



NETWORKS

National Code of Practice for the Customer Interface

Version No. 5
April 2021
DOC-030303-AEN

Contents

Foreword	7
Terms & Definitions	8
Symbols & Abbreviations	10
Introduction	11
i. Scope	11
ii. Mandatory References	12
iii. Site Safety	12
iv. Remember the Five Golden Rules	13
1. The Completion Certification Process	14
1.1 Safety Supervisory Board (SSB) involvement in Completion Certificate Process	14
1.2 Types of Electrical works that require Certification	14
1.3 Certification Process	15
1.4 Types of Completion Certificates	16
1.5 Out of Normal Working Hours Connections	18
2. DSO Requirements	19
2.1 Consultation with DSO office	19
2.2 Load Thresholds	19
2.3 Particular to Apartment/Office Blocks	21
2.4 Enclosures for DSO Metering Equipment	22

2.5	Requirements for Metering Enclosures used Outdoors	24
2.6	Protection for Secondary Cables from DSO Metering CTs within Main Switchboard	26
2.7	Access to DSO Metering Equipment	27
2.8	Unacceptable Locations for DSO Equipment	27
2.9	Customer Materials	28
2.10	DSO Seals	28
2.11	Labelling	29
2.12	Multi-customer Premises	31
2.13	Bus bars	33
2.14	Main Protective Earth Neutral Conductor Connection (Neutralising)	33
2.15	Main Supply Point	34
2.16	Customer Switching Signals	35
2.17	Surge Protection Device	35
3.	Connection Arrangements	36
3.1	Earthing Arrangements	37
3.2	Single Occupancy Premises	40
3.3	Multi-Occupancy Premises	41
4.	Domestic Connections	44
4.1	Standard Outside Meter Box Connection	44
4.2	Internal Meter Box Connection	46
4.3	Centralised Metering Connections	47
5.	Commercial Connections	49

5.1	Switch Room	49
6.	Special Situations	51
6.1	Un-Metered Connection	52
6.2	Metered Connection	55
7.	Service Alteration	58
7.1	Domestic	58
7.2	Commercial/Industrial	59
8.	Agricultural/Horticultural Premises	60
8.1	Specification for Standard Underground Service Supplied from Overhead Network	60
Annex A. (Informative)	CRU Certification Procedures	64
A.1.	Process No 1: Connection /Reconnection Required	64
A.2.	Process No 2: REC without Self-Certification Privileges – Third party Connection	66
A.3.	Process No 4: Interim Certificates / For Connections / Reconnection	67
A.4.	Process for De-Energisation of Installation from the DSO Network	69
Annex B. (Informative)	Local Area Boundaries	71
Annex C. (Informative)	HV Connection – Single Line Diagram	72
C.1.	Single Feed Customer	72

C.2.	Multi – Feed Customer	76
Annex D. (Mandatory) LV Connections – Single Line Diagrams	.....	79
D.1.	Single Phase Connection – W/C Metering	80
D.2.	Single Phase – CT Metering	84
D.3.	Three Phase – W/C Metering	86
D.4.	Three Phase – CT Metering (Total Load less than 200kVA)	88
D.5.	Three Phase – CT Metering (Total Load greater than 200kVA)	92
D.6.	Miscellaneous	94
Annex E. (Mandatory) Checklist	.....	95
E.1.	Connection Checklist	95
E.2.	Assembler’s Checklist	96
Annex F. (Mandatory) Spacing Requirements	.....	100
F.1.	Single Phase Equipment	100
F.2.	Three Phase Equipment – W/C	102
F.3.	Three Phase Equipment CT	103
Annex G. (Mandatory) Switch Rooms	.....	108
G.1.	Independent Building	108
G.2.	Incorporated In a Building.....	110
Annex H. (Mandatory) Metering Panels	.....	113
H.1.	W/C Metering - Single Phase Meter Location	113
H.2.	CT Metering	117

Annex I. (Mandatory) E- Transport Connections	119
I.1. Home Charging	119
I.2. Location Charging	122
I.3. On-Street Charging	123
I.4. Rapid Charging	126
Annex J. (Mandatory) Generator Connections	127
J.1. Micro-Generation	127
J.2. Stand-By Generator Connection (No Parallel Operation)	129
J.3. Generator Connection (Parallel Operation)	131
Annex K. (Mandatory) Safety Service Connections.	132
Annex L. (Mandatory) Petrol Stations	135
Annex M. (Informative) Key safe	137
Derogations	137

Foreword

The National Code of Practice for Customer Interface at www.esbnetworks.ie. The purpose of this document is to have a single interpretation of the requirements of the Distribution System Operator (DSO) for the customer interface.

It is a consensus document agreed between people involved in the electrical industry and the DSO. Contractors' associations, consulting engineers, switchboard assemblers, electrical wholesalers, distributors, regulatory bodies, The National Standards Authority of Ireland (NSAI) and DSO staff made a positive contribution in the compiling of this code.

It is important that everyone working at the DSO/customer interface or designing electrical equipment for the interface fully understands this Code of Practice and complies with it.

Each DSO local office will provide details of who should be contacted regarding queries, which may arise in the interpretation of this Code of Practice. It is essential to refer to the latest version of The National Code of Practice for Customer Interface at www.esbnetworks.ie

Document No.	Title	Full / Partial
DOC-030303-AEN	The National Code of Practice for Customer Interface at www.esbnetworks.ie	Full

Term	Definition
Shall	Designates a Company Requirement, hence conformance is mandatory.
Should	Designates a Company Recommendation where conformance is not mandatory, but is recognised as best practice.
May	Designates a Permissive Statement - an option that is neither mandatory nor specifically recommended.

Term	Definition
CSA	Cross Sectional Area
DSO	Distribution System Operator
Electrical Operating Area	Area used essentially to contain electrical apparatus, and to which access is restricted to certain categories of persons defined in IS 10101:2020
Enclosure	Housing affording the type and degree of protection suitable for the intended application.
High Voltage	Voltage > 1000V AC phase to phase
Isolating Switch	Mechanical switching device that, in the open position, complies with the requirements specified for the isolating function.

Term	Definition
Isolation (isolating function)	Function intended to cut off the supply from all or a discrete section of the installation by separating the installation or section from every source of electrical energy for reasons of safety.
Low Voltage	Voltage \leq 1000V AC phase to phase
Main Isolating Switch	Switching device provided at the main supply point for the purpose of isolating an installation.
Main Supply Point	Point at which the supply is connected to an installation.
MEC	Maximum Export Capacity
MIC	Maximum Import Capacity
Safety Service	Engineering service primarily intended to provide for the safety of persons within or around premises in the event of a fire, other contingency, or the failure of other services; it may in addition include provision for fire-fighting.
Safety Supply	Electricity supply that is intended to be available, in the event of a failure of the normal supply, for the operation of safety services.
Standby Supply	Electricity supply intended to be available in the event of the failure of the normal supply. This supply is primarily intended to ensure the continuity of operations normally carried out in the premises.
SSB	Safe Supervisory Board; The principal functions of the SSB include, without limitation, the registration of electrical contractors and, the inspection, auditing and monitoring of electrical contractors and their work and activities with respect to safety.

Table 2 Terms and Definitions (source IEV)

Symbols & Abbreviations

For the purposes of this document, the following symbols & abbreviations apply.




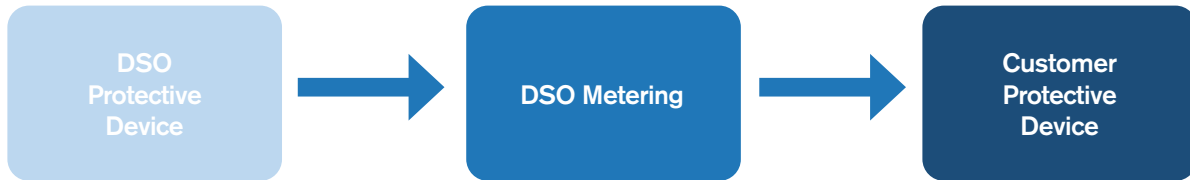
Symbol	Abbreviation
	Caution. Used to give the end user of the document information on what can happen, why, and the consequences of ignoring the caution. It does not contain rules.
	An information box provides additional information intended to assist the understanding or use of the document. It does not contain rules.
	This is a stop or critical point in the procedure. It contains a rule that shall be followed by the end user.

