Northern Ireland Electricity (NIE) Addresses and Telephone Numbers

NIE Registered Office

Northern Ireland Electricity Ltd.
Danesfort
120 Malone Road
BELFAST
BT9 5HT

NIE Customer Operations Depots

Northern Ireland Electricity Ltd.
Belfast Depot
57 Dargan Road
BELFAST
BT3 9JU

Northern Ireland Electricity Ltd.
Ballymena Depot
Pennybridge Industrial Estate
Larne Road
BALLYMENA
BT42 3HB

Northern Ireland Electricity Ltd.
Craigavon Depot
Carn Industrial Estate
PORTADOWN
BT63 5QJ
NIE Telephone Numbers

Failure of supply services are available 24 hours a day, other services are available 09:00 to 17:00, Monday to Friday, such as;

- Failure of Electricity Supply
- New Electricity Connection
- Alteration to Lines and Equipment
- Customer Helpline

Telephone: **03457 643643**
Minicom text phone: **03457 147128**
Email: customercontact@nie.co.uk

NIE is committed to excellent customer service at all times. If you feel that there is a matter that NIE is unable to resolve to your satisfaction, then you can contact the Consumer Council for Northern Ireland (CCNI).

**Consumer Council for Northern Ireland (CCNI)**

If NIE is unable to resolve your concerns, you can then contact the Consumer Council for Northern Ireland (CCNI) between 09:00 and 17:00, Monday to Friday.

CCNI
Elizabeth House
116 Holywood Road
BELFAST
BT4 1NY

Complaints: 0800 121 6022
Telephone/ Text phone: 02890 672488
Fax: 02890 657701
Email: info@gccni.org.uk
Disclaimer
This document is supplied for guidance purposes only. NIE reserves the right to change internal policies from time to time, which may affect the accuracy of the information herein. All queries and concerns shall be directed to the local NIE depot.
# CONTENTS

Northern Ireland Electricity (NIE) Addresses and Telephone Numbers ........1  
Foreword .............................................................................................................1  
Introduction .......................................................................................................1  

1.0 Safety and Security of NIE Equipment ......................................................2  

2.0 Procedure for obtaining a Low Voltage (LV) Connection to the Distribution System .................................................................3  
2.1 Initial Enquiry and Plans .........................................................................3  
2.2 Change of Maximum Import Capacity .....................................................4  
2.3 Additional Information ..........................................................................4  
2.4 Provision of Quotation ..........................................................................4  
2.5 Acceptance of Quotation .......................................................................5  
2.6 Statutory Consents ...................................................................................5  
2.7 Commencement of Site Work ..................................................................5  
2.8 Provision of Metering ............................................................................6  
2.9 Additional Visit Charges ........................................................................6  

3.0 General Technical Information and Requirements ....................................7  
3.1 Point of Connection ...............................................................................7  
3.1.1 Domestic and Small Commercial Premises .......................................7  
3.1.2 Commercial/Industrial Installation .......................................................7  
3.2 General Characteristics of LV Connections ..........................................7  
3.2.1 Frequency and Voltage ......................................................................7  
3.2.2 Phase Identification ............................................................................7  
3.2.3 Phase Rotation .....................................................................................7  
3.2.4 Phase Balance .....................................................................................7  
3.2.5 Prospective Short Circuit Current and External Earth Loop Impedance .................................................................8  
3.3 Service Arrangements .............................................................................9  
3.3.1 Underground Services .......................................................................9  
3.3.2 Overhead and Undereave Services ......................................................12  
3.4 Metering and Termination Arrangements ................................................12  

© Northern Ireland Electricity Ltd.
6.2 Metering Arrangements .......................................................... 46
6.2.1 Multiple Tenancy Installations ........................................... 46
6.3 Switch-panel Design ............................................................... 47
6.4 Sprinkler Systems ................................................................. 47
7.0 Miscellaneous Premises .......................................................... 54
7.1 Metering .............................................................................. 54
7.1.1 Unmetered Connections ....................................................... 54
7.1.2 Metered Connections ........................................................... 54
7.2 BT Telephone Kiosks ............................................................. 54
7.3 DRD (NI), Street Lighting, Traffic Signs etc. ............................ 55
7.4 Advertising Boards, Bus Shelters, Non-BT Telephone Kiosks and Similar Installations ................................................................. 55
7.4.1 Double Insulated Earth Free Installations .............................. 55
7.4.2 Earthed Installations ............................................................ 55
7.5 Short Duration Connections - Festival Lighting (e.g. Christmas Lighting) ................................................................. 55
7.6 Temporary Connections ......................................................... 55
7.7 Caravan Sites ........................................................................ 56
7.8 Mobile Homes ....................................................................... 57
8.0 Requirements for Fixed Standby Generators .............................. 63
8.1 Connection of Fixed Standby Generators ................................ 63
8.2 Changeover Switches .............................................................. 63
8.3 Location of Generators ............................................................ 63
# TABLE OF FIGURES

## General Provisions

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Single/Three Phase Metering Equipment on Open Backboard in Switch-room using Loose Switchgear</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Maximum Import Capacity Range up to 70kVA</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Single/Three Whole Phase Metering Equipment on Open Backboard in Switch-room using Loose Switchgear</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Maximum Import Capacity Range up to 70kVA</td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>Three Phase Current Transformer Metering Equipment on an Open Backboard in Switch-room using Loose Switchgear</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Maximum Import Capacity Range 70-138kVA</td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Three Phase Current Transformer Metering Equipment - Installed in Purpose Made Switch-panel</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Maximum Import Capacity Range 70-138kVA</td>
<td></td>
</tr>
<tr>
<td>G5</td>
<td>Three Phase Current Transformer Metering Equipment - Installed in Purpose Made Switch-panel</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Maximum Import Capacity Range &gt;138kVA</td>
<td></td>
</tr>
<tr>
<td>G6</td>
<td>Typical Switch-panel layout for Multiple Tenancy Installations with centralised Metering</td>
<td>27</td>
</tr>
<tr>
<td>G7</td>
<td>CT Metering Requirements</td>
<td>28</td>
</tr>
<tr>
<td>G8A</td>
<td>Duct Seal (Outdoor Meter Position)</td>
<td>29</td>
</tr>
<tr>
<td>G8B</td>
<td>Duct Seal (Indoor Meter Position)</td>
<td></td>
</tr>
</tbody>
</table>

## Domestic Arrangements

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Metering Arrangement - Standard Domestic</td>
<td>33</td>
</tr>
<tr>
<td>D2</td>
<td>Economy 7 - Storage Heating (up to 80A)</td>
<td>34</td>
</tr>
<tr>
<td>D3</td>
<td>Economy 7 - Water Heating with Afternoon Boost</td>
<td>35</td>
</tr>
<tr>
<td>D4</td>
<td>Economy 7 - Storage Heating (up to 80A) &amp; Water Heating</td>
<td>36</td>
</tr>
<tr>
<td>D5</td>
<td>Economy 7 - Single Phase Heating Loads requiring Day Boost Water-Heating with afternoon boost</td>
<td>37</td>
</tr>
<tr>
<td>D6</td>
<td>Economy 7 - Single Phase Heating Loads requiring Day Boost Water-Heating</td>
<td>38</td>
</tr>
<tr>
<td>D7</td>
<td>Economy 7 - Single Phase Boiler Heating Loads requiring Day Boost Water-Heating (with afternoon boost)</td>
<td>39</td>
</tr>
<tr>
<td>D8</td>
<td>Typical Communal Metering Arrangement for up to 6 Points of Connection with a Total Combined Maximum Import Capacity up to 70kVA (100A per Phase)</td>
<td>40</td>
</tr>
<tr>
<td>D9</td>
<td>Typical Communal Metering Arrangement for more than 6 Points of Connection with a Total Combined Maximum Import Capacity up to 70kVA (100A per Phase)</td>
<td>41</td>
</tr>
<tr>
<td>D10</td>
<td>Preferred Servicing Arrangement for External Meter Cubicle (Cable Ducted in Wall Cavity)</td>
<td>42</td>
</tr>
<tr>
<td>D11</td>
<td>Alternative Servicing Arrangement for External Meter Cubicle (Surface Cable)</td>
<td>43</td>
</tr>
</tbody>
</table>
Commercial Arrangements
C1 Three Phase - General Power
C2 Economy 7 - Three Phase - General Power
   Single Phase - Heating Load (up to 80A)
C3 Economy 7 - Three Phase - General Power
   Single Phase - Heating Load (up to 80A)
   Water heating (with Afternoon Boost)
C4 Economy 7 - Three Phase - General Power
   Single Phase - Heating Load (up to 80A)
   Water heating (with Afternoon Boost)
C5 Economy 7 - Three Phase - General Power
   Three Phase - Heating Load
C6 Typical Layout for Connection of Sprinkler System

Metering Provisions
M1 Unmetered Double Insulated Connection Installation
M2 Unmetered Conventionally Earthed Connection Arrangement
M3 Typical Single Phase Temporary Connection Arrangement
M4 Typical Three Phase Temporary Connection Arrangement
M5 Caravan park - Suggested Layout for Switchgear

Standby Generators
SG1 Typical Fixed Standby Generator Arrangement
Foreword

This document is issued by Northern Ireland Electricity Limited (NIE) and covers the arrangements for the connection of customers’ electrical installations to the NIE low voltage (400V three phase, 230V single phase) distribution system (‘the Distribution System’).

Applications and arrangements for connection of customers’ generators to operate in parallel with the Distribution System is beyond the scope of this document. Further information is available from www.nie.co.uk/Connections/Generation-connections.

