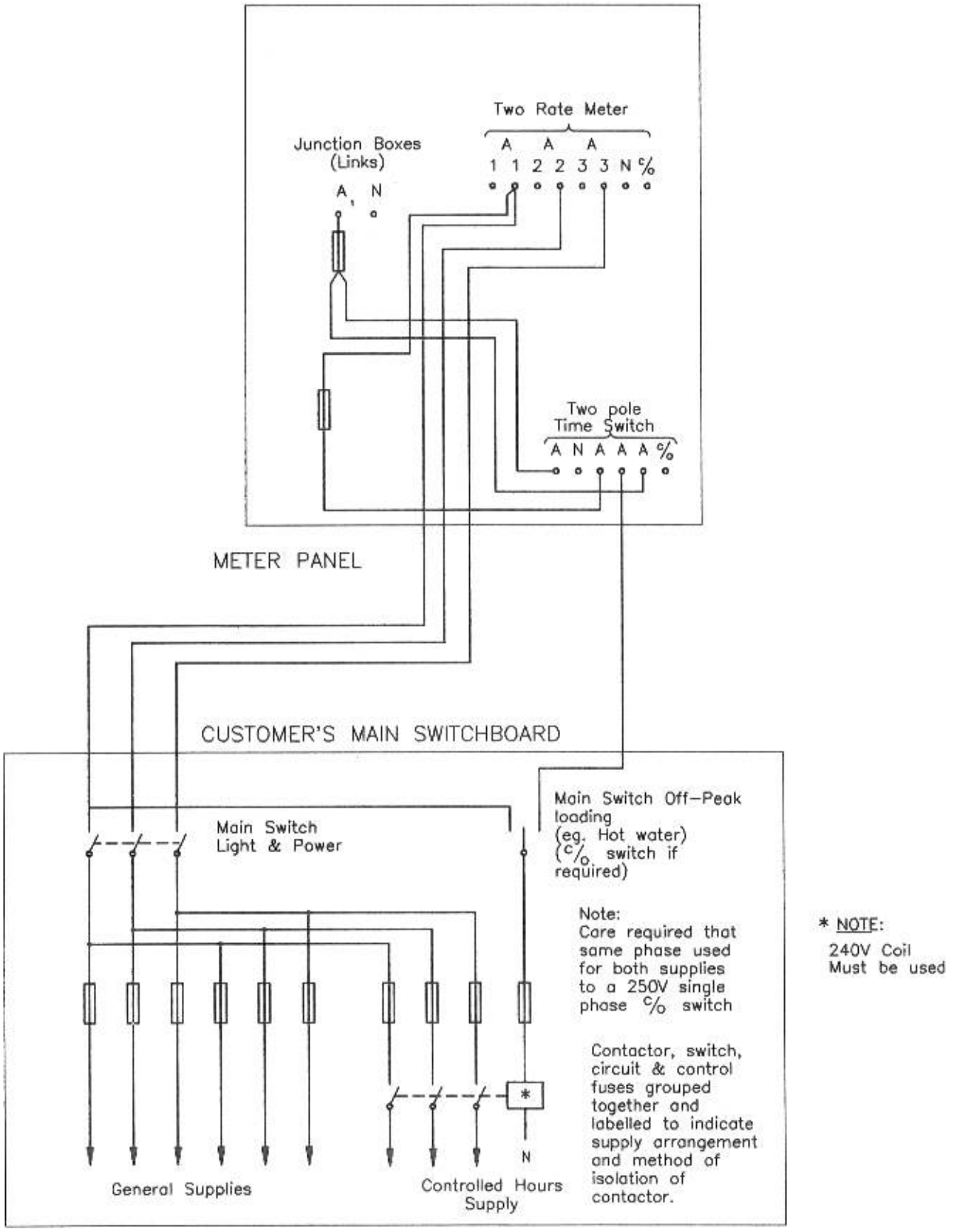


CONTROLLED LOAD - SINGLE PHASE
(NOT EXCEEDING 30 AMPERES)

Note:
Consumers metered mains tails to be marked to indicate section of load and phase connection.

SWITCHING SERVICE
TIME-OF-USE DIRECT METERING
TYPICAL WIRING DIAGRAM

FIG. 3.3



* NOTE:
240V Coil
Must be used

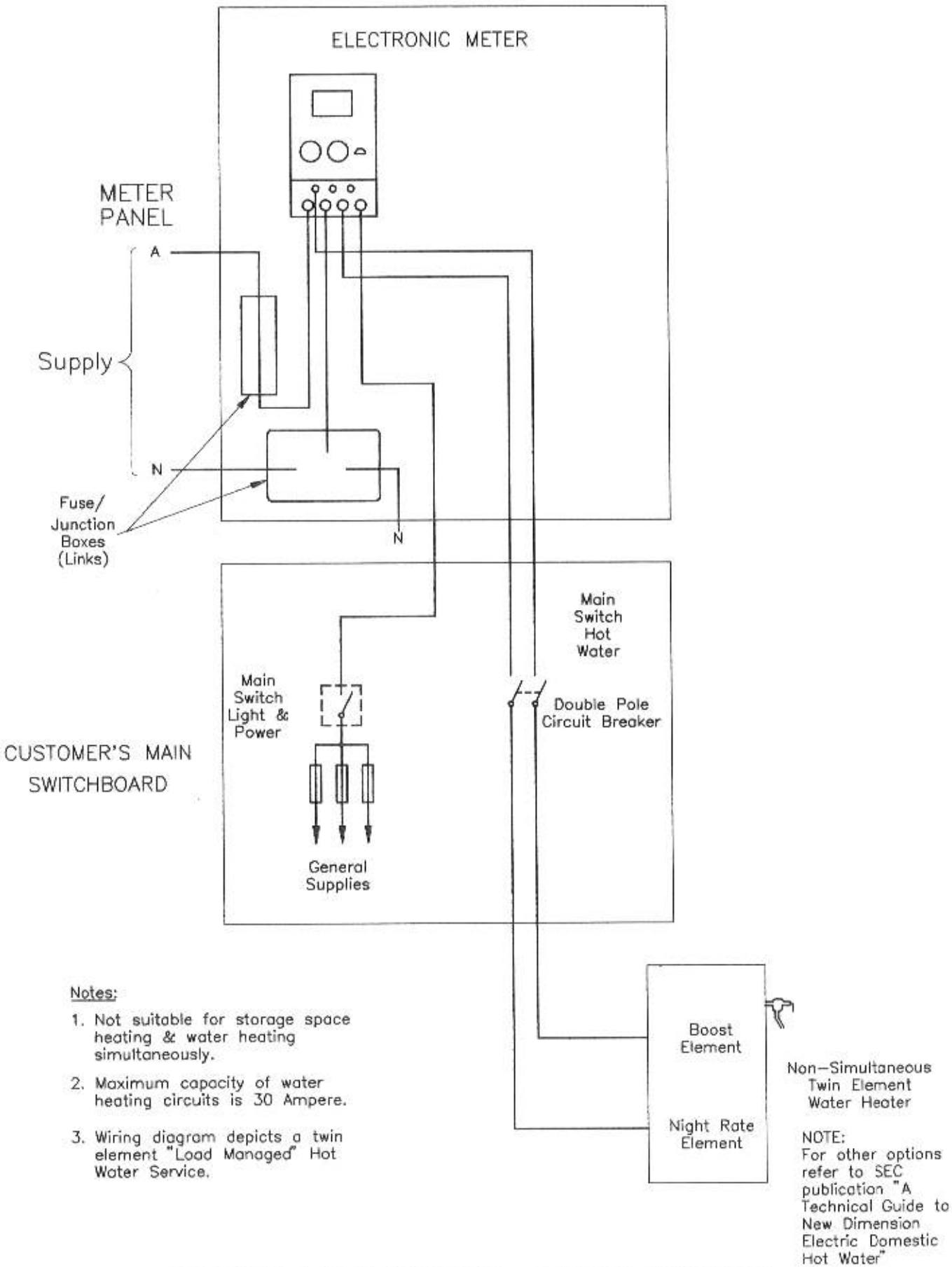
CONTROLLED LOAD - POLY PHASE
(OR LOAD EXCEEDING 30 AMPERES)

Note:

Consumers metered mains tails to be marked to indicate section of load and phase connection.

SWITCHING SERVICE
TIME-OF-USE DIRECT METERING
TYPICAL WIRING DIAGRAM

FIG. 3.4



Notes:

1. Not suitable for storage space heating & water heating simultaneously.
2. Maximum capacity of water heating circuits is 30 Ampere.
3. Wiring diagram depicts a twin element "Load Managed" Hot Water Service.

OFFPEAK LOAD CONTROL DIRECT METERING
ONE PHASE
TYPICAL WIRING DIAGRAM

FIG. 3.5

4 SUPPLY ARRANGEMENTS

4.1 System of Supply

The electricity supplied throughout Victoria is in the form of alternating current of approximately sinusoidal waveform at a frequency of 50 Hz. The nominal supply voltage is 415/240 V from a 3–phase 4–wire system. In some rural areas, the supply may be a single phase 240 V 2–wire or 480/240 V 3–wire system. Supply may also be available at high voltage.

The Supply Authority may superimpose control signals on the normal supply voltage.

NOTE:-The SEC endeavours to maintain the voltage at the Consumer's Terminals within plus or minus 6% of the nominal supply voltage but is not able to guarantee this accuracy and will not accept responsibility for any damage to a customer's installation or equipment arising from fluctuation outside this accuracy unless they are a direct result of the SEC's negligence. Customers should install any equipment necessary to protect apparatus sensitive to voltage variation, transients or loss of one or more phases of supply.

4.2 Supply System Earthing

The neutral conductor of the low voltage supply system is solidly earthed. Unless otherwise advised, the Multiple Earthed Neutral (MEN) system is used.

4.3 Prospective Fault Current

The customer shall provide protective devices having an interrupting capacity adequate for the prospective short circuit current at the customer's main switchboard or at any other point within the installation as required by the Wiring Regulations.

To meet the requirements of the Wiring Regulations, the installation must be designed to withstand, without damage, the maximum currents which may occur under fault conditions such as a short circuit.

The prospective short circuit current varies throughout the distribution system.

In SEC Areas of Supply, where supply is provided in an underground residential distribution mains area, the prospective fault current at the consumers terminals shall be deemed to be 3000 amperes single phase and 6000 amperes three phase symmetrical.

In other locations, the magnitude of the prospective fault current that is available at the consumers terminals may be obtained, upon written request, from the Supply Authority.

NOTE:-Protective devices controlling outgoing circuits on the customer's main switchboard shall be so selected and arranged that they will interrupt the fault current rapidly enough to avoid as far as practicable loss of mains supply.

4.4 Number of Supplies

4.4.1 General

For the purposes of this Clause "a supply" means the establishment of a Point of Supply as detailed in Clause 1.5.

The Supply Authority, under normal conditions, will provide only one supply to each property.

Providing it would not be necessary for the Supply Authority to carry out augmentation works solely to provide for the additional supply, more than one supply may be provided to a property in the following circumstances –

(a) separate supply may be given to separate individual structures for different customers on the one property under the arrangement for dual occupancy or if each structure and/or vacant lot has a direct frontage and access to a public road or a Supply Authority easement; or

(b) subject to the approval of the Responsible Officer, where the magnitude of the customers' load and/or the distance separating the relevant electrical installations, having regard to the type of customer's activities and site conditions, is such that it would be sound engineering practice to provide more than one supply.

The provision in (a) above caters for a multi–unit building where the lots all front to a public road or free standing buildings on separate allotments abutting a public road.

Typical arrangements for number of supplies are shown in Figure 4.1.

In other exceptional circumstances, as determined by engineering considerations, the Customer Service Manager (SEC) or City Electrical Engineer (LGESA) may agree to a customer's written request for the provision of a special or additional supply.

The customer may be required to pay the cost involved in providing an additional supply. Before commencement of work, the Supply Authority must be consulted regarding costs associated with the supply of electricity.

NOTE:-No 'service cable' will be provided where a substation is located on the customer's property as the customer is responsible for all wiring from the substation terminals. See Clause 1.5 – Point of Supply.

4.4.2 Segregation of Supplies

Where, in accordance with the provisions of Clause 4.4.1, more than one supply is provided, each shall connect a separate and clearly defined portion of the premises without intermixture or electrical interconnection of the portions (either directly or by changeover facilities) unless otherwise approved by the Chief Electrical Inspector, Victoria. Unless the additional supply is provided for the connection of specific equipment, the whole of the installation in any defined portion of the premises shall be connected to the same supply.

The following would be deemed to constitute clearly defined portions of a premises –

1. Separate individual structures; or
2. Within one structure where clear lines of separation of the portions are readily identifiable by a permanent and legible map which clearly indicates the defined portions of the premises, installed adjacent to each main switchboard. Any such map shall be kept current at all times by the building proprietor.

In addition, where more than one supply is provided to any one building or structure, a prominent notice shall be provided at each set of Consumer's Terminals and main switchboard to indicate the presence and location of other supplies. A label shall also be affixed to each distribution board to indicate the main switchboard from which it is supplied.

The provisions of this Clause need not apply where facilities for the remote control of all main switches are installed to enable opening of every main switch from a single location or, alternatively, from each main switchboard.

4.5 Number of Installations per Supply

Where more than one set of Consumer's Terminals (i.e. circuit connection to the Supply Authority's distribution system) is established to provide supply to –

(a) number of different occupancies; each set of Consumer's Terminals shall be deemed to provide supply to a separate installation and the provisions of Clause 4.4.2 shall apply.

(b) single occupancy; such an arrangement is deemed to constitute a single installation.

In addition, where arrangements are made to the satisfaction of the Responsible Officer, two sets of Consumer's Terminals may be established for the following situations –

- A substation on a customer's rural property.
- A customer's dedicated underground supply connection pit or pillar.
- Class 1B movable units (Granny Flats) rented from the Department of Planning and Housing or separate building extensions where local planning requirements or Consolidated Building Regulations do not permit separate ownership as advised by the local municipality.
- Where two occupancies are located within land locked areas where the perimeter of the building is the property boundary and the main switchboard cannot be located in an area accessible to both occupiors.

Where two sets of consumer's terminals for individual occupancies are established at a single point, and each occupancy is deemed to be a separate installation, the requirements relating to individual consumer's mains supplying one occupancy passing through another occupancy are as follows:–

- **Where consumer's mains associated with one installation pass through a separate occupancy, the section of consumer's mains within that occupancy shall be clearly and permanently identified, by means of making or attached labels, at intervals not exceeding 2.0 m and the main switchboard of any occupancy through which the cables pass shall be clearly marked to indicate that such consumer's mains are not controlled from that switchboard.**
- **Where the installation is, or may be, subject to subdivision other arrangements may be necessary and the Supply Authority must be contacted.**

4.6 Temporary Supplies

4.6.1 General

Where it is not necessary to extend or augment the permanent street mains to make supply available the Supply Authority may, subject to the payment of relevant charges, provide a temporary supply in situations where supply to an installation is requested for a limited period. Refer SEC Standard Service Prices.

Where it is necessary to extend or augment the permanent street mains to make supply available, the terms and conditions of supply will be subject to negotiation upon receipt of a written request for supply. Provision of a temporary supply in these circumstances is conditional upon availability of adequate construction resources.

The customer should ascertain that a temporary supply could be made available, and of the conditions which would apply, before commencement of any works as the Supply Authority cannot provide a temporary supply unless it is able to energise all the associated Supply Authority underground or overhead lines.

Where a temporary supply is provided for constructional purposes, it will be disconnected at the time of installation of the permanent service equipment at the premises unless prior arrangements have been made by the temporary supply customer for the retention of such supply and any relevant additional fixed charge paid.

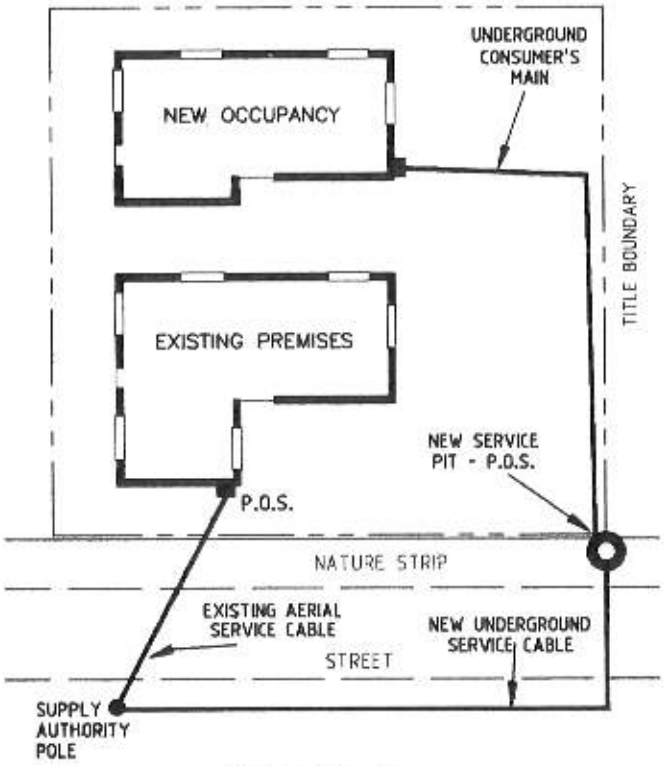
4.6.2 Temporary Supply Arrangements

4.6.2.1 Customer's Installation

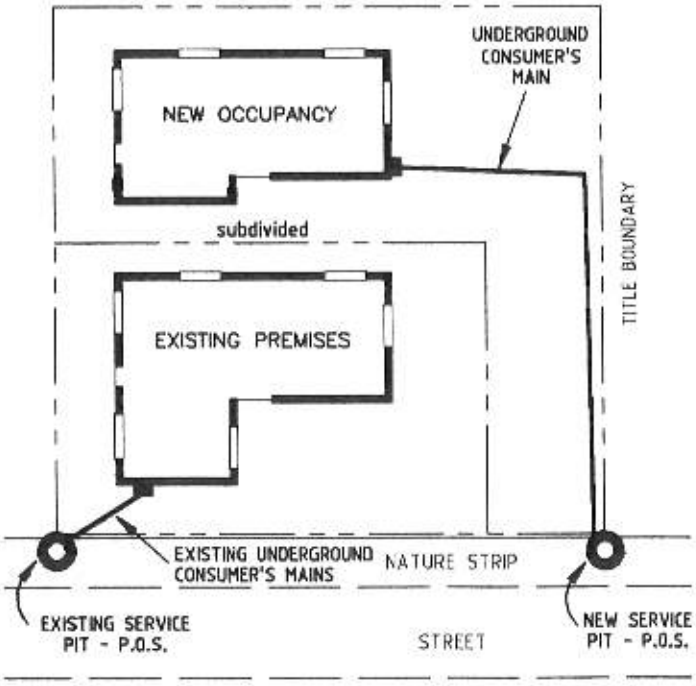
The customer's REC is responsible for the supply and erection of an approved meter box and meter panel and, when required, an approved pole. Arrangements shown in Figures 4.2, 4.3, 4.4 and 4.5 shall be deemed suitable.

The electrical installation shall be installed in accordance with the Wiring Regulations and adequate protection shall be provided, especially on construction sites, to prevent damage to the Supply Authority's metering equipment.

NOTE: Attention is directed to AS 3012, Electrical Installations – Construction and Demolition Sites.

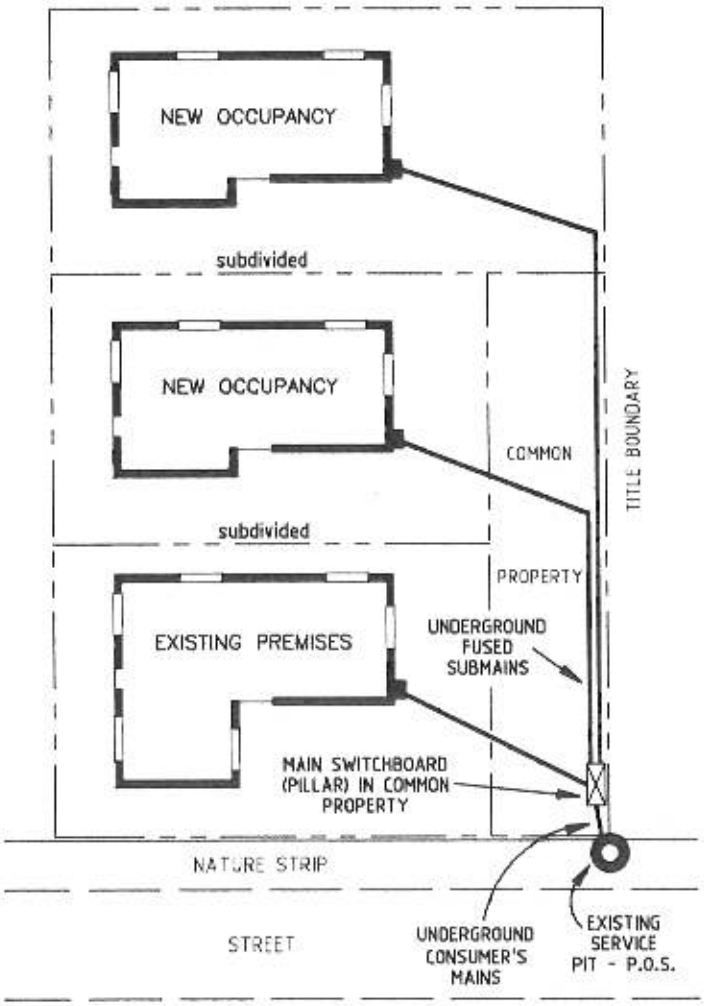


SUPPLY FROM OVERHEAD MAINS



SUPPLY FROM UNDERGROUND MAINS

TYPICAL ARRANGEMENTS FOR DUAL OCCUPANCY/TWO LOT SUBDIVISION



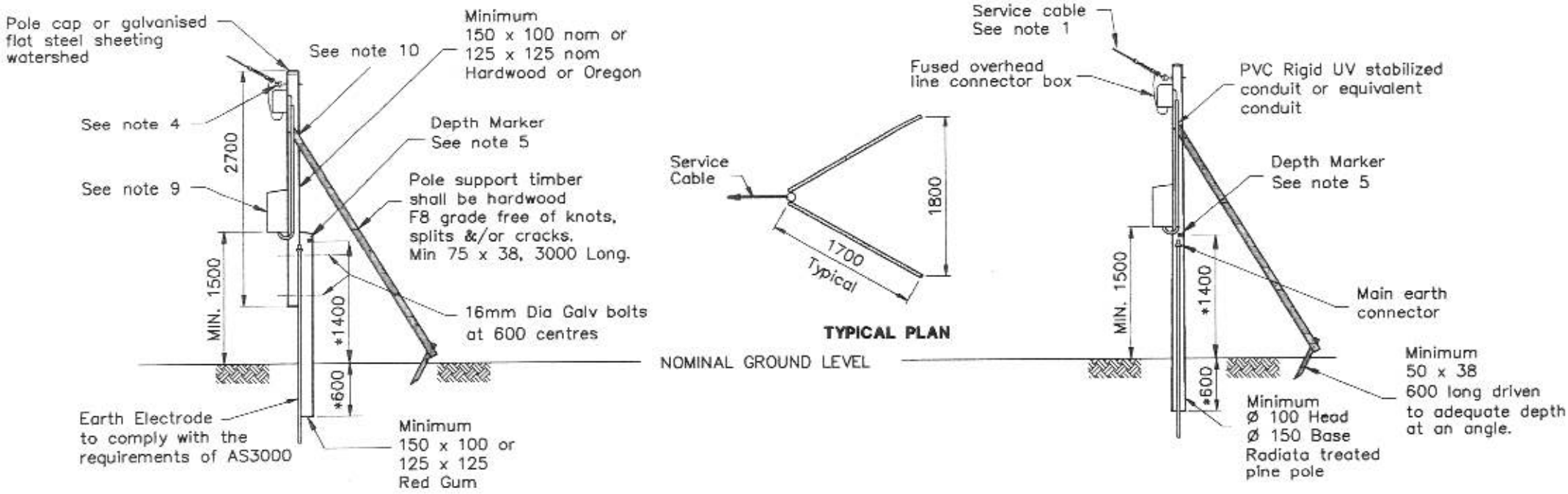
TYPICAL ARRANGEMENT FOR MULTIPLE OCCUPANCY SUBDIVISION

NOTES:

1. BEFORE COMMENCEMENT OF WORK THE SUPPLY AUTHORITY MUST BE CONSULTED REGARDING COSTS AND SUPPLY ARRANGEMENTS ASSOCIATED WITH THE SUPPLY OF ELECTRICITY.
2. P.O.S. – Point of Supply
3. Location of service pit to be determined by the supply authority
4. Buildings on "battleaxe" lots which are commonly created for dual occupancy subdivision shall be supplied by an underground consumer's mains from the Point of Supply.
5. The provision and method of installation of an underground service cable to a property in an LGESA area of supply shall be determined by the Responible Officer of the relevant LGESA.

TYPICAL ARRANGEMENTS FOR NUMBER OF SUPPLIES

FIG. 4.1



General Notes:

1. Pole should be positioned to ensure service clearances as set out in Fig.5.1.
2. These installations are also acceptable for underground distribution provided the consumer's mains are mechanically protected as per Fig.4.4.
3. All timber to be well seasoned and of select grade.
4. An approved service bracket shall be provided and installed by customer at a minimum height of 3000mm.
5. A depth marker consisting of a saw cut (minimum length of 100mm) filled by a row of at least three galvanised nails shall be made on the pole at a distance of 2000mm from the base of the pole.
6. Supply will be connected to a pole erected at a new site only after a 'Notice of Completion' has been submitted by a registered electrical contractor.
7. The electrical installation shall comply with the Wiring Regulations.
8. Excavated soil MUST be compacted around pole in 100mm layers and thoroughly tamped.
9. Main switch to be no higher than 2000mm.
10. Pole supports to be securely attatched to pole and pegs using a minimum of 2 – 75mm nails at each fixing point.

* NOTE: Where footing strength is extremely poor, pole to be installed at a depth of 900mm. ie depth marker at 1100mm above ground level

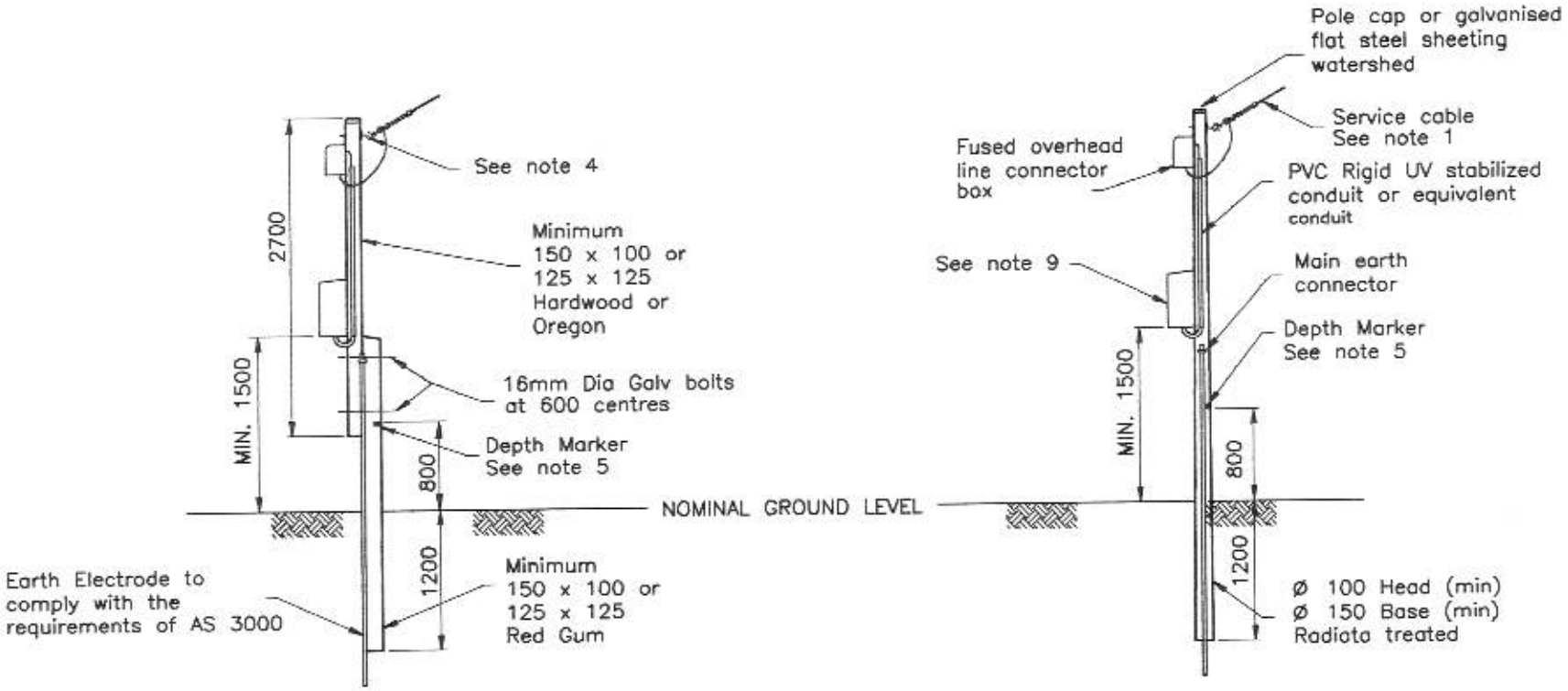
Alternative Structures:

(a) An alternative arrangement would be to install a pole with 1.2m depth in ground as per Figure 4.3.

(b) Any fabricated alternative arrangement shall be suitably protected against corrosion and be designed to support a load of 2kN at the service bracket. The design shall be carried out by a qualified Structural Engineer or equivalent and shall be submitted to the Supply Authority for approval.

BUILDERS SUPPLY POLE - ALTERNATIVE 1
2 WIRE AERIAL SERVICE

FIG. 4.2



General Notes:

1. Pole should be positioned to ensure service clearances as set out in Fig.5.1.
2. These installations are also acceptable for underground distribution provided the consumer's mains are mechanically protected as per Fig.4.4.
3. All timber to be well seasoned and of select grade.
4. An approved service bracket shall be provided and installed by customer at a minimum height of 3000mm.
5. A depth marker consisting of a saw cut (minimum length of 100mm) filled by a row of at least three galvanised nails shall be made on the pole at a distance of 2000mm from the base of the pole.
6. Supply will be connected to a pole erected at a new site only after a 'Notice of Completion' has been submitted by a registered electrical contractor.
7. The electrical installation shall comply with the Wiring Regulations.
8. Excavated soil MUST be compacted around pole in 100mm layers and thoroughly tamped.
9. Main switch to be no higher than 2000mm.

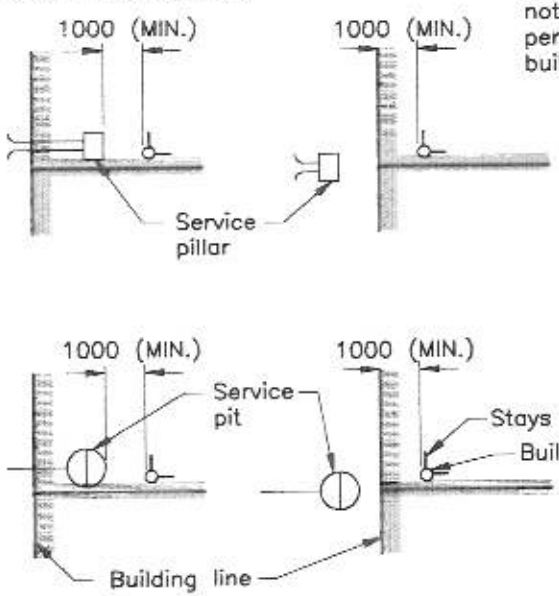
Alternative Structures:

Any fabricated alternative arrangement shall be suitably protected against corrosion and be designed to support a load of 2kN at the service bracket. The design shall be carried out by a qualified Structural Engineer or equivalent and shall be submitted to the Supply Authority for approval.