Table 3: Symbols & Abbreviations

Introduction

This document sets out the DSO technical requirements for the interface between the DSO and the end user.



The interface shall be between the DSO Metering and the Customer Protective Device.

i. Scope

The National Code of Practice for Customer Interface relates to situations where an interface exists between the DSO (ESB Networks DAC) and the customer at Low, Medium or High Voltage. DSO is fully supportive of the National Standards Authority of Ireland (NSAI), The Commission for the Regulation of Utilities (CRU) and Safe Electric in their efforts to improve safety and standards of electrical installations. The DSO recognise the need for and the importance of testing and certification of all electrical installations. Completion certificates are required for all new installations and alterations or extensions to all existing installations.

ii. Mandatory References

The following ESB Networks, CRU and NSAI documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

Document No.	Title
DTIS-230206-BRL	Conditions Governing the Connection and Operation of Micro-Generation
DOC-060416-CEY	Distribution Code
DOC-210717-CNV	MV/LV Design - Electrical
DOC-280518-DFK	Construction Standards for MV Substation Buildings
NSAI document	National Rules for Electrical Installations (Current Edition)
CRU Document	Electrical Safety Supervisory Criteria Document (Current Version)






Table 3: Symbols & Abbreviations

iii. Site Safety

- Be aware of your working environment and your responsibilities to yourself and others.
- Contractors, builders, developers and DSO shall meet all statutory requirements in order that site conditions and site practices provide a safe working environment.
- Electrical contractors and DSO staff shall always be alert to the dangers and hazards associated with electrical work.
- Particular attention is required when an installation is made live whether on a temporary or permanent basis.

- Always make sure if you make an installation or part of an installation “live” that you have not created a dangerous situation for someone else.
- Always check for absence of voltage before you work on any electrical installation.

iv. Remember the Five Golden Rules

Rule		
1		Disconnect completely
2		Secure against reconnection
3		Verify absence of voltage
4		Carry out earthing and short-circuiting
5		Protect against adjacent live parts

1. The Completion Certification Process

The completion certification process is owned and defined by the CRU, to assist with an understanding of the completion certification process sections 1.1, 1.2, 1.3, 1.4, while ANNEX A has been included with the permission of the CRU.

1.1 Safety Supervisory Board (SSB) involvement in Completion Certificate Process

The CRU is responsible for regulating electrical contractors with respect to safety under the Energy (Miscellaneous Provisions) Act 2006 (“the Act”). This scheme is operated by Safe Electric, the Electrical Safety Supervisory Body.

From the 1st of October 2013, it is a criminal offence to carry out Restricted Electrical Works (Designated Electrical Work) as defined in Statutory Instrument No. 264 of 2013 if you are not a Registered Electrical Contractor (REC) with Safe Electric. Restricted Electrical Works can only be undertaken by a REC and must be certified using the appropriate certificate.

Also under the 2006 Act, it is a criminal offence to describe oneself as a registered electrical contractor or in a manner likely to suggest that such a person is a registered electrical contractor unless that person is for the time being a member of a designated body under section 4, 9D (25) of the Energy (Miscellaneous Provisions) Act 2006 (“2006 Act”).

The penalties for the contravention of these subsections as set out in the 2006 Act include a fine of up to €15,000 and/or imprisonment for up to three years.

1.2 Types of Electrical works that require Certification

Restricted Electrical Works essentially encompass any electrical work in a domestic environment that would require a modification, replacement or addition to the main distribution board. Anyone wishing to carry out Restricted Electrical Works shall be a REC under the Safe Electric scheme. To find a REC in your area visit www.safeelectric.ie

The majority of new or additional electrical works performed by RECs fall under Controlled Electrical Works and so require

certification. The work can either be self-certified by the REC who carried out the work, or the SSB can inspect and certify the work if the works are non-domestic (provided the work was done by someone who is competent and insured).

1.3 Certification Process

In order to gain electricity connection from the grid the customer is required to produce a Completion Certificate. This certificate can only be completed by a REC after the electrical installation has been completed. It is a criminal offence for one to carry out Restricted Electrical Works (Designated Electrical Work) as defined in Statutory Instrument No. 264 of 2013, if you are not a REC with Safe Electric. Restricted Electrical Works can only be undertaken by a REC and shall be certified using the appropriate certificate.

The certification processes as defined in CRU documentation are outlined in ANNEX A.

The DSO have a role in the following certification processes:

- PROCESS NO 1: CONNECTION /RECONNECTION REQUIRED
- PROCESS NO 2: REC WITHOUT SELF-CERTIFICATION PRIVILEGES – THIRD PARTY CONNECTION
- PROCESS NO 4: INTERIM CERTIFICATES / FOR CONNECTIONS / RECONNECTION
- PROCESS FOR DE-ENERGISATION OF INSTALLATION FROM THE DSO NETWORK



1. The certificate shall only be issued on the completion and testing of the electrical installation.
2. The correct Meter Point Reference Number (MPRN) shall be recorded on the certificate.
3. The address of the electrical installation shall match the MPRN address.



The MPRN is readily available on the correspondence the customer receives from the DSO regarding their application for a new connection/alteration/rewires etc.

1.4 Types of Completion Certificates

The REC that constructs an electrical installation and subsequently signs a completion certificate is making a formal declaration that the installation as installed by the REC:


- Complies with the, current, National Rules for Electrical Installation, at time of certification;
- That the use of a completion certificate fulfills the certification requirements set down in section 9D (18) the Energy (Miscellaneous Provisions) Act 2006.

There are three types of completion certificates that the DSO require to allow the DSO complete their work:

Cert. Type	Description
No. 1	For electrical installation with MIC of less than 50kVA and requiring connection to the DSO (also known as Controlled Electrical Work Nr.1).
No. 2	For electrical installation with MIC of equal to or greater than 50kVA and requiring connection to the DSO (also known as Controlled Electrical Work Nr.1).
Interim Certificate	Interim Certificates are validated by the SSB to enable the main distribution board in an industrial or commercial installation to be energised so that a completed subsystem e.g. a lift system, or a standalone module, can be tested or commissioned.

Periodic Inspection Report – Condition report on the state of an electrical installation (also known as Controlled Electrical Work Nr. 5). RECs are required to certify the modification, installation or replacement of electrical installations, using a completion certificate No. 3. The certificate should be completed in full by extracting from the information in the accompanying test record sheet.

DSO require completion certificates, submitted through Safe Electric, for the following types of Electrical Work to allow the DSO to complete their work at the customer interface:

1	All new installations/re-wires requiring connection to DSO.	
2	All alterations to existing installations involving changes to the wiring between DSO connection point/meter and the customer's distribution board.	
3	In multi-tenanted/multi-metered situations a completion certificate is required for each DSO connection i.e. one certificate per customer connection point.	
4	Where electrical installation are contained as part of street furniture such as school signs, phone kiosks, bus shelters etc., and are connected to DSO network, a completion certificate is required for each connection at the interface.	
5	All Medium Voltage installations require a completion certificate and a Declaration of Fitness.	
		Prior to connection of customer MV equipment to DSO network, a Declaration of Fitness (DOF) is required by the DSO.
6	A completion certificate is required before connection will be restored to an installation that has been de-energised for 6 months or more.	

1.5 Out of Normal Working Hours Connections

There are times when connections will be required outside of normal working hours. These occasions require close co-operation between the DSO and the REC. The following outlines the agreed steps to be completed:

Step	Person	Action
1	REC	Contact local DSO office at an early stage in the planning of the work.
2	REC	Any required DSO payments have been made, this will ensure a service order to complete the work has been created.
3	REC	The REC shall contact Safe Electric with the following details that they intend using to certify the proposed work: <ul style="list-style-type: none">• Certificate Number• Certificate Type• Customer MPRN• Customer Name• Customer Address
4	Safe Electric	Shall record this initial information which will allow the DSO service order for this work to be released.
5	REC	The reserved certificate for this work shall be used to record the test results after the electrical work is completed.
6	REC	The completed certificate shall be sent to Safe Electric without delay.