The document is intended to be read by persons competent in the design, construction and testing of electrical installations. This document is not exhaustive and in certain instances it may be necessary to consult with NIE.

Introduction

It is NIE policy to connect customers’ installations to the Distribution System safely and efficiently without hindrance to other parties. NIE is prepared to offer appropriate advice and assistance with all queries concerning the provision (and/or alteration) of LV connections to the Distribution System.

This booklet has been written taking into account the following documents:

- **BS7671 (17th Edition)** IET Wiring Regulations
- **BS1361 (1971)** Part 2: Specification for Cartridge Fuses for AC Circuits in Domestic and Similar Premises
- **BS88 (1988, 2007)** Part 2 or Part 6: Cartridge Fuses for Voltages up to and including 1000V AC and 1500V DC
- **ENA ER G12** Requirements for the Application of Protective Multiple Earthing to Low Voltage Networks
- **ENA ER G87** Guidelines for the Provision of Low Voltage Supplies to Multiple Occupancy Buildings
- **ESQCR (NI) 2012** Electricity Safety, Quality and Continuity Regulations (Northern Ireland) 2012
- **HSE Guidance Note GS6** Avoidance of Danger from Overhead Electric Lines
- **HSENI (2012)** Working in Proximity to Low Voltage Overhead Power Lines
- **HSE Booklet HS G47** Avoiding Danger from Underground Services
- **NIE Document** Standard Connection Terms and Conditions for LV Connections
- **NIE Document** Statement of Connection Charges
- **The 1992 Order** The Electricity (Northern Ireland) Order 1992
1.0 Safety and Security of NIE Equipment

NIE is not compelled to commence or continue to give to any customer a connection to the Distribution System unless it is reasonably satisfied that the installation, which is or would be connected thereto is constructed, installed, protected and used (or arranged for use) so as to prevent, so far as is reasonably practicable, either:

(i) danger; or
(ii) interference with the NIE electricity network.

To satisfy this requirement, new electrical installations must comply with both BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended) and ESQCR (NI) 2012.

It is the responsibility of the customer (and their contractor and/or designer) to ensure compliance with these regulations and all other appropriate regulations, standards, conditions, statutory obligations and specifications.

It is the responsibility of the customer to provide a secure, weatherproof location for NIE equipment. Electrical connections to customers’ installations will only be made where NIE is satisfied that the proposed location is suitable in all respects.

Any person working in close proximity to live NIE equipment should contact NIE to request local isolation so that work can proceed safely.

All conductors provided by the customer for connection to NIE’s equipment shall be properly colour coded and sheathed as appropriate. In the event of the coding not being correct, the connection shall not be made.

All site safety should be managed in accordance with HSE Guidance Note GS6 (Avoidance of Danger from Overhead Electric Lines) and HSE Booklet HS G47 (Avoiding Danger from Underground Services). Further information is available at www.niesafety.co.uk/index
2.0 Procedure for obtaining a Low Voltage (LV) Connection to the Distribution System

2.1 Initial Enquiry and Plans

Applications for an LV connection to the Distribution System should be made online at www.nie.co.uk/Connections or in writing, to NIE Central Processing, 57 Dargan Road, Belfast BT3 9JU.

The Applicant must also provide:

- A site location plan;
- A scaled site layout drawing in as much detail as possible, indicating the preferred metering position, if possible; and
- A fully completed application form, with details of loading to include any abnormal loading and types of starting (e.g. welders, motors, geothermal and space heating). Also, if the connection is not to be of a permanent nature, the anticipated duration should be advised.

Information should be provided on the exact nature and magnitude of the proposed connected load, in particular:

- A competent electrical engineer or contractor should estimate the maximum import capacity of the installation. It is the responsibility of the applicant to determine the level of maximum import capacity (previously known as maximum demand) required. This has particular significance for larger electricity connections where the maximum import capacity requested becomes the customer’s chargeable service capacity.
- Motor sizes and method of starting (e.g. star delta, direct on line, variable-speed drive etc.) and frequency of starting. Starting and running currents should be provided.
- Welding loads and types of welder.
- Catering and all heating loads.
- Type of proposed heating system e.g. geothermal, air to heat, oil etc.

Applications for connection should be made as early as possible to avoid delays. It should be noted that the application for electricity connection process could take up to 6-9 months depending on the planning process and information provided. If the connection is not to be of a permanent nature, the anticipated duration should be advised.
2.2 Change of Maximum Import Capacity

In respect of existing connections, it is the responsibility of the customer to advise NIE if they propose or require any increase or decrease in capacity above or below their existing electrical load. Applications for reduced or increased capacity must be agreed with NIE on a case-by-case basis.

If it is necessary for the customer's switchgear arrangements to be altered then any associated costs will be borne by the customer. Any required changes must be agreed with NIE prior to commencement.

- Increased Capacity

Where a customer wishes to increase their maximum import capacity (MIC) then they must make a formal application to NIE. Before submitting the application NIE would strongly advise that the customer contacts their electricity supplier to discuss their requirements.

Additional load must not be connected before all necessary network reinforcement and metering changes have been completed by NIE. Where reinforcement is required by NIE then connection charges will apply, which will be detailed by NIE to the customer in a letter of quotation.

- Reduced Capacity

A customer must make a formal application to NIE if they require their MIC to be reduced, for example, in order to reduce their Chargeable Service Capacity (CSC).

Before submitting the application NIE would strongly advise that the customer contacts their electricity supplier to discuss their requirements. In some instances the customer may be party to a ‘5 Year Agreement’ contract with NIE. Where this is the case, the customer may be required to repay all or part of any subsidy previously given.

2.3 Additional Information

Consideration should be given to potential load growth. NIE may request further information on future development plans relating to the premises, so that the best engineering solution and optimum investment for the site and surrounding area is achieved.

Where a project comprises the refurbishment of existing premises, or major additions to existing load, NIE requires to be advised, in writing, of any proposed increase in load.

2.4 Provision of Quotation

On receipt of all the necessary information, a quotation based on the NIE Statement of Connection Charges (available to download from
All quotations for new LV connections and alterations to existing LV connections are subject to the relevant statutory and regulatory requirements applicable to NIE and to the provision of connections to the Distribution System in general. In addition, any such connections provided by NIE are subject to the current NIE Standard Connection Terms and Conditions for LV Connections and applicants should be aware that the acceptance of an NIE quotation implies the acceptance of these terms and conditions by the applicant.

2.5 Acceptance of Quotation

No further action will be taken by NIE until a quotation is accepted in writing by the applicant (or their agent or representative) and until the appropriate payment, when requested, is received. Any payments due to NIE should be forwarded to Central Process, Dargan Road, Belfast BT3 9JU, quoting the reference number stated on the letter of quotation.

Quotations are valid for a period of 90 calendar days, after which time the existing application will be cancelled unless:

(i) the terms and conditions offered have been accepted; or
(ii) a revised quotation has been requested.

To avoid delays, NIE would strongly recommend early acceptance of any such quotations.

2.6 Statutory Consents

Following acceptance of the quotation by the applicant (or their agent or representative), all necessary statutory and other appropriate consents (including wayleave arrangements, site acquisitions and planning approvals) will be pursued by NIE. It should be noted that this process can, on occasion, lead to considerable delays which are outside the control of NIE.

2.7 Commencement of Site Work

The customer (or their agent or representative) should, giving as much notice as possible, liaise with NIE to agree a mutually acceptable date for the commencement of the site work.

If the connection is being provided for domestic premises it may be possible at an early stage to complete the installation including metering. See following Section 2.7 - Provision of Metering.
2.8 Provision of Metering

In order for metering to be provided and for the connection to be energised, the following two conditions must be met:

i. The customer must have entered into a contract with an electricity supplier who operates within Northern Ireland. It is the responsibility of the electricity supplier to request NIE to install metering equipment and energise the connection.

ii. A completed Connection Card must be signed by a competent person declaring that the electrical installation has been wired in accordance with BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended).

2.9 Additional Visit Charges

In the event of an installation not being connected because of non-compliance with the requirements of this document, an additional visit charge may be levied and this shall be payable (before the connection is energised) to:

Northern Ireland Electricity
SRU Department
Pennybridge Industrial Estate
Larne Road
Ballymena
BT42 3HB
3.0 General Technical Information and Requirements

3.1 Point of Connection

NIE’s responsibility extends to the point of connection. The customer and the electrical contractor signing for the installation accept responsibility for the electrical installation from that point.

3.1.1 Domestic and Small Commercial Premises

The point of connection in domestic and small commercial premises is normally the outgoing terminals of the meter. However in multiple tenancy premises, the point of connection may, subject to agreement with NIE, be the outgoing terminals of the main cut-out at the intake position.

3.1.2 Commercial/Industrial Installation

The point of connection in large installations is normally the outgoing terminals of the NIE cut-outs or the incoming side of the current transformer (CT) chamber in the case of a switchgear termination (see Figs G4 and G5 for guidance).

3.2 General Characteristics of LV Connections

3.2.1 Frequency and Voltage

Low voltage supply connections provided by NIE, unless otherwise stated by NIE in writing, will be alternating current (ac) at a frequency of 50 Hertz (+/- 2.5%) and voltages of 230 volts (+10/-6%) single phase and 400 volts (+10/-6%) three phase.

3.2.2 Phase Identification

All meter conductors for connection to NIE equipment shall be properly identified and marked as appropriate. In the event that the colour coding or markings are not correct, the connection will not be provided. It is NIE policy to mark three phase cables as ‘L1’ (Brown), ‘L2’ (Black) and ‘L3’ (Grey) and the neutral as ‘N’ (Blue).