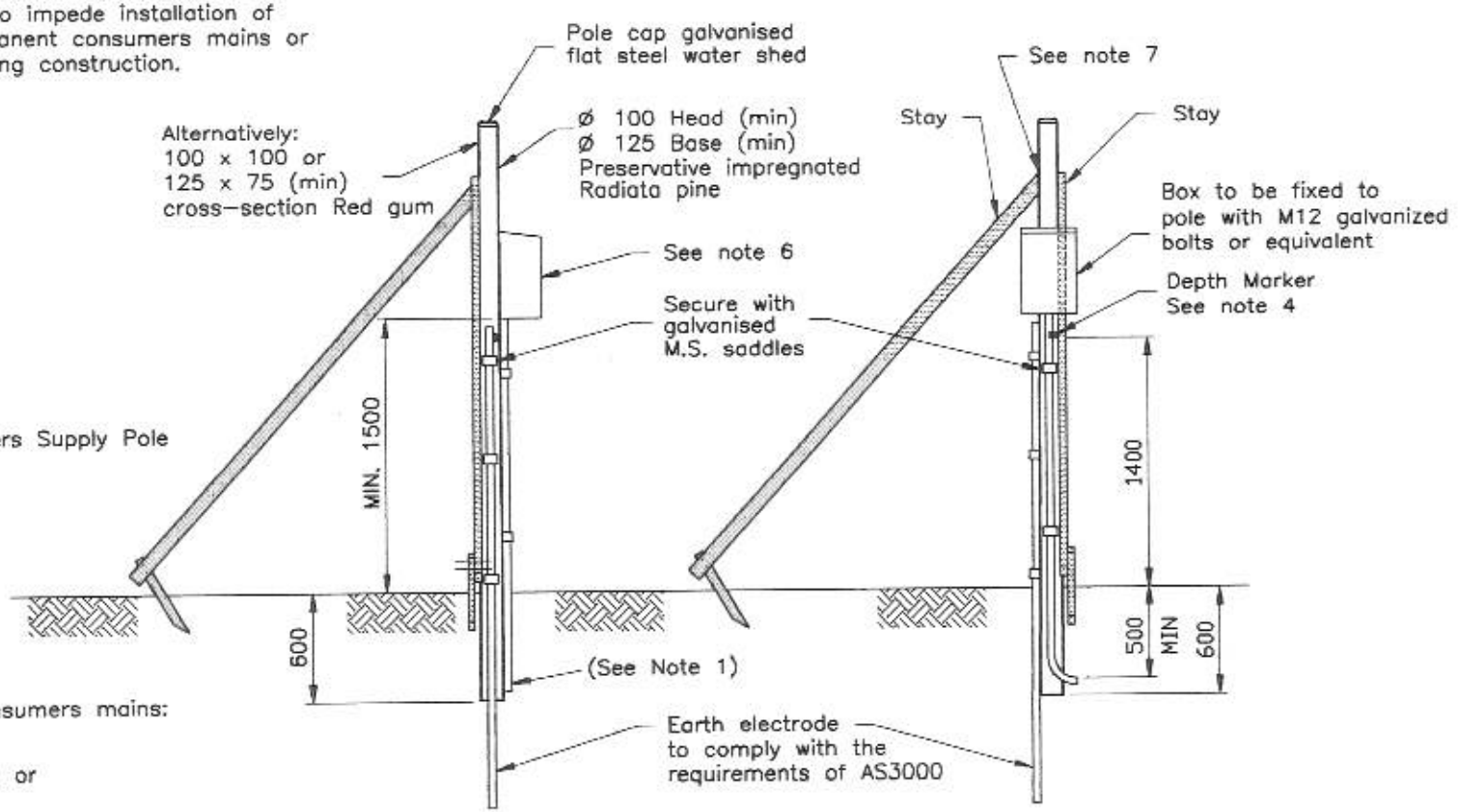
BUILDERS SUPPLY POLE - ALTERNATIVE 2
2 WIRE AERIAL SERVICE

FIG. 4.3

POLE LOCATION



Pole should be located so as not to impede installation of permanent consumers mains or building construction.



NOTES:

1. Mechanical protection shall be provided for consumers mains:

   Below ground by:–

   (a) Heavy duty electrical conduit to AS 2053, or

   (b) Galvanised steel piping to AS 1074, or

   (c) Reinforced concrete cable cover slabs with a minimum thickness of 40mm and a classification of not less than grade 15 to AS 3600. Cover slabs other than concrete may be used subject to specific approval by the Supply Authority for the purpose. All cover slabs unless light orange in color shall be further identified by the addition of a orange marker tape installed in accordance with the Wiring Regulations.

   Above ground by:–

   Galvanised steel piping to AS 1074 or approved galvanised steel cable guards in addition to heavy duty rigid PVC conduit to AS 2053 – or other approved equivalent.

2. Pole to Fig. 4.2 and Fig. 4.3 may be used subject to mechanical protection of cable being equivalent to note 1 above.

3. The electrical installation shall comply with the Wiring Regulations.

4. A depth marker consisting of a saw cut (minimum length of 100mm) filled by a row of at least three galvanised nails shall be made on the pole at a distance of 2000mm from the base of the pole.

5. Excavated soil MUST be compacted around pole in 100mm layers and thoroughly tamped.

6. Main switch to be no higher than 2000mm.

7. Pole supports to be securely attatched to pole and pegs using a minimum of 2 – 75mm nails at each fixing point.

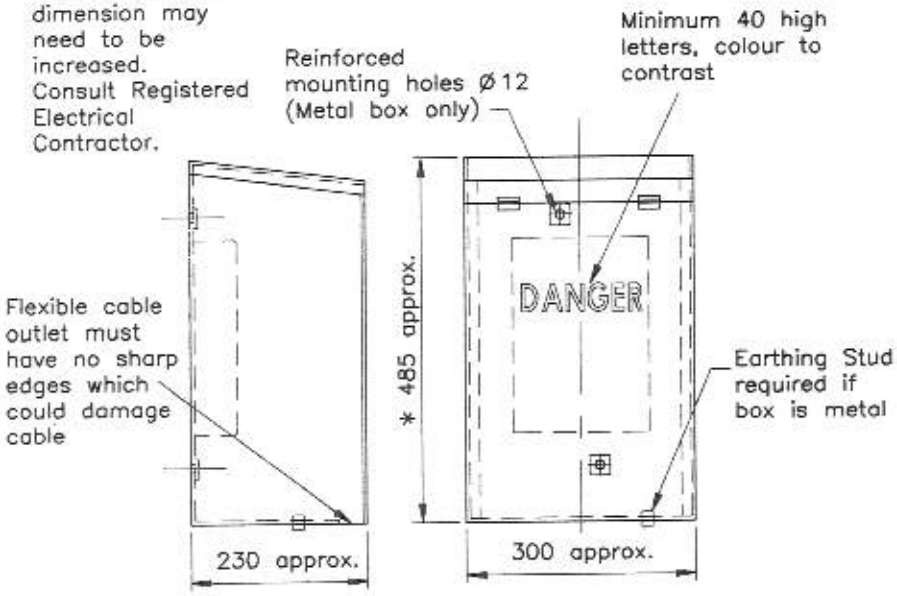
BUILDERS SUPPLY POLE
UNDERGROUND DISTRIBUTION

FIG. 4.4

VKBOOK\SIRULES

METER BOX - METAL OR TIMBER
(Suitable for both U/G & O/H meter boards)

*To provide for switchboard the dimension may need to be increased. Consult Registered Electrical Contractor.



ACCEPTABLE MATERIAL

Timber: Well seasoned timber Min. thickness 25mm suitably treated to render weatherproof.
–Exterior: painted with primer, undercoat and finish.
–Interior: paint optional.
Particleboard & veneered timbers are not acceptable.

Metal: 1.2mm thick Galvabond or equivalent, paint optional.

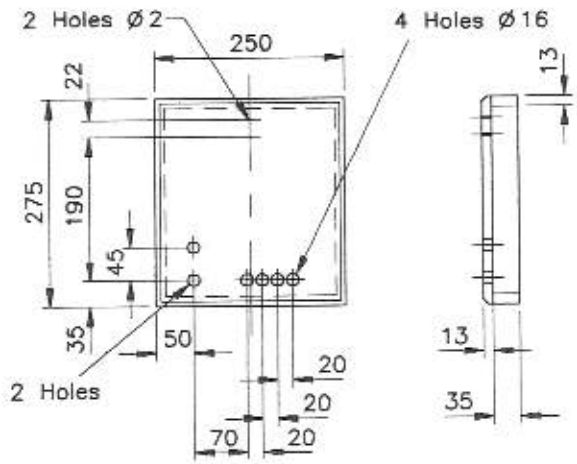
Plastic: Weather proof plastic of adequate thickness & strength.

CONSTRUCTION

Door to be hinged at top (Stainless steel or brass hinges)
Door to be fitted with suitable stay.
Box to be weather proof.
If timber, box roof to be covered with Galvanised flat steel sheeting 0.5 thick, turned down all round.

CAUTION
POWER OUTLETS IN BUILDERS SUPPLY POLE MUST BE PROTECTED BY RCD's (EARTH LEAKAGE PROTECTION).

METER BOARD UNDERGROUND



Standard service fuse to be supplied, installed and wired by customer's REC on meter panel.

FUSE

Fuse shall be of a type which accepts a cartridge 57 x Ø22.2 and is capable of being sealed. E.G. Henley, Series 7 Type 2(a) or equivalent. Fuse box must be of a type that will prevent inadvertant personal contact.
Fuses can be left or right hand mounted (left hand mounted shown above).

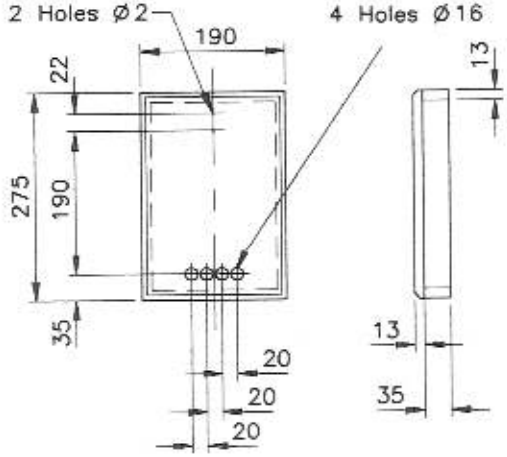
METER BOARD MATERIALS

Pressed 'Pyneboard' or equivalent, sealed.
275 x 250 x 13 – 1 off
Pinus radiata or equivalent, sealed.
275 x 35 x 13 – 2 off
250 x 35 x 13 – 2 off
Meter board as shown to be supplied with box.

INSTALLATION

Meter must be accessible. Switchboard is not specified. If metal, box must be earthed.
Meter connections to be brought through holes provided in meter board, in the sequence from left to right:
Line Active (from Fuse), Line neutral, Load Neutral, Load Active (to Switchboard).

METER BOARD OVERHEAD

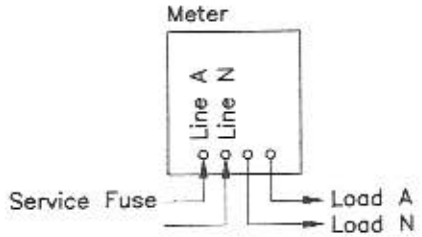


METER BOARD MATERIALS

Pressed 'Pyneboard' or equivalent, sealed.
275 x 190 x 13 – 1 off
Pinus radiata or equivalent, sealed.
275 x 35 x 13 – 2 off
190 x 35 x 13 – 2 off
Meter board as shown to be supplied with box.

INSTALLATION

Meter must be accessible. Switchboard is not specified. Metal meter box must be earthed



BUILDERS SUPPLY POLE METER BOXES

FIG. 4.5

VKBOOK\SIRULES

4.6.2.2 Method of Supply

In a Category 1 (urban non–fire hazardous) area as detailed in Appendix A the Supply Authority will provide either –

(a) an aerial service cable to a point up to 20 m inside the property boundary and not further than 45 m from the Supply Authority pole outside the property (Refer also to Clause 5.1.3); or

(b) an underground service cable to the property boundary.

In a Category 2 (rural or fire hazardous) area, and in any case where the street mains are underground, the method of supply under normal conditions shall be by underground service cable to the property boundary.

Where an underground service cable is installed, the customer's REC shall supply and install Underground Consumer's Mains in accordance with Clause 5.2.3.

Use of the permanent consumer's mains to supply the temporary installation is acceptable.

In special circumstances, such as where an Underground Service Cable is not installed, the Responsible Officer may approve the use of an aerial service cable in a Category 2 area for a limited period. Unless otherwise agreed by the Customer Service Manager (SEC) or City Electrical Engineer (LGESA), this period shall not exceed 12 months.

4.6.2.3 Buildings in Course of Erection

Where a temporary electricity supply is required for constructional purposes, supply will be given when the permanent consumer's mains and metering facilities are installed in their permanent position before completion of the building. The portion of the installation to be connected must be complete and comply with the requirements of the Wiring Regulations and these Rules. Suitable arrangements are shown in **Figure 4.6.**

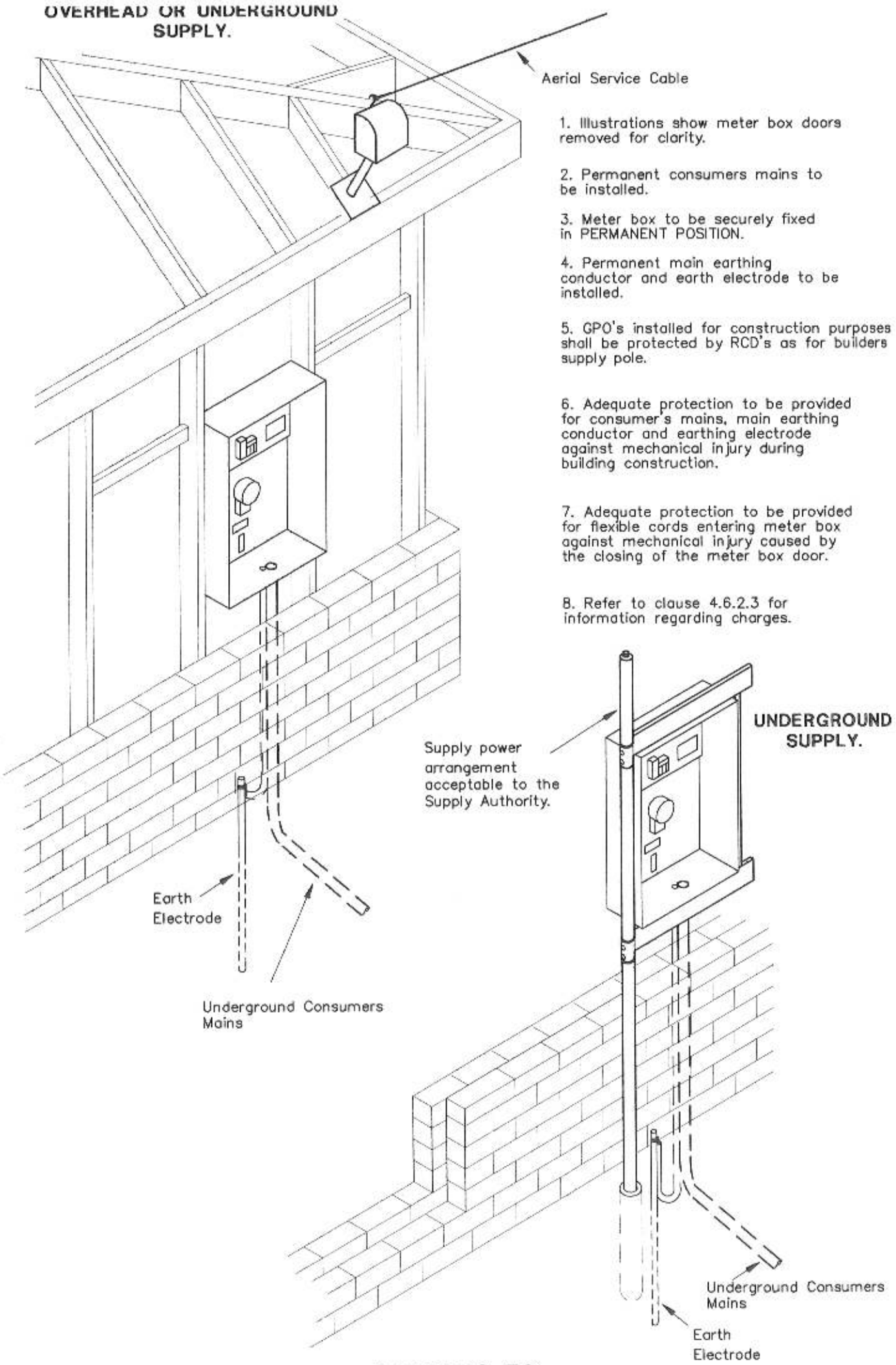
In such cases, a charge set out in the Standard Service Prices as a Partial Supply in Permanent Position will apply. The Standard Service Truck Visit fee will apply to any alterations involving servicing and metering following initial connection.

The customer shall advise the Supply Authority when the supply is no longer required for constructional purposes to enable adjustment of tariff if necessary.

NOTE:-In accordance with the Wiring Regulations, a separate Notice of Completion of Electrical Wiring Work is required to be submitted upon completion of the permanent installation.

4.6.2.4 Public Thoroughfares

Where, in special circumstances such as a mobile library, television supply or the like, the Responsible Officer approves a temporary supply provided to a box on a Supply Authority distribution pole, the installation shall be carried out in accordance with Clause 6.2.5.



SUPPLIES TO BUILDINGS IN COURSE OF ERECTION

FIG. 4.6

V:\BOOK\SRULES

4.7 Sources of Alternative Supply

4.7.1 General

Where the customer installs an alternative source of supply, such as a standby emergency generator or an uninterruptible power supply, facilities for connection of the alternative source to the electrical installation normally supplied from the Supply Authority's system shall not be installed unless the proposed arrangements have been agreed to by the Responsible Officer.

Where the system is to operate automatically, a schematic diagram shall be submitted to the Responsible Officer for approval.

4.7.2 Connection of Installation to Alternative Supply Sources

Where the Responsible Officer agrees to the installation of facilities to enable an installation to be disconnected from the Supply Authority's supply system and connected to a private alternative source, such facilities shall be arranged either directly or by suitable interlocking procedures so that the Supply Authority's system, service, and metering equipment cannot be energised from such alternative source. A prominent notice shall be fixed on the main switchboard to show that such facilities exist, which sections of the installation they can supply and their point of control.

In addition, if the alternative supply automatically comes into operation on the loss of mains supply, a means of isolating the alternative supply shall be provided on the installation main switchboard.

NOTE: Reference should be made to AS 3010 "Electrical Installations – Supply by Generating Set".

4.7.3 Parallel Generation

Specific technical requirements apply in respect of any proposal to incorporate parallel generation, including 'Co–generation', facilities within an installation. It is therefore essential that the Customer Service Manager (SEC) or City Electrical Engineer (LGESA) be formally consulted before any commitment to proceed is made.

4.8 Supply Authority Substation on Customer's Premises

4.8.1 Accommodation

If, in the opinion of the Responsible Officer, a substation on the premises is necessary to provide new or additional supply, the Supply Authority's assets must be protected by a lease or an easement or both as deemed appropriate. The Supply Authority's requirements will be laid down in a letter offering specific conditions of supply. These conditions will include the following –

(a) For pole–mounted type substations, an easement agreement for the supply line shall be required. For other substations, the customer shall provide or arrange with the registered proprietor, a lease agreement and easements in favour of the Supply Authority for adequate space in the premises to accommodate the substation equipment and the supply mains to and from the substation.

(b) A plan to the satisfaction of the Supply Authority defining the leased area and the easements for access and the ingress and egress of overhead or underground lines shall be prepared by the customer's surveyor.

(c) The customer shall provide any necessary building or enclosure to the satisfaction of the Customer Service Manager (SEC) or City Electrical Engineer (LGESA) and provide and maintain suitable arrangements for vehicular access to the substation on a 24 hour basis.

To assist a customer in the planning of an indoor substation in SEC areas of supply, reference should be made to the SEC publication "Specification for Indoor Substation on Customer's Property".

The Supply Authority has the right to use all substation equipment and to install additional equipment for the purpose of supplying other premises subject to the existing requirements of the customer on whose property the substation is located first being met.

4.8.2 Extension of High Voltage Mains

The Supply Authority will, subject to the prevailing terms and conditions for extension of the Supply Authority's system, provide, install and maintain the high voltage mains necessary to connect Supply Authority substations on customer's premises abutting the property boundary at a location agreed to by the Supply Authority. Should the customer require a substation to be located in such a position as to require the extension of the Supply Authority's high voltage mains within the property and the Supply Authority agrees to such extension, the associated costs would normally be required to be borne by the customer.

4.9 Type of Supply and Conductor Loading

4.9.1 Determination of Number of Phases of Low Voltage Supply

4.9.1.1 Three Phase 415/240 Volt Areas

Individually metered installations having a calculated maximum demand current not exceeding 80 Amperes will normally be given a two–wire supply.

For individually metered installations having a calculated maximum demand current exceeding 80 Amperes, the provision of a two–wire, three–wire or four–wire supply shall be determined by the Responsible Officer.

4.9.1.2 Single Phase 480/240 Volt Areas

The provision of two–wire or three–wire supply shall be determined by the Responsible Officer.

4.9.2 Balancing of Load and Limitation of the Loading of Apparatus

Where a three–wire or four–wire supply is given the load shall be divided as evenly as practicable between the active conductors.

Where an installation is supplied by an aerial or underground service cable having more than one active conductor, the load shall be so arranged that, so far as is practicable at the time of maximum demand of the installation, the current in any active supply conductor shall not exceed the current in any other active supply conductor by more than 25 Amperes.

Where the actual load is not known, the arrangement of the load may be determined on the basis of a Calculated Maximum Demand as set out in the Wiring Regulations.

To facilitate balancing, apparatus incorporating a 240 Volt loading should generally be provided with one active terminal for a load up to 25 Amperes and two active terminals suitable for connection to different phases where the total load exceeds 25 Amperes but does not exceed 50 Amperes. Where three active terminals are provided, the components of loading should be arranged so that the loading on any terminal does not normally exceed that on any other terminal by more than 25 Amperes.

See also Clause 2.6 regarding interference with supply to other customers, including limitation of switching of apparatus, and Clause 2.7 regarding limitation of the starting current of motors.

5 PROVISIONS FOR SERVICE CABLES AND CONSUMER'S MAINS

5.1 Service Cables

5.1.1 General

The customer shall provide adequate mounting and installation facilities for the Supply Authority servicing equipment in the positions approved or selected by the Responsible Officer. Service equipment supplied and installed by the Supply Authority shall remain the property of the Supply Authority.

The provision and method of installation of an aerial service cable or an underground service cable to a property in a LGESA area of supply, shall be determined by the Responsible Officer of the relevant LGESA in accordance with the conditions under which electricity is made available by that LGESA.

Where supply mains are external to the property, the Supply Authority installs and maintains the service cable between its system and the customer's point of supply. In all cases, the Supply Authority reserves the right to determine the location of the Consumer's Terminals and the method of supply.

5.1.1.1 Category 1 (Urban Non–Fire Hazardous) Areas

In Category 1 areas as detailed in Appendix A, the service cable will normally be aerial from overhead mains OR underground from underground mains.

Where overhead mains exist, a customer may, in general, elect to have an underground in lieu of aerial service cable installed. Refer to Clause 5.1.4.6(b) – Elective Underground Supply.

5.1.1.2 Category 2 (Rural and Fire Hazardous) Areas

In Category 2 areas as detailed in Appendix A, the service cable will, in general, be underground, except in the case where a structure can be serviced from the Road Reserve by a single span of aerial service cable in accordance with Clause 5.1.3. The Responsible Officer may approve the use of an aerial service cable where it is not practicable to install an underground service cable (due to obstruction, rock, etc).

NOTE:-See also Clause 4.8 regarding substation on customer's premises.

5.1.2 Connections to Service Equipment

The customer shall provide sufficient length of cable and suitable means of termination for connection of the consumer's mains to service equipment. In general, aluminium conductors are not acceptable for termination directly on service equipment.

5.1.3 Aerial Service Cables

Where, in accordance with Clause 5.1.1, an aerial service cable is permitted, the Supply Authority will supply one span of aerial service cable which shall terminate within the customer's property at a point of attachment located up to 20 m from the property boundary and not further than 45 m from the Supply Authority pole outside the property. The Responsible Officer will determine the route of the service cable and approve the position of the point of attachment to the building, pole or structure.

5.1.3.1 Point of Attachment (POA)

The POA of an aerial service cable to a customer's installation shall be selected with regard to the details provided in **Figures 5.1 and 5.2** and the notes therein.

NOTES:

1. In the case of a substantial electrical load or an installation on a corner allotment having alternative Points of Attachment from separate streets, the Responsible Officer shall be consulted.
2. Services from urban pole type substations should be avoided wherever practicable.
3. The possibility of the pole being relocated in the future should also be given some consideration in determining the POA.

5.1.3.2 Fixing for Aerial Service Cable at POA

The customer shall provide and install a suitable service bracket having adequate fixing at the POA for an aerial service cable. Bolts extending through timber fascia or brick walls, into suitable fixings, shall be used where necessary. Any service bracket provided shall be of a type approved by the SEC or acceptable to a LGESA for use in that particular area, and shall, in general, have an installed safe working load capacity of 2 kN. However, a service raiser bracket having an installed safe working load capacity of 1 kN is acceptable where the attached span of aerial service cable does not exceed 45 m in route length and does not comprise more than two conductors.

Any non–approved service brackets shall –

(a) have their design certified by a qualified structural Engineer and the computations submitted to the Supply Authority for approval.

NOTE: The computations shall allow for a design maximum load of 4 kN for all service brackets except for service raiser brackets suitable for 2 conductor service cable where the design maximum load shall be 2 kN, i.e. a safety factor of 2 shall apply. These computations shall allow for the design maximum load being applied from the side of the bracket for all angles up to 60^0 from the centreline of the bracket.

(b) be hot dipped galvanised after fabrication.

Suitable brackets and fixing arrangements are shown in Figures 5.3, 5.4 and 5.5.

5.1.3.3 Clearances of Aerial Service Cables

The clearances of aerial service cables above ground and to other structures, etc, shall be as detailed in Figures 5.1 and 5.2. Such minimum clearances shall not be reduced by subsequent works on the premises.

5.1.3.4 Tree Clearances from Aerial Service Cables

The customer is responsible for ensuring that any tree or other vegetation on the customer's property is kept pruned to maintain a minimum clearance from any aerial service cable supplying the customer's premises as specified in the appropriate Table of the Code of Practice for Tree Clearing.

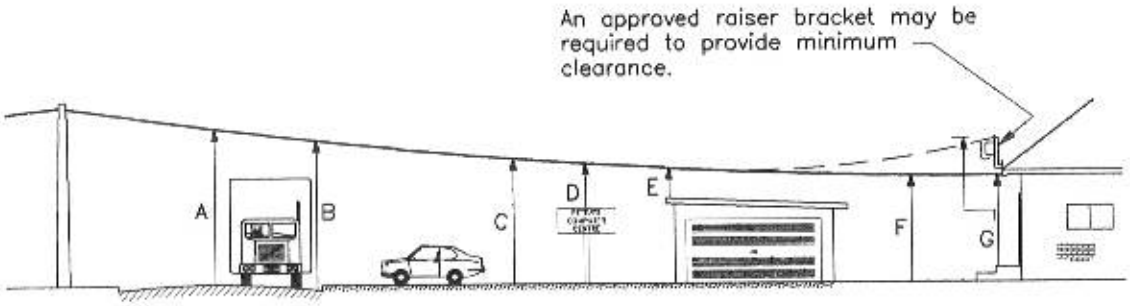
NOTE: For clearances of less than 1.0 m from an INSULATED service cable reference should be made to the Code of Practice for Tree Clearing.

5.1.3.5 Failure to Maintain Prescribed Clearances

If the customer should fail to maintain the clearances prescribed in Clause 5.1.3.4 above, the Supply Authority may at any time, and at the customer's expense, remove any tree or limb on the customer's premises which may endanger the safety or effectiveness of the aerial service cable.

CLEARANCES FOR THE TERMINATING SPAN

For an aerial service in a span terminating at the Point of Attachment, the following clearances shall be maintained under the worst operating conditions of temperature, wind and electrical loading.



A.	Above a public roadway – Centre of roadway	5.5m
B.	Above a public roadway – At the kerbline of:– (Refer Melway street directory, for definitions)	
	• Freeways, primary arterial roads, main highways, over dimensional routes.	5.5m
	• Secondary arterial roads, collector roads	4.9m
	• Other roads	4.6m
C.	Above customer's property – Over driveway	3.9m
D.	Structure or part of building on which a person cannot stand eg. sign, mast, blank wall.	0.6m
E.	Where the service cable passes over but is not attached to any part of a building or structure not normally accessible but on which a person may stand eg. car–port, pergola. Refer Note 2.	1.2m
F.	Above customer's property – Elsewhere	3.0m
G.	At Point of Attachment	3.0m

NOTES:

1. Wherever practicable services should be located to avoid crossing driveways and structures.

2. Where the Point of Attachment is directly above a verandah, the vertical clearance may be reduced to 0.6m.

3. A conductor drip loop of not more than 250mm is permissible below Point of Attachment.

4. Special consideration should be given to areas within customer's property where large vehicles or machinery may be used eg farms. In general, a minimum clearance above these areas of 5.5m should be maintained.

5. If the above requirements cannot be met, the Responsible Officer must be consulted regarding the supply conditions.

INSULATED SERVICE CABLE CLEARANCES FOR TERMINATING SPAN

FIG 5.1

NOTES

1 ⋰⋱ POA shall not be located in dotted area.

2 The maximum POA height should not exceed 6 metres and shall permit work to be performed conveniently with access provided by ladder.

3 Access to "stick – operated" service fuse/s shall be available to allow ready operation from ground level with a fise operating stick.

4 POA shall not be within areas accessible from the boundary of balconies measured 0.9m radially from such boundaries up to a height of 3.0m above the surface normally accessible for pedestrian traffic or resort.

5 For opening windows & doorways: –

(a) Top of window/door less than 2.7m above floor level: –

POA shall not be within an area 0.9m from bottom and sides of window/door and extending to 3.0m above floor level.

(b) Top of window/door greater than 2.7m above floor level: –

Under 3.0m from floor level, POA shall not be within 0.9m from sides and bottom of window/door.

Above 3.0m from floor level, POA shall not be within 0.3m from sides and top of window/door.