If a REC is working in close proximity to live DSO sealed equipment (where no main isolator exists), they shall contact (see ANNEX B) the local DSO office if they require isolation of that equipment to allow the work to proceed safely prior to certification.

2. DSO Requirements

2.1 Consultation with DSO office

It is essential to consult with the local DSO office at the **planning stage** of the following projects: new premises, refurbishment of existing premises, and major additions to existing load. All essential information such as site maps, architect's drawings etc. should be submitted to DSO to allow applications to be processed efficiently.



ANNEX B contains information on DSO local office boundaries. The contact number for the DSO is 1800 372 757 or +353 21 2386555 Lines are open Monday to Friday 8.30am to 6pm and Saturday 8.30am to 1.30pm.

2.2 Load Thresholds

Domestic Connections		
MIC	Description	Customer Max. Protection size
3kVA	Non-Dwelling Farm Building Connection	25A
12kVA	Single phase connection	63A
16kVA	Enhanced Single phase connection	80A
20kVA*	Enhanced Single phase connection	100A
29kVA*	Enhanced Single phase connection	125A
49kVA	Three phase connection	80A

Commercial Connections		
MIC	Description	Customer Max. Protection size
<2kVA	Unmetered connection	6A
≤15kVA	Single phase connection	63A
≥ 15kva but ≤ 49kVA	Three phase connection	80A
≥ 50kVA but ≤ 100kVA	Three phase connection	160A
>100kVA but ≤ 200kVA	Three phase connection	250A
>200kVA but ≤ 500kVA	Three phase connection	Circuit Breaker
>500kVA	MV connection	Circuit Breaker

2.2.1 New Installations

Single phase Whole Current (W/C) meters shall be used to measure loads up to 16kVA. In general, three phase W/C meters will be used to measure loads over three phases up to 16kVA. Current Transformers (CT) with matching meters shall be used to measure loads in excess of 16kVA per phase. Allowances for potential load growth should always be made.

2.2.2 Switchboard Adaptability

Switchboards being designed for speculative developments should make provision for the various likely metering permutations to avoid costly alterations at the connection stage.

2.2.3 Tariffs

Circuits for separately metered tariffs require electrical and physical segregation (i.e. barriers). Providing this is satisfied they may be catered for side by side in the same enclosure.



The customer or consultant acting on customer's behalf shall ensure the correct tariff applies to the installation.

2.2.4 Extensions/Renovations to Existing Metering

Discuss with local DSO Office beforehand, where, in certain circumstances, three phase W/C metering at 16kVA per phase may be considered. DSO will fit and connect their own Protection Device, via a cut out, for total loads within a premise up to 200kVA/300A.

DSO will normally require a substation for loads of 200kVA and greater. The customer will supply and fit a main circuit breaker for total loads within a building greater than 200kVA.

New loads in excess of 500kVA shall be supplied at medium voltage.



Some loads of less than 200kVA may require a substation in certain locations depending on available capacity.

2.3 Particular to Apartment/Office Blocks

The final connection arrangements in commercial units seldom become apparent until a very late stage. Therefore, various metering permutations shall be considered in the main switchboard at the project design stage. This may avoid subsequent costly alterations.

- Section 3.2 caters for a single customer occupying a single premises with DSO metering before the customer's main isolating switch.

- Section 3.3 caters for multi-customers in a single premises with DSO metering after the customer's main isolating switch.
- For the multi-customer in a single premises option, centralised metering is the preferred DSO method of connection.

In “limited” situations the use of unmetered conductors feeding de-centralised metering may be allowed with prior agreement of the local DSO Design Manager. This agreement shall be in place prior to the completion of the planning stage of the project.

2.4 Enclosures for DSO Metering Equipment

2.4.1 Domestic Installations

The standard method of connection for a new single occupancy premises shall be the outdoor metering cabinet. DSO equipment shall only be fitted in an outdoor metering cabinet which meets the requirement as contained in 4.1.

The only customer equipment allowed in the outdoor metering cabinet is an IP 55 enclosure containing customer's protection, which if installed shall only be fitted in the bottom right hand side (RHS) of the cabinet (see F.1). This is to allow for additional DSO equipment in the future.



The customer's Main Overcurrent Device shall comply with the relevant clause in the current edition of the National Rules for Electrical Installations.

Where it is impossible to fit an outdoor metering cabinet in an accessible outdoor location, the local DSO office shall be consulted at the planning stage to determine the most suitable location for the DSO equipment. If following consultation an indoor location is determined to be suitable, an enclosure shall be provided for DSO equipment (see ANNEX F)

2.4.2 Whole Current (W/C) Metering

W/C meters and DSO equipment are installed by DSO in an enclosure supplied, fitted and owned by the customer. W/C meter enclosures shall have a (vertically) hinged cover or visor and standard 8mm triangular lock.

DSO metering equipment shall be fitted in indoor situations at a height from floor level no lower than 600 mm to the bottom of the lowest meter and no higher than 2000 mm to top of highest meter (see ANNEX H).

2.4.3 Current Transformer (CT) Metering

Customers shall supply and fit a sealable enclosure to accept DSO CTs. Where a main switchboard is installed this enclosure should be within the switchboard. CT Meter Cabinets (supplied and fitted by DSO) are installed on a wall adjacent to the main switchboard.

In some situations, consideration will be given to incorporate DSO CT Meters into the main switchboard (see H.2). Discuss with local DSO staff at the design stage of the switchboard.



Where the CT Enclosure is of a metal type the cover shall be hinged (vertically) as well as sealable.

Where the CTs are on the DSO side of the customer's main disconnecting device, the enclosure shall offer protection against contact with live parts by the ingress of tools, wires or any other foreign body (IP 3X min.)



For wall mounted CT Meter Cabinets, the length of CT secondary cables shall not exceed 15m and shall be accessible.

2.5 Requirements for Metering Enclosures used Outdoors

2.5.1 Centralised Multi-customer metering

Outdoor locations are not recommended for centralised multi-customer metering. Vandalism, interference, and environmental conditions increase the likelihood of damage corrosion etc.



All locations other than main switch rooms and standard internal metering locations are considered to be outdoors.

Because of these considerations and where it has been agreed with DSO at the planning stage to locate centralised multi-customer metering outdoors, the following minimum requirements described below shall apply:

1. The switchboard housing the metering equipment shall be manufactured from polyester or other suitable non-conductive material.
2. The switchboard shall have a minimum rating of IP44; this rating may increase due to the environmental influences in the location selected.
3. The switchboard internal construction shall comply with the standards required for normal locations.
4. The switchboard shall be protected against vandalism/interference by one of the following methods described in (a.) or (b.):

- a. The switchboard shall be installed in a concrete structure that is weatherproof e.g. where installed on the outside wall of a building it may comprise of two wing walls constructed at either end of the switchboard with a securely constructed roof to provide a weatherproof enclosure. Adequate lighting shall be provided. The doors and door frame of the structure shall be the full width of the switchboard including the DSO cut out and shall be manufactured from high grade steel which shall have a minimum thickness of 3mm (door) and all parts shall be treated with hot dip galvanising to EN ISO 1461:2009.
- b. The switchboard shall be installed in a unit manufactured from high grade sheet steel which shall have a minimum thickness of 3mm, and all parts shall be treated with hot dip galvanising to EN ISO 1461:2009.

In addition, to the requirements described in (a.) or (b.), the requirements listed in below shall also apply:

- Enclosures must incorporate sufficient internal ventilation to prevent the formation of condensation but without reducing the degree of protection required.
- All hinges shall open a minimum of 180 degrees, door stays shall be provided where necessary.
- All below ground parts shall have heavy duty corrosion protection.
- Consideration shall be given to the risk of corrosion (as above), dust, vibration, and impacts, and adequate measures shall be taken to minimise these risks.
- All external doors shall be fitted with vandal proof locks to prevent unauthorised entry.
- The locking devices shall be manufactured from high grade non-corrosive metal.