3.2.3 Phase Rotation

Apart from the Belfast district area of NIE, phase rotation will normally be L1-Brown, L2-Black, L3-Grey (L1-Red, L2-Yellow, L3-Blue) in time sequence. Within Belfast district phase rotation will normally be L3-Grey, L2-Black, L1-Brown (L3-Blue, L2-Yellow, L1-Red) in time sequence. Phase rotation will normally be advised by NIE via a letter of terms for new connections. It is the responsibility of customers, or contractors acting on their behalf, to check phase rotation prior to connecting equipment.

3.2.4 Phase Balance

In respect of three-phase connections, the customer must ensure that the total load is balanced as accurately as possible over the three phases of the
connection ensuring compliance with NIE’s planning standard **Engineering Recommendation (ER) P29, ‘Planning Limits for Voltage Unbalance in the UK for 132kV and below’.**

### 3.2.5 Prospective Short Circuit Current and External Earth Loop Impedance

The following values are given for guidance only as a basis for design of the customer’s electrical installation. They may be regarded as typical values however the actual values will be site specific.

It is the responsibility of the customer’s designer and electrical contractor to ensure compliance with **BS7671 (IET Wiring Regulations 17th Edition, 2011)** (as amended) with respect to total Earth Loop Impedance ($Z_e$) and Prospective Short Circuit Current ($I_{sc}$) values. It should be noted that NIE reserves the right to alter connection arrangements in which case the actual values may change.

<table>
<thead>
<tr>
<th>Prospective Short Circuit Current at Point of Connection ($I_{sc}$)</th>
<th>From Ground Mounted Transformer (up to 800kVA)</th>
<th>16,000A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From Ground Mounted Transformer (up to 1000kVA)</td>
<td>27,000A</td>
</tr>
<tr>
<td></td>
<td>From Pole Mounted Transformer/Low Voltage Network System</td>
<td>10,000A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External Earth Loop Impedance ($Z_e$)</th>
<th>Single Phase (up to 100A)</th>
<th>Three Phase (&lt;200A)</th>
<th>Three Phase (200-300A)</th>
<th>Three Phase (&gt;300A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN-C-S System</td>
<td>0.35Ω</td>
<td>0.35Ω</td>
<td>0.2Ω</td>
<td>0.15Ω</td>
</tr>
</tbody>
</table>

The maximum Earth Loop Impedance ($Z_e$) of a TN-S system shall not exceed 0.8Ω.

The maximum Earth Loop Impedance ($Z_e$) of a TT system (including the customer’s earthing electrode) must not exceed 200Ω.

In exceptional circumstances hybrid earthing arrangements may be considered and, where appropriate, agreed with NIE on a case-by-case basis.
3.3 Service Arrangements

The preferred method of providing an LV connection is via an outdoor meter cubicle and an underground service where possible.

All NIE equipment shall preferably be fitted at ground level, but not greater than 1200mm from floor level to the centre point of the meter position.

Outdoor meter cubicles are to be provided and maintained by the customer.

In order to minimise the cost of providing connections to customers it is NIE policy to offer the customer the option of carrying out the excavation and reinstatement (with instruction from NIE) of the cable service track, particularly on their own property. The location of all metering positions and the route of all service cables must be agreed with NIE prior to excavation.

3.3.1 Underground Services

Where practicable, LV connections shall be low level via an outdoor meter cubicle, with the cable entry to the left hand side of the meter board. For all services, the centre point of the meter position shall not be higher than 1200mm. The customer must provide a suitable cable entry duct from below ground level into the meter cubicle. Details and requirements for meter cubicles and cable entry shall be detailed in the NIE offer of connection to the customer. Underground service arrangements are shown in Figs D10 and D11.

All service cables shall be laid at a depth of 450mm below finished ground level and when excavation and reinstatement is undertaken by the customer this level must be strictly adhered to. NIE will normally lay and terminate the service cable.

Service cables shall normally be laid directly within cable trenches with the exception of the following instances where they must be laid in ducts:

- road crossings
- driveway crossings
- through landscaped gardens
- river crossings
- bridge crossings

Service cables may be laid in ducts elsewhere, where required and agreed with NIE, for example within the grounds of new housing developments.

At the customer’s request, and where conditions allow, it may be suitable to lay all or part of the service cable within customer’s property directly in a cable trench without ducts from the nearest point on the NIE network to the
customer’s intake position. A duct must be provided from the point of entry in to the building to the meter cubicle.

All ducts installed on public property shall be red in colour, while ducts on private property may be black or red. Acceptable sizes of ducts are 38/32mm (outer diameter/inner diameter), 110/100mm and 160/150mm. The duct shall be embossed with, ‘DANGER ELECTRICITY’, throughout its length and be used for NIE equipment only.

Ducts must be laid in continuous or coupled lengths, complete with a strong ‘draw rope’. Where ducts are installed by the customer, the onus is on the customer or their appointed contractor to ensure the ducts are adequate for installation of NIE cable. Cables installed in ducts must have the appropriate derating factors applied.

If a service cable cannot physically be installed in a 38/32mm duct over long lengths then the service cable may be laid in a 110/100mm or 160/150mm PVC duct.

Where a customer provides the trenching for a service cable, the dimensions should be 550mm deep by 400mm wide. Where services or mains cables are to be installed in public or third party property, the details for trenching shall be agreed with NIE, and where necessary, will be included in the offer of terms.

Requirements of trench dimensions, cable blinding and bedding material will be detailed in the NIE offer of connection.

- **Preferred Arrangement: Outdoor Meter Position**
  
The preferred metering arrangement is an outdoor recessed meter cubicle with the cable installed within the cavity of the premises housed in a black or red 38/32mm duct as per Fig. D10. The duct shall be embossed with, ‘DANGER ELECTRICITY”, throughout its length and be used for NIE equipment only. The 38/32mm duct must emerge in to the bottom left hand side of the outdoor cubicle to facilitate sealing.

- **Alternative Arrangement #1: Outdoor Meter Position**
  
Upon written request and at the discretion of NIE, consideration may be given to an alternative position for the main fuse and metering equipment only when it is not practicable to install a 38/32mm duct within the cavity. An alternative outdoor position may be offered where practicable. The cable may be surface mounted and clipped to the outside wall and housed in a cable guard or high impact PVC conduit as per Fig D11.

A 38/32mm duct must be provided with an easy sweep bend terminating at ground level to facilitate sealing by NIE, embossed with, ‘DANGER ELECTRICITY’, throughout its length, for NIE equipment only. The surface
mounted cable will be clipped to the outside wall, protected within a cable
guard or high impact conduit.

- **Alternative Arrangement #2: Indoor Meter Position**

Only where prior agreement with NIE is made, it may be possible to facilitate
an indoor meter position for domestic and small commercial buildings. An
internal meter cubicle position may be acceptable provided that the meter
cubicle is located as close as possible to the front entrance of the building to
facilitate ease of access. In such circumstances the service cable must run no
more than 3000mm inside the building (see section 3.5).

Where existing NIE mains cables are at the rear of the property, consideration
may be given to locating the new meter cubicle at the rear entrance of the
building. As above, the service cable must run no more than 3000mm inside
the building.

The position of indoor meter arrangements for large commercial buildings will
be dealt with by NIE on a case by case basis.

The meter cubicle must be mounted on an external wall and a minimum
space of 300mm wide must be left between the inside edge of the meter
cubicle and the meter itself.

For all indoor single phase domestic meter arrangements, cable services shall
be laid in a black/red 38/32mm duct within a 110/100mm minimum diameter
black/red PVC duct.

For indoor three phase commercial/multiple tenancy metering arrangements,
cable services shall be laid in a 160/150mm minimum diameter duct.

All ducts must be embossed with, ‘DANGER ELECTRICITY’, throughout their
length, be used for NIE equipment only and have an easy sweep bend rising
internally so as to terminate 150mm to 200mm from the left hand side of each
meter cubicle at finished floor level to facilitate sealing by NIE.

Ducts must be laid in continuous or coupled lengths, complete with a strong
‘draw rope’ at a depth 450mm below finished ground level along the total
length to the intake position (as per Figures G1 to G6).

- **Duct Sealing**

All ducts must be sealed after cable installation by NIE with a suitable gas-
proof re-enterable seal.

For outdoor metering arrangements, the resultant gap between the 38/32mm
duct and the service cable, the gap between the 38/32mm duct and the meter
cubicle and the gap between the 160/150mm PVC duct (if present) and the
38/32mm duct shall be sealed by NIE following the installation of the service
cable to prevent the possibility of gas entering the premises.
For indoor metering arrangements, the resultant gap between the 38/32mm duct (if present) and the service cable, the gap between the 110/100mm or 160/150mm PVC duct and the 38/32mm duct shall be sealed by NIE following the installation of the service cable to prevent the possibility of gas entering the premises.

3.3.2 Overhead and Undereave Services

For overhead and undereave services, the preferred arrangement is via a non-metallic lead-in tube through the external wall. Lead-in tubes, where required, may be supplied by NIE, normally for installation by the customer.

Entry of overhead and undereave services into a customer’s premises is restricted to an external wall immediately inside the property and must be no greater than 2000mm in length.

Indoor NIE equipment shall not be mounted at a height greater than 1200mm above floor level to the centre point of the meter position.

3.4 Metering and Termination Arrangements

3.4.1 Single Phase

Single phase whole current meters will be used to measure single phase loads up to 80A (18kW) in domestic and small commercial installations. Single phase metering arrangements are shown in Figs D1 to D11.

3.4.2 Three Phase

Normally, three phase whole current meters will be used to measure three phase loads up to a maximum of 100A per phase (70kVA). Meters with matching current transformers (CTs) will be used to measure loads in excess of 100A per phase. Three phase metering arrangements are shown in Figs C1 to C5.