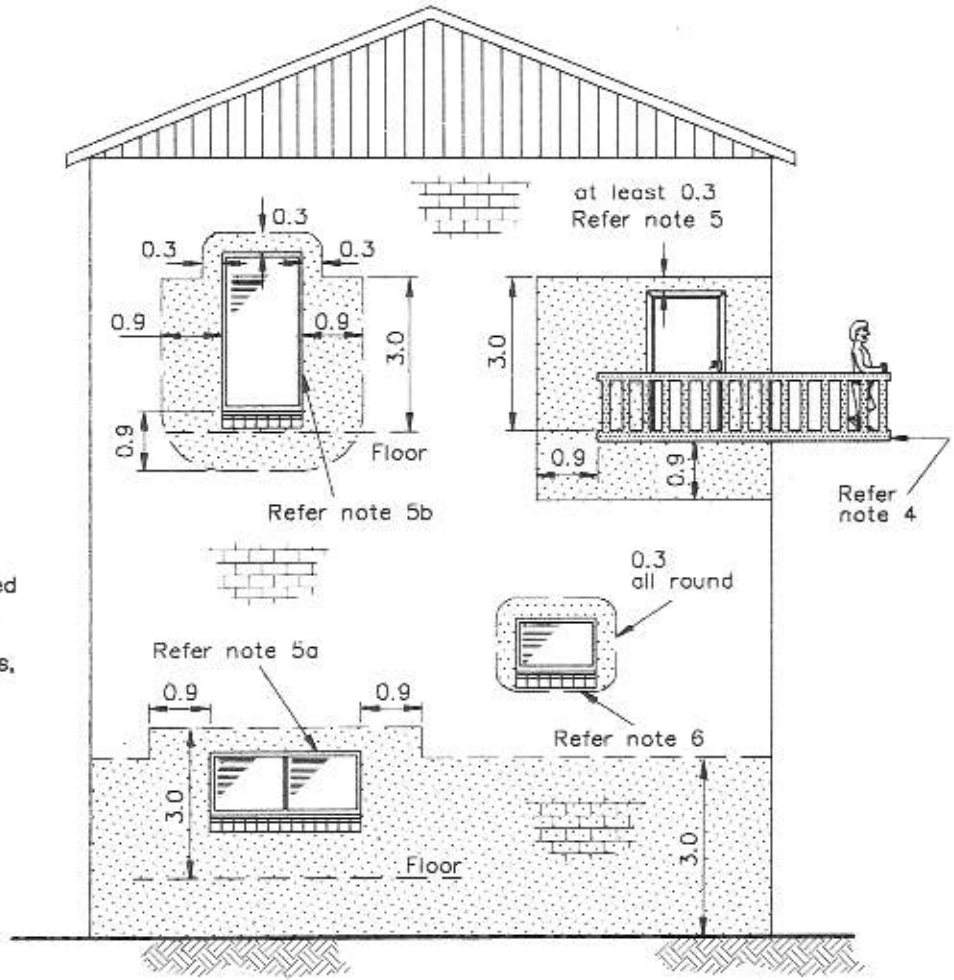
6 For non–opening windows, POA shall not be within 0.3m from the window.

7 Unless a more practical location is available which will satisfy all other conditions, the POA shall be located on the foremost portion of the structure facing the LV supply mains.

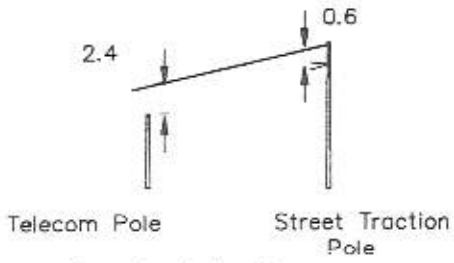
8 If any of the above requirements cannot be met the consumer's mains shall be installed underground. The REC must negotiate servicing arrangements with the Supply Authority.

9 The POA where practical, should be located to avoid the crossing of adjacent properties, roofs and verandahs, etc. Where this cannot be readily achieved, the Responsible Officer must be consulted.

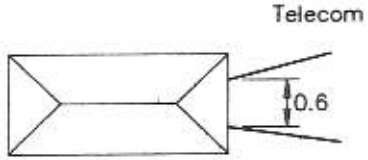
10 All dimensions in metres.



CLEARANCES FROM TELECOM OR STREET TRACTION CONSTRUCTION



Over street traction wires and conductors or approach to Telecom poles where unattached



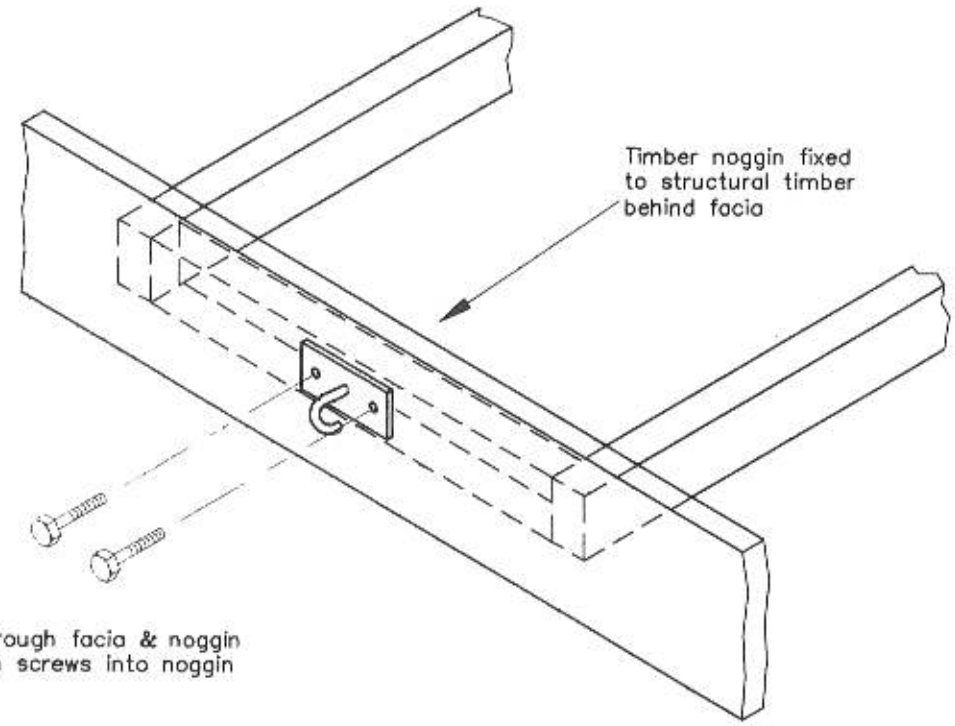
At the point of attachment or at any point along the length of service

GUIDANCE FOR LOCATION OF POINT OF ATTACHMENT (POA)

FIG. 5.2

VXBOOK\SIRULES

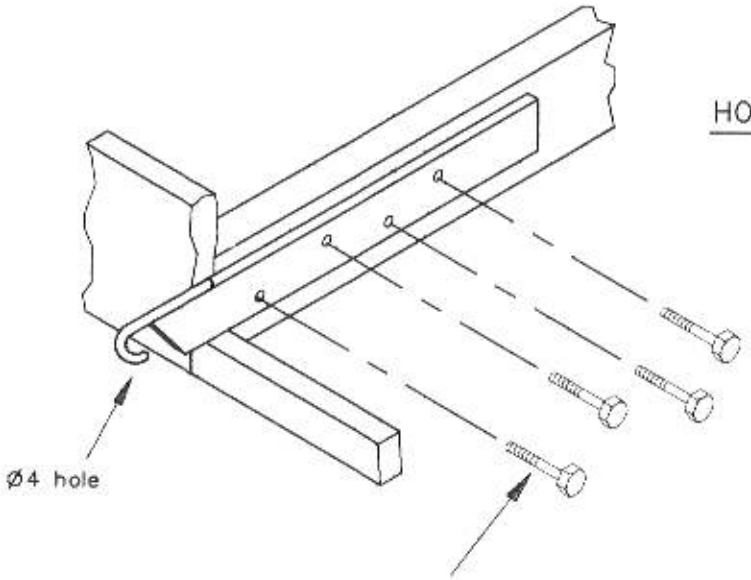
HOUSE END BRACKET



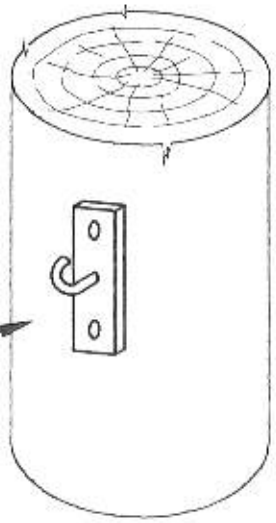
M12 Bolts through facia & noggin
or M12 coach screws into noggin

HOUSE END BRACKET

(RAFTER TYPE)



M12 Bolts through structural
timber



Bracket fixed to pole
with M12 bolt galv. &
length to suit pole dia.
& Ø12 coach screw,
galv. & 100 long

POLE END BRACKET

NOTE: –

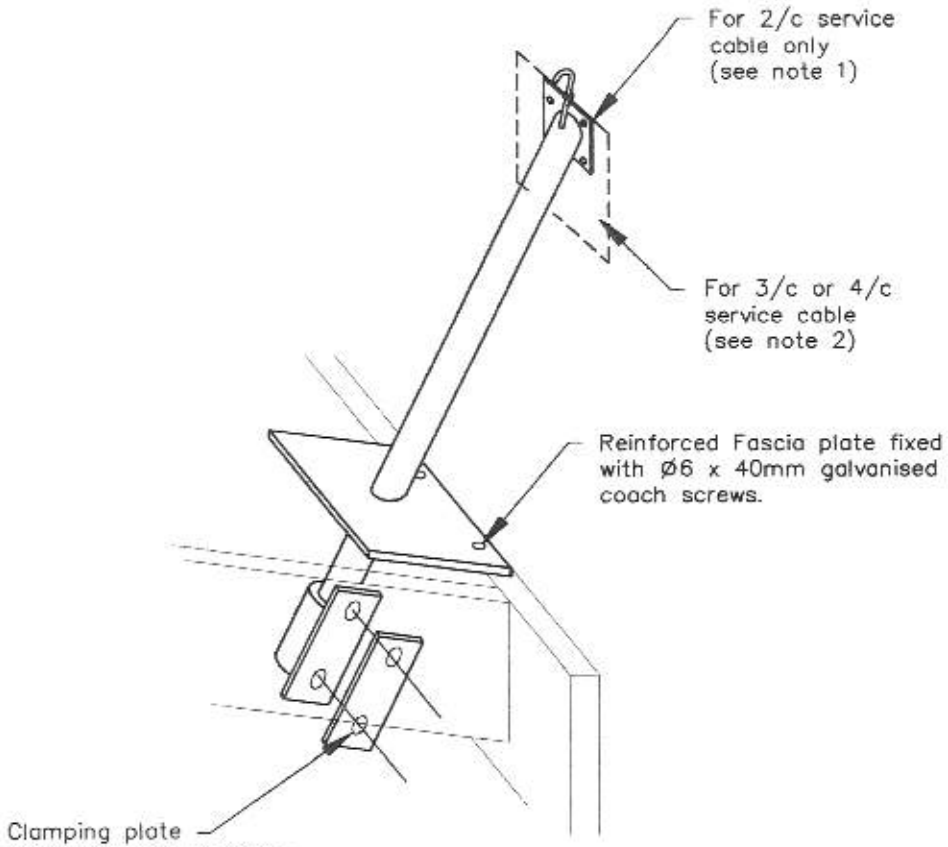
Hook down for uplift
in service cable

Hook up for service
falling away from POA

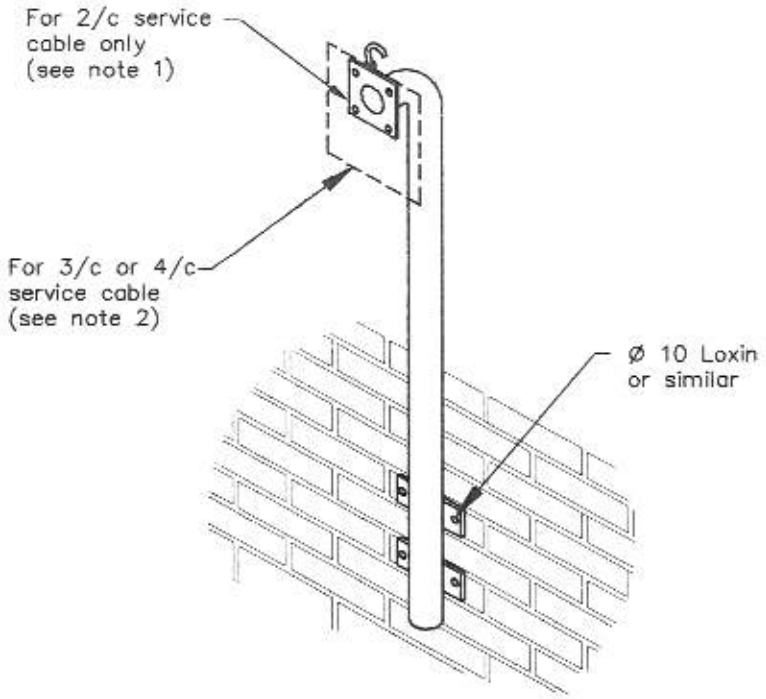
All bolts and screws
to be galvanised.

SERVICE BRACKET
TYPICAL INSTALLATIONS

FIG 5.3



RAFTER MOUNTED



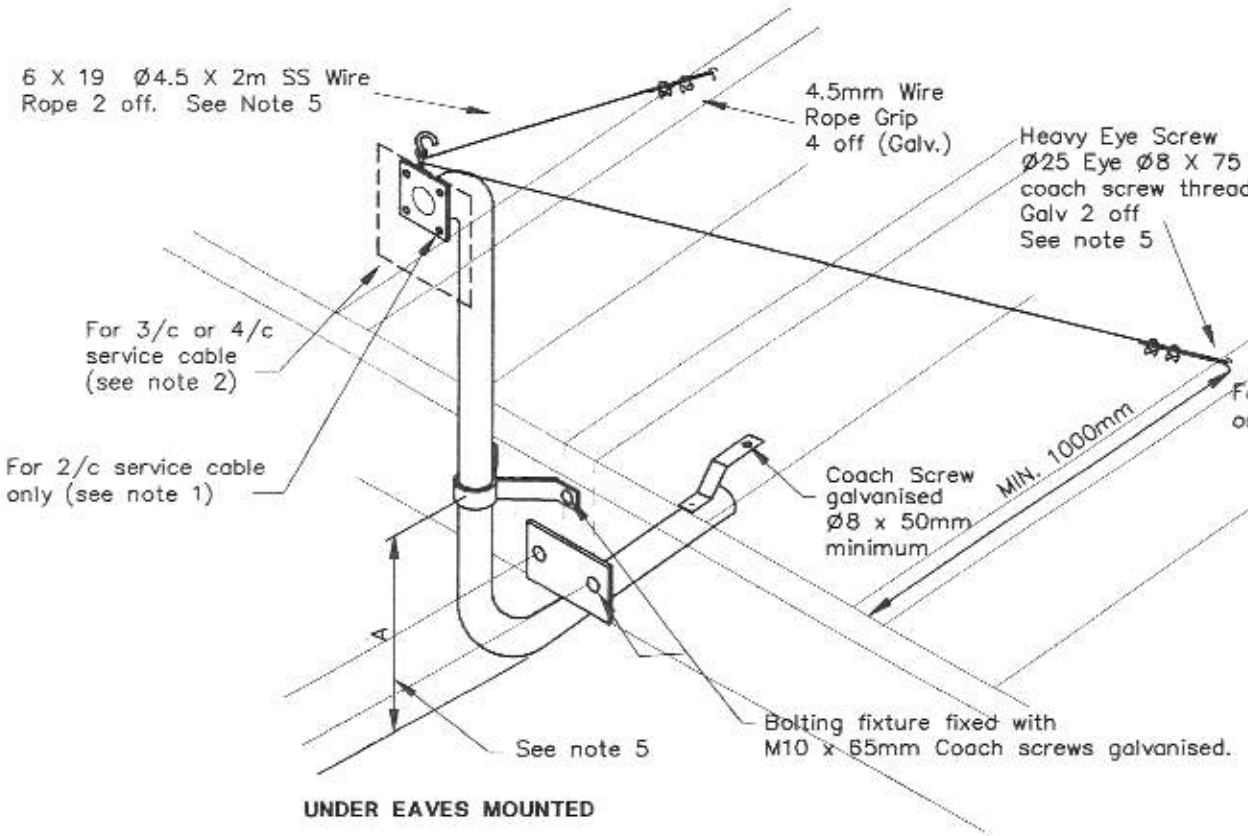
SURFACE MOUNTED

NOTES

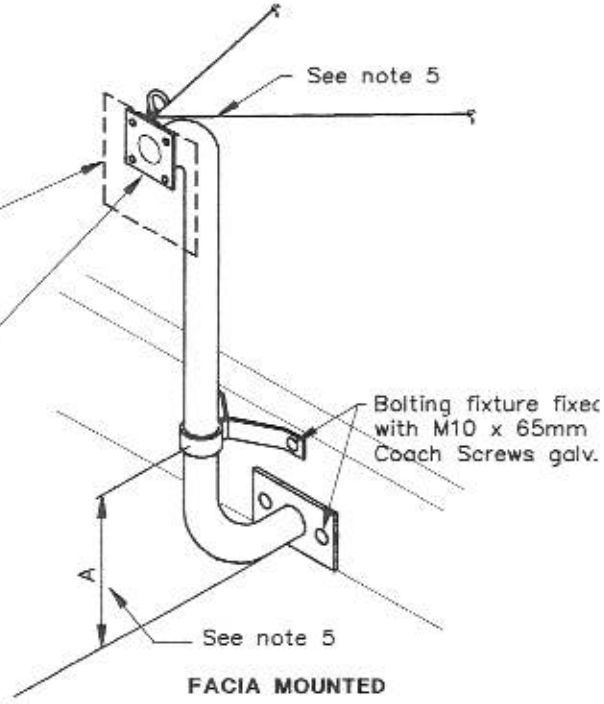
1. 2/c Raiser Brackets :–
   - Have a small FOLCB mounted mounting plate (75x100mm approx) with "1kN" stamped on the back.
   - Ony suitabe for 2/c service cable.
2. 3 or 4/c Raiser Brackets :–
   - Have a large FOLCB mounting plate (230x230mm approx) with "2kN" stamped on the back.
   - Suitabe for 3 or 4/c service cable
3. Only approved raiser brackets shall be used.
4. The customer is responsible for the installation of raiser brackets.
5. 2/c denotes 2 Conductor.

TYPICAL SERVICE RAISER BRACKETS

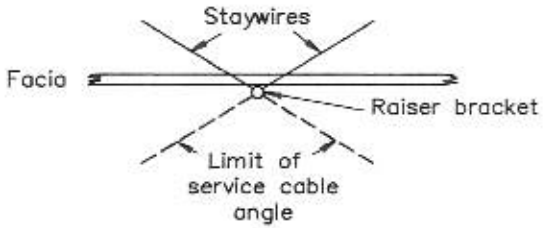
FIG. 5.4



UNDER EAVES MOUNTED



FACIA MOUNTED



PLAN VIEW OF RAISER BRACKET

NOTES

1. 2/c Raiser Brackets :–
   - Have a small Fused Mains Connection Box mounting plate (75x100mm approx) with "1kN" stamped on the back.
   - Ony suitabe for 2/c service cabe.
2. 3 or 4/c Raiser Brackets :–
   - Have a large FOLCB mounting plate (230x230mm approx) with "2kN" stamped on the back.
   - Suitable for 3 or 4/c service cable
3. Only approved raiser brackets shall be used.
4. The customer is responsible for the installation of raiser brackets.
5. Stay Wires
   - Stay wires to be used when a value of dimension 'A' greater than 150mm cannot be achieved.
   - Service cable angle limit with staywires fitted is shown.
   - Eye Screw to be fitted through a Ø10 hole drilled through the roofing material. Once positioned the remaining gap around the eye screw is to be sealed with a suitable sealant.
   - Stay wires to be installed at angles that provide support against the pull of the aerial service cable.
   - Additional structural support or noggins (not shown) may be required to prevent twisting of rafters or joists.
6. 2/c denotes 2 conductor.

TYPICAL SERVICE RAISER BRACKETS

FIG 5.5

WBROOK\SIRULES

5.1.4 Underground Service Cables – SEC Areas of Supply

5.1.4.1 General

Where the location of the Consumer's Terminals has not been previously established by the installation of a service pit or similar, the Responsible Officer will determine the location of the Consumer's Terminals. The customer may be required to provide, install and maintain facilities for the installation of the service cable.

Typical arrangements are shown in Figures 5.6, 5.7, 5.8 and 5.9.

5.1.4.2 Identification of Property Boundary

Where an Underground Service Cable is to be installed, the Responsible Officer shall nominate the location on the property boundary at which the Point of Supply will be established.

In the event that the boundary of the property to be supplied is not clearly defined, the prospective customer shall be responsible for the provision of such information as the Responsible Officer may require to identify that boundary.

Private Electric Lines shall not extend beyond the boundary of the property on which the Point of Supply is established.

Any portion of an underground electric cable installed outside the boundary of the property to be supplied, and intended to convey electricity to a particular "Point of Supply", shall be owned by or vested in the SEC and is defined as an "Underground Service Cable". Such Underground Service Cables are maintained by the SEC.

5.1.4.3 Notice of Proposed Installation

It is essential that the method and Point of Supply be determined with the Responsible Officer at an early date.

Where an Underground Service Cable is to be installed, there is a requirement for the SEC to notify various public authorities of the intention to install the cable in a public roadway or, in some cases, to negotiate an easement for the cable on an adjoining property.

In these circumstances, it is necessary that the REC provide a **MINIMUM OF 20 WORKING DAYS** notice before supply is required, to enable the SEC to effect the notification mentioned above and subsequently to arrange for installation of the Underground Service Cable.

In this regard, the REC shall notify the **SEC IN WRITING. FAILURE TO PROVIDE WRITTEN NOTICE AS SPECIFIED WILL RESULT IN CONNECTION TO SUPPLY BEING DELAYED.**

5.1.4.4 Determined Maximum Demand and Location of Consumer's Terminals

Where the Determined Maximum Demand does not exceed 100 A per phase, the Consumer's Terminals shall be within a pit installed at the boundary of the property to be supplied.

Where the Determined Maximum Demand exceeds 100 A per phase, the SEC may, as good engineering practice, extend the Underground Service Cable into the property to be supplied. The customer shall be responsible for the cost of installation and maintenance of that portion of the cable within the property to be supplied and a suitable device on which to terminate the cable. The Consumer's Terminals – with regard to application of the Wiring Regulations – shall be the point of termination of the Underground Service Cable within the property and shall be located within 5.0 m of the property boundary unless otherwise agreed in special circumstances. Such an agreement shall be subject to written conditions of contract between the SEC and the customer.

5.1.4.5 Arrangements for Underground Supplies from Overhead Reticulation

There are three quite different conditions under which L.V. Underground Service Cables may be installed from the SEC's overhead reticulation system to a property, namely –

- **"Compulsory" underground supply** – where the SEC requires the consumer's mains to be placed underground for fire hazardous areas, (refer to Appendix A and Clause 5.1.1.2) and will, where practicable, provide an Underground Service Cable to the property.

For new installations and to existing installations where the supply arrangements are to be upgraded, where supplies exceed 170 A per phase Determined Maximum Demand, the method of supply shall be compulsory underground.

Exceptions to mandatory undergrounding will be considered by the Supply Authority where –

(a) because of physical constraints, it would not be practical to underground;

(b) the customer would be involved in significant added costs in relocating an existing overhead point of supply and provided that a suitable aerial service can be fitted;

- **"Elective" underground supply** – where the customer would normally be provided with an overhead service to the property but has, for aesthetic or other reasons, chosen an Underground Service Cable at the customer's expense; and
- **"No Other Option" underground supply** – to provide supply to new dual and multiple installations in existing urban areas with overhead mains where no access is available for overhead services.

In rural areas, new installations will generally be in the category of compulsory underground supply.

NOTE:-If a defect notice is issued, and before proceeding with repairs or modifications to existing aerial consumer's mains or private poles, the customer's REC must ascertain from the SEC whether the line must be placed underground and whether the method of supply to the property is to be altered in any way.

5.1.4.6 Financial Arrangements

(a) Compulsory Underground Supply

The SEC shall, subject to the prevailing conditions for extension of the SEC's system, provide and arrange for the installation of a service cable to the Point of Supply for the property. Provision of the pit and any necessary conduits for an Underground Service Cable will be arranged by the SEC at no charge to the customer.

Where it is not practicable to install an Underground Service Cable (due to obstruction, rock, etc.), the SEC will normally provide an overhead service to the customer's property.

In this circumstance, the customer shall provide, install and maintain an approved cable termination – including a pole where necessary – for the purpose of termination and connection of the SEC's overhead service cable.

(b) Elective Underground Supply

A customer may elect to have the SEC install underground in lieu of overhead supply. However, the provision of an Underground Service Cable at the customer's request shall be conditional upon both the SEC's agreement thereto and the customer undertaking responsibility for the provision of all civil works (i.e. installation of conduit and pit, etc.) associated therewith, in accordance with the SEC's specification for such work. In addition, the customer shall meet the additional costs incurred by the SEC, if any, in providing the Underground Service Cable.

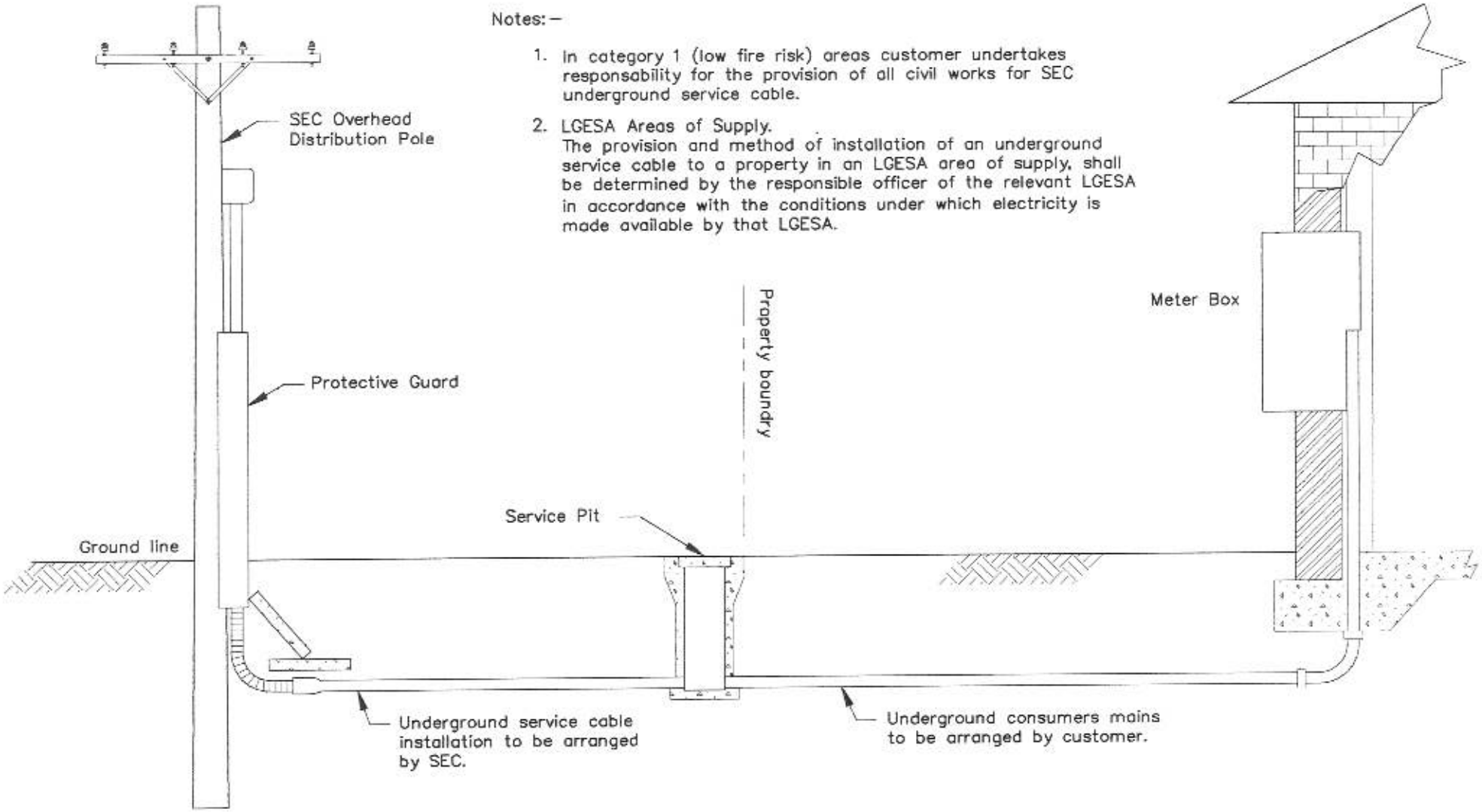
(c) "No Other Option" Underground Supply

Financial arrangements include the cost of the civil works if undertaken by the SEC plus a contribution to upgrading local power lines, and an alternative enabling the civil works to be undertaken by the builder/developer for a reduced payment to the SEC.

Installations Up To 100 Amperes
SEC Areas Of Overhead Suply

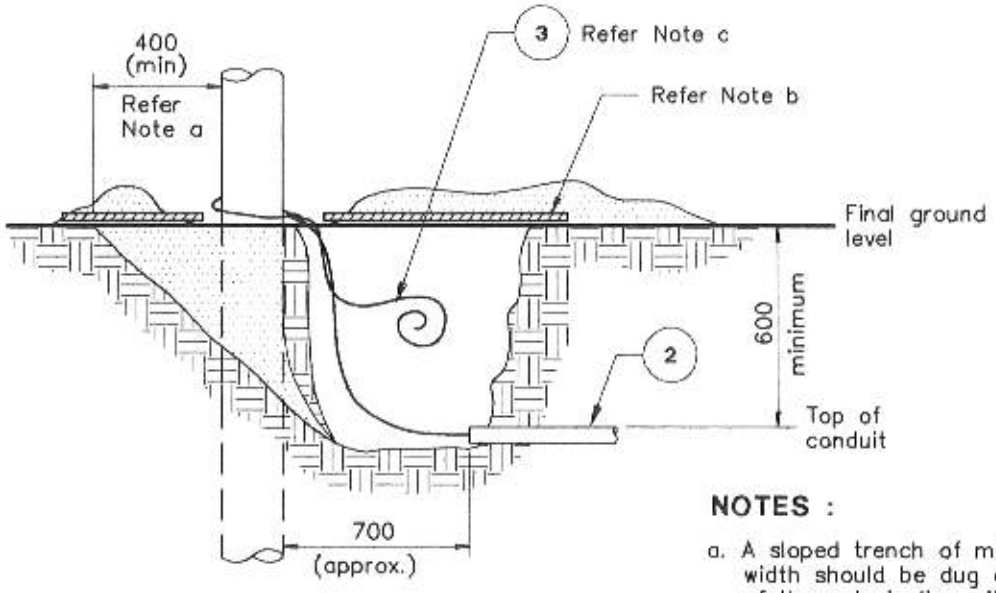
Notes:–

1. In category 1 (low fire risk) areas customer undertakes responsability for the provision of all civil works for SEC underground service cable.
2. LGESA Areas of Supply.
   The provision and method of installation of an underground service cable to a property in an LGESA area of supply, shall be determined by the responsible officer of the relevant LGESA in accordance with the conditions under which electricity is made available by that LGESA.



UNDERGROUND SERVICE CABLE
TYPICAL ARRANGEMENT

FIG 5.6



S.E.C. SUPPLY POLE DETAIL

NOTES :

a. A sloped trench of minimum 200mm (approx.) width should be dug adjacent to one side of the pole in line with the conduit to allow pulling in of the service cable.

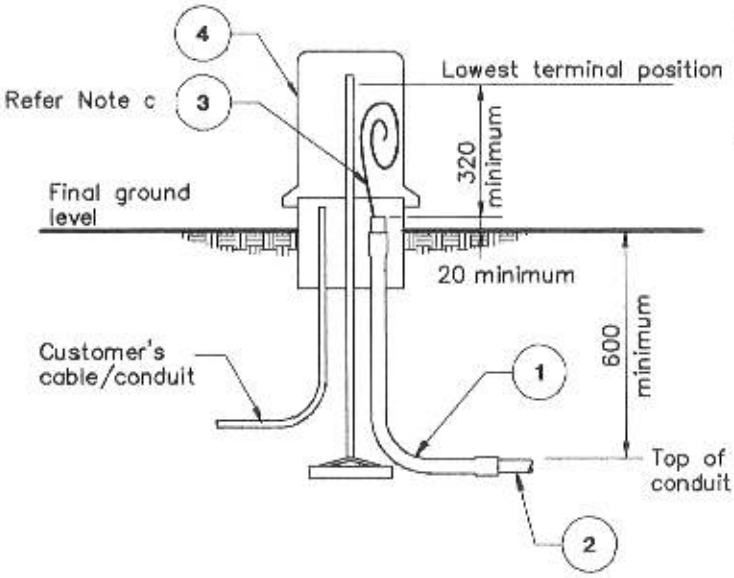
b. Trench at pole end to be temporarily covered prior to cable installation.

c. A 1m length of the draw wire is to be left coiled in the service pillar and secured to the S.E.C. supply pole.

d. Refer to Figure 5.9 for the minimum requirements of a customer's service connection pillar

e. Both ends of conduit are to be temporarily sealed prior to cable installation to prevent the ingress of dirt.

f. Service cable may also be connected to the consumer's terminals in a switchboard or other suitable enclosure. The enclosure dimensions and method of connection require the approval of the SEC's Responsible Officer.