Where vandal proof locks are specified, a Keysafe (see ANNEX M) shall be fitted to the unit. The Keysafe is supplied by the local DSO office as part of the design of the electricity services..

2.5.2 Specific requirements for single customer non-domestic outdoor enclosures

A minimum rating of IP44 shall apply subject to the environmental influences in the location selected. In a horticultural environment, IP55 is the minimum required. In order to maintain the stability and integrity of enclosures used to house DSO equipment in outdoor locations, the following minimum specifications shall apply:

1. Where enclosures are manufactured from ferrous materials, the enclosures shall be manufactured from high grade sheet steel which shall have a minimum thickness of 3mm and all parts shall be treated with hot dip galvanising to EN ISO 1461:2009.
2. All hinges shall open vertically a minimum of 180 degrees, door stays shall be provided where necessary. All below ground parts shall have heavy duty corrosion protection.
3. Consideration shall be given to the risk of condensation, dust vibration and impacts and adequate measures be taken to minimise these risks. Where required, these units shall be fitted with vandal proof locks to prevent unauthorised entry.
4. The locking device shall be manufactured from high grade non-corrosive metal.

2.6 Protection for Secondary Cables from DSO Metering CTs within Main Switchboard

A trunking or conduit (minimum 75 mm per set of CTs with draw wire) to protect secondary cables shall be provided by the customer within the main switch board. This should be of metal, rigid plastic or similar and shall be accessible throughout its route. Metal trunking of adequate size (100mm minimum) shall be provided from the switchboard to the CT metering cabinet and shall be sealable.

2.7 Access to DSO Metering Equipment

- Access to DSO equipment shall be available to the DSO at all times.
- **All enclosures used for DSO meters shall have a standard 8mm triangular lock fitted.**
- **A clear space of at least 1.2m shall be left in front of DSO equipment.**
- In multi-occupancy premises DSO meters should be grouped in one easily accessible location (centralised metering).



Where direct access to DSO equipment is restricted, a Keysafe (see ANNEX M) shall be fitted to the premises. The Keysafe will be supplied by the local DSO office as part of the design of the electricity services of the installation.

- DSO W/C meters and CTs shall be in one section of a Main Switchboard to allow for regular testing and inspection.
- Each set of CTs should be physically separated to allow them to be worked on individually.
- The phases and neutral cores for each account must be terminated within the CT chamber.
- A separate neutral bar shall be provided adjacent to each set of CTs.

2.8 Unacceptable Locations for DSO Equipment

DSO equipment including meters and fuses shall not be installed in toilets, cellars, boiler houses, fuel stores, storage cupboards, underneath wooden stairs or any location liable to dust, dampness, heat, vibration or any location having a corrosive atmosphere. Any location likely to be blocked by machinery, goods, furniture, or liable to cause accidents is not permitted.

2.9 Customer Materials

The customer shall provide all trunking, cables and connectors beyond the DSO main cable terminations. Load cables for connection to DSO main fuse unit, W/C meters or CTs shall be stranded copper conductor or multi-stranded flexible copper conductor. Where multi-stranded cables are used, they must be fitted with appropriate ferrules or lugs.

2.10 DSO Seals

All access to unmetered enclosures, unmetered fuses, CT enclosures, secondary wiring and bus bar chambers and all other possible points of access to unmetered connections shall be made inaccessible by means of an effective sealing system fitted by the manufacturer which will be sealed by the DSO. Seals shall always be visible for inspection.



Sealing holes drilled in cover which allow sealing wire to enter the enclosure are unacceptable.



Electrical contractors are reminded that it is an offence under the “Energy (Miscellaneous Provisions) Act 1995 as amended”, to break DSO seals or to interfere with DSO equipment.

- 1) If you find DSO seals are broken or missing, report to the DSO BEFORE YOU START WORK.
- 2) Sealing, and the removal of all seals shall be undertaken by DSO staff only.
- 3) DSO seal numbers are recorded for each installation. Under no circumstances interfere with them.
- 4) Do not work on or move DSO equipment.

2.11 Labelling

Metering equipment shall be labelled 'DSO W/C meters' or 'DSO CTs' etc. Unmetered equipment should be clearly labelled 'ESB Networks'. Labels must be of permanent and durable material. It is important that the electrical contractor have them in place before connection.



Failure to fit the required labels will result in a delay to completion of a connection.

2.11.1 Safety Service's Equipment

A safety service's connection taken from the live side of the main circuit breaker shall be suitably labelled, and visible to a person operating the main circuit breaker. Labels shall be fitted onto the fixed sections of a switchboard to eliminate the potential danger where labelled doors/covers are interchangeable. Labels to be securely fitted at appropriate points (see ANNEX K).

2.11.2 Multi-Metering Installation

In Multi-Metering installations a permanent label is required for the relevant apartment/unit number at the following equipment:

- The DSO fuse before the meter
- The DSO meter
- The customer's Main Overcurrent Protective Device
- The main entrance of the relevant apartment/unit

In existing installations that utilise relays to control DSO metering, a permanent label is required for the relevant apartment/unit number at the following equipment:

- The DSO fuse before the meter
- The DSO meter
- The customer Main Overcurrent Protective Device
- The main entrance of the relevant apartment/unit
- The relay and all associated control wiring

2.11.3 Micro-Generation

When any form of Micro-Generation is installed in a premises, an appropriate label shall be placed at the Main Supply Point.

2.11.4 MV and HV customer Earth Switch

Where the cable from the DSO to the customer can be earthed by an approved switch on the customer side of the interface. The switch shall be lockable with a DSO “Danger” lock and have the following label permanently attached.

Warning Label for Customers Earth Switch



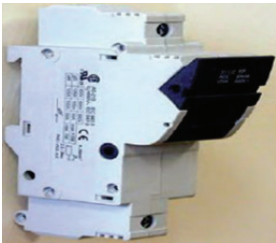
This earthing switch is under the operational control of ESB Networks DAC and shall only be operated with the permission of ESBN operator

2.12 Multi-customer Premises

All meters and metering equipment for each customer shall be located at one central point, normally at the termination of DSO connection cable. In all new indoor installations suitable enclosures shall be provided to accept DSO equipment.

2.12.1 Connection up to 200kVA

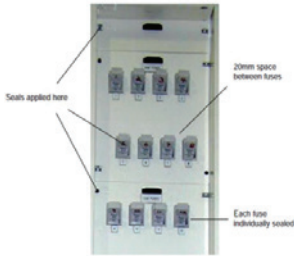
For connections up to 16kVA, the specified fuse units (see below) shall be supplied and fitted by the customer before DSO W/C meters. The customer shall supply appropriate fuses for W/C metering.



- 80/125A front loading unit with 22 x 57 fuse link conforming to IEC 408-269.2.
- All shall be individually sealable.
- A 20mm (min) space being left between each unit.
- For 3 Phase Metering the units shall be ganged to accommodate one seal.



- 80A fuse units conforming to BS7657 which accept RH/RHL cartridge fuses approved to either BS 1631 or BS 88 part 3.
- All shall be individually sealable.



- The shrouding at unmetered fuses shall be one continuous piece with separate windows cut at 20mm spacing between each fuse unit.
- Each fuse unit shall be individually sealable.
- Shrouding at fuses shall be sealable.
- Fuses shall not be loaded prior to connection.

For connections greater than 16kVA up to 200kVA, the fuse units (shown below) shall be supplied and fitted by the customer before DSO metering current transformers (CTs). **The customer shall supply the appropriate fuses for the CT Metering.**



- NH type units conforming to IEC/EN 60269-2-1 and DIN 43620, with shrouding conforming to IP 2X enclosing all terminals.
- NH pull down disconnecter approved for connections over 80A and up to 300A.
- Access cover of enclosure containing NH units shall be sealable.

2.12.2 Connection above 200kVA (LV only)

Above 200kVA the customer's circuit breaker is fitted before the CTs.