If requested, NIE may provide, at additional cost to the customer, a switching facility to ensure the simultaneous switching of a customer’s load contactors with tariff switching times.

3.4.3 Termination Arrangements

Termination arrangements should be agreed with NIE prior to commencement of site work.

For loads of up to 400A per phase (277kVA), NIE may supply and fit a fused cut-out. Fuses up to 100A will normally comply with BS1361 (Part 2 Specification for Cartridge Fuses for AC Circuits in Domestic and Similar Premises, 1971), and fuses greater than 100A will comply with BS88 (Part 2 or Part 6 Cartridge Fuses for Voltages up to and including 1000V AC and 1500V DC, 1988).
For loads in excess of 400A per phase (277kVA) the customer shall provide a
termination chamber and a main incomer in the form of an automatic circuit
breaker or switch-fuse matched to the capacity of the electricity connection
available.

For loads in excess of 100A per phase, a separate CT chamber must be
provided.

There is also a facility for providing connections at high voltage (HV). Arrangements for HV connections are beyond the scope of this document and
enquiries should be addressed to NIE.

Failure to advise NIE of the connection of additional load may result in the
customer being held liable in the event of damage imposed on NIE
equipment.

3.5 Location of Meter Positions
(See also Section 3.6 Multiple Tenancy Premises).

NIE, in its role as common services provider to the market, has the right of
final determination on the location of the metering equipment in a customer’s
premises. Only one metering position will be permitted within single tenancy
premises.

Meter positions should be selected on the basis that conditions are secure
and dry and that the route length of the service is kept as short as possible to
minimise voltage drop. Meter positions should be located as close as possible
to an entrance to facilitate ease of access. There should be adequate space
to allow safe access and working.

For safety considerations, NIE will not permit the location of meter positions
for new-build commercial premises in stairwells and foyers which are the sole
means of escape from upper floors. In existing premises (which may be
undergoing refurbishment), it may be permissible to locate meter positions in
such locations providing the meter position is enclosed within fire protective
building materials. It is the responsibility of the customer to ensure compliance
with the Building Regulations (NI) 2012 (as amended) on appropriate
means of escape in the event of a fire.

It is not acceptable for metering positions to be located under stairs, in
bedrooms, toilets, washrooms, cellars, boiler rooms or fuel stores. Meter
positions are not generally accepted in generator rooms. However in
exceptional circumstances, with prior agreement with NIE, where the
generator room is clean and meets the requirements of the Control of Noise
at Work Regulations (NI) 2006 (as amended), then the location of a meter
position within a generator room may be considered, where the noise level is
less than 80dB.
Clearance requirements for indoor and outdoor meter positions from low and high pressure gas installations are outlined in Table 1 below.

<table>
<thead>
<tr>
<th></th>
<th>Low Pressure Gas Installation</th>
<th>High Pressure Gas Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor</td>
<td>300mm</td>
<td>1150mm</td>
</tr>
<tr>
<td>Outdoor</td>
<td>500mm</td>
<td>1550mm</td>
</tr>
</tbody>
</table>

In damp, dirty, dusty and/or corrosive conditions the customer will be expected to provide an IP54 rated non-metallic cubicle to contain metering equipment.

Any outdoor meter cubicle shall be directly accessible from the main entrance driveway, positioned on the front elevation of the dwelling or on the gable wall within 2000mm of either corner of the front elevation. Further requirements for outdoor meter cubicles are given in Section 4.2.1.

If an indoor meter position is granted, underground services shall not enter more than 3000mm inside the building/generator room and overhead and undereave services shall not enter more than 2000mm inside the building/generator room.

For normal single phase metering installations the space requirements are 600mm high by 400mm wide by 210mm deep, and this space is reserved exclusively for NIE equipment (see Fig G1).

For normal three phase 100A whole current metering installations the requirements are 600mm by 600mm by 210mm deep, and this space is reserved for NIE equipment (see Fig G1).

For current transformer (CT) metering installations the requirements are 400mm high by 600mm wide by 250mm deep for three phase, or 400mm high by 400mm wide by 250mm deep for single phase (see Fig G7).

Metering installations shall be in a lockable cubicle to be provided for that sole purpose, and not used as a general store.

The meter cubicle should be constructed so that there is a minimum of 300mm between the bottom edge of the meter board and finished floor level. The maximum height for mounting NIE equipment outdoors is 1200mm above ground level or finished floor level indoors to the centre point of the meter position. The vertical edges of the meter board should be a minimum of 300mm from any adjoining wall. Typical arrangements are shown in Figs G1 to G7.
3.6 Multiple Tenancy Premises

A centralised communal meter position is the preferred method of metering in multiple tenancy premises. This location should be designated solely for the housing of NIE service and metering equipment and the customer’s distribution switchgear. The location should be adjacent to the point of connection. Typical metering arrangements for multiple tenancy premises are shown in Figs G6, D8 and D9.

For Houses of Multiple Occupancy (HMOs), NIE will not provide multiple meters.

The use of unmetered mains and additional metering points may be considered in large multi-story developments where, due to the limitations imposed by the electrical design, it is not considered reasonable to establish a single communal metering point. In such circumstances NIE may agree to such an arrangement providing certain conditions are complied with as follows:

i. A request is received in writing and such request is agreed prior to the commencement of the associated installation work.

ii. The proposed installation must conform to the recommendations set out in the Energy Networks Association ER G87 ‘Guidelines for the Provision of Low Voltage Supplies to Multiple Occupancy Buildings’.

iii. The design of the internal network should seek to minimise the amount of unmetered equipment installed at all times. This is to be achieved by establishing individual communal metering points at strategic points located within the building and serviced via rising mains from the point of connection. Metering within individual apartments will not be acceptable. Separate meter points must be provided for electricity connections to the landlord and for building fire alarms.

iv. In small to medium sized premises, the rising mains must comprise either a steel wire armour, split concentric or similar approved cable designed, selected and be installed in accordance with BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended). In very large developments the rising mains may take the form of a sealed rising busbar arrangement. In all cases the rising mains must be installed in communal areas. All associated equipment shall be sealable and accessible by NIE.

v. The ‘Point of Connection’ will be established at the point where the Distribution System connects to the customer’s equipment, and the

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1 Available to purchase from Energy Networks Association, 6th Floor, Dean Bradley House 52 Horseferry Road, London, SW1P 2AF

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owners of the said property must therefore accept the responsibilities of the 'Building Network Operator' (BNO) as defined in ER G87. This places the responsibility for operation, maintenance and replacement of the unmetered network within the building, with the BNO, not with NIE.

vi. The unmetered network within the building must be complete and sealed by NIE before connection to the building is energised.

vii. A CT chamber with removable links shall be provided at the point of connection to facilitate the installation of check metering as and when required.

The final letting arrangements for office blocks, enterprise units, flats etc. seldom become apparent until a very late stage, and therefore adequate provision for the various metering permutations should be considered at the design stage and prior to the erection of the main switchgear or design of the main switchboard if appropriate. This should avoid costly alterations and delays at the final connection stage.

Metering to flats, workshops, multi-customer installations, will not be completed unless permanent means of identification, such as suitably inscribed three ply plastic labels, are provided on switchgear and for metering at each point of connection (at both ends).

In all instances where current transformers are to be used, suitable CT chambers must be provided by the customer to house the metering CTs. The chamber shall be complete with removable links to facilitate fitting and removal of CTs. Provision should also be made on the incoming side of CT chambers for the connection of potential fuse connections (6mm diameter holes in bars).

The service unit and main isolator must have the facility to allow sealing lug to be fitted.

- **Dimensions of Metering Equipment**

In multiple metering installations typical meter (only) dimensions are as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Phase</td>
<td>200mm high by 200mm wide</td>
</tr>
<tr>
<td>Single Phase, inc. Economy 7 Heating</td>
<td>350-400mm high by 420mm wide</td>
</tr>
<tr>
<td>Single Phase, inc. Economy 7 Heating &amp; Water Heating</td>
<td>350-400mm high by 520mm wide</td>
</tr>
<tr>
<td>Three Phase, inc. Economy 7 Heating</td>
<td>350-400mm high by 460mm wide</td>
</tr>
<tr>
<td>Three Phase, inc. Economy 7 Heating &amp; Water Heating</td>
<td>350-400mm high by 630mm wide</td>
</tr>
</tbody>
</table>

**Note:** All metering installations above shall have depth dimensions of 210mm.
NIE may use metering equipment of reduced/increased dimensions as technology allows. The above dimensions are for guidance only and detailed metering space requirements should be confirmed with NIE.

A clear working space of 1 metre must be left in front of the switchboard to facilitate connection.

Where there is a communal metering position, it should be noted that the metering equipment and associated plant is the property of NIE and the landlord is responsible for the following:

- Providing adequate protection for the above equipment;
- Safeguarding of such equipment against any loss or damage;
- Making available to NIE a front door key and a meter cubicle key to facilitate meter reading; and
- Ensuring that each tenant has access without restriction to the meter position.

For apartment block metering up to six apartments, a space of minimum dimensions 600mm high by 600mm wide and 210mm deep shall be provided (as per Fig. G1) to facilitate termination of the incoming NIE service cables.

For apartment block metering with more than six apartments, a space of minimum dimensions 1150mm high by 700mm wide and 410mm deep shall be provided (as per Fig. G6) to facilitate termination of the incoming NIE service cables.

For additional meters, adjacent spaces of 200mm high by 200mm wide by 210mm deep may be required to accommodate each of NIE’s metering equipment.