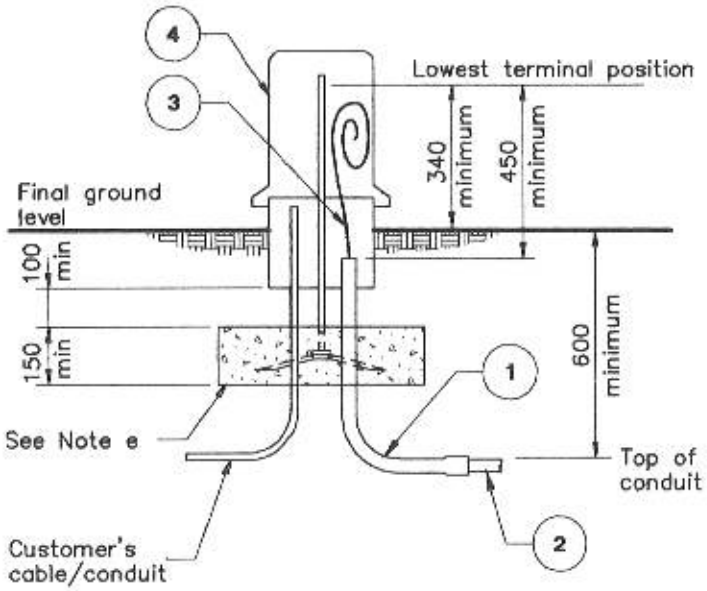


CUSTOMER'S SERVICE PILLAR DETAIL

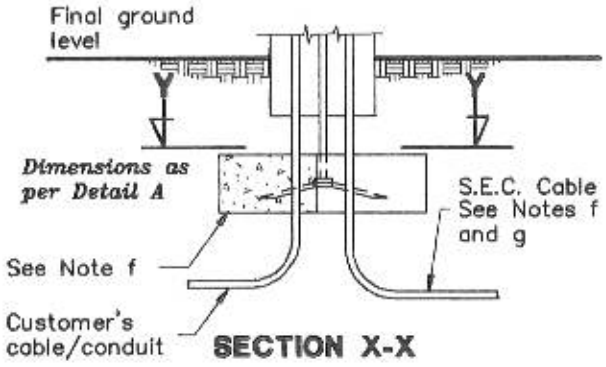
Item No.	Description
4	Pillar, connecting, service.
3	Draw wire, Galvanised Steel 2mm (14 S.W.G.)
2	Conduit, Plain, 80mm N.B. Underground, Rigid P.V.C., Heavy Duty, Orange. Electrical to AS 2053
1	Bend, 90 degree 'large sweep' Plain, Rigid P.V.C., 80mm N.B. Orange, Electrical to A.S. 2053.

U/G SERVICING FROM O/H DISTRIBUTION SUPPLY FROM 100A TO 170A POLE AND PILLAR DETAIL

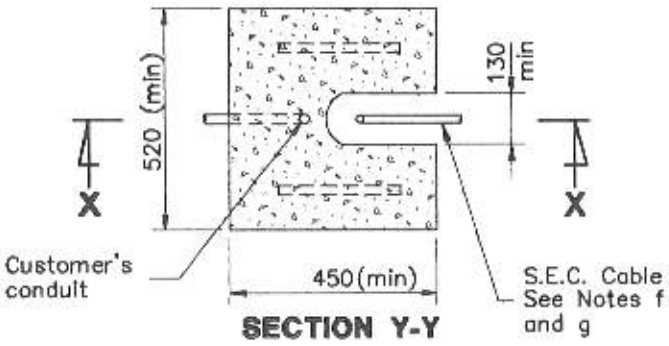
FIG 5.7



CUSTOMER'S SERVICE PILLAR DETAIL & CONCRETE FOUNDATION DETAIL 'A'



SECTION X-X



SECTION Y-Y

CONCRETE FOUNDATION DETAIL 'B'

NOTES :

a. A 1m length of the draw wire is to be left coiled in the service pillar and secured to the S.E.C. supply pole.

b. Refer to Figure 5.9 for the minimum requirements of a customer's service connection pillar.

c. Both ends of conduit are to be temporarily sealed prior to cable installation to prevent the ingress of dirt.

d. Service cable may also be connected to the consumer's terminals in a switchboard or other suitable enclosure. The enclosure dimensions and method of connection require the approval of the SEC's Responsible Officer.

e. Where customer's pillar is secured with a concrete foundation, and S.E.C. cable is in conduit, refer Concrete Foundation Detail 'A'.

f. Where customer's pillar is secured with a concrete foundation, and S.E.C. cable is not in conduit, an access for S.E.C. cable into the pillar shall be maintained, refer Concrete Foundation Detail 'B'

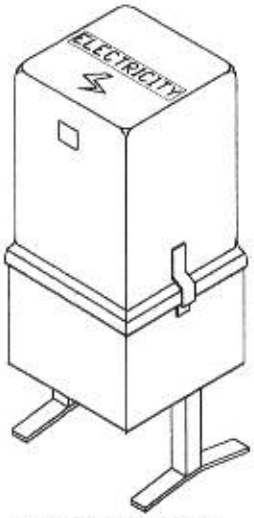
g. The method of construction of the concrete foundation,ie,the inclusion of a conduit, or the open access for SEC cable shall be the decision of the SEC Responsible Officer.

h. THIS SUPPLY ARRANGEMENT ASSUMES THAT A SUBSTATION ON THE CUSTOMER'S PREMISES IS NOT REQUIRED AND ADEQUATE SUPPLY IS AVAILABLE.

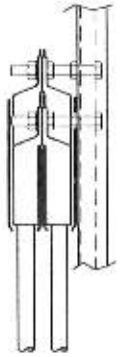
ITEM	DESCRIPTION
4	Pillar, Connecting,Customers Service
3	Draw Wire, Galvanised Steel, 2mm (14 S.W.G.)
2	Conduit, Plain, 100mm N.B. Underground, Rigid P.V.C., Heavy Duty, Orange, Electrical to A.S. 2053
1	Plain, Rigid P.V.C., 100mm N.B. Orange, Electrical to A.S. 2053 Bend, 90 degree 'large sweep', (min. 760mm Radius)

U/G SERVICING FROM O/H DISTRIBUTION
SUPPLY ABOVE 170A
PILLAR DETAIL

FIG 5.8

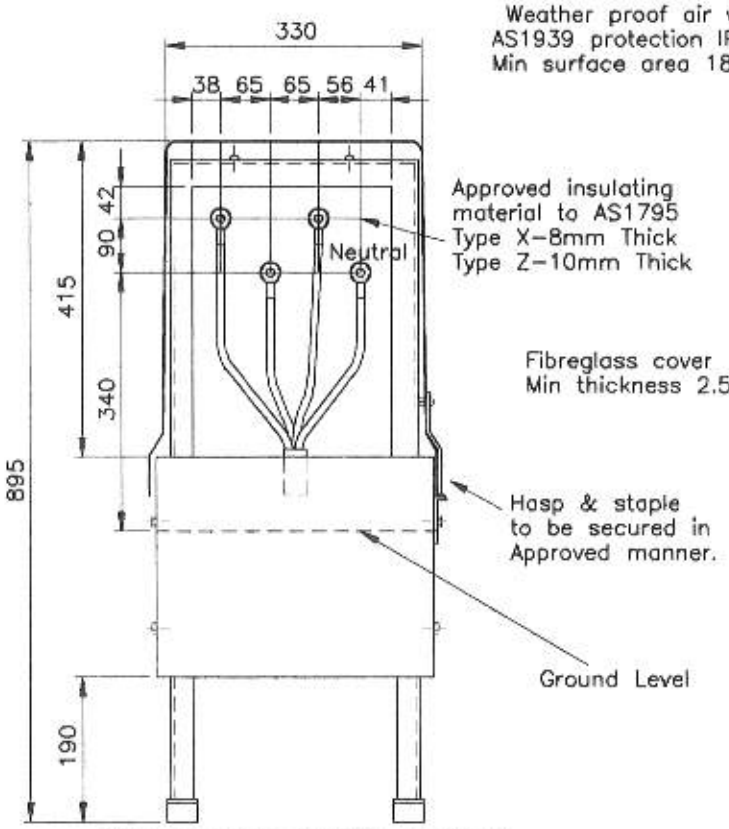


ASSEMBLY

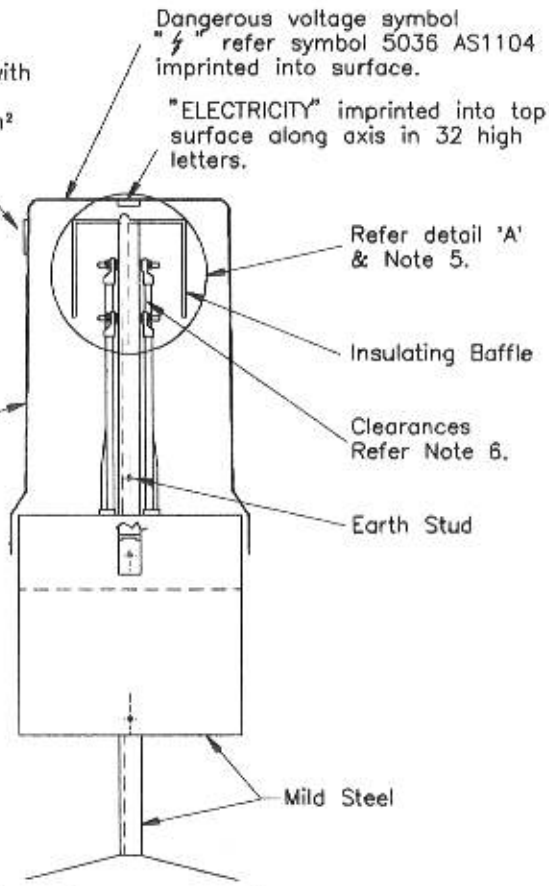


DETAIL A

Connection arrangement supplies above 170A. Refer to note 5.



(Front of cover & baffle removed.)



Connection arrangement supplies 100 – 170A (Side of cover removed)

NOTES:

1. This drawing details the SEC's minimum requirements for a consumers' connecting pillar.
   Other arrangements may be acceptable subject to approval of the Responsible Officer.
2. Where the distribution system is underground, fuses in the pillar may also be required. Refer to Responsible Officer.
3. Conductor terminal stud to be M12 brass threaded supplied with 6 washers and 4 brass nuts. Additional 25mm length required on neutral stud to provide for M.E.N. bonding.
4. Consumer's mains shall comply with Clause 5.2.3.
5. The determined maximum demand (D.M.D.) will be determined by the SEC. Where this value exceeds 170A, cable lugs shall be connected with palm to palm directly. Refer detail A.
6. The terminal positions shown are suitable for the connection of SEC service cables. The consumer's mains must also meet minimum clearances between live terminals and metal work as determined by AS3000.
7. Final ground level shall be clearly marked on outside of pillar and shall comply with minimum requirements shown.
8. Earthing of pillar to be carried out by the installation of an earthing electrode and an MEN connection to the neutral terminal.

CONSTRUCTION DETAILS

Remove all sharp edges and burrs.
All mild steel items to be galvanised to AS1650.
All welding shall conform to AS1554 Pt.1.

UNDERGROUND SERVICING
SUPPLIES OVER 100 AMP (D.M.D.)
TYPICAL CONSUMER'S CONNECTING PILLAR.

FIG. 5.9

5.2 Consumer's Mains

5.2.1 General

In addition to complying with the requirements of the Wiring Regulations the consumer's mains shall be installed in accordance with the requirements of these Rules. Unmetered sub–mains shall be considered as consumer's mains for the purposes of this Clause.

For LGESA areas of supply, the aerial consumer's mains shall also be installed to the satisfaction of the Responsible Officer of the relevant LGESA.

The Supply Authority reserves the right to determine the location of the Consumer's Terminals. Reference should be made to Clauses 1.5, 5.1 and 5.4 regarding Points of Supply and provision of Service Protection Devices.

NOTE:-Attention is directed to Clauses 5.1.2 and 6.7 where the use of aluminium conductors is being contemplated.

5.2.1.1 Size

The minimum size of consumer's mains for any single occupancy installation shall be in accordance with the Wiring Regulations and in any case, for individual domestic occupancy installations, shall be such that these conductors are capable, under installed operating conditions including those of voltage drop, of supplying a minimum total loading of 8.4 kVA at the occupancy main switchboard. No conductor forming portion of any consumer's mains shall have a cross sectional area of less than 4.0 mm^2.

5.2.1.2 Single Domestic Installations

Where a single domestic installation is connected to a 2 wire supply and the metered portion of the consumer's mains comprises more than one active conductor, one metered active conductor shall have a current carrying capacity of not less than 50 Amperes.

NOTE:-AS 3000–1991 specifies a minimum current–carrying capacity for consumer's mains of 63 A for single phase domestic installations and 32 A for other installations.

5.2.1.3 Multiple Domestic Installations

The minimum current carrying capacity of the common mains supplying a number of single domestic installations shall be determined in accordance with the requirements of the Wiring Regulations and the Wiring Rules.

5.2.2 Aerial Consumer's Mains – SEC Areas of Supply

The SEC requires that all private electric lines (i.e. consumer's mains, submains or final subcircuits) proposed to be constructed or to be substantially reconstructed shall be placed underground, except that overhead lines may be constructed and/or maintained in the following circumstances –

(a) Where a private electric line is located in an urban area not considered a bush or grass fire hazard. (The local SEC office will advise of areas so considered).

(b) Where an existing overhead private electric line involving one or more private poles is located in an area considered to be a bush or grass fire hazard, but required maintenance **DOES NOT** involve substantial reconstruction. (Substantial reconstruction includes reconductoring and/or replacement of more than 30% of poles in a line).

(c) Where substantial economic difference or construction and technical problems can be substantiated, the Customer Service Manager for the area concerned will consider a written application for approval of construction or maintenance of an overhead private electric line, other than (a) or (b) above. Such application must be submitted at least **TEN WORKING DAYS BEFORE** the proposed date of commencement of work.

Aerial Consumer's Mains, where permitted, shall be installed in accordance with the requirements of the Wiring Regulations, these Rules and, in addition, with the SEC publication "Specification for the Design, Construction and Maintenance of Private Overhead Electric Lines" or any equivalent successor publication.

NOTES:

1. In rural areas of Victoria aerial cables are liable to attack by birds, particularly the parrot family. In these areas, advice should be sought from the local SEC office if the use of an aerial cable is being considered.
2. A guide to assist the customer's REC with polarity testing following repairs to Aerial Consumer's Mains is available from SEC offices.

5.2.3 Underground Consumer's Mains

The customer shall be responsible for the provision, installation and maintenance of Underground Consumer's Mains.

In accordance with the relevant regulations, all electrical wiring work associated with the installation and maintenance of Underground Consumer's Mains shall be carried out, on behalf of the customer, by a Registered Electrical Contractor (REC) to the satisfaction of the Responsible Officer and in accordance with both the relevant provisions of the SEC Wiring Regulations and the additional requirements of these Rules.

5.2.3.1 Safety

(a) Substations

Where cables are to be installed on or in a Supply Authority substation, no excavation work within 10 m of the substation shall commence before the route of the cable has been approved by, and advice regarding the substation earthing system obtained from, the Responsible Officer.

In the case of a "Single Wire Earth Return" (SWER) substation, arrangements **SHALL** be made to de–energise the substation prior to and during trenching operations.

NOTE: Damage to a high voltage earthing conductor can cause an extremely hazardous situation.

(b) Poles

A minimum safe working clearance from any live apparatus of 2.0 m shall be maintained by all persons and apparatus in personal contact therewith. If this clearance cannot be maintained, the Supply Authority **SHALL** be consulted before proceeding.

Any timber pole marked with a large 'X' cut into or marked on the surface has a limited life and must therefore be considered unsafe to climb or support a ladder.

(c) Service Pits

Any cables within a service pit shall be treated as **ALIVE** and, hence, shall not be handled without taking appropriate safety precautions.

5.2.3.2 Installation

Underground Consumer's Mains shall be installed in accordance with the requirements of the Wiring Regulations and these Rules.

5.2.3.3 Connection of Cables

In general, no charge is made for connection of standard wiring systems. Charges may be applicable for the connection of "non–standard" wiring systems to the Supply Authority's system. Refer to Clause 5.2.3.8(c) – Wiring Systems (Cables).

5.2.3.4 Other Authorities' Charges

See Clause 5.2.3.6(c) regarding charges associated with the crossing of other Authorities' assets within private property.

5.2.3.5 Notification

To enable the Supply Authority to install an Underground Service Cable or other apparatus required to provide supply to the property and to program associated functions, notification of the proposed installation of Underground Consumer's Mains must be given as early as practicable prior to commencement of such installation.

In this regard, the REC shall notify the Supply Authority **IN WRITING** as required by (a) to (d) below. **FAILURE TO PROVIDE WRITTEN NOTICE AS SPECIFIED WILL RESULT IN CONNECTION TO SUPPLY BEING DELAYED.**

(a) Service Pit Not Installed

Where the Supply Authority nominates a Point of Supply on the property boundary and no service pit exists at that point, the **MINIMUM** notice required is **20 WORKING DAYS.** Notice may be effected by clearly endorsing the "Notice of Installation Work" (NIW) with the words "(1, 2 or 3 phase) Underground Service Cable requested" and should, in addition, include a sketch plan of the proposed consumer's mains route.

(b) Service Pit Installed

Where the Supply Authority nominates a Point of Supply which has been predetermined by the prior installation of a suitable service pit abutting the property boundary (as occurs in Underground Residential Distribution and "rural" subdivisions), the **MINIMUM** notice required is **6 WORKING DAYS.**

(c) Pole or Substation on Property

Where the necessary arrangements for the establishment of a Supply Authority substation or line on the customer's property have been completed and the Supply Authority nominates a Point of Supply on that substation (or Supply Authority pole), the **MINIMUM** notice required is **6 WORKING DAYS.**

In addition, to satisfy Clause 5.2.3.1 regarding Supply Authority substations, it may be necessary to co–ordinate Supply Authority and REC works. Hence, early consultation with the Responsible Officer is essential.

(d) Conversion from Overhead to Underground

Where an existing overhead supply remains operative, notice as required by the preceding sub–clauses shall be provided.

However, in the event that existing Consumer's Mains are defective and it is proposed to install Underground Consumer's Mains and an Underground Service Cable, the REC shall liaise with the Responsible Officer to enable appropriate notification to be given by the Supply Authority to other Authorities in accordance with Clause 5.1.4.3, **BEFORE COMMENCING** any work.

(e) Notice to Other Authorities

Where it is proposed to cross a major asset of another Authority within the customer's property, the REC shall consult with that Authority and the local Supply Authority office regarding reasonable requirements of the other Authority or alternative means of providing supply at the desired location.

5.2.3.6 Cable Route

(a) General

Private Electric Lines shall not extend beyond the boundary of the property on which the Point of Supply is established.

The route of Underground Consumer's Mains should, to the extent which is practicable, be selected with due regard to the following –

1. Following straight lines between identifiable points.
2. The requirements of Clause 5.2.3.6(e) in Underground Residential Distribution areas of supply.
3. Keeping clear of fencing repair/replacement works.
4. Avoidance of substation earthing systems.
5. Avoiding the crossing of other services.
6. Subsequent cable location, fault location and repair.
7. Restrictions, such as hazardous areas in petrol service stations, imposed by the Wiring Regulations.

(b) Record of Cable Route

The REC shall record the route of Underground Consumer's Mains in all installations and any underground submains supplying individual occupancies which form portion of a multiple installation on the customer's property on a durable card which shall be completed and fixed within the meter box (or other suitable position in the absence of a meter box) to provide a permanent guide for the use of the customer and other interested parties.

In all cases, sufficient points should be recorded by way of running distances and offsets from the boundary fences and/or the lines (or the projection thereof) of permanent structures so that the position of the cable at any point can be determined with an accuracy of ± 0.2 m.

Samples of completed cards are shown in Figure 5.10.

In the case of a multiple installation, a guide shall be installed at each occupier's installation and shall include the complete route from the Point of Supply to the particular installation.

NOTE: Where there is insufficient space on the cable location card to record all the relevant information, it is recommended that a durable drawing protected by a plastic wallet or by laminating, be placed within the main switchboard and/or group metering enclosure. Notice of the location of this drawing shall be affixed on or adjacent to each multiple occupancy switchboard.

(c) Major Assets of Other Authorities

A Private Electric Line may cross an asset of another Authority only where that asset is located within the boundaries of the private property. Any and all charges associated with establishing or maintaining such a crossing shall be met by the customer.

Any crossing of another Authority's asset/easement shall be constructed in accordance with the requirements of this Code and, **IN ADDITION,** with any reasonable special conditions of the other Authority. (Refer to Clause 5.2.3.5(e)).

Where a major asset (such as a channel or pipeline, etc.) is installed parallel with and abutting the property boundary facing the road reserve or property from which electricity supply is to be obtained, the Supply Authority may decide to provide an overhead service line across the asset to a private pole at a location within the property nominated by the Supply Authority.

In cases where the other Authority owns the land on which its asset is placed, the Supply Authority will provide supply to the (separate) property across the Authority's land at an appropriate location and in accordance with the Supply Authority's prevailing terms and conditions for an extension of the Supply Authority's distribution system.

(d) Entry to Building

Provision may be required to be made in the building at construction stage for the consumer's mains to pass through the building foundations and into the metering position, as shown in Figures 5.11 and 5.12.

If provision has not been made at the initial building stage, the consumer's mains shall be installed at not less than the minimum depth specified to a point directly below the outside of the exterior wall foundations. The conduit shall then be enclosed in galvanised steel tube or approved equivalent from the conduit bend or elbow as it ascends vertically upwards, negotiates the foundations and enters the wall cavity, as shown in Figures 5.13 and 5.14.

NOTE:-Care must be taken to arrange underground cable enclosures in such a manner as to prevent moisture entering the building via the enclosure; particularly where a pit or conduit end is installed at a higher level than the entry to the building.

(e) Underground Residential Distribution

Where supplied from Underground Residential Distribution, the length of consumer's mains above ground level between the Consumer's Terminals and the first electrical protective device (fuse or circuit breaker) shall be kept to the practicable minimum.

Where it is proposed that such consumer's mains enter the building at a point other than directly below the metering position, the proposed route of the cable within the building shall be to the satisfaction of the Responsible Officer. In such cases, approval for the route shall be obtained **PRIOR TO INSTALLATION** of the cable.

NOTE:-The cable and its enclosure should be installed below the floor of the building, and where practicable, be fixed to the bearers, joists or similar, and shall be visible at the time of inspection. (Refer to Clause 5.2.3.7(b)).

SINGLE INSTALLATION

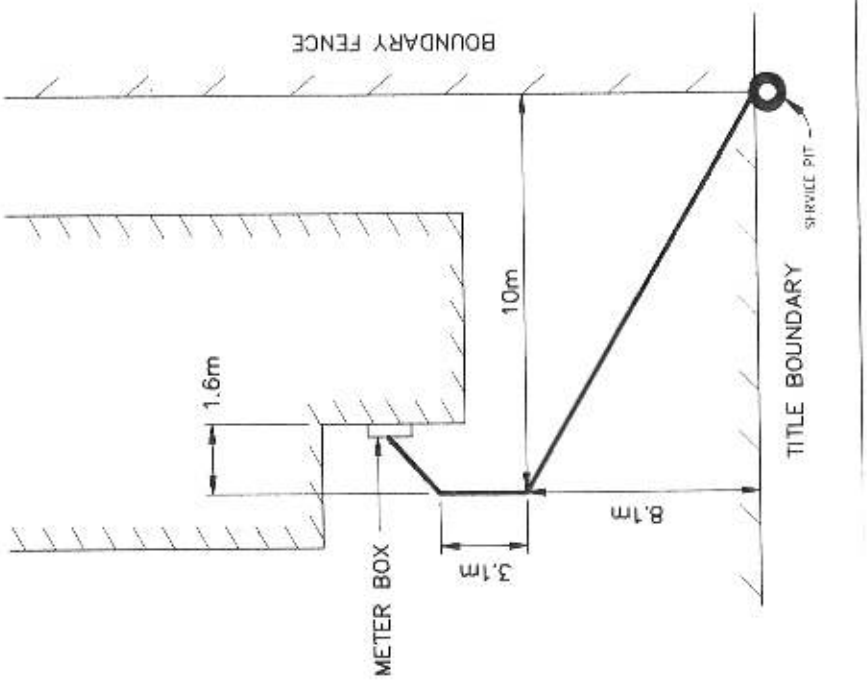
WARNING -

Do Not Remove From Meter Box

UNDERGROUND CABLE LOCATION

SERVICE OR UNDERGROUND CONSUMER'S MAINS CABLE IS SHOWN BELOW (OTHER ELECTRIC CABLES MAY EXIST BUT NOT BE RECORDED HERE).

CABLES PROTECTED BY		CABLE DETAIL	
GALVANISED STEEL TUBE	☐	TYPE	*DOUBLE INSULATED*
PLASTIC PIPE	☐	SIZE	*2X16* mm²
PROTECTIVE COVER SLABS	☐		



MULTIPLE INSTALLATION

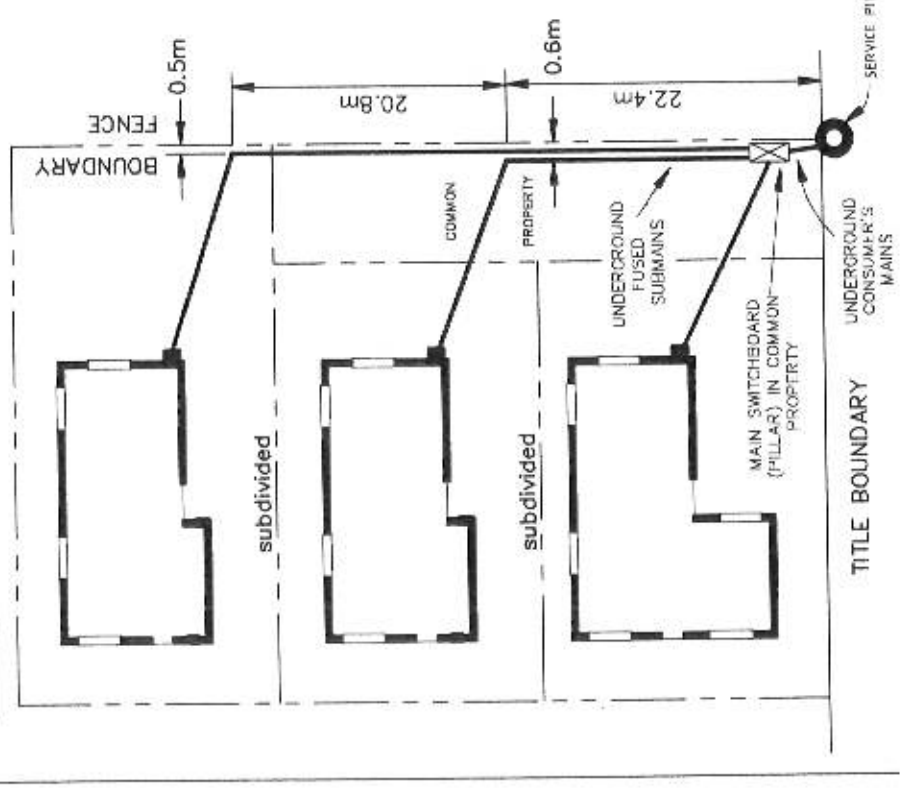
WARNING -

Do Not Remove

UNDERGROUND CABLE LOCATION

SERVICE OR UNDERGROUND CONSUMER'S MAINS AND SUBMAINS CABLES ARE SHOWN BELOW (OTHER ELECTRIC CABLES MAY EXIST BUT NOT BE RECORDED HERE).

CABLES PROTECTED BY	
GALVANISED STEEL TUBE	☐
PLASTIC PIPE	☐
PROTECTIVE COVER SLABS	☐



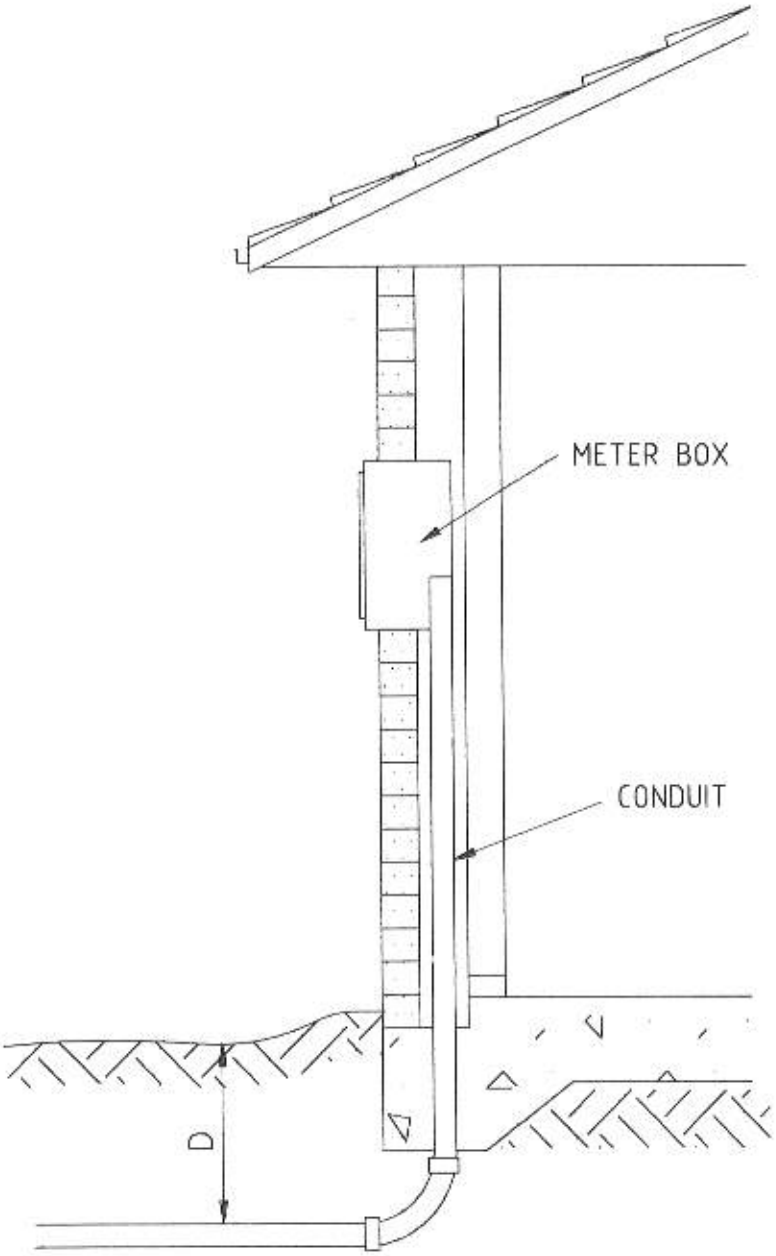
NOTE: Refer to Clause 5.2.3.6(b) regarding recording of underground cables for large multiple installations.