2.12.3 Remote Reading of Metering Equipment

For Quarter Hourly (QH) metering, adequate GSM/GPRS coverage is required at the chosen metering position to facilitate remote meter reading. If GSM signal strength is inadequate, provision shall be made by customer/contractor for the installation of necessary extra cabling and equipment to a suitable alternative antenna location. Alternatively, customer/contractor may supply, at their own expense, a dedicated PSTN line for meter reading.

2.13 Bus bars

If more than two connections are required at the main isolator, then a sealable bus bar chamber shall be provided.

2.14 Main Protective Earth Neutral Conductor Connection (Neutralising)

All new LV connections provided by the DSO for the customer shall have a neutral conductor up to the Main Supply Point. The customer's Main Protective Conductor is connected to the DSO neutral conductor at the Main Supply Point to form a TN-C-S system.

For connections where the DSO provides a protective device (cut out), the customer's Main Protective Conductor shall be connected to the DSO neutral at the protective device.

For connections where the DSO conductors are connected to the customer's Main Isolating Switch there shall be a copper link between the customer's neutral and earth bars in the enclosure containing the DSO conductors.

There shall be only one point of connection between the customer's main protective conductor and the DSO neutral per DSO Main Supply Point.



The customer's Main Earth Terminal shall not be within DSO sealed enclosure.

2.15 Main Supply Point

DSO responsibility extends up to customer's Main Supply Point. The customer/customer's representative has responsibility for the electrical installation from that Main Connection Point.

The Main Supply Point is normally:

2.15.1 In Major Installations

a) At DSO main fuses.

Or

b) On incoming side of customer's main circuit breaker.

2.15.2 In other installations

- a) At connection point of customer's tails.
- Or
- b) On customer's side of DSO isolator.



In indoor locations the DSO Main Fuse Unit shall be located as close as possible to an external door within 2m

2.16 Customer Switching Signals

Where ESB Networks provide a switching signal to a customer for control of a specific load, the maximum permissible current shall be $\leq 80\text{mA}$.

2.17 Surge Protection Device

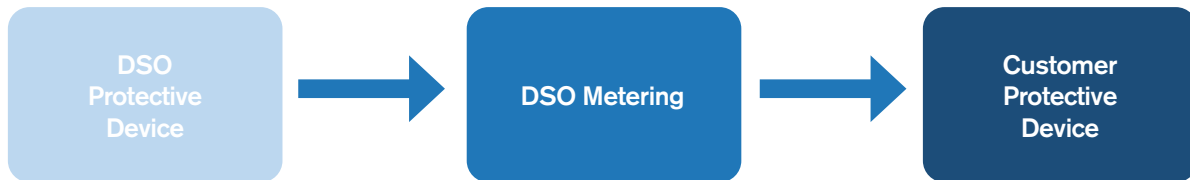
Surge Protection, if required by the customer, shall be fitted on the customer side of the DSO meter as outlined in the National Rules for Electrical Installations.

3. Connection Arrangements

There are two types of connections:

1. Maximum Import Capacity (MIC) This is the maximum kVA the customer is allowed from their DSO supply.
2. Maximum Export Capacity (MEC) This is the maximum kVA the customer is allowed to give to the DSO network.
A customer shall have a connection agreement for each MIC and/or MEC they have connected to DSO network.

A customer shall have a connection agreement for each MIC and/or MEC they have connected to DSO network.



MIC

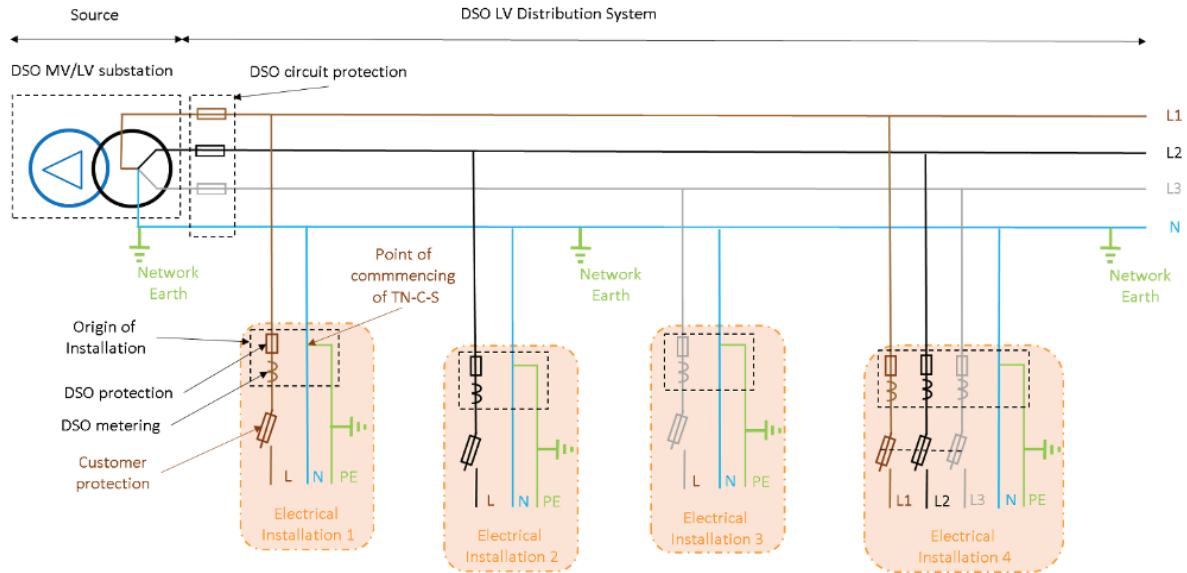


MEC

3.1 Earthing Arrangements

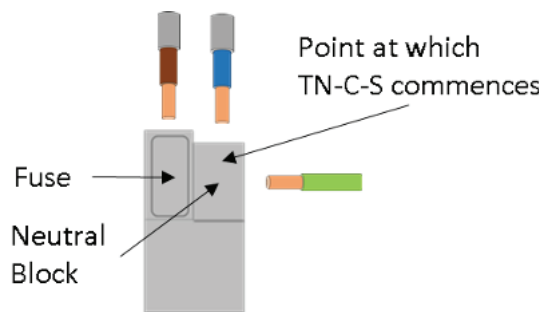


All circuit drawings, single line diagrams and pictographs shown in this document are for illustration purposes only.

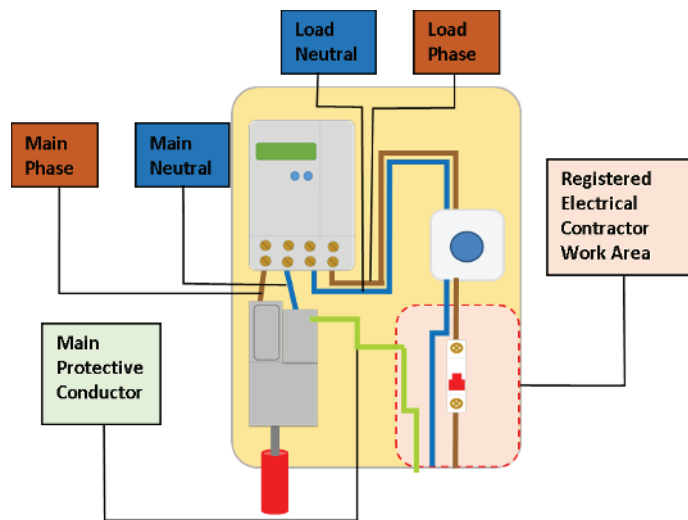


TN-C-S shall be the standard earthing system for all new LV connections to the DSO LV network. There shall be only one point of connection between the customer's protective conductor and the DSO neutral at the DSO Main Supply Point.

- For connections where the DSO provides a protective device (cut out), the customer's Main Protective Conductor shall be connected to the DSO incoming neutral termination block at the protective device (cut out).
- For connections where the DSO conductors are connected to the customer's Main Isolating Switch there shall be a copper link between the customer's neutral and protective earth bars in the enclosure containing the DSO conductors.