3.7 Earthing Arrangements

It is the customer’s responsibility to ensure that their installation is adequately earthed. Where possible and subject to operational constraints NIE will make available either a TN-C-S or TN-S earthing facility at the service intake position as per the requirements of ESQCR (NI) 2012. The type of earthing facility will be stipulated in the NIE letter of quotation.

A separate main earth terminal in accordance with BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended) should be provided by the customer/contractor adjacent to the meter position.

- Protective Multiple Earthing (TN-C-S)

Protective Multiple Earthing (TN-C-S) is the preferred system of earthing for new connections. The customer’s electrical installation must comply with the

TN-C-S is provided only by NIE at the point of connection in accordance with the general conditions of connection. Unmetered networks within multiple occupancy premises shall be installed with a Separate Neutral Earth (SNE) earthing system.

TN-C-S will not be offered to the following:

- Caravans/Mobile Homes
- Boating marinas
- Swimming pools
- Leisure centres
- Construction sites
- Fuel filling stations
- Farm out houses/barns
- Temporary builders’ connections
- Multiple occupancy individually serviced steel framed buildings

If TN-C-S earthing facilities are used in premises where a caravan, a swimming pool or fuel pumps (where there is electrical separation between the fuel pump/canopy and the associated premises) are connected, the TN-C-S bonding MUST NOT be extended to include these items. They must be supplied by circuits protected by sensitive Residual Current Devices (RCDs) and the metalwork must be separately bonded via the earth continuity conductor and separately earthed outside the resistance area of the TN-C-S earth.

Only TT connections shall be provided for new or refurbished buildings whose sole purpose is a fuel filling station (i.e. where there is no associated shop). It is NIE policy not to provide TN-C-S or TN-S connections to fuel filling stations as it cannot guarantee that the neutral and protective conductors are separate throughout the system. All new connections and refurbishments of fuel filling stations shall have TT earthing arrangements.

With the provision of a TT supply, it is critical that Class II insulated housing (e.g. GRP type construction) is used for NIE delta box, CT and metering cubicles. Metallic enclosures are not permitted as these would need to be earthed by NIE and therefore compromise the TT earthing arrangement.

3.8 Switch-panel Design

NIE provides a service of inspection and approval of switch-panel drawings in respect of connection arrangements. All drawings should be approved by NIE (Metering Services) prior to manufacture so that the customer’s requirements and obligations can be addressed. Typical switch-panel arrangements are shown in Figs G4 to G6.
If a switch-panel is to be extended or altered to facilitate increased load or additional customers, a drawing showing the proposed alteration must be submitted to NIE and approved prior to commencement of the work.

### 3.8.1 Metering Enclosures

Metering enclosures, if incorporated, should have hinged covers and twist-turn door handles. It is recommended that locking arrangements for metering compartments do not consist of special keys or tools.

### 3.8.2 Current Transformer Enclosures

A separate chamber to house metering CTs must be provided. The customer may wish to provide an individual metering cubicle, separate from the switch-panel. In this event the metering enclosure should be in close proximity to the CT enclosure (see Fig G3).

Metering cubicles, whether separate or combined in switch-panels, shall comply with Ingress Protection IP54 rating on the environmental protection that the enclosure provides, for protection, security and accuracy of NIE equipment. Any variation to this is to be agreed with NIE.

It may be advantageous to offset the L2-Black (Yellow) CT link forward in the CT chamber to reduce the overall dimensions of this compartment. This requirement will be identified in writing and shall be subject to approval by NIE prior to manufacture.

### 3.8.3 Overall Design and Layout

Flexible/solid conduit shall be provided within switch-panels to route CT secondary leads from metering to CT chambers, to protect wiring and maintain separation from customers’ wiring. Where separate metering cubicles are used, a PVC conduit should be provided between the cubicle and switch-panel.

Conduits should be 25mm diameter and of high impact PVC or similar material. In larger installations it may be necessary to provide PVC trunking for secondary cables. All compartments within switch-panels including the service cable intake chamber, must be completely separate, divided with suitable noncombustible insulating material and be complete with floors.

All switch-panel compartments containing unmetered connections must be capable of being sealed, and the customer should arrange for the necessary external sealing facilities to be included on the panel.

Where live connections are exposed to touch when panel covers have been removed (e.g. cable intake compartment), a clear Perspex protective guard shall be fitted across the connections to prevent inadvertent contact with live metal.
3.8.4 Remote Meter Reading

To allow for the connection of a telecommunication line for remote meter reading, a 20mm PVC conduit from the metering compartment to the exterior of the switch-panel shall be provided.

3.8.5 Main Earthing Terminal

A main earthing terminal (MET) should be installed within the switch panel, adjacent to the intake position, and in an accessible position in accordance with BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended).

It is the customer’s responsibility to ensure equipotential earth bonding of all metal work within the premises.

Increasingly other utility services, such as water and gas, enter the premises via mixed metal and plastic systems. Where such a mixed system is installed, e.g. through use of a metal stopcock in conjunction with metal and plastic pipes, then the earth bonding should be extended to include the metal sections of the pipe work. The bonding should be applied to the customer’s side of any meter, stopcock or insulating insert. Where entirely plastic systems are used, including a plastic stopcock, it is not necessary to extend the MET.

3.9 NIE Cut-out Seals

All access to meter enclosures, CT enclosures, busbars and all other possible points of access to unmetered connection terminals or conductors shall be rendered inaccessible by making provision for a seal which is affixed by NIE. All such unmetered apparatus must be capable of accepting an NIE seal at a surface-mounted fixing point. Such seals must be visible for inspection at all times. Sealing the fixing screw to a fixed point is essential. Sealing holes drilled in covers which allow for sealing wire to enter enclosures containing live conductors, are unacceptable.

Fitting and the removal of seals shall be undertaken by NIE staff (or their authorised agents) only.

3.10 Labelling

All compartments must be clearly labelled detailing the duty, current rating and voltage (if necessary).

Labels must be of permanent and durable material such as inscribed three ply plastic. It is important that they are in place before the connection is energised. Where possible, labels should be fixed to the chassis of switch-panels (not on covers) to eliminate the potential danger of the interchange of panel covers.
Any electricity connections taken from the live side of the main incomer, such as those for sprinkler systems, must be labelled, and should be clearly visible to the operator.

3.11 Customer Materials

The customer shall provide all trunking, conduits, cables and connections after the NIE service cable terminations.

Load cables for connection to whole current meters or CTs must be of stranded copper conductor. Multi-stranded flexible cable, if used, must be fitted with copper ferrules (whole current meters) or lugs (for CT meters). Cables for connection to NIE fused cut-outs should be of stranded copper. Maximum conductor size that can be fitted into NIE whole current meters or cut-outs is 35mm.
SINGLE/THREE PHASE METERING EQUIPMENT ON OPEN BACK BOARD IN SWITCHROOM USING LOOSE SWITCHGEAR

MAXIMUM IMPORT CAPACITY RANGE UP TO 70KVA

SERVICE: 35mm² Hybrid cable to standard cut-out

Note:
All dimensions are in mm and are minimum requirements except where indicated.
All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.

FIG. G1
SINGLE/THREE PHASE WHOLE CURRENT METERING
EQUIPMENT ON AN OPEN BACKBOARD IN SWITCHROOM
USING LOOSE SWITCHGEAR

MAXIMUM IMPORT CAPACITY RANGE UP TO 70 KVA

SERVICE: 95mm$^2$ Waveform cable to heavy duty cut-out

Note:
All dimensions are in mm and are minimum requirements except where indicated.
All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.

FIG. G2
THREE PHASE CURRENT TRANSFORMER METERING EQUIPMENT ON AN OPEN BACKBOARD IN SWITCHROOM USING LOOSE SWITCHGEAR

MAXIMUM IMPORT CAPACITY RANGE 70–138KVA

Three Phase Service: 95mm² Waveform cable to heavy duty cut-out

Note:
All dimensions are in mm and are minimum requirements except where indicated.
Clear space required for heavy duty cut-out is 700x1150x450.
Exact dimensions are to be agreed with NIE engineer prior to connection.
All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.
Existing customers with a ducted installation wishing to increase their demand, must consult with NIE for increased cable sizes. For an alternative arrangement refer to Fig. G5.

FIG. G3
THREE PHASE CURRENT TRANSFORMER METERING EQUIPMENT INSTALLED IN PURPOSE MADE SWITCHPANEL

MAXIMUM IMPORT CAPACITY RANGE 70–138KVA

Three Phase Service: 95mm² Waveform cable to heavy duty cut-out

Note:
All dimensions are in mm and are minimum requirements except where indicated.
All compartments housing NIE equipment must be sealable.
Exact dimensions are to be agreed with NIE engineer prior to connection.
All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.
Existing customers with a ducted installation wishing to increase their demand must consult with NIE for increased cable sizes. For an alternative arrangement refer to Fig. G5.

FIG. G4
THREE PHASE CURRENT TRANSFORMER METERING EQUIPMENT INSTALLED IN PURPOSE MADE SWITCHPANEL

MAXIMUM IMPORT CAPACITY RANGE >138KVA

Parallel three phase service: 185mm$^2$–300mm$^2$ Waveform cable to heavy duty cut-out or direct to switchgear

Note:
All dimensions are in mm and are minimum requirements except where indicated.
Exact dimensions are to be agreed with NIE engineer prior to connection.
If metering cubicle is to be separate item then it shall be located adjacent to CT chamber.
The position of the metering cubicle is combined within the switch-panel.
The length of the 25mm PVC conduit shall be less than 2000mm.
All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.