Incorporating Appendix B of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

CUSTOMER'S CABLE LOCATION RECORD CARDS

FIG. 5.10

VXBCOK\SIRU



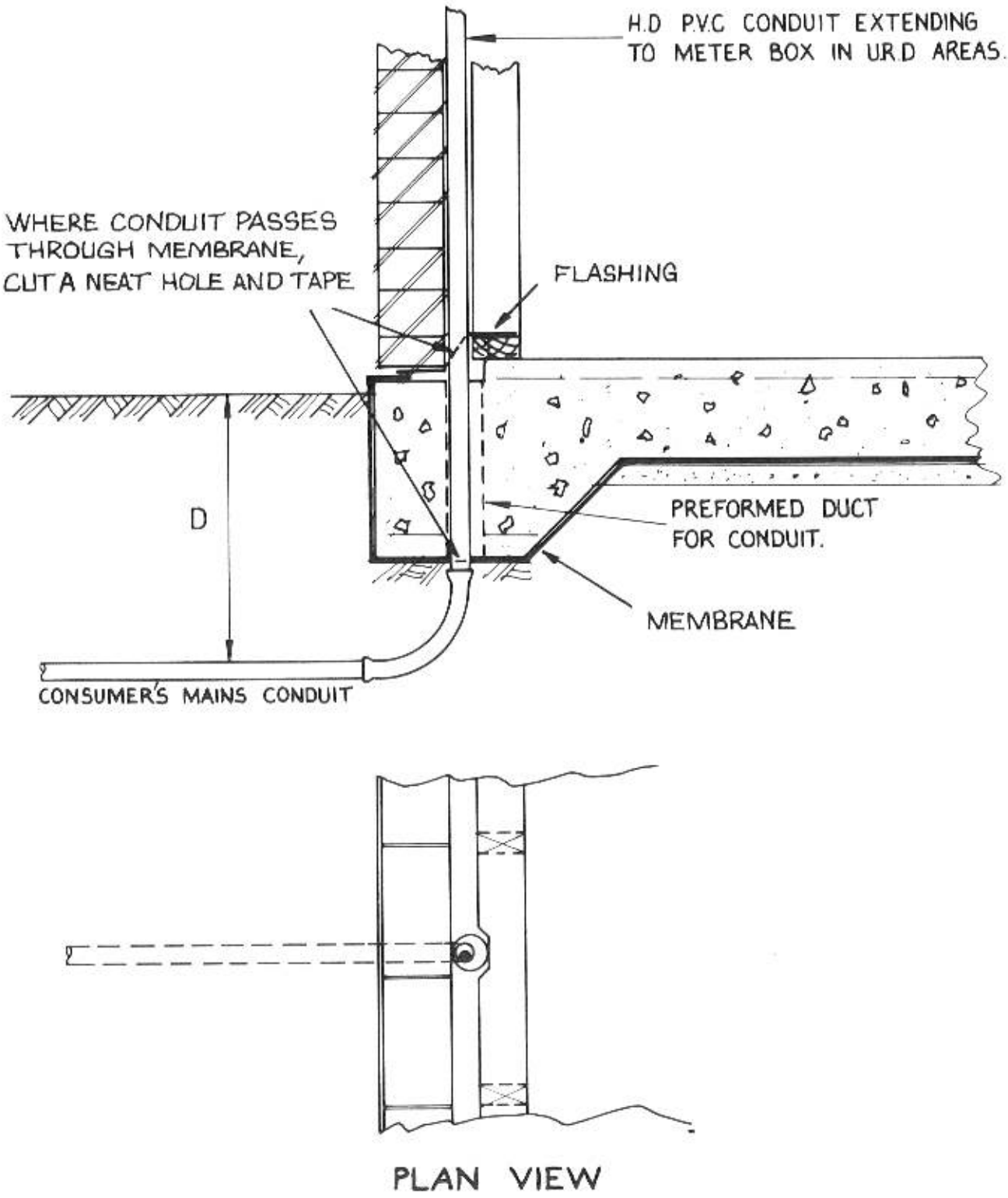
NOTES:

1. Dimension 'D' shall be not less than the minimum depth of cover specified for the particular wiring system employed. (Refer Clause 5.2.3.10(a))
2. In U.R.D. Supply Areas:
   Increased mechanical protection from ground to meter box required in all cases.
   (Refer Clause 5.2.3.11(b))
   Length of cable above ground level shall be the practicable minimum. If not rising vertically from ground to meter box, special conditions apply. (Refer Clause 5.2.3.6(e))
3. Where no provision has been made for entry through footing (Refer Clause 5.2.3.6(d))
4. **Care must be taken to arrange underground cable enclosures in such a manner as to prevent moisture entering the building via the enclosure; particularly where a pit is installed at a higher level than the entry to the building.**

Incorporating Appendix B of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

CABLE ENTRY TO BUILDING

FIG. 5.11



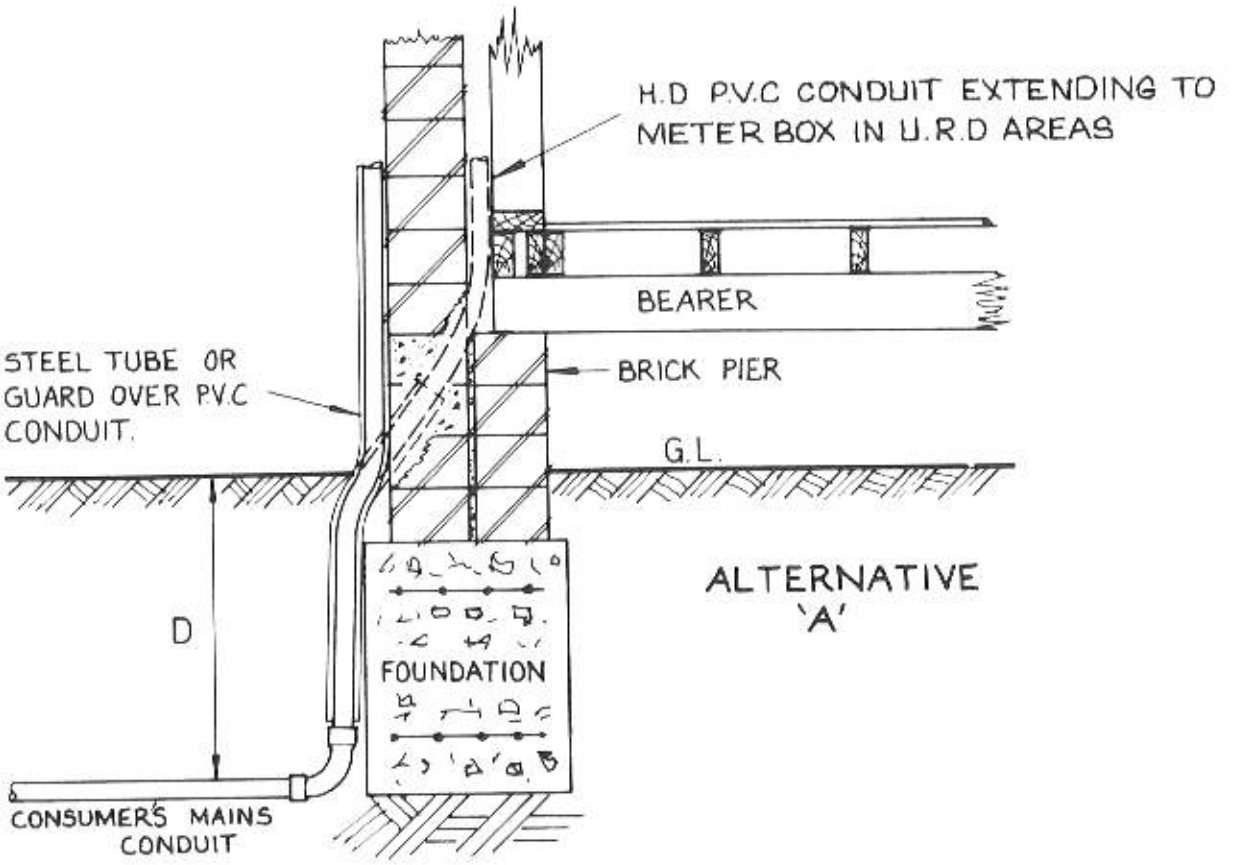
PLAN VIEW

Care must be taken to arrange underground cable enclosures in such a manner as to prevent moisture entering the building via the enclosure; particularly where a pit is installed at a higher level than the entry to the building.

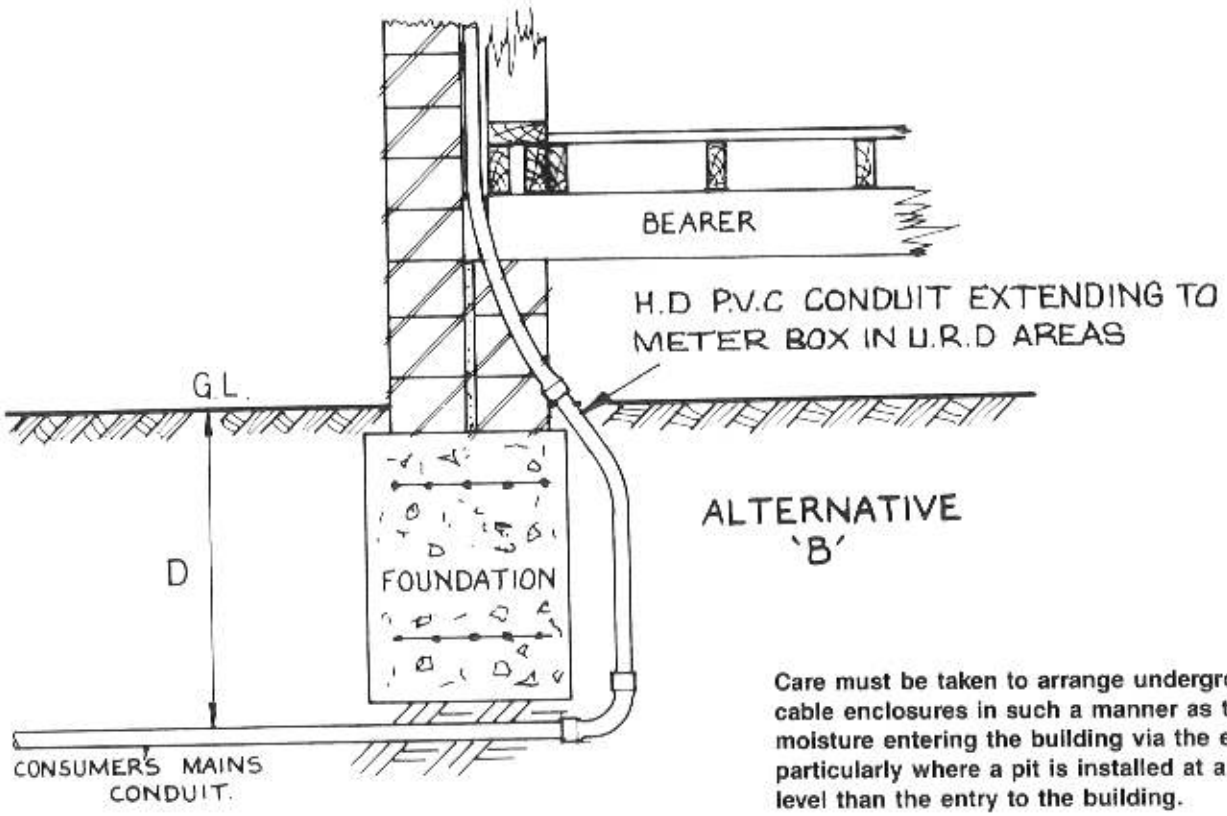
Incorporating Appendix B of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

CABLE ENTRY DETAILS

FIG. 5.12



NOTE: Dimension 'D' shall be not less than the minimum depth of cover specified for the particular wiring system. (Refer Clause 5.2.3.10(a))

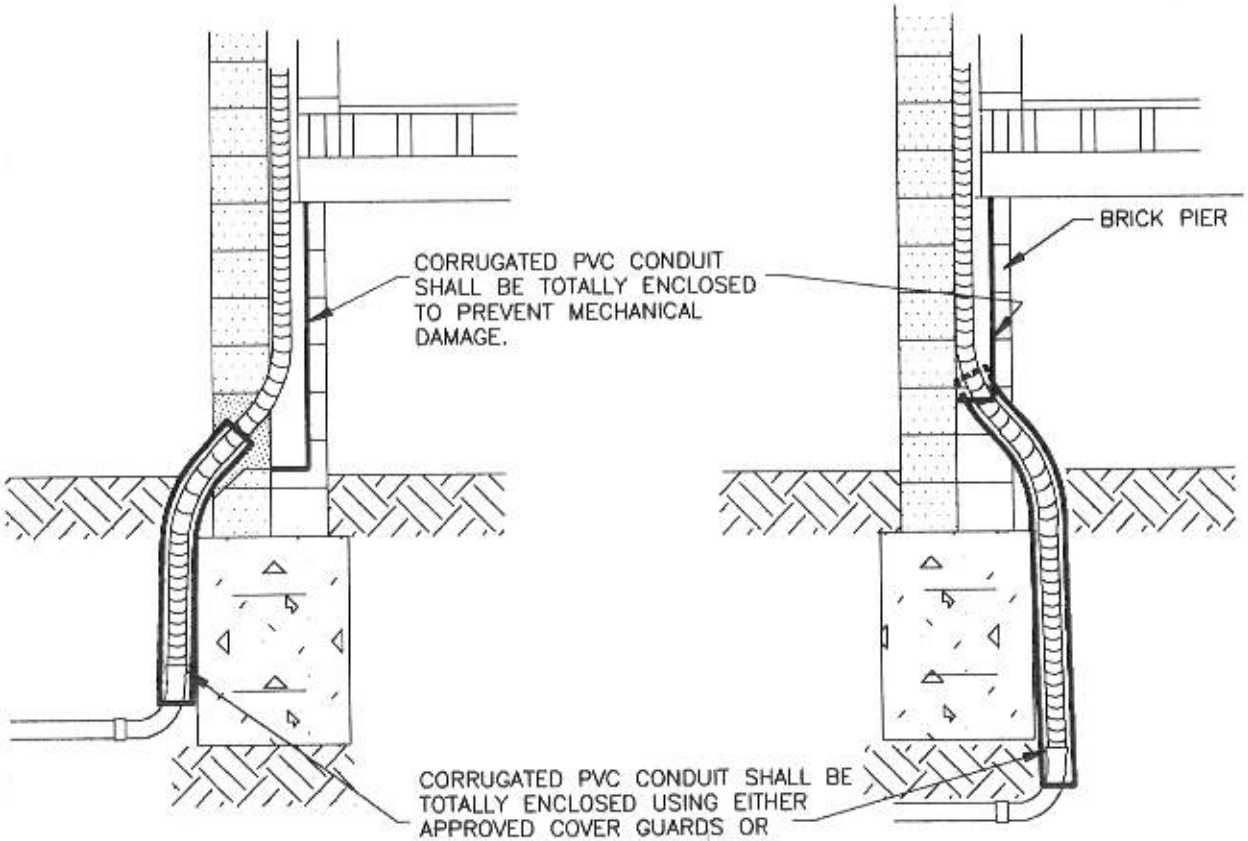


Care must be taken to arrange underground cable enclosures in such a manner as to prevent moisture entering the building via the enclosure; particularly where a pit is installed at a higher level than the entry to the building.

Incorporating Appendix B of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

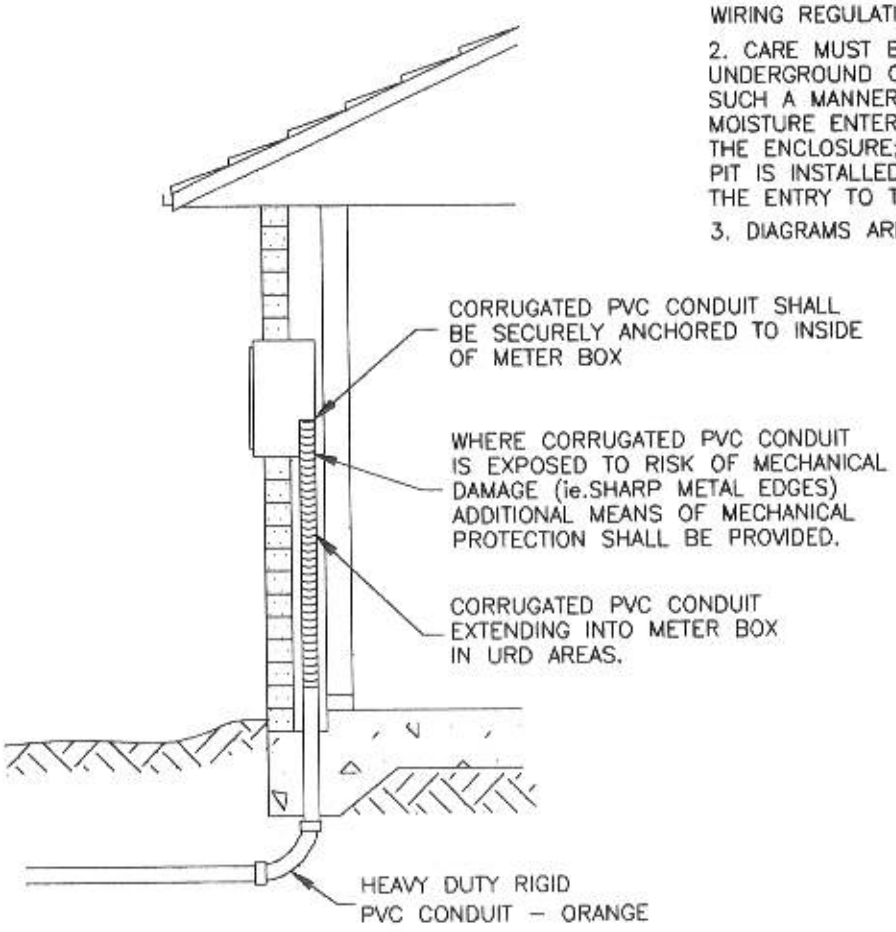
ALTERNATIVE CABLE ENTRIES TO BUILDING

FIG. 5.13



NOTES:

1. CORRUGATED PVC CONDUIT SHALL BE ORANGE IN COLOUR AND SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE WIRING REGULATIONS.
2. CARE MUST BE TAKEN TO ARRANGE UNDERGROUND CABLE ENCLOSURES IN SUCH A MANNER AS TO PREVENT MOISTURE ENTERING THE BUILDING VIA THE ENCLOSURE; PARTICULARLY WHERE A PIT IS INSTALLED AT A HIGHER LEVEL THAN THE ENTRY TO THE BUILDING.
3. DIAGRAMS ARE NOT TO SCALE.



ALTERNATIVE CABLE ENTRIES TO BUILDING USING CORRUGATED CONDUIT

FIG 5.14

5.2.3.7 Inspection

(a) General

The Supply Authority may require an inspection of cable trenches for underground consumer's mains, therefore any such cable trench shall not be backfilled until the Supply Authority is notified and authorisation to backfill has been received.

(b) Underground Residential Distribution

Where supplied from Underground Residential Distribution, any portion of underground consumer's mains (between the Consumer's Terminals and the first electrical protective device – fuse or circuit breaker) within a building installed other than directly below a metering or distribution position shall not be hidden from view by any structural lining unless permission has been obtained from the Responsible Officer. (Refer to Clause 5.2.3.6(e)).

At an appropriate stage of the construction, the REC shall advise the Responsible Officer to enable any required inspection to be made and approval obtained.

5.2.3.8 Cables

(a) Minimum Size

The minimum size for Underground Consumer's Mains shall be in accordance with the Wiring Regulations.

(b) Minimum Insulation Resistance Level

1. Between conductors; and
2. between conductors and earth or metallic sheath,

when tested using a 500 V insulation resistance tester, the insulation resistance shall be not less than the following value –

- For cables up to 50 m route length – 50 megohms.
- For cables in excess of 50 m route length, a reduction of 5 megohms for each additional 25 m route length is acceptable subject to an absolute minimum of 5 megohms being obtained.

(c) Wiring Systems ("Cables")

Underground Consumer's Mains shall be installed in such a manner that, in the event of future accidental damage being sustained, the likelihood of such damage producing a short circuit between conductors and, hence, reliable operation of electrical protection is enhanced.

Where supplied from Underground Residential Distribution, the wiring system shall be one of those specified in Table 5.1.

In other cases, the wiring system shall be one of those specified in either Table 5.1 or Table 5.2 unless otherwise approved by the Responsible Officer in special circumstances.

Where installed in a pipe or conduit all conductors shall, except as provided below, be contained in the one pipe or conduit.

Where a conduit greater than 50 mm nominal dia. would be required, more than one non–metallic conduit may be used provided that not less than two conductors of different polarity or phase are included in each conduit.

Where indicated in Table 5.2, single core, insulated and sheathed cable of 95 mm^2 cross–sectional area or greater, may be buried direct and protected by approved cover slabs provided the cables are neatly and securely lashed together to form a bundle during installation.

NOTE: See Clause 5.2.3.12(c) regarding limitations on the use of certain wiring systems where connected within a pit.

TABLE 5.1 : WIRING SYSTEMS : UNDERGROUND RESIDENTIAL DISTRIBUTION

TYPE OF CONSUMER'S MAINS CABLE	MINIMUM COVER ABOVE CABLE PROTECTION / ENCLOSURE		
	Heavy Duty Non–metallic Conduit to AS 2053	Medium or Heavy Galvanised Steel Tube to AS 1074	Buried Direct Using Approved Cover Slabs
Stranded copper conductor, elastomer, thermoplastic or x.l.p.e. insulated **single–core** cable **with** elastomer or thermoplastic **sheathing**, complying with AS 3116, 3147 or 3198 for underground cable	0.5 m	0.5 m	Not Permitted
Stranded copper conductor, elastomer, thermoplastic or x.l.p.e. insulated **multi–core** cable with elastomer or thermoplastic sheathing, complying with AS 3116, 3147 or 3198 for underground cable	0.5 m	0.5 m	0.5 m
Stranded copper conductor, **neutral screened** cable complying with AS 3155 for underground cable	0.5 m	0.5 m	0.5 m

NOTES:

1. Where difficulty is encountered in achieving the minimum cover specified, refer Clause 5.2.3.10(a).
2. Maximum size Underground Consumer's Mains which can be directly connected to Supply Authority service cable in pit is 50 mm^2 copper.

Incorporating Appendix A, Table A1 of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

TABLE 5.2 : WIRING SYSTEMS : OTHER THAN UNDERGROUND RESIDENTIAL DISTRIBUTION

TYPE OF CONSUMER'S MAINS CABLE	MINIMUM COVER ABOVE CABLE PROTECTION / ENCLOSURE		
	Heavy Duty Non–metallic Conduit to AS 2053	Medium or Heavy Galvanised Steel Tube to AS 1074	Buried Direct Using Approved Cover Slabs
Unsheathed, thermoplastic insulated cable (single insulated) complying with AS 3147 N.B. Use Restricted. Refer Clause 5.2.3.12(c)	0.5 m p.v.c. conduit only	Not Permitted	Not Permitted
Elastomer, thermoplastic or x.l.p.e. insulated **single–core** cable with elastomer or thermoplastic sheathing, complying with AS 3116, 3147 or 3198 for underground cable	0.5 m	0.5 m	0.5 m Restricted. Refer Clause 5.2.3.8(c)
Elastomer, thermoplastic or x.l.p.e. insulated **multi–core** cable with elastomer or thermoplastic sheathing, complying with AS 3116, 3147 or 3198 for underground cable	0.5 m	0.5 m	0.5 m
Neutral screened cable complying with AS 3155 for underground cable	0.5 m	0.5 m	0.5 m
Multi–core armoured, paper insulated lead sheathed cable with hessian serving or p.v.c. outer sheath, complying with AS 1026	0.5 m	0.5 m	0.5 m
Multi–core armoured, elastomer thermoplastic or x.l.p.e. insulated cable with bedding and sheathing or serving complying with AS 3116, 3147 or 3198	0.5 m	0.5 m	0.5 m
Mineral insulated metal sheathed cables complying with AS 3187 and AS 3000 for underground use	0.5 m As required by Clause 5.2.3.10(a)	0.5 m As required by Clause 5.2.3.10(a)	0.5 m As required by Clause 5.2.3.10(a)

NOTES:

1. Stranded copper required for pit connections. Refer Clause 5.2.3.12(c).
2. Where difficulty is encountered in achieving the minimum cover specified, refer Clause 5.2.3.10(a).
3. Maximum size Underground Consumer's Mains which can be directly connected to Supply Authority service cable in pit is 50 mm^2 copper.

Incorporating Appendix A, Table A2 of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

5.2.3.9 Mechanical Protection of Cable

Acceptable protection for Underground Consumer's Mains is detailed in the following sub–clauses and Tables 5.1 and 5.2.

Wherever heavy–duty rigid p.v.c. conduit is used to enclose unsheathed (single insulated) cables, **P.V.C. SOLVENT CEMENT SHALL BE USED TO ENSURE THAT JOINTS IN THE CONDUIT ARE WATERTIGHT.**

(a) Cover Slabs

Concrete cover slabs shall have a minimum thickness of 40 mm and a classification of not less than Grade 15 to AS 3600 – SAA Concrete Structures.

Concrete cover slabs shall be placed over the cable firmly butted together in a continuous line throughout its length. The slabs shall overlap the cable by a minimum of 40 mm on each side of the cable and shall be placed not more than 75 mm above the cable.

Cover slabs of other than concrete may be used subject to specific approval by the Supply Authority for the purpose.

All cover slabs unless light orange in colour shall be further identified by the addition of orange marker tape installed in accordance with the Wiring Regulations.

(b) Cable Guards

Cable guards shall be of a type specifically approved by the Supply Authority for the purpose.

Sheet steel guards shall have a minimum thickness of 1.6 mm and be protected against the effects of corrosion by galvanising to AS 1397 for above ground use and to AS 1650 for below ground use; or other equivalent treatment.

5.2.3.10 Laying Below Ground

The bottom of the trench shall be free from all sharp projections and provide uniform support for the cable or its enclosure and the installation of the consumer's mains shall be carried out in accordance with the requirements of the Wiring Regulations.

NOTE:-Care should be taken to arrange underground enclosures to avoid moisture entering the building via the enclosure; particularly where a pit is installed at a higher level than the entry to the building.

(a) Minimum Depth

The MINIMUM depth of cover above the top of the mechanical protection for the cable (measured to the final finished ground level) shall be as shown in Table 5.1 or 5.2 for the particular case.

In areas subject to cultivation or camping, this minimum should be added to the depth of cultivation or tent pegs, etc, expected in the location of the cable. Attention is also directed to AS 3001 – Electrical Installations – Movable Premises (including caravans) and their Site Installations, regarding underground wiring where tent pegs are likely to be driven.

In locations where it is impracticable to maintain the minimum depth specified (for example, by obstruction from other underground installations or continuous rock), the Responsible Officer may approve a lesser depth of burial subject to the following –

1. The cable enclosure shall be laid in a channel chased into the surface of the rock and covered with a layer of fine aggregate concrete not less than 50 mm thick; or
2. The cable shall be enclosed in medium or heavy galvanised steel tube to AS 1074 and covered with approved cover slabs or provided with an equivalent degree of mechanical protection. Such a system shall be laid at a depth of not less than 0.3 m; or
3. Served mineral insulated metal sheathed ("MIMS") cables suitable for use underground may be laid in a channel chased in rock and covered with fine aggregate concrete or enclosed in heavy–duty rigid conduit and laid directly below a paved area.

(b) Use of Common Trench

If required, a common trench may be used within private property to accommodate the electric cable and the service assets of other authorities (such as Telecom Australia lead in and water service). In such cases, the cable shall be enclosed as specified in Clause 5.2.3.9 and laid at the appropriate depth.

The requirements of other authorities for use of a common trench including clearances and minimum depth shall also be met.

NOTE: In general, the electrical system should be laid below other services and the trench partially backfilled prior to installing the other services. It is recognised, however, that this is not always possible.

(c) Supply Authority Pole on Property (Including Pole Type Substations)

Where the Underground Consumer's Mains are to be attached to a Supply Authority pole (whether timber, concrete or steel) and a rigid cable enclosure is used in the ground, the rigid cable enclosure shall be stopped between 0.5 and 1.0 m away from the pole and sufficient slack cable shall be left at the base of the pole to allow for pole replacement. (For "large" cables, the slack should be provided by forming a "drip loop" of cable at the base of the pole).

Conductors consisting of –

1. multi–core cables of 20 mm or less outside diameter;
2. single–core insulated and sheathed cables of 95 mm^2 or less conductor cross–sectional area; or
3. single–core unsheathed (single insulated) conductors,

shall be enclosed in black or grey flexible non–metallic conduit from the end of the rigid cable enclosure to and up the pole to the point of termination. In the case of unsheathed (single insulated) cables, a watertight connection is required between conduit and flexible conduit.

Single–core insulated and sheathed cables greater than 95 mm^2 in cross–sectional area may remain unenclosed from the end of the rigid cable enclosure provided they are lashed together in the ground during installation.

In all cases, the cable or flexible conduit between the end of the rigid cable enclosure and the Supply Authority's pole shall be protected by approved cover slabs and installed in accordance with the Wiring Regulations.

5.2.3.11 Installation Above Ground

(a) Outdoor Locations

Where installed on the surface of a wall, pole or other structure, the cable shall be enclosed in medium or heavy galvanised steel tube to AS 1074 or **APPROVED** galvanised steel cable guards from not less than 0.3 m below the ground to 2.4 m above.

The enclosure shall be of such size as to readily accommodate the complete wiring system which it protects and shall be securely attached. Steel fittings and screws shall be galvanised or stainless.

NOTE: Electro–tinned or cadmium plated steel fittings and screws are not acceptable for exposure to the weather or below ground level.

Where flexible conduit is required, the flexible conduit shall be continued to the highest point of attachment of the cable and shall be so arranged as to prevent the ingress of moisture.

Cables shall be placed in such a position that they are least liable to mechanical damage and shall not obscure a Supply Authority pole identification mark or number.

(b) Indoor Locations – Underground Residential Distribution

Underground Consumer's Mains installed between the SEC's Underground Residential Distribution system and the first electrical protective device (fuse or circuit breaker) within the installation shall be provided with substantial mechanical protection where placed on or in a building. For example, in a brick veneer or timber wall cavity, insulated and sheathed, unarmoured, cables shall be enclosed in heavy duty non–metallic conduit to AS 2053. (Double brick wall cavity would be exempt).

See Clause 5.2.3.7(b) regarding the need under certain conditions, for cable installations within buildings to be visible at the time of inspection.

5.2.3.12 Cable Terminations, Joints and Sundry Materials

(a) General

All materials and methods used shall be to the satisfaction of the Responsible Officer.

Polyphase supplies shall be colour coded or otherwise marked to clearly and permanently identify each incoming active conductor and the neutral conductor.

(b) Termination at Building (or "Load") End

At the building (meter box) end of the cable, the cable cores or conductors shall be of adequate length to reach the appropriate Supply Authority apparatus and shall be separated and insulated as necessary to be ready for connection to that apparatus.

NOTE: Where supplied from Underground Residential Distribution, and where a metallic enclosure is employed, particular attention to additional insulation and the earthing requirements of the Wiring Regulations is necessary to the length of consumer's mains between the Consumer's Terminals and the first electrical protective device (fuse or circuit breaker). Refer to Figure 5.15 – Insulation Requirements for Cable Cores of Consumer's Mains used in URD at Building (or "Load") End.

(c) Pit at Property Boundary

Where the Determined Maximum Demand does not exceed 100 A per phase and the nominated Point of Supply is a pit at the property boundary, the REC shall install the consumer's mains cable complete with enclosure, into the pit. The cable end(s) shall be sealed to prevent the ingress of moisture and shall extend to a minimum of 1.0 m above the lid of the pit. The cable shall be left neatly coiled within the pit with a suitable water resistant tag attached specifying the lot or street number and street name of the premises it supplies. The lid of the pit shall be replaced.