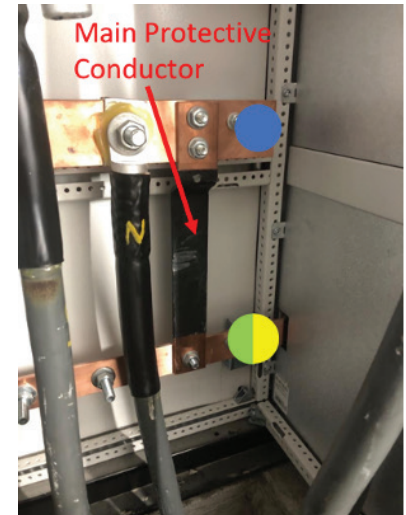


To assist with future periodic test inspections, the panel designer should consider a means to allow for visually inspection of the link between the Neutral and the Protective Conductor.



If a REC wishes to upgrade an electrical installation to TN-C-S, they can connect their Main Protective Conductor to the DSO neutral,

- provide the DSO equipment is suitable to accept the Main Protective Conductor,
- the work can be completed without the breaking of DSO seals and /or security tags,
- the REC issues a wiring certificate for the work completed



If the connection of the Main Protective Conductor to the DSO neutral is controlled by DSO seals, the REC shall issue an appropriate wiring certificate to cover the connection

MV and HV connections to the respective DSO networks shall be three phases only connections.

3.2 Single Occupancy Premises



A premises is the building and all facilities including land belonging to it that requires certification for the initial connection to the DSO system. Certification requirements are defined in chapter 6 of the National Rules for Electrical Installations.

In a single occupancy premises, there shall be only one connection between the DSO and the customer. This connection can be MIC, MEC or a combination of both.

The connection shall consist of DSO protection, DSO metering and customer Main Overcurrent Protection.

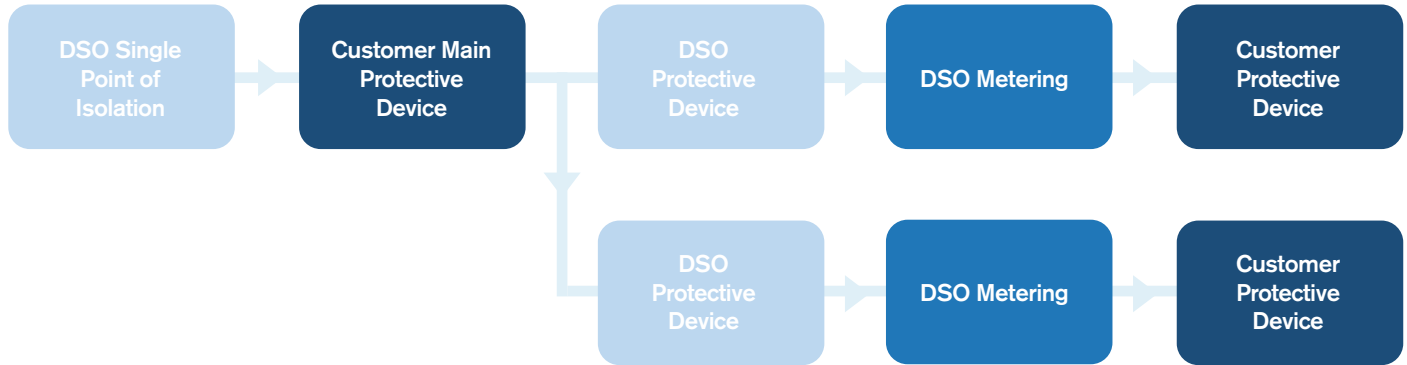
The connection point shall be as easily accessible to DSO appointed staff as required to complete their normal duties.

The photograph opposite shows a single occupancy connection during the DSO cable installation process.



3.3 Multi-Occupancy Premises

A multi-occupancy premises consists of several single occupancy connections fed from a single DSO source and individually metered at centralised metering location(s).



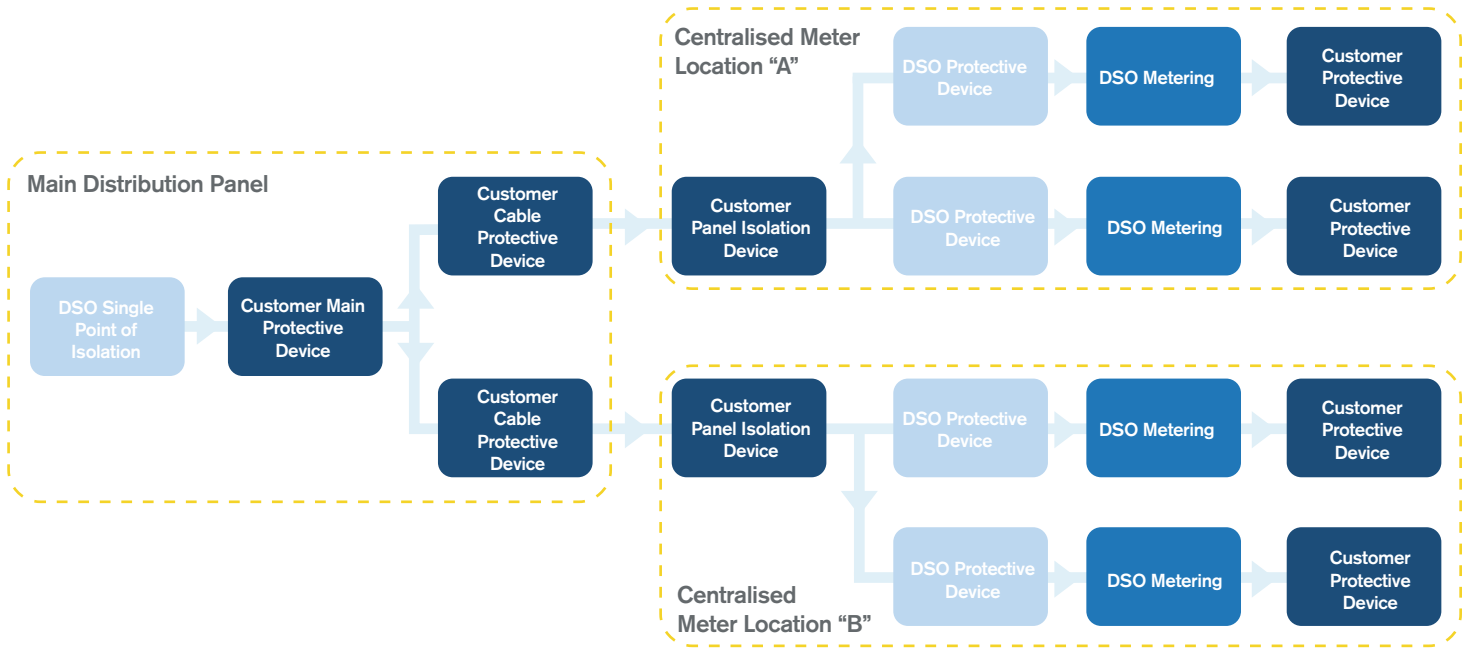
For single metering locations or multi-metering locations the follow shall apply;

- There shall only be a single DSO point of isolation for the premises.
- The customer (landlord) or their agent shall be responsible for:
 1. The panel(s)/enclosure(s) containing DSO protection and metering equipment feeding individual customers.
 2. Non-DSO equipment in these panel(s)/enclosure(s).
 3. Interconnecting conductors between panels and between meter location and individual customer premises.