FIG. G5
TYPICAL SWITCHPANEL LAYOUT FOR MULTIPLE TENANCY INSTALLATION WITH CENTRALISED METERING

Note:
All dimensions are in mm and are minimum requirements except where indicated.
All units must be permanently numbered before connection of supply.
All switchgear including metering equipment must be labelled before connection of supply.
All enclosures containing unmetered equipment must have sealing facilities.
All individual connections >70kVA shall require a C/T chamber and additional metering space.
Any compartment housing NIE Equipment must have a facility for sealing.
Exact dimensions are to be agreed with NIE engineer prior to connection.
For Key-pad specifications see Section 4.4.
All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.

FIG. G6
CT METERING REQUIREMENTS

Current Transformer Dimensions

<table>
<thead>
<tr>
<th>Customer’s Load Amps / 5</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>54mm</td>
<td>80mm</td>
<td>46mm</td>
</tr>
<tr>
<td>300</td>
<td>54mm</td>
<td>83mm</td>
<td>46mm</td>
</tr>
<tr>
<td>500</td>
<td>67mm</td>
<td>100mm</td>
<td>31mm</td>
</tr>
<tr>
<td>800</td>
<td>69mm</td>
<td>100mm</td>
<td>32mm</td>
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<tr>
<td>1000</td>
<td>68mm</td>
<td>100mm</td>
<td>33mm</td>
</tr>
<tr>
<td>1500</td>
<td>82mm</td>
<td>117mm</td>
<td>35mm</td>
</tr>
<tr>
<td>2000</td>
<td>82mm</td>
<td>117mm</td>
<td>36mm</td>
</tr>
</tbody>
</table>

Note:
All dimensions are a minimum requirement except where indicated.
Metering cubicles shall be to IP54 rating, for protection, security and accuracy of NIE equipment.
Metering cubicle & CT chamber should be adjacent to each other.
CT chamber must have removable links
CT chambers must be capable of accepting an NIE seal at a surface mounted fixing point.
On TT Earthing Systems the CT chamber shall be of a Class 2 Type.

FIG. G7
DUCT SEAL (OUTDOOR METER POSITION)

Resultant gap between 38/32mm duct and service cable must be sealed by NIE using an Approved gas- and water-proof re-enterable seal.

FIG. G8A

DUCT SEAL (SINGLE PHASE INDOOR METER POSITION)

Resultant gap between 38/32mm duct and service cable and gap between 110/100mm duct must be sealed by NIE using an Approved gas- and water-proof re-enterable seal.

FIG. G8B

Note:
The resultant gap between a three phase service cable terminating in an indoor meter position via a single 110/100mm duct must be sealed by NIE using an approved gas- and water-proof re-enterable seal.
4.0 Domestic Premises

These requirements are supplementary and additional to the general requirements set out in Section 3 and must be read in conjunction with that section.

4.1 Size of Load

Domestic loads up to 18kW will normally be provided via a single phase 80A electricity connection. Loads in excess of 18kW will normally be provided via a three phase connection and the arrangements shown for commercial and industrial premises, as shown in Section 6, would apply.

4.2 Metering Arrangements

Metering arrangements for single phase domestic connections are shown in Figs D1 to D11. Three Phase metering arrangements are shown in Section 6 Figs C1 to C5.

The standard method of meter housing for domestic premises is in outdoor meter cubicles. This provides a higher level of customer service by facilitating regular meter reading and minimising inconvenience to customers.

4.2.1 Earthing Terminal

The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

4.2.2 Outdoor Meter Cubicles

All new connections to the Distribution System must be in the form of an outdoor meter cubicle compliant with ESI Technical Specification 12-3 (1992). Suggested methods of installation are shown previously in Figs D10 and D11. Door locks should be of the spring loaded type to facilitate self-latching. It is the responsibility of the customer to maintain and repair all damaged/missing meter cubicle doors.

The preferred arrangement for a traditionally constructed (brick) house with an 80A electricity connection or less is a recessed outdoor meter cubicle with service cable entry by means of a 38/32mm diameter duct installed in the cavity as per Fig. D10. Either, a gap of 100mm either side of the 38/32mm duct must be clear of cavity insulation or the 38/32mm duct shall be fixed to the inner surface of the outside wall. If the connection is via a parallel service then an additional 38/32mm duct shall be provided.

An alternative outdoor meter arrangement may be granted with prior consent from NIE, as per Fig. D11 involving a recessed outdoor meter cubicle with the cable secured to the outside wall protected by a cable guard.
Only where an outdoor metering arrangement cannot be facilitated, upon written request and at the discretion of NIE, consideration of an alternative position to site the mains fuse and metering equipment indoors may be granted.

The customers’ meter conductors (maximum length 3000mm) must exit the meter cubicle to the bottom right hand corner to prevent the ingress of water into the outdoor meter cubicle. Adequate sealing between the meter cubicle architrave and the external wall shall be provided. If the customer’s meter conductors are greater than 3000mm in length, then a double pole isolation switch of suitable rating must be fitted at the source of electricity connection (after the meter). Where NIE does not provide an earth (TT connection) then a RCD of suitable rating should be fitted in place of the double pole isolator.

4.2.3 Internal Meter Cubicles

The standard method of meter housing for domestic premises is in outdoor meter cubicles and the use of internal meter cubicles must therefore be agreed with NIE prior to the issuing of a quotation for connection. Internal meter cubicles must be located and constructed in accordance with the general requirements of Section 3.

In the event that a premise with an internal meter position requires repositioning, then the service must be moved to an outdoor meter position as per section 4.2.1. In the event of a service cable fault to an indoor meter position, a new cable may be laid to the original meter position.

4.2.4 Keypad Installations

Where installed, Keypad meters shall be fitted at the point of connection. The ‘Freedom’ unit will be fitted, as far as is reasonably practicable, in a position agreed with the customer.

NIE may consider installation of a Keypad meter in an outdoor meter cubicle and installation of the associated Freedom unit inside the premises only when the customer provides access from the outside meter cubicle to inside the premises via a 20mm duct and fish wire. In such circumstances, a position within the premises will be agreed with the customer as far as reasonably practicable.

Keypad meters may also be provided for new communal metering positions provided that the customer installs communication cables (to NIE’s current specification) between the communal metering position (where the Keypad meter is to be installed) and the final supply destination (where the Freedom unit is to be installed). The length of the communications leads between the keypad meter and Freedom unit shall not exceed 120 metres.

The communications cable shall be Modular-type four-way flat 7/0.15T/copper suitable for termination in an RJ11 6/4 data plug. The RJ11 standard face
plate should be 90mmx90mm and be mounted on a surface box level with the bottom of the meter on the left hand side.

4.3 Multiple Tenancy Premises

The general arrangements for multiple tenancy premises are given in Section 3.6 and must be complied with. The requirements relating to remote metering installations may have particular relevance to multiple tenancy premises with Economy 7 installations. The design and installation must be agreed with NIE prior to the commencement of the associated installation work. Arrangements for various domestic multiple tenancy options are shown in Figs G6, D8 and D9.
METERING ARRANGEMENT - STANDARD DOMESTIC

Note:
Cable sizes should be in conjunction with current BS7671 (IET Wiring Regulations 17th Edition, 2011) regulations.
Minimum cable size installed in NIE meter will be 16mm PVC-PVC, maximum shall be 35mm² PVC-PVC.
Minimum clear space on back board for NIE equipment is 600x400mm.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. D1
ECONOMY 7 – STORAGE HEATING (UP TO 80A)

Conventional metering shown
Equipment within chain dotted may be replaced by a radio tele-meter or prepayment type meter

Provided by customer/contractor
NIE equipment

Note:
If customer's meter conductors are greater than 3000mm, then a double pole isolation switch, of suitable rating must be fitted at the source of supply (after the meter) by the customer.
Where NIE does not provide an earth (TT connection) then a RCD of suitable rating should be fitted.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. D2
**ECONOMY 7 – WATER HEATING WITH AFTERNOON BOOST**

**FIG. D3**

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**Note:**

Main live water heating tail must not be broken through ISCO.

Maximum load on water heating is 3kW.

If customer’s meter conductors are greater than 3000mm, a double pole isolation switch of suitable rating must be fitted at the source of supply (after the meter) by the customer.

Where NIE does not provide an earth (TT connection) then a RCD of suitable rating should be fitted.