Unsheathed (single insulated) cable and cables greater in size than 50 mm^2 shall not enter the pit. Consumer's Mains within the pit shall be single–core insulated and sheathed stranded copper conductor or individual cores of multi–core cable, including neutral screened cable, suitably sheathed with insulating material as shown in Figures 5.16, 5.17 and 5.18.

In the event that no pit abuts the property boundary, the Responsible Officer **SHALL** be consulted. REC's are not permitted to open aboveground SEC pillars, cabinets, etc, unless specifically authorised to do so in a particular case.

(d) Private Pole on Property

In general, private poles on the customer's property are not normally permitted.

Where the Supply Authority provides an overhead service to a private pole on the customer's property, the pole height and method of termination shall be to the satisfaction of the Responsible Officer. Pole height shall provide necessary clearances for the Supply Authority service line.

The REC shall terminate Underground Consumer's Mains on the private pole, generally as follows –

Where the maximum demand does not exceed 100 A per phase, the Underground Consumer's Mains shall terminate in a fused overhead line connector box (FOLCB) mounted on the pole between 3.0 m and 6.0 m above ground level or, in cases where a circuit breaker is installed in lieu of an FOLCB the circuit breaker shall be mounted between 3.0 m and 4.0 m above ground level.

Where the Maximum demand exceeds 100 A per phase, the Underground Consumer's Mains shall terminate at the point of attachment of the overhead service line as detailed by the Responsible Officer.

NOTE: Refer to Clause 5.1.4.6(a) – Compulsory Underground Supply.

(e) Supply Authority Pole on Property (Including Pole Type Substations)

A minimum safe working clearance from any live apparatus of 2.0 m shall be maintained by all persons and apparatus in personal contact therewith. If this clearance cannot be maintained, the **SUPPLY AUTHORITY SHALL** be consulted before proceeding. See also Clause 5.2.3.1 which requires that certain substations be de–energised for safety and indicates certain poles which are unsafe to climb.

Drilling of concrete poles is **NOT PERMITTED** under any circumstances as ingress of moisture can lead to failure of the pole; hence, fixing of apparatus shall be effected by banding with suitable stainless steel bands. In the case of a concrete pole carrying high voltage conductors, it may be necessary to provide additional insulation between the consumer's mains and the body of the pole or brackets attached thereto.

Where the maximum demand does not exceed 100 A per phase, Underground Consumer's Mains shall be terminated by the REC in a fused or circuit breaker type overhead line connector box (OLCB) fixed at a point on the Supply Authority pole 4.0 m above ground level.

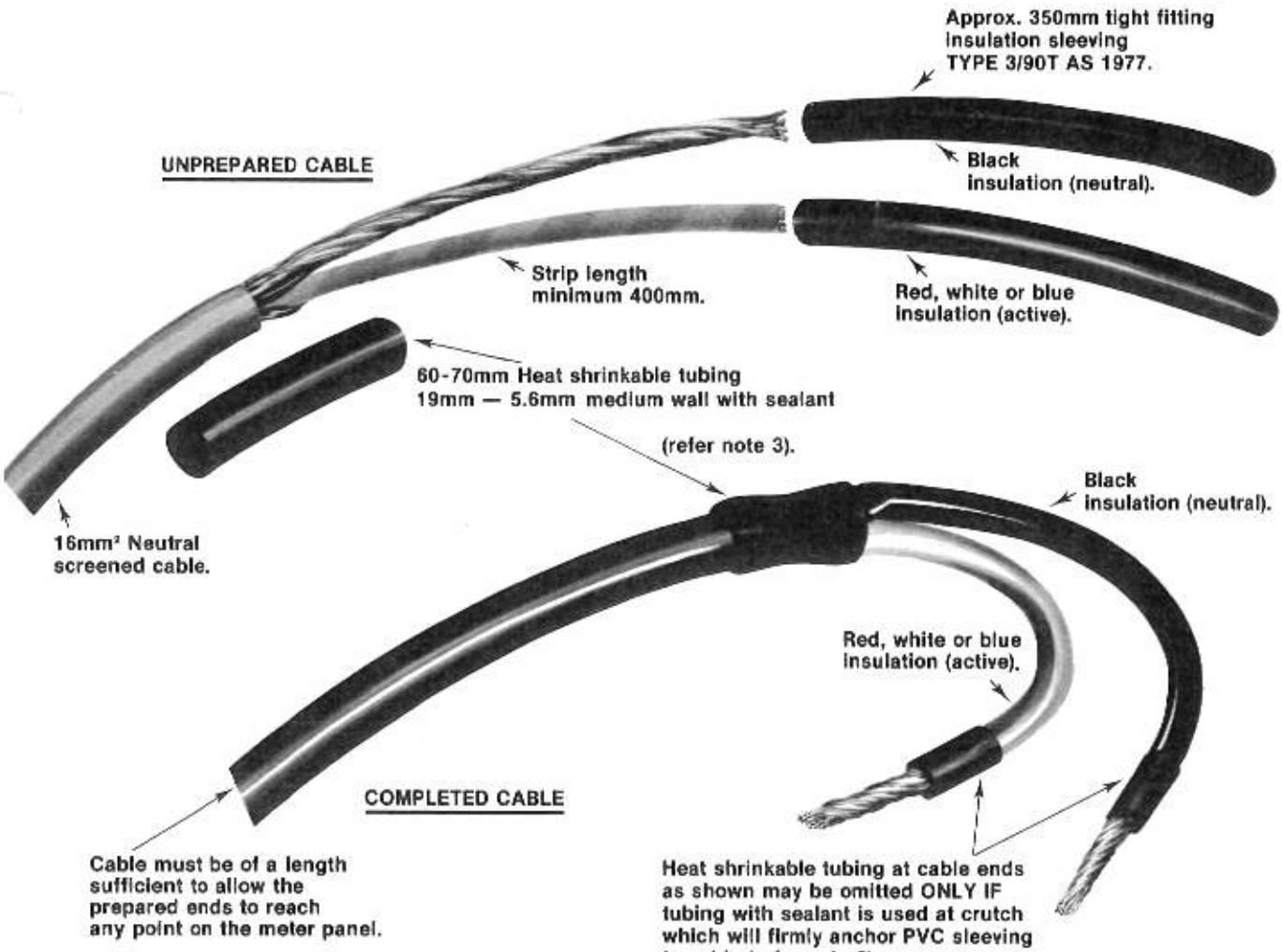
The Supply Authority will provide and install the necessary cable, conduit, etc. for the connection from the Supply Authority's supply system to the Point of Supply (i.e. the OLCB fixed by the REC on the Supply Authority's pole).

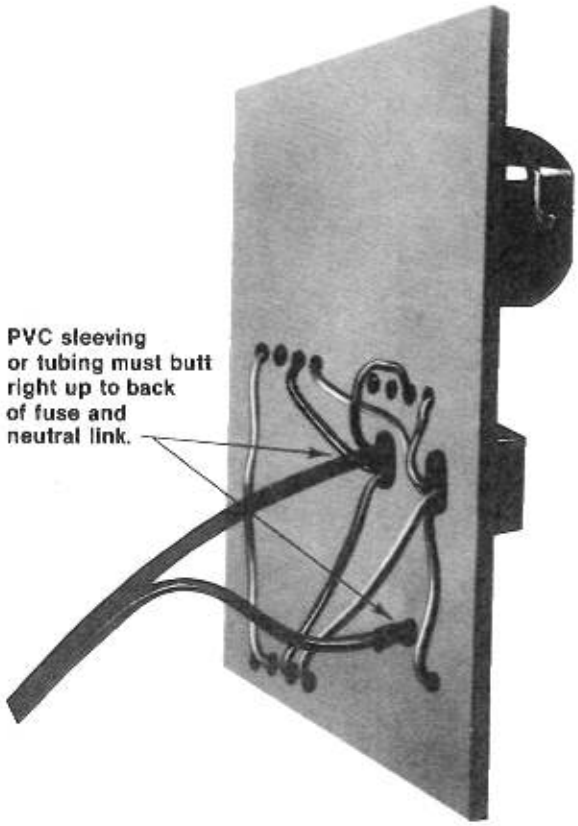
Where the maximum demand exceeds 100 A per phase, the consumer's mains cable shall be of such length that it will provide adequate length of conductor for connection to the service fuses or other appropriate apparatus of the Supply Authority's system.

The REC shall leave the cable, complete with its enclosure (if any), neatly attached to the pole not higher than 4.0 m above ground level. The cable ends shall be sealed to prevent ingress of moisture.

(f) Other Arrangements

The termination of Underground Consumer's Mains within other types of Supply Authority substations, or in circumstances other than specified above, shall be as detailed by and to the satisfaction of the Responsible Officer.





NOTES:

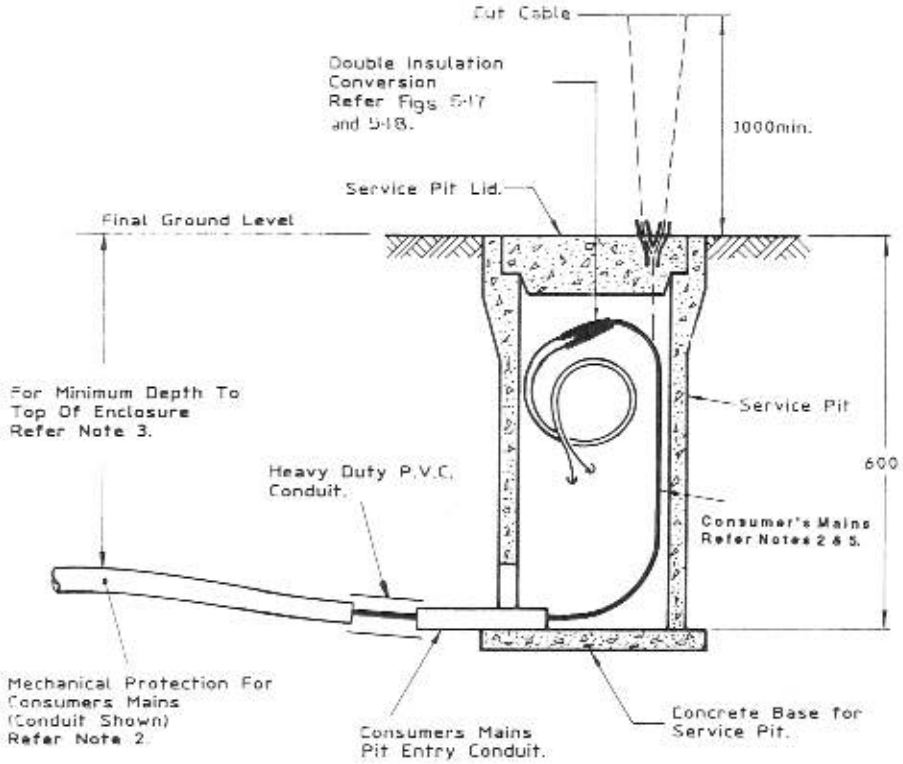
1 Illustrations show typical arrangement for a 2 core 16mm² neutral screened cable. For other cables the same principles apply using the appropriate size heat shrinkable tubing.

2 Care must be taken when heating tubing over PVC sleeving as the heat required to shrink the heat shrinkable tubing is 120°C.

3 If heat shrinkable tubing without sealant is used at the crutch joint then it will be necessary to use an additional piece of heat shrinkable tubing at the other end of the PVC insulating sleeving to firmly anchor it in position.

INSULATION REQUIREMENTS FOR CABLE CORES OF CONSUMERS MAINS USED IN URD AREAS AT BUILDING (OR "LOAD") END

FIG.5.15

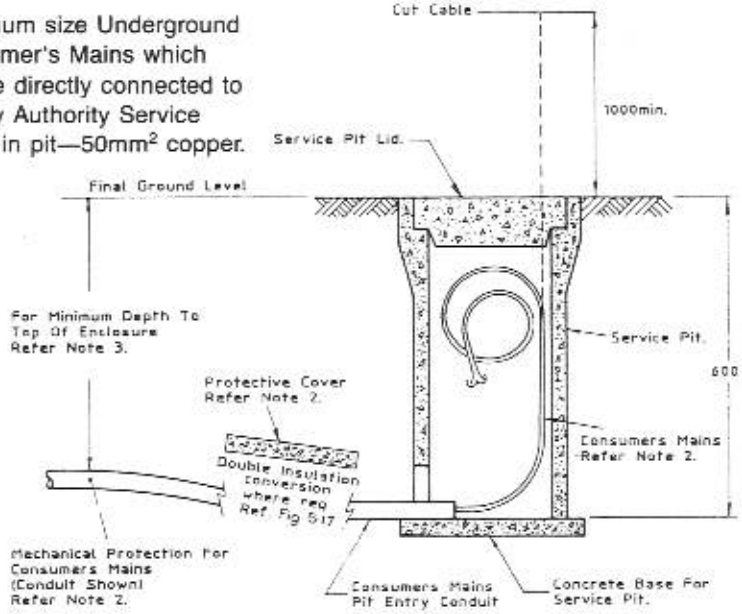


Detail A Multi-Core - (Up To 16mm^2) Consumers Mains Only

NOTES:

1. **WARNING — Cables in pit are live and Electrical Mechanics shall adopt safe working practices while carrying out any work in the pit.**
2. In these drawings particular approved items are shown, however the use of other materials may be permissible in accordance with Note 3 below.
3. Consumer's Mains (type of cable and installation requirements) shall be in accordance with Clause 5.2 of these Rules.
4. The Supply Authority service cable has been omitted from these drawings for clarity.
5. To provide the double insulated tails for multi-core (insulated and sheathed) Consumer's Mains up to 16mm^2 it is permissible to prepare the cable for connection in the pit at a point one metre from the end of the Consumer's Mains. (Refer Detail 'A')
6. To provide the double insulated Consumer's tails for either single insulated or multi-core cable (greater than 16mm^2) the reconstruction of the Consumer's Mains shall be done outside and adjacent to the pit. (Refer Detail 'B')

Maximum size Underground Consumer's Mains which can be directly connected to Supply Authority Service Cable in pit—50mm^2 copper.



Detail B Single Insulated Single-Core Or Multi-Core Consumers Mains

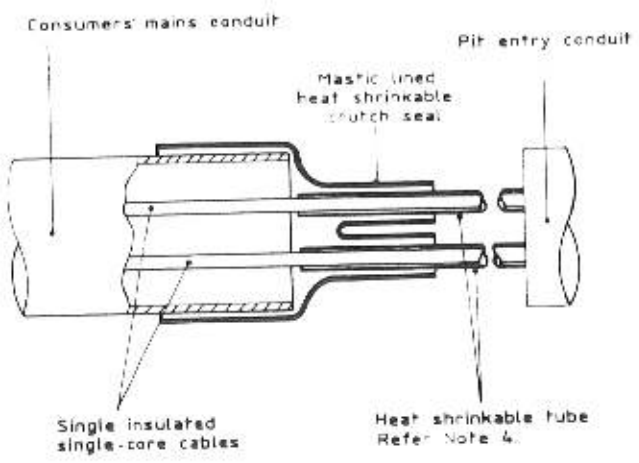
7. Heat shrink tubes applied to provide double insulated tails shall comprise one continuous length from conversion point to core ends.
8. **The maximum size of the double insulated tails which can be accommodated in the pit is 50mm^2.** Where Consumer's Mains need to be greater than this size (e.g. volt drop considerations), the cable must be reconstructed outside and adjacent to the pit to provide 50mm^2 or less double insulated tails in pit. Where customer's Determined Maximum Demand (DMD) is greater than 100amps., consumer's mains cable shall be terminated in a pillar supplied by the customer or on customer's switchboard as determined by the Supply Authority's Responsible Officer.
9. Electrical Mechanics shall—
   - A Lift service pit lid;
   - B Push Consumer's Mains through pit entry conduit into pit (Electrical Mechanic shall not pull Cosumer's Mains or draw wire through the service pit);
   - C Cut Consumer's Mains a minimum of 1000mm above final ground level, convert if necessary and seal end to exclude moisture (Ref.5);
   - D Coil Consumer's Mains in pit, and
   - E replace service pit lid.
10. Details for preparation of neutral screened and multi-core cables in service pit refer Figure 5.18.

Incorporating Appendix B of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

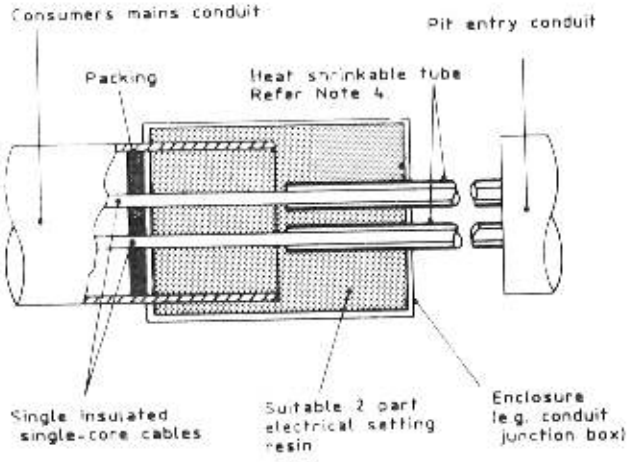
SERVICE PIT — GENERAL ARRANGEMENT

FIG.5.16

SINGLE INSULATED SINGLE-CORE CABLE
(Not to be used in URD areas)

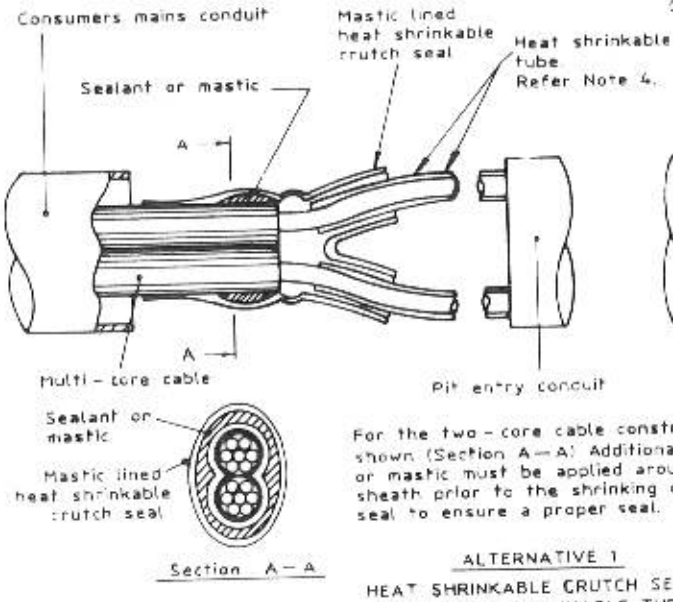


ALTERNATIVE 1
HEAT SHRINKABLE CRUTCH SEAL WITH HEAT SHRINKABLE TUBE



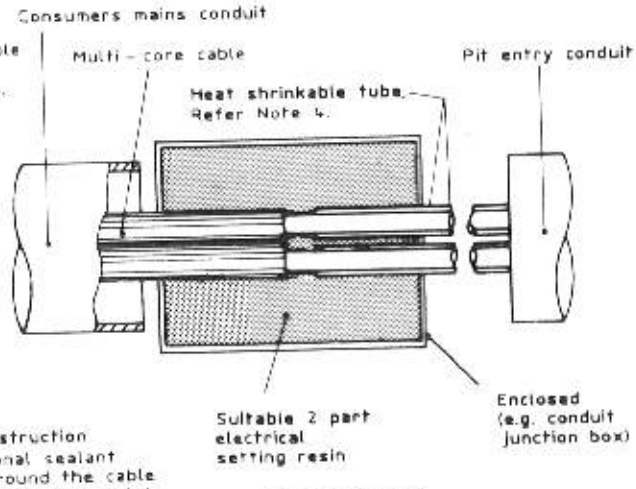
ALTERNATIVE 2
RESIN FILLED ENCLOSURE WITH HEAT SHRINKABLE TUBE

MULTI-CORE CABLE



For the two-core cable construction shown (Section A—A) Additional sealant or mastic must be applied around the cable sheath prior to the shrinking of the crutch seal to ensure a proper seal.

ALTERNATIVE 1
HEAT SHRINKABLE CRUTCH SEAL WITH HEAT SHRINKABLE TUBE



ALTERNATIVE 2
RESIN FILLED ENCLOSURE WITH HEAT SHRINKABLE TUBE

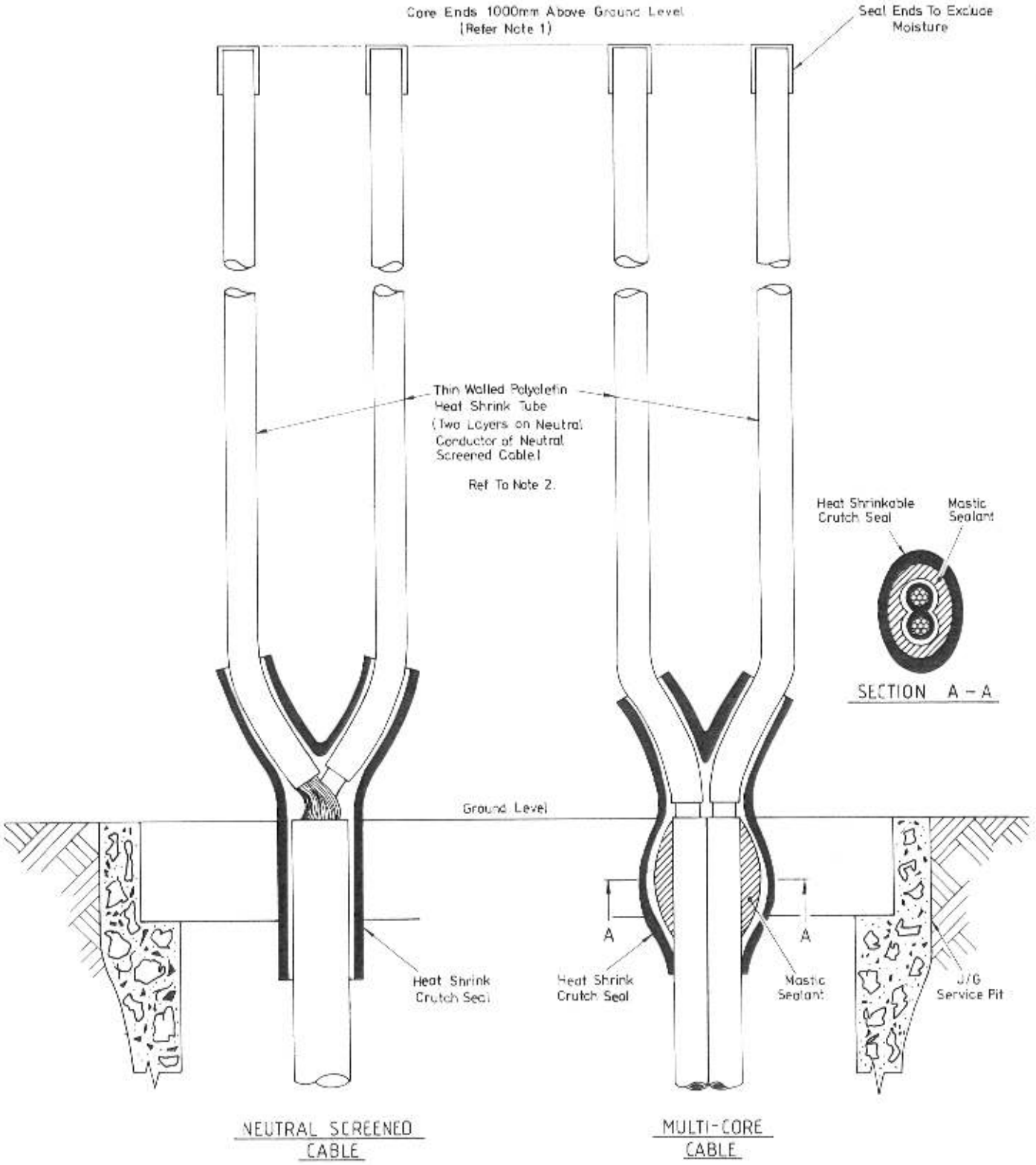
NOTES:

1. Alternatives 1 & 2 are two methods approved by the Supply Authority. Other methods may be accepted, however, prior approval from the Supply Authority shall be required.
2. The methods represented above show the reconstruction of the consumer's mains outside the pit. For up to 16mm^2 multi-core cable, this can be applied inside the pit (reference Figure 5.16) however, only the heatshrink method would be acceptable at this point.
3. The discontinuity in the conduits shown above will require further mechanical protection, e.g. concrete cover slabs.
4. Heat shrinkable tube to extend for full length of cable in the pit. Refer clause 5.2.3.12(a) for colour coding of multi-phase supplies.
5. Heat shrink tubings shall be flame retardant polyolefin with minimum recoverable wall thickness to Supply Authority requirements.

Incorporating Appendix B of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

"DOUBLE" INSULATION OF CONSUMER'S MAINS AT PIT

FIG. 5.17



NOTES:

1. All Consumer's Mains cores shall have a minimum length of 1000mm above ground level.
   For Builder's Supply Consumer's Mains, the core ends may extend to a maximum of 2000mm above ground level.
2. Heat shrink tubings shall be flame retardant polyolefin with minimum recoverable wall thickness to Supply Authority requirements.
3. Refer to Figure 5.16 for Consumer's Mains greater in size than 16mm^2.

Incorporating Appendix B of the SEC's "Code of Practice for L.V. Underground Electricity Services to Properties" with modifications.

PREPARATION OF UNDERGROUND CONSUMER'S MAINS UP TO 16mm^2 IN SERVICE PIT

FIG. 5.18

5.3 Special Service Cables

Where a service cable is to be installed in or on portion of a building above a public thoroughfare (e.g. a shop verandah), the Responsible Officer shall be consulted regarding the location of the Consumer's Terminals and service protection arrangements.

5.4 Service Protection Devices

5.4.1 Provision

5.4.1.1 Aerial Service Cable

In general, the customer shall provide, install and maintain an approved service protection device (with the exception of the fuse link) at or near the Consumer's Terminals.

Where aerial consumer's mains are permitted and installed in Category 2 (rural and fire hazardous) areas as detailed in Appendix A, the service protection device shall be a circuit breaker of a type approved by the Supply Authority for the purpose.

In other installations where –

(a) the calculated maximum demand does not exceed 100 Amperes per active conductor, the service protection device shall be a fused overhead line connector box of a type approved by the Supply Authority and capable of accepting a fuse suitable to the Supply Authority.

(b) the calculated maximum demand exceeds 100 Amperes per active conductor, the service protection device shall be to the satisfaction of the Responsible Officer. The Supply Authority may, where appropriate, provide, install and maintain the service protection device at the customer's expense.

5.4.1.2 Underground Service Cables

In general, the provision and location of the service protection device shall be determined by the Responsible Officer. However, in SEC areas of supply, for installations where the calculated maximum demand does not exceed 100 Amperes per active conductor, the customer need not provide a service protection device at the commencement of the consumers mains.

5.4.1.3 Substation or Supply Authority Pole on Property

(a) Supply Authority Pole Including Pole Type Substations

In general, where supply is provided from a Supply Authority pole, including a pole type substation, located on the customer's property, a service protection device shall be provided and installed in accordance with Clause 5.4.1.1. However, in installations located in Category 2 (rural and fire hazardous) areas and supplied by underground consumer's mains the service protection device may be either a circuit breaker or fused overhead line connector box of a type approved by the Supply Authority for the purpose.

(b) Other Substations

Where supply is provided from other types of substations the provision and location of the service protection device shall be to the satisfaction of the Responsible Officer.

5.4.2 Access to Service Protection Devices

In general, service protection devices shall be installed in a position free of obstruction and where ready access is available to allow operation from ground or floor level with a fuse operating stick. However, where hand–operated devices are installed, direct access thereto by means of a ladder is acceptable. In no case shall hand operated devices be installed at a height exceeding 6 metres.

If subsequent building alterations impede access to the service protection devices the customer shall pay the cost of alterations necessary to restore unobstructed access or arrange for the relocation of the service equipment at the customer's cost.

In the case of a public building or any premises where a number of occupiers are supplied through the same service, the "primary" service protective device must be located in a suitable position in a common–use area near a public entrance which is accessible to Supply Authority personnel at all hours without having to obtain a key to the premises. The service protection device shall not be installed within any individual occupier's premises.

6 METERING

6.1 General

The customer shall provide adequate mounting and installation facilities for the Supply Authority metering equipment in the positions approved or selected by the Responsible Officer. Equipment supplied and installed by the Supply Authority shall remain the property of the Supply Authority.

From the date of publication of these Rules, the Supply Authority will provide a meter panel only. Provision for mounting the meter panel shall be provided by the customer.

NOTE: The Supply Authority may supply a meter board for mounting of metering equipment under exceptional circumstances.

6.2 Location of Supply Authority Metering Equipment

6.2.1 General

In addition to complying with the requirements for accessibility and protection of the Supply Authority's equipment as set out in these Rules, the metering equipment shall be located at a position determined or approved by the Responsible Officer.

Meters shall be located in a position readily accessible for fixing, reading, testing, adjustment and removing them without difficulty or hazard. In general, the position shall be such that Supply Authority personnel can gain access to it without having to obtain a key. However, objection will not be raised to the enclosure of metering equipment within business premises which will normally be open during ordinary business hours.

Where metering equipment is installed in a room or area set aside for the purpose, such room or area and access thereto shall be kept clean, free of rubbish, and not used for any other purpose such as storage of furniture, cleaning materials and equipment.

For installations on properties exceeding 0.4 Ha where metering equipment is to be installed on the premises the Responsible Officer should be consulted regarding a suitable meter location.

6.2.1.1 Unsuitable Metering Locations

The following locations are **NOT ACCEPTABLE** for mounting metering and control equipment –

(a) In a carport associated with a single occupancy unless access to the main entrance of that occupancy is gained through the carport.

(b) On a single occupancy building, over an external elevated area which is greater than 2.0 m above finished ground level at the point from which access is obtained. (Refer Figure 6.1).

(c) Above a gas meter, except as shown in Figure 6.2.

(d) Over stairways, ramps, in narrow passageways or in other confined spaces.

(e) Vehicle docks, carparks, driveways and factory passageways where the equipment or the person working on it would not be effectively protected.

(f) Positions in close proximity to or over machinery or open–type switchgear.

(g) Locations which are liable to be affected by fumes, dampness, dust, noise, vibration or other external factors of such nature as may cause deterioration of equipment or unsatisfactory working conditions.

(h) Hazardous locations as defined in the Wiring Regulations.

(i) Where the ambient temperature is maintained in excess of 30C.

(j) Where there is insufficient light.

(j) Where there is insufficient light.

(k) Where the use of a ladder would be necessary.

(l) In areas to which access is normally restricted for security, health or other reasons.

(m) In areas behind security doors and gates capable of being locked.

6.2.2 Single Domestic Premises

In single domestic premises, the metering equipment shall be fixed in a position which is readily accessible without having to enter rooms, enclosed verandahs or yards which may be locked.

This means that the meters on a residence shall be located outside of any area enclosed by a gateway or fence and, in general, on the face of the residence toward a street from which there is ready pedestrian access or along the adjacent side wall within 1.5 m of that face or an associated corner window of the residence. However, where the main entrance is on the side of the residence the meter box may be installed on that side not further than 1.5 m beyond the main entrance. Suitable locations are shown in Figure 6.3.

As metering equipment may produce a degree of noise, the installation of such equipment on a bedroom wall is not recommended but is acceptable.

Where a perimeter or security fence is erected between the building and the access street, the metering equipment shall be installed in a suitable vandal resistant meter box installed in the fence as approved by the Responsible Officer.

6.2.3 Single Business Premises

Unless otherwise approved by the Responsible Officer, in single business premises, metering equipment shall be fixed in a position as close as practicable to the entrance to the premises and which is readily accessible without having to enter rooms or areas not normally open to visitors or the public. In addition, metering equipment shall not be located in areas intended for window display or where access is restricted during normal operations.