In the event of damage to any of the apparatus mentioned in the sub-points above, the responsibility for repair or replacement of the apparatus shall lie with the customer (landlord) or their agent

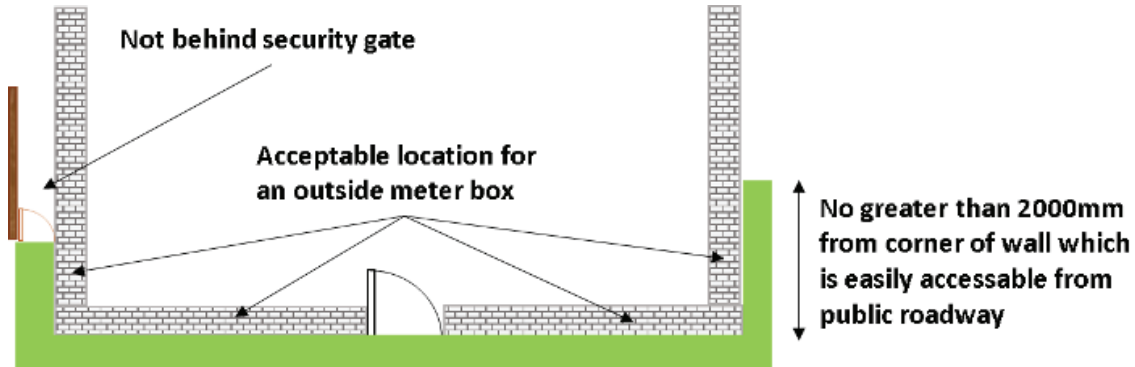
- All DSO equipment shall be in a location(s) which is easily accessible to DSO appointed staff as required to complete their normal duties.
- All sections of panel(s)/enclosures containing unmetered apparatus shall be sealable.
- A Keysafe shall be provided for the DSO to gain access to DSO equipment in secure areas.
- Each individual customer shall have the ability to read their own DSO meter.



Multi-metering locations.

4. Domestic Connections

4.1 Standard Outside Meter Box Connection



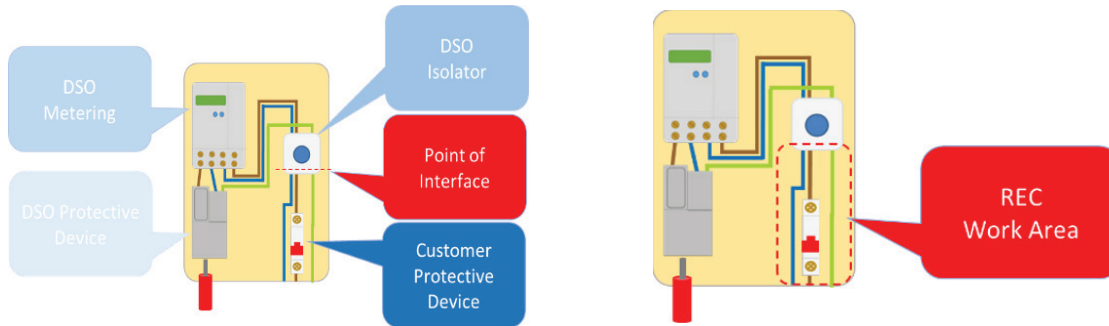
For all new standard single-phase domestic connections, the outside meter box is the preferred option for connection between the DSO and customer.

- The outside meter box shall be of a standard size 600mm x 400mm x 155mm (high x wide x deep) and fitted flush in an external wall at a height above the finished ground level to the bottom of the outside meter box of minimum 1000mm and maximum 1200mm (see ANNEX H).

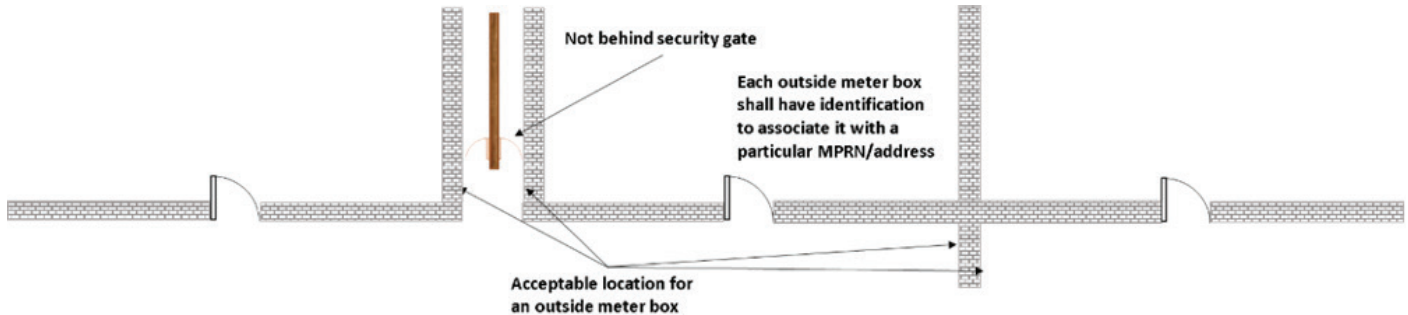


The Outside Meter Box is owned and installed by the customer for use by ESB Network DAC. ESB Networks DAC will replace doors on standard size outside meter boxes only.

- The outside meter box shall be directly accessible from the main entrance driveway. A position on the house wall facing the driveway, or within 2m of either corner of this wall is normally acceptable subject to proper access.
- The DSO service cable shall enter the outside meter box via an approved 50mm red duct in the bottom left hand side of the outside meter box.
- The customer may install an IP55 rated enclosure in the bottom right hand side of the outside meter box. This enclosure shall contain main overcurrent protection equipment only (see ANNEX H).



- Only the pre-constructed openings in the outside meter box shall be used to allow for cable access and egress.
- Where outside meter boxes are fitted in party walls between premises or several outside meter boxes are grouped together, each outside meter box shall have identification to associate it with a particular MPRN/address. This identification shall be in place at the time of the DSO service installation.



- Customer equipment shall NOT pass through another customer's premises.
- If a “Family Apartment” connection is required at a premises, a second outside meter box shall be fitted adjacent to the existing outside meter box (see ANNEX H). The customer shall provide approved 50mm red duct between the outside meter boxes to carry the DSO service cable.

4.2 Internal Meter Box Connection

In certain urban areas it may not be possible to get a suitable external location for an outside meter box. At design stage the local DSO office shall be contacted to review possible electrical designs. If an internal location is decided on, it shall meet with the following requirements:

- The customer shall provide a suitably sized enclosure to house the required DSO equipment (see ANNEX F for spacing requirements).
 1. For New W/C connections this means a DSO cut out, DSO meter and DSO Isolator.
- The enclosure shall have:
 1. 8mm triangular locks on the door
 2. Fire retardant back plate
- The enclosure shall be fitted so that the bottom of the DSO equipment is a minimum of 1400mm, and the top of the DSO equipment is a maximum of 2000mm above floor level.
- The customer shall provide a route from the external of the premises to the meter box location for the service cable which meets an impact standard of AG3 (IS10101:2020 Annex 512A).
- The maximum length of DSO service cable inside the customer’s premises shall be no longer the 3m in length and shall be mechanically protected.

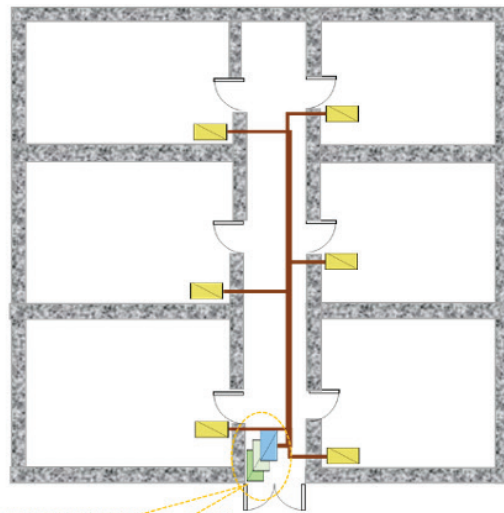
4.3 Centralised Metering Connections

For multiple domestic connections the preferred option is centralised meter location. The location of the meter enclosure(s) shall be decided at the design stage with the local DSO office. The enclosure shall meet the following requirements:

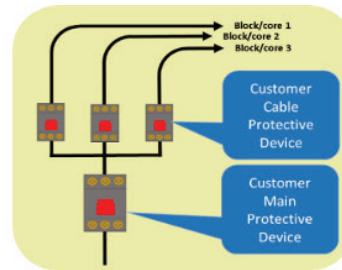
The customer shall provide a suitable enclosure to house the DSO equipment (see ANNEX F for spacing requirements).