The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.
ECONOMY 7 – STORAGE HEATING (UP TO 80A) & WATER HEATING WITH AFTERNOON BOOST

Conventional metering shown
Equipment within chain dotted may be replaced by a radio tele-meter or prepayment type meter

General Power

Storage Heating

Time/tele-switch
80A

16mm²

25A

16mm²

2.5mm²

4mm²

Neutral
ISCO

Main Earthing Terminal

Main Bonding

Provided by customer/contractor
NIE equipment

Note:
Main live water heating tail must not be broken through ISCO.
Maximum load on water heating is 3kW.
If customer's meter conductors are greater than 3000mm, a double pole isolation switch of suitable rating must be fitted at the source of supply (after the meter) by the customer.
Where NIE does not provide an earth (TT connection) then a RCD of suitable rating should be fitted.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. D4

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ECONOMY 7 – SINGLE PHASE HEATING LOADS REQUIRING DAY BOOST

Conventional metering shown
Equipment within chain dotted may be replaced by a radio tele-meter or prepayment type meter

Note:
Main live water heating tail must not be broken through ISCO. Maximum load on water heating 3kW
If customer’s meter conductors are greater than 3000mm, a double pole isolation switch of suitable rating must be fitted at the source of supply (after the meter) by the customer.
Where NIE does not provide an earth (TT connection) then a RCD of suitable rating should be fitted.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. D5
ECONOMY 7 – SINGLE PHASE HEATING LOADS REQUIRING DAY BOOST WATER HEATING (WITH AFTERNOON BOOST)

Conventional metering shown
Equipment within chain dotted may be replaced by a radio tele-meter or prepayment type meter

Note:
Main live water heating tail must not be broken through ISCO. Maximum load on water heating 3kW
If customer’s meter conductors are greater than 3000mm, a double pole isolation switch of suitable rating must be fitted at the source of supply (after the meter) by the customer.
Where NIE does not provide an earth (TT connection) then a RCD of suitable rating should be fitted.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. D6

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Note:
Main live water heating tail must not be broken through ISCO. Maximum load on water heating 3kW.
If customer’s meter conductors are greater than 3000mm, a double pole isolation switch of suitable rating must be fitted at the source of supply (after the meter) by the customer.
Where NIE does not provide an earth (TT connection) then a RCD of suitable rating should be fitted.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.
TYPICAL COMMUNAL METERING ARRANGEMENT FOR UP TO 6 POINTS OF CONNECTION WITH A TOTAL COMBINED MAXIMUM DEMAND UP TO 70KVA
(100A PER PHASE)

Neutrals and Earths not shown

Note:
For up to 3 points of connection (POC), one point of connection should be connected per phase.
For 4 to 6 points of connection the above arrangement may be used to a maximum of 100A (2 points of connection per phase). Alternatively a house service unit may be used in place of separate cut-out. All points of connection must be clearly labelled at both ends.
For greater than 6 points of connection a house service fuse board must be used as per FIG. D9.

FIG. D8
TYPICAL COMMUNAL METERING ARRANGEMENT FOR MORE THAN 6 POINTS OF CONNECTION WITH A TOTAL COMBINED MAXIMUM IMPORT CAPACITY UP TO 70KVA (100A PER PHASE)

Neutrals and Earths not shown

Cable size dependant on loading

House service unit provided by customer/contractor

Note:
Installations greater than 6 metered connection points must provide a house service unit. All points of connection must be clearly labelled at both ends.

FIG. D9
Note:
It is the builders’ responsibility to comply with current regulations.
To comfortably accept the above cubicle, builders should provide an opening of
606mm high by 402 wide by 155 deep.
The contractor should ensure that the door hangs so as to allow latch to fall into closed position.
For O/H connections contact NIE before fitting cubicle.
NIE equipment only to be fitted inside exterior cubicle.
Customer meter conductors to enter at the bottom right hand corner.
35mm² under ground service cable only will be used in this instance.
Maintenance of the meter cubicle is the responsibility of the customer.
All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.

FIG. D10
ALTERNATIVE SERVICING ARRANGEMENT FOR EXTERNAL METER CUPRBOARD (WITH SURFACE-MOUNTED CABLE)
(ONLY WHERE D10 IS NOT POSSIBLE - MUST BE PREVIOUSLY AGREED WITH NIE)

Note:
It is the builders’ responsibility to comply with current regulations.
To comfortably accept the above cubicle, builders should provide an opening of 606mm high by 402 wide by 155 deep. The contractor should ensure that the door hangs so as to allow latch to fall into closed position.
For O/H connections contact NIE before fitting cubicle. NIE equipment only to be fitted inside exterior cubicle. Customer meter conductors to enter at the bottom right hand corner. 35mm² under ground service cable only will be used in this instance. Maintenance of the meter cubicle is the responsibility of the customer. All ducts shall be sealed by NIE with an approved gas-proof re-enterable seal.

FIG. D11
5.0 Agricultural & Horticultural Premises

These requirements are supplementary and additional to the general requirements set out in Section 3 and must be read in conjunction with that section.

5.1 Point of Connection

5.1.1 Connection Provided via Domestic Premises

Where a connection to agricultural or horticultural premises is provided via domestic premises, the connection arrangement relating to domestic premises shall apply as shown in Sections 3 and 4.

5.1.2 Connection Provided via Out-house or Outdoor Cubicle

Where a connection is provided to an outhouse or outdoor cubicle a jet proof (Ingress Protection IP55) meter enclosure (600x400x210 single phase), (600x600x270 three phase) must be provided and installed by the customer to house NIE meters. The location of the cubicle should be agreed with NIE beforehand, whether indoor or outdoor.

A connection will not be provided to locations within buildings which are intended for the purpose of housing livestock. A connection may be provided to an outdoor cubicle which is mounted externally on the outside wall of a livestock house but meter cubicles must not be located in positions which could render them liable to damage from livestock, farm machinery, vehicles or any similar potential hazards.

At the discretion of NIE and subject to the written permission of NIE it may be acceptable to provide a connection to a domestic type garage or other outhouse associated with a house without the use of an IP55 enclosure. Such permission will only be granted where it can be assured that the single point of connection will feed both the house and the garage/outhouse and that the location is intended for a purpose which will ensure an ongoing clean environment. Separate connections to one address are not acceptable.

5.2 Installation of Service Cable

Low voltage connections are normally provided via underground service cables if possible. On most farms this will normally be from a pole adjacent to the premises. In order to minimise the cost of providing a connection to the customer it is usual to offer the customer the option of carrying out any excavation and reinstatement within their property.

The requirements of Section 3.3.1 must be complied with in relation to excavation and reinstatement for service cables.
5.3 Metering Arrangement

The metering arrangement to be adopted in agricultural or horticultural premises will be appropriate to the relevant tariff. In smaller single phase installations the arrangement will be similar to that shown in Section 4 for domestic premises. In larger three phase installations the arrangements will be similar to those for commercial installations as shown in Section 6.

5.4 Second Point of Connection

A second point of connection will not be provided to a combined farm and domestic house. Only in circumstances where there is an individual postal address with a separate customer name, will a second independent service intake position be provided to a farm associated with a domestic house. This offer is also conditional on there being no electrical interconnection between the two properties.
6.0 Commercial and Industrial Premises

These requirements are supplementary and additional to the general requirements set out in Section 3 and must be read in conjunction with that section.

6.1 Size of Load

The standard connection arrangement to commercial premises will be via a three phase service where practicable but single phase connections may, subject to NIE agreement, be provided for loads up to 18kW. In such cases the arrangements shown in Section 4 for domestic premises will apply. Loads in excess of 18kW will normally be provided via a three phase service.

6.2 Metering Arrangements

Commercial and industrial premises range from those requiring small single phase domestic type connections to those requiring much larger three phase connections. The metering arrangements required will depend not only on the size of electricity connection required but also on the precise nature and use of the premises.

Metering arrangements for single phase commercial connections are shown in Section 4 Figs D1 to D9. Three phase metering arrangements are shown in Figs C1 to C5.

Typical metering arrangements given in this guide are not exhaustive and NIE should be consulted at an early stage if there is any doubt regarding the requirements.

6.2.1 Multiple Tenancy Installations

The general requirements for multiple tenancy installations are given in Section 3.6. Typical metering arrangements for commercial multiple tenancy premises are shown in Figs G6.

In general where situations of multi-metering installations arise to offices suites, separate units in enterprise centres, etc. a centralised metering location with easy access is the standard arrangement. Any variation to this must be agreed in consultation with NIE. If distributed (or remote) metering is agreed then the customer must assume responsibility for the provision and maintenance of the rising mains cabling. A formal agreement with the customer will be required for subsequent sale/leasing of properties. The requirements given in Section 3.6 have particular relevance to premises such as enterprise units, multi-storey office blocks and multiple tenancy shopping malls.
6.3 Switch-panel Design

The requirements of Section 3.8 are particularly relevant to commercial and industrial installations and require careful consideration. Typical switch-panel layouts are shown in Figs G4 to G6.

6.4 Sprinkler Systems

In order to ensure continuity of electricity connection to a sprinkler system during emergencies, it may be considered appropriate for the connection to originate from the incoming side of the main incomer switch. Fig. C6 shows a typical arrangement.

6.5 Second Point of Connection

A second point of connection will not be provided to a combined commercial property and domestic house. Only in circumstances where there is an individual postal address with a separate customer name, will a second independent service intake position be provided to a commercial property associated with a domestic house. This is also conditional on there being no electrical interconnection between the two properties.
THREE PHASE – GENERAL POWER

Note:
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. C1
ECONOMY 7
THREE PHASE – GENERAL POWER
SINGLE PHASE – HEATING LOAD (UP TO 80A)

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**Note:**
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. C2
ECONOMY 7
THREE PHASE – GENERAL POWER
SINGLE PHASE – HEATING LOAD (UP TO 80A)
WATER HEATING (WITH AFTERNOON BOOST)

Note:
Main live tail to water heating must not be broken through ISCO.
Maximum load on water heating 3kW.
2.5mm² cables may be used for connection to water heating.
Alternative designs are subject to approval, see notes at beginning of this section.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. C3
ECONOMY 7
THREE PHASE – GENERAL POWER
SINGLE PHASE – HEATING LOAD (UP TO 100A)
WATER HEATING (WITH AFTERNOON BOOST)

Note:
2.5mm² cables may be used for supply to water heating and E7 relay isolators. E7 signal must be connected to the L1/Brown phase.
Alternative designs are subject to approval, see notes at beginning of this section.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. C4
ECONOMY 7
THREE PHASE – GENERAL POWER
THREE PHASE – HEATING LOAD

Note:
2.5mm² cables may be used for supply to water heating and E7 relay isolators.
E7 signal must be connected to the L1/Brown phase.
Alternative designs are subject to approval, see notes at beginning of this section.
The NIE earth terminal in the cut-out shall not be used as the customers’ main earth terminal.