6.2.4 Multiple Occupancy Premises

Where premises are subdivided into separate occupancies, facilities approved by the Responsible Officer for the grouping of metering and service equipment may be required.

Where a single occupancy consisting of an individual structure forms part of a multiple occupancy premises, such occupancy should be treated as a single occupancy premises for the purpose of the location of metering equipment and the common vehicular driveway serving other occupancies may then be deemed to be the "street".

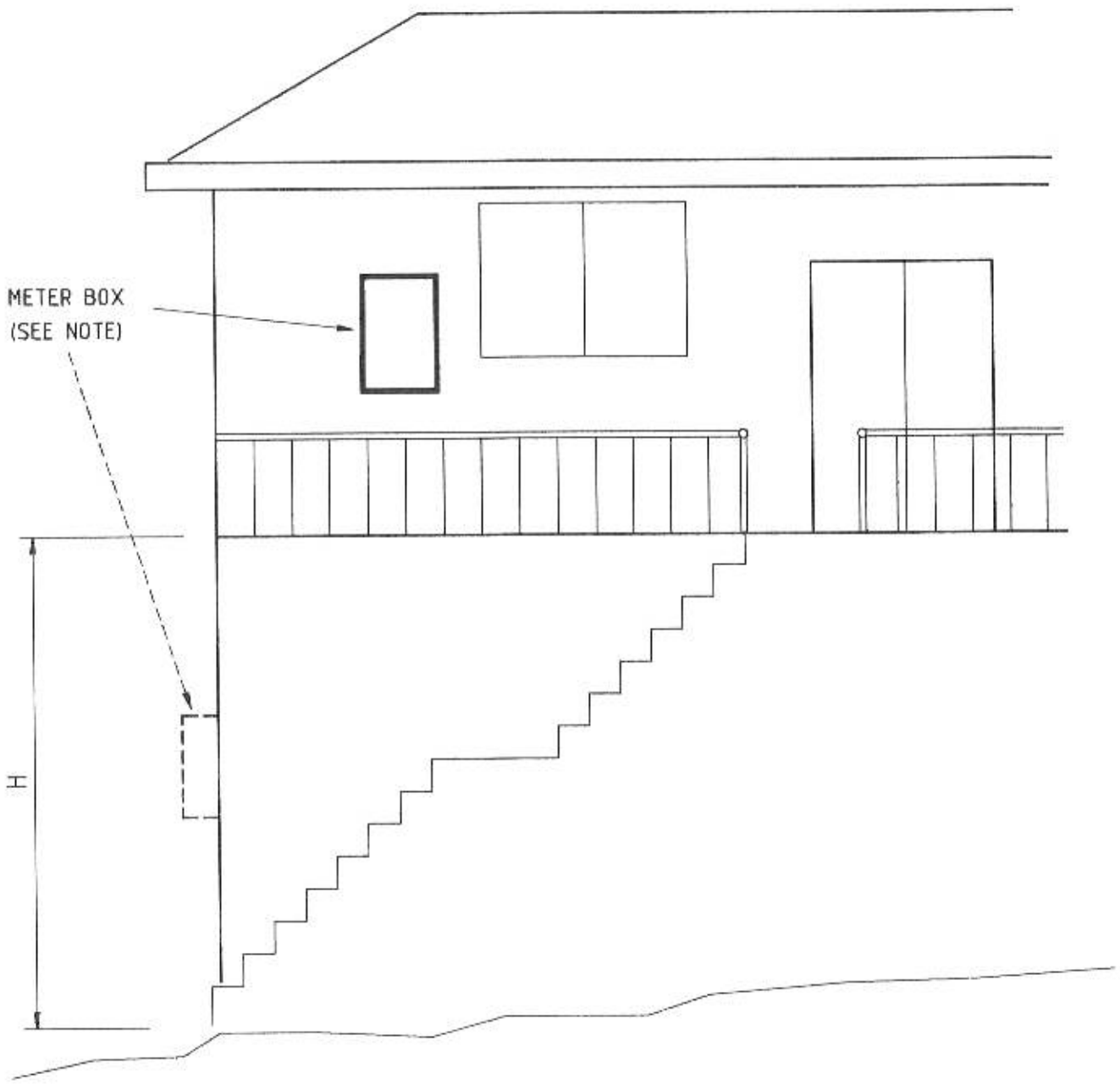
Where one service cable supplies a structure containing a number of occupancies the metering equipment may be in one location such that all occupants have common right of access. The metering may, however, be grouped at a number of locations as determined by engineering considerations of supply including voltage drop as, for example, in the case of multi–storey buildings, etc. Group metering locations may be in a room, cupboard or alcove set aside for metering purposes.

Whenever a building is to be subdivided or may be subdivided in the future, care should be taken to ensure that the meters and wiring are either within the lot to be supplied or within the area to be set aside as common property.

In the case of buildings having three or more floors, meters shall be located not more than one floor above or below the occupancy supplied thereby.

Specific details for installations may be obtained from the relevant Supply Authority office.

NOTE: Attention is directed to Clause 7.1.1 regarding submission of schematic diagrams of multiple occupancy premises for approval.



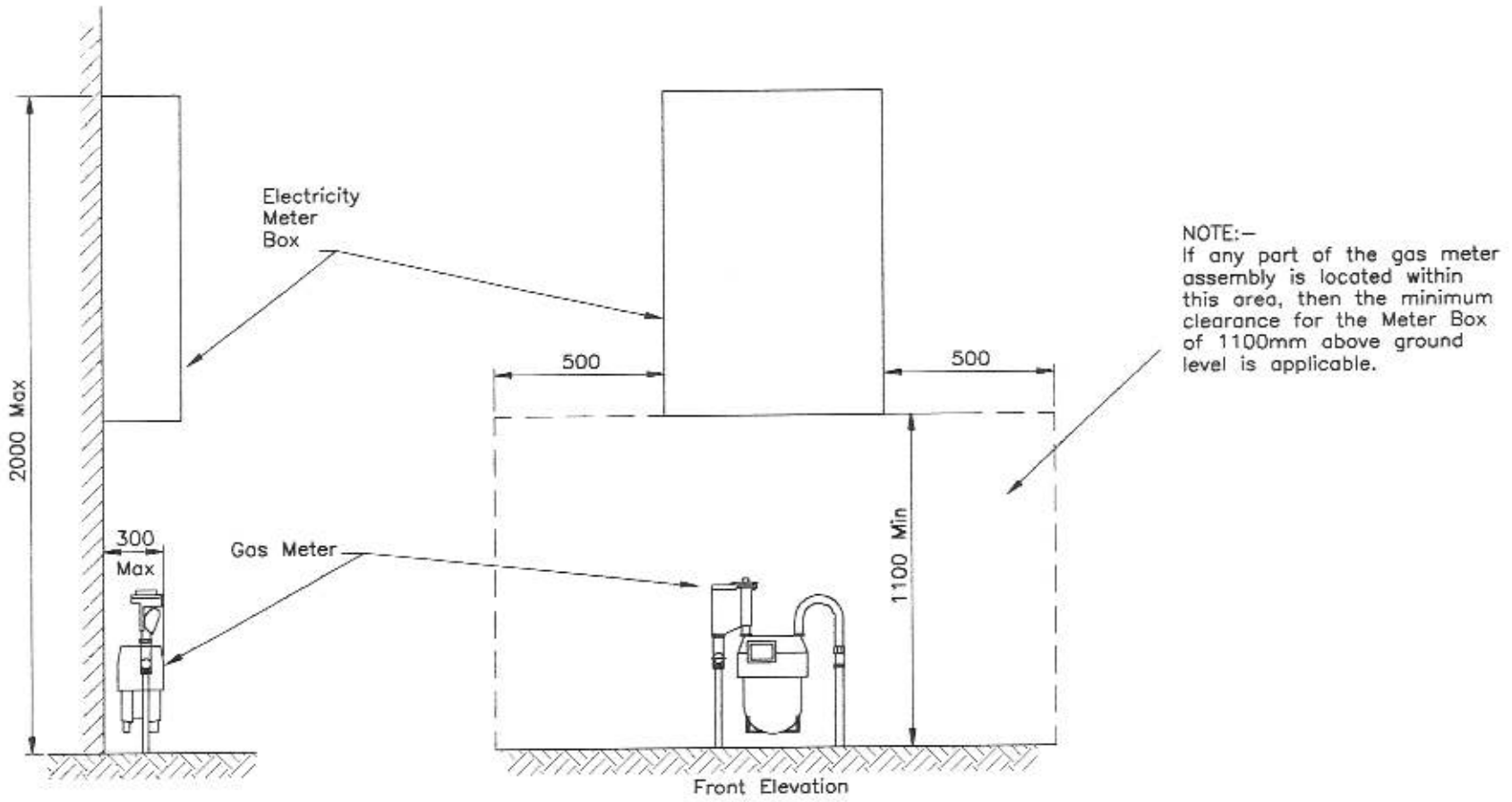
NOTE:

If dimension 'H' exceeds 2.0m, metering equipment shall be installed on lower portion of structure.

INDIVIDUAL INSTALLATIONS
ACCEPTABLE METER LOCATIONS

FIG 6.1

VXBOOK/SIRULES

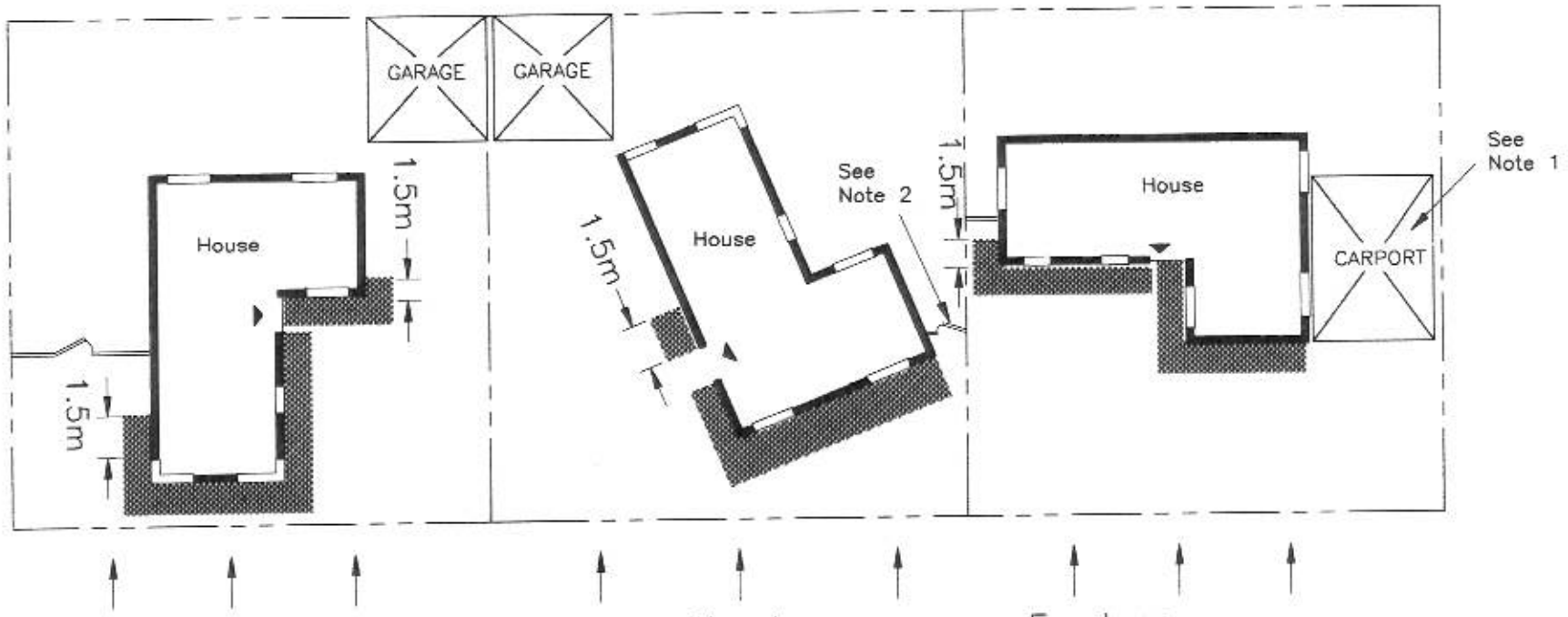


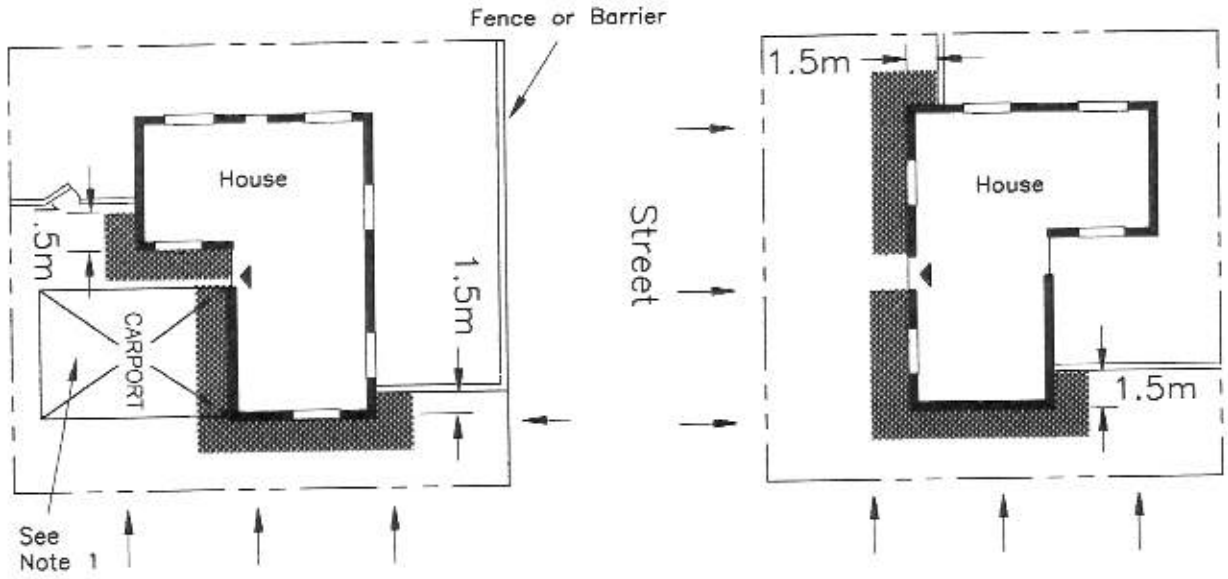
DOMESTIC METER BOXES NEAR GAS METERS

FIG. 6.2

VK/BOOK/SIRULES

INDIVIDUAL INSTALLATIONS
ACCEPTABLE METER LOCATIONS





Access from two streets

LEGEND:

- Pedestrian Access
- Main Entrance
- Acceptable Location

NOTES:

1. A meter box in a carport is not permissible unless access to the main entrance is gained through carport.
2. In general meter position must not be located behind fences or gates.
3. As metering equipment may produce a degree of noise, the installation of metering equipment on a bedroom wall should be avoided.
4. If meter position cannot be located in shaded areas as shown, consult the Responsible Officer.
5. Where perimeter or security fence is erected between the building and access street, a suitable vandal resistant meter box shall be installed in the fence as approved by the Responsible Officer.

FIG. 6.3

6.2.5 Public Thoroughfares

In special circumstances, and by negotiation, supply may be provided to an enclosure on a Supply Authority distribution pole. In such cases the installation shall be arranged to the satisfaction of the Responsible Officer.

The customer is responsible for the supply and mounting of a suitable enclosure in a position nominated by the Responsible Officer, generally located on the "footpath" side of the pole. The minimum mounting height shall be 2.7 metres to the bottom of the enclosure. The top of the enclosure should generally not exceed 3.5 metres from ground level. The customer shall provide a service protection device and all materials necessary for connection by the Supply Authority.

NOTE:-A minimum safe working clearance from any live apparatus of 2.0 m shall be maintained by all persons and apparatus in personal contact therewith. If this clearance cannot be maintained, the Supply Authority **MUST** be consulted before proceeding.

Drilling of concrete poles is **NOT PERMITTED** under any circumstances as ingress of moisture can lead to failure of the pole; hence, fixing of apparatus shall be effected by banding with suitable brackets or stainless steel bands. In the case of a concrete pole carrying high voltage conductors, the Responsible Officer may require additional insulation between consumer's mains and the body of the pole or brackets attached thereto.

6.3 Accessibility of Supply Authority Metering Equipment

Adequate space, generally not less than 1.0 metre, shall be provided and maintained in front of any point on the metering panel and shall extend to a height of 2.0 metres above the ground, floor or platform to enable Supply Authority personnel to read meters and work safely and without difficulty. Any opening providing access to this space shall be not less than 2.0 metres in height and 0.6 metres in width.

The panel shall be so located that its height above the floor or ground is not more than 2.0 metres to the top edge and not less than 1.0 metre for domestic installations or 0.75 metres for commercial and industrial installations to the bottom edge, unless otherwise approved by the Responsible Officer. If the panel is enclosed, other than in a standard meter box, a minimum clearance of 175 mm shall be provided from the front face of the panel to the inner face of the door or any internal projection thereof. The Responsible Officer will advise the depth of the panel and frame, if any, upon request. In general, a clear overall depth of 300 mm is acceptable.

Any elevated floor or platform used to provide access shall be substantial and permanent and shall be fitted with a railing where considered necessary by the Responsible Officer. Access to such elevated positions shall be provided by an approved fixed stairway equipped with a handrail. Access by means of a ladder is not permissible. See also Clause 6.2.1.1(b).

NOTE:-Attention is directed to Clause 6.8 and SEC publication "Requirements for Low Voltage Current Transformer Metering" for space requirements of the metering position when current transformer metering is used.

The customer shall ensure that access is not subsequently restricted or the location otherwise rendered unsuitable. If this occurs, the customer shall restore suitable access or arrange for the relocation of the metering equipment at the customer's cost.

Locking of a meter box or other enclosure for metering equipment is acceptable only if it is achieved by means of a special standard lock and by arrangement with the Supply Authority (See Clause 6.5). Such locks shall be used only on doors or gates which give access to a room or enclosure which is solely for the purpose of housing electrical equipment.

6.4 Sealing

In general, provision for sealing is required for all accessories and equipment on the line side of the meters and certain other connections associated with metering.

The customer shall make provision in an approved manner for Supply Authority personnel to affix seals to portions of the customer's installations in circumstances where, in the opinion of the Responsible Officer, such seals are necessary to prevent obstruction or diversion of the supply of electricity or to avoid interference with the supply to other customers or for purposes associated with the control and metering of the electricity supply or for any other purposes relating to the agreement with the customer.

6.5 Protection of Supply Authority Metering Equipment

6.5.1 Within or on Normally Occupied Premises

The customer shall provide adequate protection for the metering equipment where, in the opinion of the Responsible Officer, the equipment would otherwise be exposed to mechanical damage, effects of the weather, sea air, corrosion, etc. Where such protection is necessary, it shall take the form of a weatherproof box, with hinged door or lid fitted with a suitable catch. This box shall be constructed of galvanised steel or other approved materials and shall be such that the metering equipment is completely enclosed yet remains accessible.

In general, the box within which the meters are installed may not be locked. Where locking is considered essential, the customer shall make arrangements to the satisfaction of the Responsible Officer.

NOTE:-Attention is directed to Clauses 6.6.3 and 6.6.4 regarding accommodation of metering panels.

6.5.2 Installed Externally in Isolated and Unattended Locations

Where Supply Authority meters are installed in boxes externally on buildings or poles in isolated and unattended locations, the boxes shall be constructed to the satisfaction of the Responsible Officer and shall be of galvanised steel or equivalent material of sufficient mechanical strength to afford protection against vandalism, weather or other external factors. Such boxes must be kept locked at all times or otherwise be installed to the satisfaction of the Responsible Officer.

6.6 Meter Panel Installation

6.6.1 General

The customer shall provide facilities for the mounting of the Supply Authority's metering equipment and any associated surrounds or enclosures, securely fixed to a wall or rigid supporting structure. The fastening method used shall be of a type which permits easy removal/replacement of the Supply Authority's equipment.

In SEC areas of supply, no equipment other than Supply Authority equipment shall be installed on the Supply Authority's meter panel.

For LGESA areas of supply, equipment other than Supply Authority equipment may be mounted on the Supply Authority's meter panel only with the approval of the Responsible Officer.

6.6.2 Common Enclosure Housing Meter and Switchboard Equipment

Equipment other than Supply Authority metering and service equipment, such as a switchboard for a general services supply, shall not be contained within a common enclosure with metering equipment for more than one customer unless the enclosure and accessibility of apparatus is approved by the Responsible Officer.

In any case, where a common enclosure is to accommodate equipment in addition to Supply Authority metering equipment, adequate space shall be provided to accommodate such equipment independent of the metering equipment.

Wiring not intended for connection to metering equipment shall not be located in the wiring space behind the meter panel unless contained within a space specifically set aside for the purpose, e.g. a duct or conduit located in a rear corner of the enclosure such that it does not obstruct meter wiring.

In general, wiring space behind the metering and switchboard panels should be physically separated from each other with suitable provision for the passage of the necessary conductors between the two sections.

6.6.3 Single Installations (Up to 100 A)

For single installations having a calculated maximum demand not exceeding 100 Amperes per active conductor, the customer shall provide facilities to accommodate a standard meter panel (as shown in Figure 6.4) provided and installed by the Supply Authority. The meter panel shall be mounted –

(a) in a standard meter box which is marked to indicate that it is accepted by the Supply Authority as complying with the appropriate standard; or

(b) in a meter box constructed in accordance with the specifications shown in Figures 6.5 and 6.6; or

(c) on a suitable softwood or approved metal surround giving a clear space not less than 70 mm deep between the rear face of the panel and the surface on which the surround is mounted. See Figure 6.7.

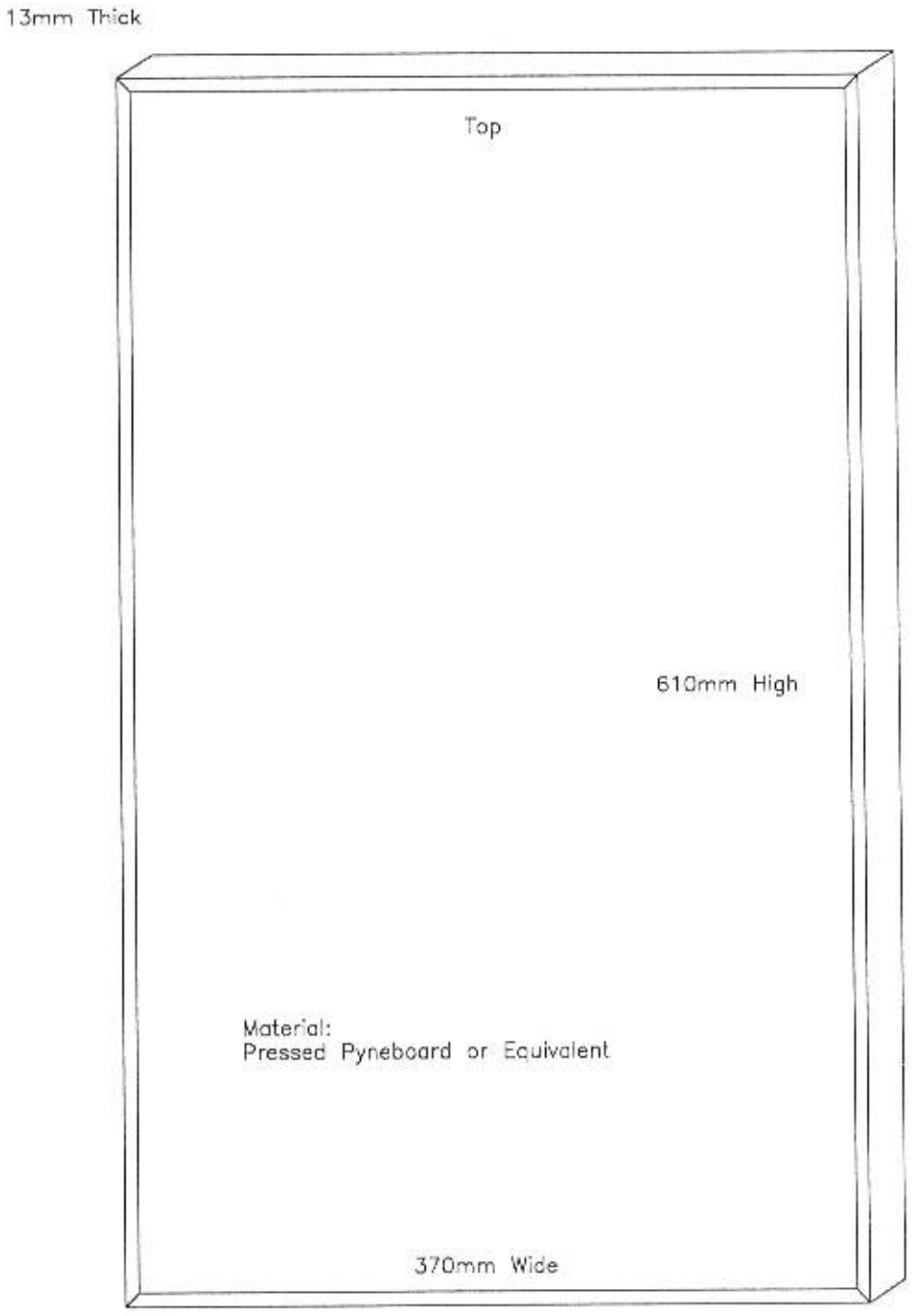
NOTES:

1. The maximum size of any one conductor which may normally be terminated on a standard meter panel is 35 mm^2.
2. Type acceptance of commercially manufactured meter boxes should be obtained from the SEC.
3. In some circumstances the standard meter panel may not be adequate for polyphase domestic installations – for details consult the Supply Authority.

6.6.4 Other Installations

Where the installation is unsuitable for the use of the standard meter panel as described in Clause 6.6.3, the customer shall provide facilities for the Supply Authority's metering equipment to the satisfaction of the Responsible Officer.

Dimensions 610mm High
370mm Wide
13mm Thick



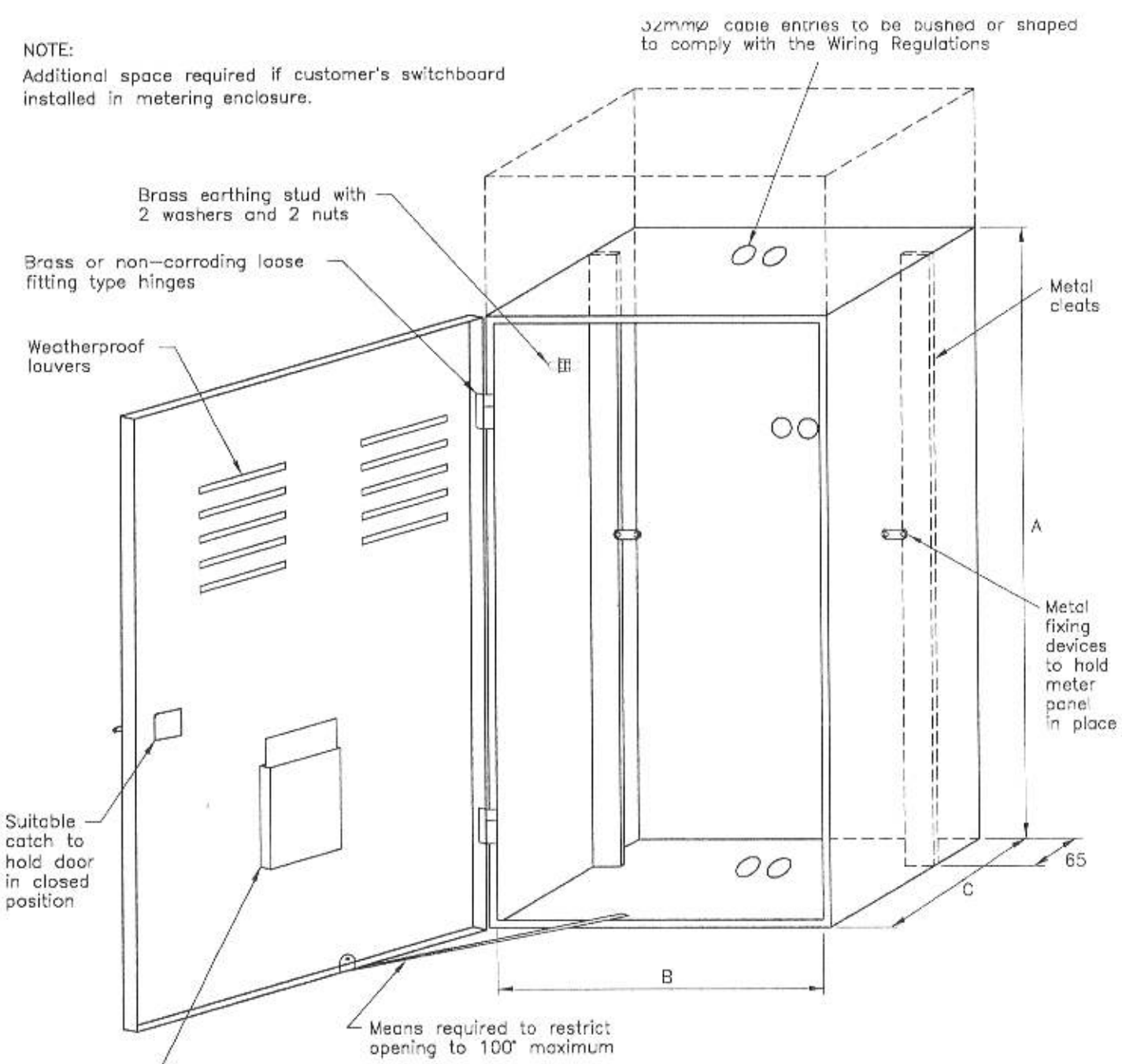
NOTES:

1. To avoid unnecessary future expense this panel allows for off-peak water and space heating.
2. CONSULT THE SUPPLY AUTHORITY FOR POLYPHASE DOMESTIC INSTALLATIONS.

STANDARD METER PANEL

FIG. 6.4

NOTE:
Additional space required if customer's switchboard installed in metering enclosure.



INTERNAL DIMENSIONS	'A' MIN	'B' MIN	'C' MIN
Installations up to 100 Amp per phase	615mm	375mm	245mm

MATERIAL:

Constructed of galvanised sheet not less than 1.2mm thickness (or other acceptable metal sheet).

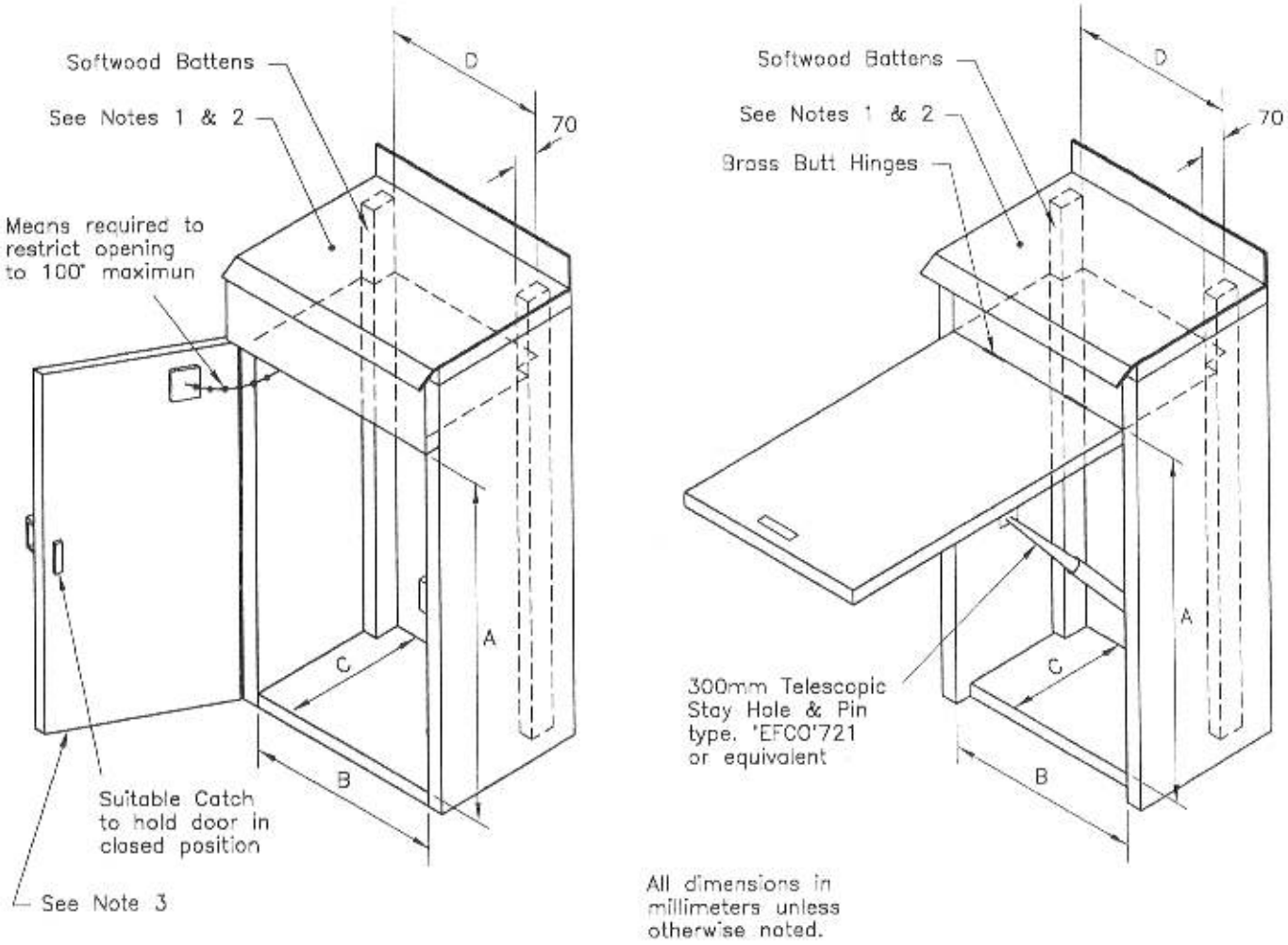
NOTES:

1. The top of the box should preferably slope form rear to front but may be horizontal.
2. Suitable flashing may be required to prevent entry of moisture into box if the box is to be exposed to the weather. Particular attention should be paid to sealing around the door. The degree of protection shall be IP33 as defined in AS 1939. Adequate drain holes shall be provided in the bottom of the box.
3. If switchboard is fitted in box exposed to the weather, switchboard must be above meter panel.
4. The overall dimensions for a typical commercial manufactured meter box are:—

   Without provision for switchboard
   650mm High 406mm Wide 254mm Deep

   With provision for switchboard
   851mm High 406mm Wide 254mm Deep
5. Refer to Clause 6.6.2 regarding provision for wiring not intended for connection to metering equipment.
6. The design and construction shall be approved by the Responsible Officer.
7. CONSULT THE SUPPLY AUTHORITY FOR POLYPHASE DOMESTIC INSTALLATIONS.

STANDARD METER BOX - METAL FIG. 6.5



NOTE

Additional space required if customer's switchboard installed in metering enclosure.

'D' is a fixed measurement in each case.
'A', 'B' & 'C' are minimum internal dimensions for metering equipment only.

Internal Dimensions mm	'A' MIN.	'B' MIN.	'C' MIN.	'D' ±2
Installations up to 100 Amps per phase	615	375	245	300

MATERIAL

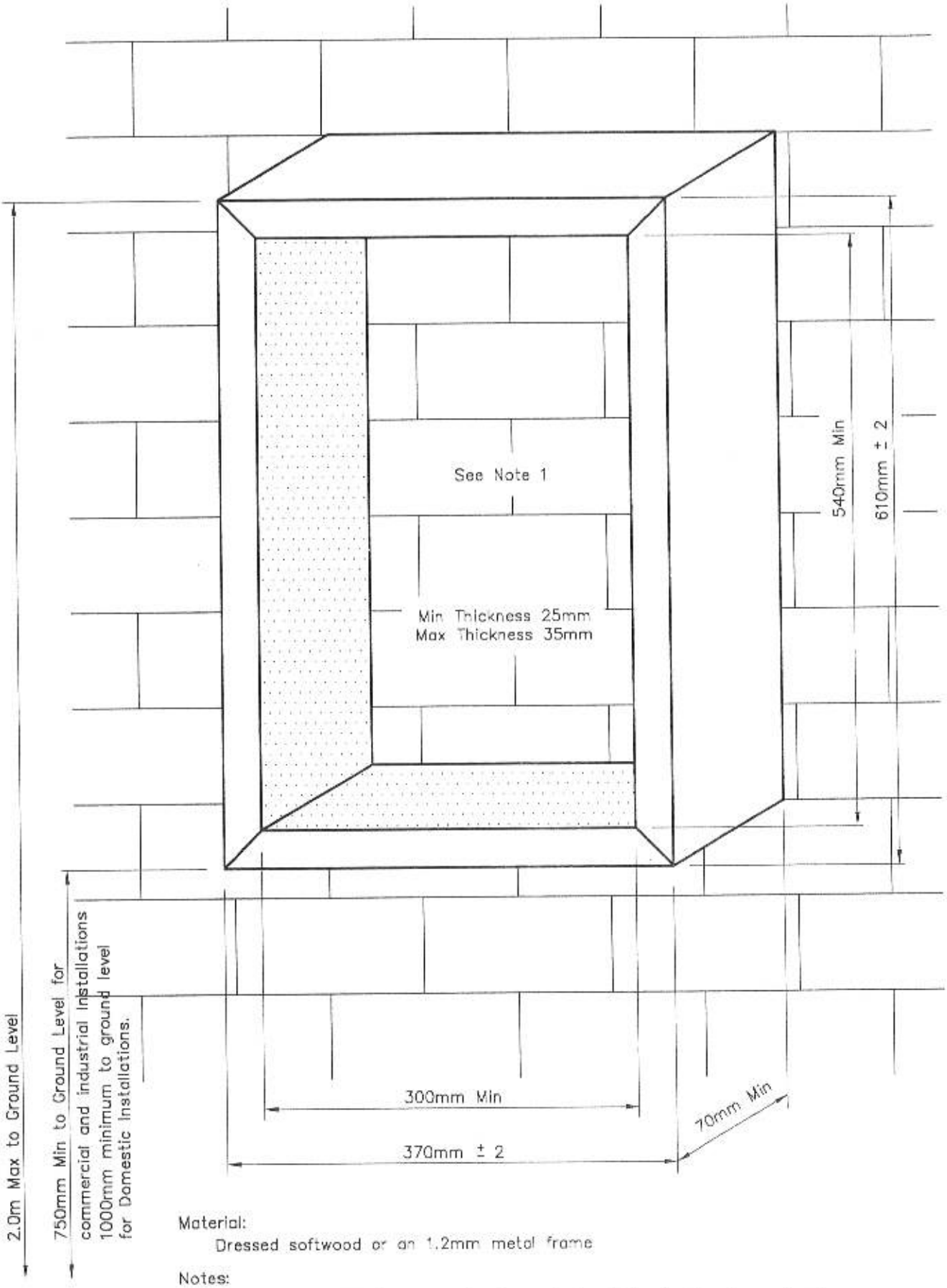
Well seasoned timber. Minimum thickness 15mm suitably treated to render it weatherproof or weatherproof plastic of adequate thickness. Particle board and veneered woods are not acceptable where exposed to the weather.

NOTES:

1. The top of the box should preferably slope from rear to front but may be horizontal
2. Suitable flashing shall be provided if the box is to be exposed to weather.
3. On box with side hinged door, switchboard (if fittec) must be located above meter panel.
4. Suitable covering shall be provided between the rear of the box and the top of the panel to prevent small objects falling behind the panel.
5. Fire resistant lining shall be provided on the inside surfaces behind the meter panel.
6. CONSULT THE SUPPLY AUTHORITY FOR POLYPHASE DOMESTIC INSTALLATIONS.

STANDARD METER BOX - TIMBER

FIG. 6.6



Material:

Dressed softwood or an 1.2mm metal frame

Notes:

1. Where installed on a conductive wall, insulating backing is required. In other cases backing is optional.
2. Where installed on a wall of combustible material, fire resistant lining shall be provided on the wall and inside of the frame.
3. The customer shall supply and install the meter panel mounting surround. Refer to clause 6.6.3.
4. CONSULT THE SUPPLY AUTHORITY FOR POLYPHASE DOMESTIC INSTALLATIONS.

STANDARD METER PANEL MOUNTING SURROUND

FIG 6.7

6.7 Connections to Metering Equipment

The customer shall provide sufficient length of cable and suitable means of termination for connection of the consumer's mains to Supply Authority equipment.

Conductors shall be stranded copper of a size which can be terminated in the Supply Authority equipment. Solid or compacted copper and aluminium conductors shall be jointed to stranded copper conductors suitable for termination on the Supply Authority's equipment. Aluminium and compacted copper conductors are **NOT ACCEPTABLE** for termination directly on metering equipment.

6.8 Current Transformer Metering

Where the calculated maximum demand of any separately metered portion of an installation exceeds 100 Amperes per active conductor, the Responsible Officer may require that the meter be of a type operated by current transformers.

The customer shall provide adequate space, housing and wiring facilities for the Supply Authority's current transformers and metering equipment. A suitable supply connection device on the line side of each active and the neutral conductor near the current transformers for the connection of the "voltage" metering circuit shall be provided and installed.

Details of requirements in SEC areas of supply are set out in the SEC publication "Requirements for Low Voltage Current Transformer Metering". In LGESA areas of supply details should be obtained from the relevant LGESA.

6.9 Spacing Between Meters and Current Carrying Conductors

The customer shall, except as otherwise determined by the Responsible Officer, provide and maintain the spacings between meters and cables carrying current in excess of 500 Amperes, as detailed in the SEC publication "Requirements for Low Voltage Current Transformer Metering".

6.10 Customer Owned Metering

Meters installed by the customer for monitoring performance and energy usage shall not be located on Supply Authority metering panels, nor connected to Supply Authority equipment. All such meters installed in the same area as the Supply Authority metering shall be clearly marked **"CUSTOMER OWNED METERING".**

7 MULTIPLE INSTALLATIONS

7.1 Multiple Occupancy Premises

7.1.1 General

A plan of the installation showing the location of the metered and unmetered mains and submains in relation to the main structural features, together with a schematic diagram indicating the control arrangement of the installation, shall be submitted to the Responsible Officer for approval prior to the intended commencement of the installation.

Where lots on a subdivision do not directly abutt a public road, access will be by way of common property, the extent of which will have been shown on the plan of subdivision. Such lots shall be serviced underground from the point of supply in such a way that all common mains are located in common property and individual mains or submains to a given lot do not pass through other lots.

Where some of the lots on a plan of subdivision abutt a public road in which the Supply Authority has mains, they may be given separate points of supply and serviced either overhead or underground.

For subdivision of buildings, wiring passing from one premises to another shall be placed in common property or in service ducts which shall be common property.

Where wiring other than wiring originating at a separate occupancy switchboard is installed in common property passing through that occupancy, the occupancy switchboard shall be marked –

> "Warning – Multiple Installation. Not all wiring passing
> through this premises is controlled from this switchboard".

Any switchboard which incorporates control or protection devices associated with more than one individually metered occupancy within a multiple installation shall be installed in a common area and shall not be installed within any individual occupier's premises. **Where the multiple installation involves a subdivision, the common area shall be registered on the plan of subdivision as common property.**

NOTES:

1. **Attention is directed to Clause 6.2.4 regarding meter locations, Clause 2.4.2 regarding MEN requirements for multiple occupancy premises and Clause 4.4.1 regarding number of supplies.**
2. **Consult the Supply Authority for servicing arrangements for building subdivisions and other multi–unit developments including dual occupancies.**
3. **For the subdivision of existing buildings under Section 12 (2) of the Subdivision Act 1988, wiring passing through one occupancy to another in an implied easement, the requirements for switchboard labelling as contained in Clause 7.1.1 should apply.**

7.1.2 Main Switch/es

The installation for premises comprising a number of separately metered occupancies shall be arranged to the satisfaction of the Responsible Officer and shall be controlled in accordance with the requirements of the Wiring Regulations and the Wiring Rules.

ANY SWITCH INSTALLED ON THE LINE SIDE OF SUPPLY AUTHORITY METERING EQUIPMENT SHALL BE CLEARLY AND PROMINENTLY MARKED "TO BE OPERATED BY AUTHORISED PERSONS ONLY" AND BE CAPABLE OF BEING SECURED IN BOTH THE ON AND OFF POSITION TO THE SATISFACTION OF THE RESPONSIBLE OFFICER.

The sealing provisions of Clause 6.4 shall also be **STRICTLY OBSERVED.** Refer also to Clause 4.4 regarding number of supplies to one property.

Typical arrangements for individual and grouped metering for multiple occupancies are shown in Figures 7.1 and 7.2.

7.1.3 Labelling

Where premises are sub–divided into separate occupancies and a separately metered supply is given to occupiers of individual rooms, suites of rooms, flats, units, shops, factories, etc, an identification number or letter or combination of both shall be assigned and marked at the main entrance of each occupancy. A durable corresponding marking shall be placed on the distribution board to identify the supply equipment to that portion of the premises.

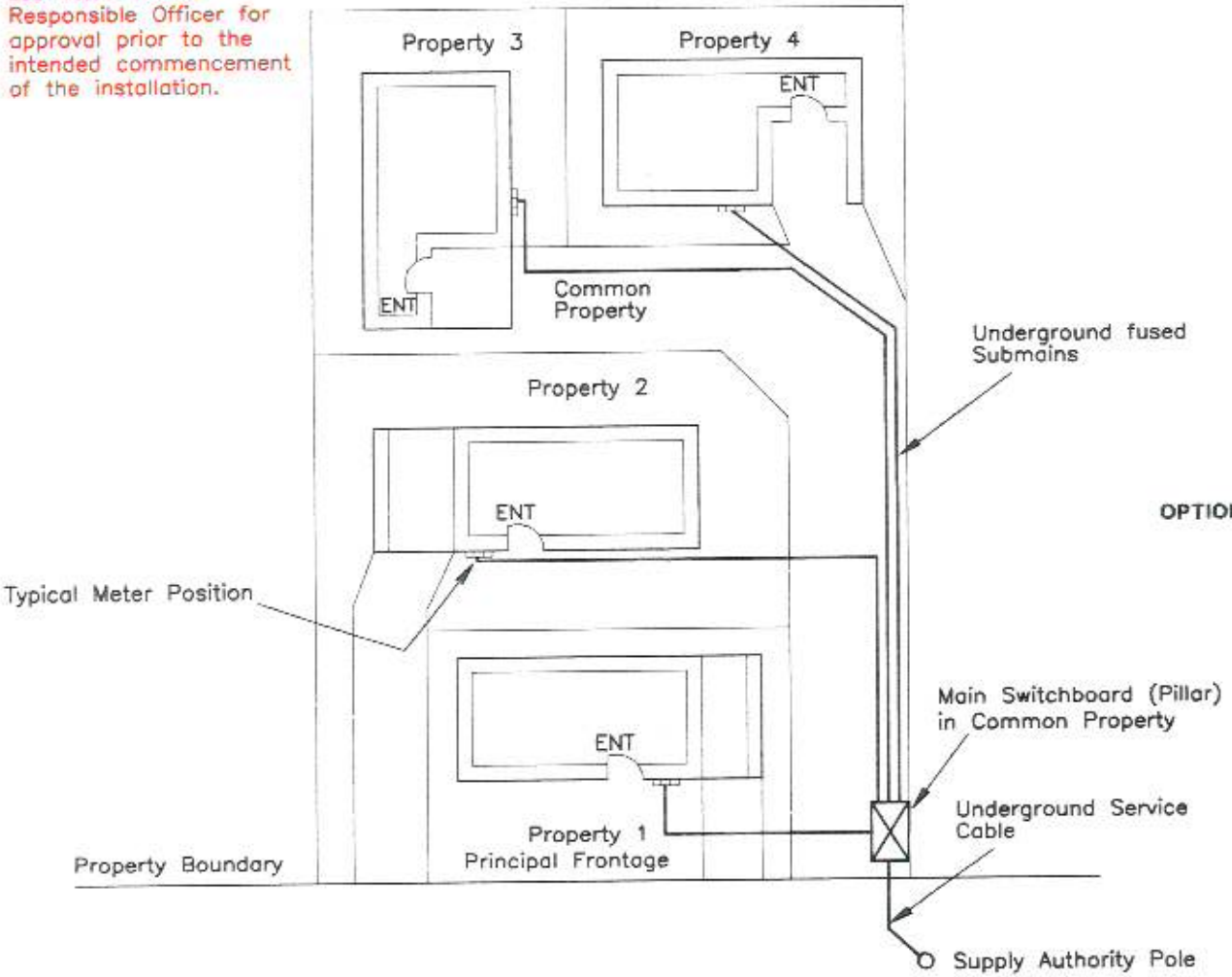
Where the occupancy consists of a number of separate areas, each shall be marked or some other approved system of identification shall be adopted. A corresponding marking shall also be made on the conductors for each occupancy at the meter panel location to enable present and future identification of conductors.

Where premises are supplied from more than one service, labels shall be provided at each set of Consumer's Terminals and at the main switchboard associated therewith, indicating the portion of the installation supplied. The location and conditions of operation of any alternative source of supply to the installation shall also be indicated.

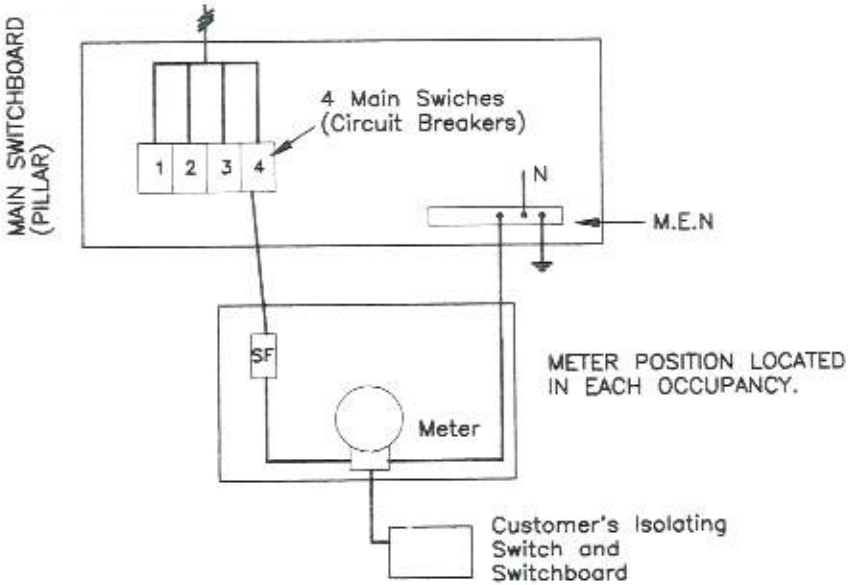
NOTE:

A schematic diagram of the installation shall be submitted to the Responsible Officer for approval prior to the intended commencement of the installation.

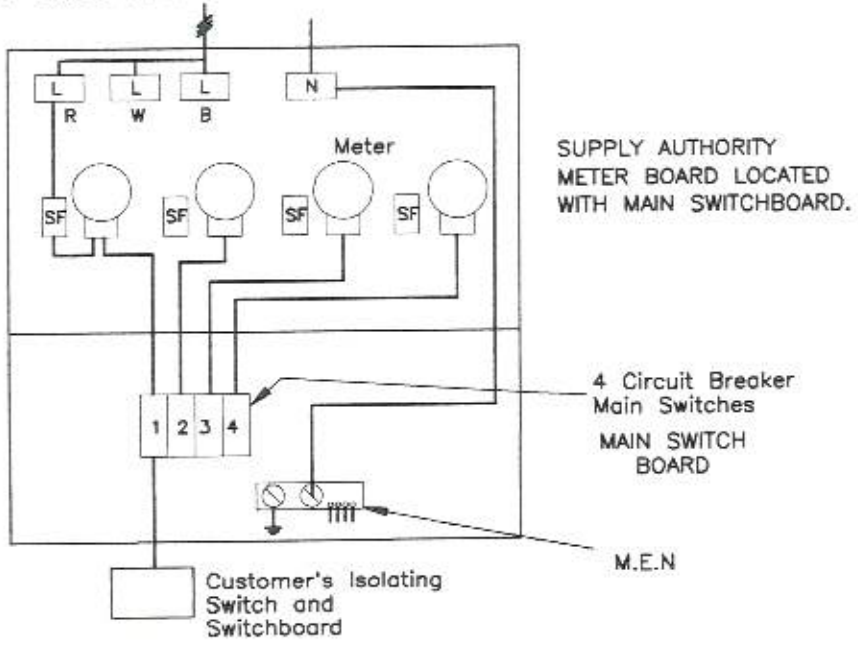
MAIN SWITCHBOARD IN COMMON PROPERTY



OPTION 1 - INDIVIDUAL METERING



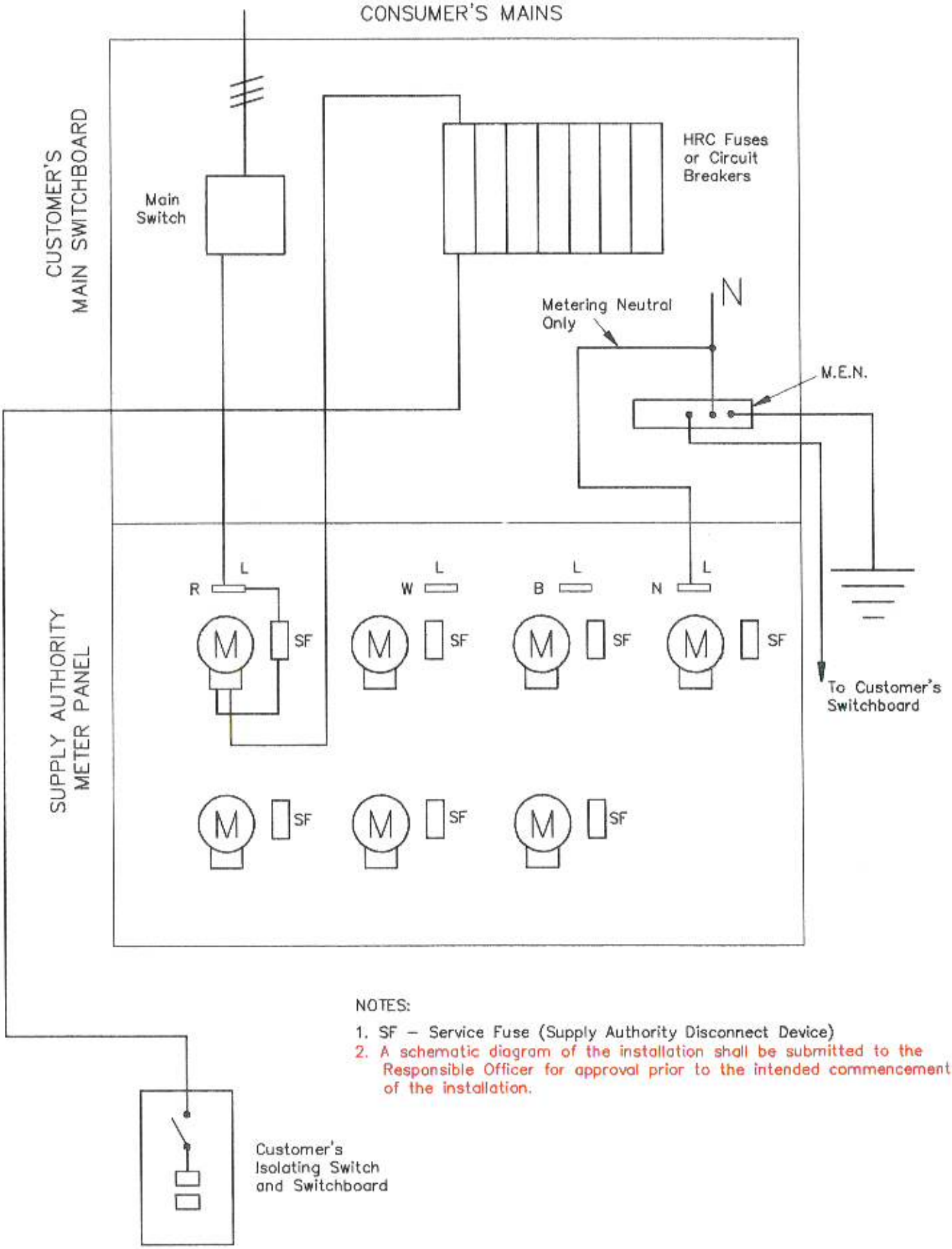
OPTION 2 - GROUP METERING (IN COMMON PROPERTY).



TYPICAL ARRANGEMENTS FOR SEPARATELY METERED OCCUPANCIES SUPPLY OVER 100 AMPS PER PHASE

SF – Service Fuse (Supply Authority Disconnect Device)

FIG 7.1



NOTES:

1. SF – Service Fuse (Supply Authority Disconnect Device)
2. A schematic diagram of the installation shall be submitted to the Responsible Officer for approval prior to the intended commencement of the installation.

TYPICAL MAIN SWITCH ARRANGEMENT FOR OVER 6 CUSTOMERS - GROUP METERING

(LGESA areas of supply may have separate arrangements – Refer to Clause 7.1.1)

FIG 7.2

8 HIGH VOLTAGE INSTALLATIONS

8.1 General

Requirements for high voltage installations are contained in the Wiring Regulations.

For technical details and for additional requirements in SEC areas of supply for high voltage installations up to and including 22 kV, reference shall be made to SEC document "Customers High Voltage Installations". In other Supply Authority areas, technical details and other requirements shall be obtained from the relevant LGESA.

A summary of the information provided in the SEC document "Customers High Voltage Installations" is as follows –

(a) Approval of designs and equipment.

(b) General design aspects such as circuit connections, metering, protection, quality of supply, underground and overhead cables and substations.

(c) Earthing.

(d) Changeover from LV to HV supply.

(e) Testing and activation.

(f) Operation and maintenance.

8.2 Installation Requirements

Customers intending to install or add to a high voltage installation shall give adequate notice to enable negotiations to be carried out and extension or augmentation of the distribution system to be constructed. Plans, drawings and particulars setting out the proposed details and operating conditions applicable to the installation shall be submitted to the Supply Authority, for approval, at the earliest possible date prior to the intended commencement of the installation.

High voltage equipment **SHALL NOT** be connected to the Supply Authority's mains unless approved by the Responsible Officer with respect to its design, construction, installation and operation.

If the customer purchases or installs any high voltage equipment before the design, construction and methods of installation of the equipment have been formally approved, the Supply Authority may refuse to connect the whole or any part of the equipment which, in the opinion of the Responsible Officer, is not satisfactory.

At the time of dealing with the application for supply, the Supply Authority will advise the customer of the normal range of voltage for which provision should be made and the main control and protection requirements additional to those detailed in the Wiring Regulations.

Protection relays, current transformers and other protective equipment must have characteristics to suit the Supply Authority's protection system. Where necessary, the Supply Authority will test the customer's equipment for this purpose at the time of the initial installation.

Facilities must be provided for the disconnection and testing of all high voltage protection circuits.

Suitable means of earthing sections of the installation must be provided so that equipment can be worked on safely.

Metering of high voltage installations shall be arranged to the satisfaction of the Responsible Officer. In SEC areas of supply, requirements are detailed in the SEC publication "Metering of H.V. Installations".

NOTES:

1. Following completion of the installation, the customer's representative will be required to carry out electrical and mechanical commissioning tests to the satisfaction of the Responsible Officer before a clearance will be issued to permit placement of equipment into service.
2. Operations on high voltage installations may only be performed by operations authorised by the SEC.

APPENDIX A

FIRE HAZARD CATEGORIES

CATEGORY 1 AREA

Includes Urban Areas which –

- will not be allocated a fire hazard rating by the Fire Control Authority; or
- have been allocated a fire hazard rating of "low" by the Fire Control Authority; or
- have been allocated a fire hazard rating of "low moderate" by the Fire Control Authority and after consultation between the Commission, the Responsible Person and the Fire Control Authority, the risk of fire ignition is not considered high; or
- are yet to have a fire hazard rating allocated by the Fire Control Authority but where, in the opinion of the Fire Control Authority, the combination of normal build–up of vegetation and general weather conditions could reasonably be expected not to produce conditions conducive to the ignition and/or rapid spread of fire.

CATEGORY 2 AREA

Includes –

- all Rural Areas; and
- Urban Areas for which the Fire Control Authority has allocated a fire hazard rating of "high moderate"; and
- Urban Areas which have been allocated a fire hazard rating of "low moderate" by the Fire Control Authority and where, after consultation between the Commission, the Responsible Person and the Fire Control Authority, the risk of fire ignition is considered high, but for other reasons the "low moderate" classification was assigned; and
- Urban Areas which are yet to have a fire hazard rating allocated by the Fire Control Authority but where, in the opinion of the Fire Control Authority, the combination of normal build–up of vegetation and general weather conditions could reasonably be expected to produce conditions conducive to the ignition and/or rapid spread of fire; and
- Any areas not otherwise defined.

Urban Area

This is specifically defined in Section 58 of the SEC Act and is an area for which the Fire Control Authority has not allocated a fire hazard rating of "high" or "very high" and which is –

(a) predominantly

subdivided into allotments which, in the case of land used or to be used for residential purposes, are not greater than 0.4 hectares; and

able to be used or developed under a planning scheme or interim development order for residential, industrial or commercial purposes; and

provided with constructed streets and public utility services; and

provided with street lighting which is installed at not less than three lanterns in every 500 metres; or

(b) any other areas that may from time to time be agreed upon between the Commission, the Fire Control Authority and any person responsible for the management of public land in the area in accordance with Section 58 of the SEC Act.

APPENDIX B

AUSTRALIAN STANDARDS

List of Australian Standards called up in the Service and Installation Rules –

AS 1026 – Impregnated paper insulated cables for electricity supply at working voltages up to and including 33 kV

AS 1074 – Steel tubes and tubulars for ordinary service

AS 1104 – Informative symbols for use on electrical and electronic equipment

AS 1397 – Steel sheet and strip – Hot–dipped zinc–coated or aluminium/zinc coated

AS 1544 – Structural steel welding (known as the SAA Structural Steel Welding Code)

AS 1544.1 – Welding of steel structures

AS 1650 – Hot–dipped galvanized coatings on ferrous articles

AS 1795 – Sheets and boards for electrical purposes

AS 1939 – Degrees of protection provided by enclosures for electrical equipment (IP Code)

AS 1977 – Flexible insulating sleeving for electrical purposes

AS 2053 – Non–metallic conduits and fittings

AS 2279 – Disturbances in mains supply networks

AS 3000 – Electrical installations – Buildings, structures and premises (known as the SAA Wiring Rules)

AS 3001 – Electrical installations – Movable premises (including caravans) and their site installations

AS 3010 – Electrical installations – Supply by generating set

AS 3012 – Electrical installations – Construction and demolition sites

AS 3116 – Approval and test specification – Electric cables – Elastomer insulated – For working voltages up to and including 0.6/1 kV

AS 3147 – Approval and test specification – Electric cables – Thermoplastic insulated for working voltages up to and including 0.6/1 kV

AS 3155 – Approval and test specification – Neutral screened cables for working voltages of 0.6/1 kV

AS 3198 – Approval and test specification – Electric cables – XLPE insulated – For working voltages up to and including 0.6/1 kV

AS 3600 – Concrete structures

NOTE: The Australian Standards referred to above shall be taken to be the latest revision, including amendments at the time of carrying out the installation.