FIG. C5

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TYPICAL LAYOUT FOR CONNECTION OF SPRINKLER SYSTEM

FIG. C6
7.0 Miscellaneous Premises

These requirements are supplementary and additional to the general requirements set out in Section 3 and must be read in conjunction with that section.

7.1 Metering

7.1.1 Unmetered Connections

Certain types of miscellaneous connections may be provided without metering but NIE reserve the right to fit meters as deemed appropriate. The following is a list of types of connection which may be provided unmetered, but in all cases guidance should be obtained from NIE:

- Telephone Kiosks
- DRD Public Street Lighting
- DRD Traffic Signs
- DRD Pay and Display Machines
- Bus Shelters
- Level Crossings
- Radio Amplifiers
- Stairway lighting in NIHE flats
- Motorway Signage

The above list is not exhaustive.

All ducts installed on public property for the provision of an unmetered connection shall be red in colour. Acceptable sizes of ducts are 38/32mm (outer diameter/inner diameter), 110/100mm and 160/150mm. The duct shall be embossed with, ‘DANGER ELECTRICITY’, throughout its length and be used for NIE equipment only.

7.1.2 Metered Connections

Where metering is required to an outdoor location, the customer is responsible for the provision of a suitable metering enclosure to IP 55 standard as per Figs D10 and D11.

7.2 BT Telephone Kiosks

A special agreement (NIE/BT/TK) exists between NIE and BT Northern Ireland which details the connection arrangement for BT telephone kiosks.

Connection requirements for other companies’ kiosks should be in accordance with the requirements of Section 7.4.
7.3 DRD (NI), Street Lighting, Traffic Signs etc.

Special agreements (NIE/DOE/SL series) exist between NIE and the Department of Regional Development (DRD Roads Service) detailing the connection arrangements for street lighting and other street furniture.

7.4 Advertising Boards, Bus Shelters, Non-BT Telephone Kiosks and Similar Installations

7.4.1 Double Insulated Earth Free Installations

Where the structure and electrical installation is designed as a double insulated installation in accordance with BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended) and declared as such by the electrical contractor, then the service cable installation must also be double insulated. A suggested means of achieving this is illustrated in Fig M1.

The service cable shall be routed via a 110/100mm diameter (red) PVC duct and a 38/32mm diameter (black or red) duct (approximate length of 900mm) secured to the backboard, so that in the event of mechanical damage the structure will not become live. Both ducts will be sealed by NIE to prevent the ingress of moisture.

7.4.2 Earthed Installations

Where the structure and electrical installation is not to double insulated standards as defined in BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended) then conventional earthing and bonding must be provided in accordance with BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended). An example of a typical installation is given in Fig M2.

7.5 Short Duration Connections - Festival Lighting (e.g. Christmas Lighting)

Early application for connection should be made to allow sufficient time for arrangements to be made for the provision of short duration connections. Installations should comply with the requirements for temporary connections as defined in BS7671 (IET Wiring Regulations 17th Edition, 2011) (as amended).

7.6 Temporary Connections

Where requests are being made for temporary connections the customer must also provide full details of the permanent connection so that both the temporary and permanent connections can be considered and a design which minimizes overall costs and disruption will be provided at the initial quotation stage.
On building sites and similar locations, NIE equipment must be housed in a secure, weatherproof, clean environment of proper construction so as to prevent danger or damage to persons or equipment. This may take the form of a brick/block construction with an outdoor meter cubicle adjacent to the site boundary, to be agreed with NIE prior to installation.

It is unacceptable to mount meter cubicles on any NIE poles.

**BS7671 (IET Wiring Regulations 17th Edition, 2011)** (as amended) stipulates that certain requirements have to be met for the provision of temporary connections. The main requirements are as follows:

- 30mA Residual Current Device (RCD), including a suitable earth electrode
- The means of isolation must be capable of being secured in the OFF position
- BS EN 60309-02 waterproof type socket outlets

TN-C-S is NOT available for temporary connections.

Fig M3 illustrates the requirements for single phase temporary connections; refer also to sections 3.7 for earthing arrangements.

Where the above requirements are not fulfilled in full then a revisit fee will be applied as in Section 2.8.

### 7.6.1 Three Phase Temporary Connections

In certain instances, with prior agreement NIE may provide a three phase temporary connection for situations such as:

- Large construction sites
- Lifts within commercial/domestic developments

All loading details, including type of start and frequency of starting must be provided to NIE at the application stage.

Fig M4 illustrates the requirements for three phase temporary connections; refer also to sections 3.7 for earthing arrangements.

### 7.7 Caravan Sites

Caravan sites are subject to the Caravans Act (Northern Ireland) 2011. The enforcement body is the local authority of the area in which the site is situated. The distribution of electricity throughout the site and the internal wiring of caravans must be in accordance with **BS7671 (IET Wiring**
Regulations 17th Edition, 2011) (as amended) together with any additional requirements of the local authority.

The earthing of individual caravans must be provided via a Residual Current Device (RCD) and normal practice provides for a mini pillar incorporating a BS EN 60309-02 socket outlet and containing an RCD at each caravan pitch. A typical arrangement is shown in Fig M5.

Where a TT system of connection is afforded then discrimination should be ensured between the RCD controlling the main connection and the RCDs located at the caravan mini pillars.

7.8 Mobile Homes

Mobile homes are considered temporary dwellings and will not be accorded the same terms for connection as permanent buildings. Connections will be made available provided that the customer has permission to occupy the land on which the mobile home is placed.

Connections may be provided by a suitable external cubicle to IP 55 standard located at low level outside the mobile home to contain the NIE cut-out and metering equipment only. The service cable, cutout and meter shall not be located in the mobile home. However, the customer’s consumer units etc. should be located in the mobile home.

Where a mobile home is placed on land adjacent to a dwelling house with an existing connection, a separate connection must be obtained. Furthermore, NIE will not connect a meter within an existing dwelling to service a mobile home.

Any reinforcement of connection or change of transformer necessary for this connection will be chargeable.

TN-C-S earthing is not available for mobile homes and the installation must be treated (and earthed) as either a TN-S or TT system.
UNMETERED DOUBLE INSULATED CONNECTION INSTALLATION

Wooden backboard

NIE Street lighting cut-out

Double saddles screwed to backboard

Duct to NIE Specification

FIG. M1
UNMETERED CONVENTIONALLY EARTHED CONNECTION ARRANGEMENT

To Load

RCD

<150mm

Earth to frame

2.5mm²

Service end box

Size typically 510x95mm

__________________________

Provided by customer/contractor
NIE equipment

Note:
Earth to frame CSA to be based on half of the CSA of the phase conductor
Service cable must be double insulated and screened
Cut-out must be an enclosed, insulated and sealed chamber
Customer's equipment must be fixed to backboard and double insulated

FIG. M2
TYPICAL SINGLE PHASE TEMPORARY CONNECTION ARRANGEMENT

Note:
All dimensions are in mm and are minimum requirements except where indicated.
Customers are responsible for their own earthing arrangements.
Temporary connection cubicles utilising a preformed permali-type meter cubicle of suitable size and provided with a cable entry duct may also be installed either as a permanent fixture in an existing cavity wall or in a weatherproofed stand alone cavity block wall construction similar to that shown.
Wooden backboard must be minimum thickness 16mm.
The cubicle must be weather proof and lockable.

FIG. M3
TYPICAL THREE PHASE TEMPORARY CONNECTION ARRANGEMENT

Note:
All dimensions are in mm and are minimum requirements except where indicated.
Customer’s switchgear must be in accordance with BS7671. Temporary connection cubicles utilising a preformed permali type meter cubicle of suitable size and provided with a cable entry duct may also be installed either as a permanent fixture in an existing cavity wall or in a weatherproofed stand alone cavity block wall construction similar to that shown.
Wooden backboard must be minimum thickness 16mm.
The cubicle must be weather proof and lockable.
Customers are responsible for their own earthing arrangements.
For any other applications, please contact NIE.

FIG. M4
Notes:
Earthing for site distribution and for switchgear feeding site distribution must be totally segregated from the TN-C-S earth.

FIG. M5
8.0 Requirements for Fixed Standby Generators

These requirements are supplementary and additional to the general requirements set out in Section 3 and must be read in conjunction with that section.

8.1 Connection of Fixed Standby Generators

Recommendations for the connection of standby generators are covered by the current edition of ENA Engineering Recommendation G59/1/NI available from:

Energy Networks Association
6th Floor, Dean Bradley House
52 Horseferry Road
London
SW1P 2AF

Special arrangements apply in respect of generators operating in parallel with the NIE system and NIE must be contacted with regard to such arrangements.

8.2 Changeover Switches

All standby generators must be connected via a changeover switch. All changeover switches and associated contactors shall be ‘break before make’ devices.

Typical connection arrangements for standby generators are shown in Fig SG1.

Prior to connection, a drawing showing the proposed arrangement should be submitted to NIE for approval.

8.3 Location of Generators

Generators are not generally accepted in metering rooms. However in exceptional circumstances, with prior agreement with NIE, where the generator is deemed relatively clean, free of exhaust particles and fumes and meets the requirements of the Control of Noise at Work Regulations (NI) 2006 (as amended), then the location of a generator within a metering room may be considered where the noise level of the generator is less than 80dB.
TYPICAL FIXED STANDBY GENERATOR ARRANGEMENT

Customer’s Equipment

- Changeover Switch
- Customer’s Main Switchfuse
- Generating Unit
- Earthing Busbar
- Customer’s Independent Earth Electrode
- Customer’s Essential Load
- Customer’s Non-essential Load
- Direction of Supply

NIE’s Equipment

- Metering Equipment
- NIE Cut-out

FIG. SG1