- The enclosure shall have:
 1. 8mm triangular locks on the door
 2. Fire retardant back plate

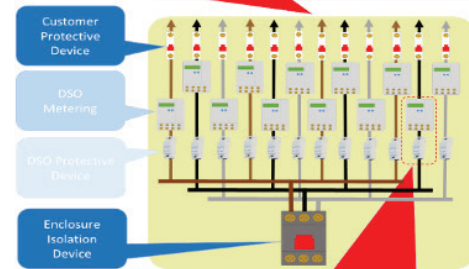
- The enclosure shall be fitted so that the bottom of the DSO equipment is a minimum of 600mm, and the top of the DSO equipment is a maximum of 2000mm above floor level.
- The enclosure shall be manufactured in accordance with 2.5 .
- The meter enclosure shall be in an area which is easily accessible.
- A meter enclosure shall supply the units in a single block/core of a multi-block/core development.
- There shall be a single point of isolation for each block/core in the meter enclosure.



Panel containing
Main Supply Point
Main Isolating Switch
Centralised Metering



REC is responsible for the Multi-metering enclosure and shall ensure that the enclosure meets the requirements as set out in Annex C.2



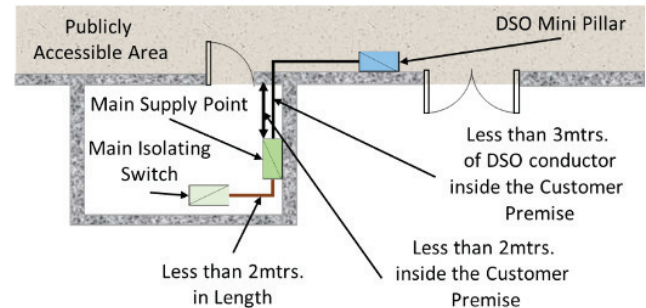
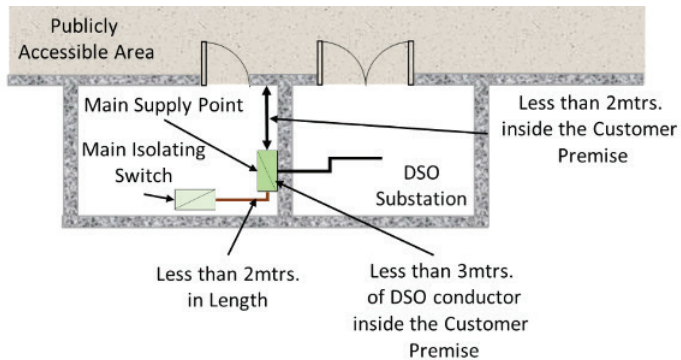
DSO fit and terminate Meter and fit the fuse in the DSO Protective Device

5. Commercial Connections

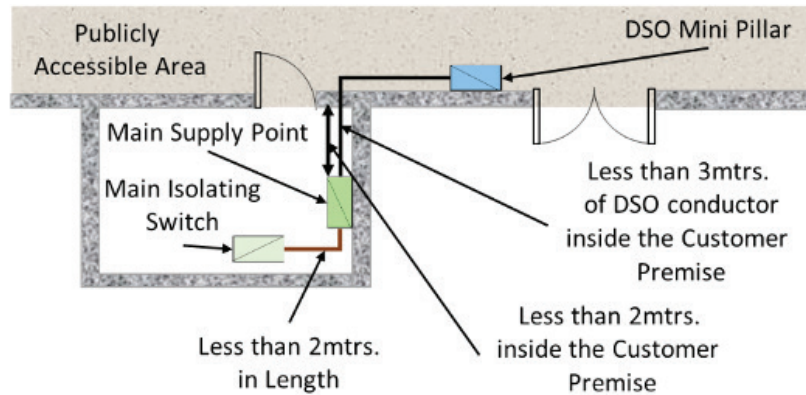
5.1 Switch Room

Most commercial connections, greater than 50kVA, will require the customer to provide a main distribution board in an electrical operating area. This area is more commonly known as a switch room. The area shall contain the following:

- Main Supply Point – DSO owned, maintained and operated protection device which is fed by conductors no greater than 3m in length inside the customer premises.
- Main Isolating Switch – Customer owned, maintained and operated protection device which is fed by conductors no greater than 2m in length from the Main Supply Point.



The position of the DSO metering is dependent on the type and number of connections fed from the Main Supply Point.



6. Special Situations

All installations connected to the DSO system shall be metered. There are, however, situations where the DSO does not require a DSO meter to be fitted, these are known as Un-Metered Connections.

When the customer installs a service pillar as described in the options below there shall be a separation of at least 2m between the DSO mini pillar and the customer's service pillar. The purpose of this requirement is to avoid conflict and ensure segregation between the DSO cable vault/ducts and the customer ducting e.g. the customer circuits cannot pass through the DSO cable vault.



If 2m segregation cannot be achieved, the DSO pillar and customer's service pillar shall be cross bonded.

6.1 Un-Metered Connection

The main criteria for an un-metered connection is a single phase verified constant load not exceeding 2kVA. At application stage, the DSO will decide if the connection meets the criteria to be unmetered or if a meter will be fitted.



If an un-metered connection is agreed with the DSO, the REC shall affix a permanent label with the MPRN for the electrical installation at the relevant interface point.

Type of installation	Option 1	Option 2	Option 3
Advertising Hoarding	Preferred Option	Other Options	N/A
Advertising Kiosks	Preferred Option	Other Options	N/A
Bus Shelters	Preferred Option	Other Options	N/A
Communication Kiosk	Other Options	Other Options	Preferred Option
Garda Cameras (CCTV)	Preferred Option	Other Options	N/A
Ice Detecting Stations	Preferred Option	Other Options	N/A
Public Lighting ≤ 2KVA	New Connections U/G	New Connections O/H	Replacement of column (3B) & New Connections U/G
School Signs	Preferred Option	Other Options	N/A
Traffic Counting Stations	Preferred Option	Other Options	N/A
TV Booster	Other Options	Other Options	Preferred Option
Water Metering Points	Preferred Option	Other Options	N/A

All options shall meet with the following requirements:

- Warning label “Live electricity” required on door(s).
- 8mm triangular locks required on door(s).
- Fire retardant back plate.
- Enclosure shall have no sharp edges.
- Outside enclosures used to house DSO equipment shall be either non-metallic, stainless steel or hot-dipped galvanized and have a minimum IP44 rating.
- See 2.5 for requirements in relation to protection against corrosion.
- The interface point shall be the outgoing side of the DSO isolator.

Option 1: Customer Service Pillar Connection

Minimum Dimensions 600mm high above ground level x 250mm wide x 150mm deep

Root depth: 320mm

Minimum opening size

510mm high x 220mm wide

Space requirements

ESB Networks: 125mm wide LHS. Customer: 125mm wide RHS

Equipment shown

DSO Single Phase Cut Out. DSO Single Phase Isolator



Option 2: Overhead PL Interface Connection (Suitable for Wall/Pole mounting)

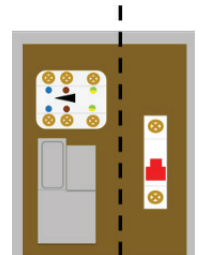
Dimensions (Minimum working envelope): 320mm high x 220mm wide x 120 deep

Space requirements

ESB Networks: 125mm wide Left-Hand Side (LHS). Customer: 125mm wide Right-Hand Side (RHS)

Equipment shown

DSO Single Phase Cut Out. DSO Single Phase Isolator



Option 3A: Integrated Enclosure in

Customer equipment

To reduce the amount of street furniture, the DSO has agreed to allow its equipment to be installed in a separate enclosure that forms part of a single piece of street furniture. The enclosure shall have, as a minimum, dimensions equal to those in Option 1. The customer may place electrical equipment in the RHS of the enclosure. If the customer requires additional secure locking, they shall incorporate a Keysafe to hold the key to the secure lock



Option 3B: Double Access Public Lighting Columns

There are times when local authorities need to replace a single existing PL column. Where this column contains an individual DSO supply at present the correct way of completing this work is as shown opposite.

This column contains two openings in the column. The lower opening is for the DSO cut out and isolator. The upper opening is for the customer equipment. DSO cut out is positioned a minimum of 600mm above ground level.



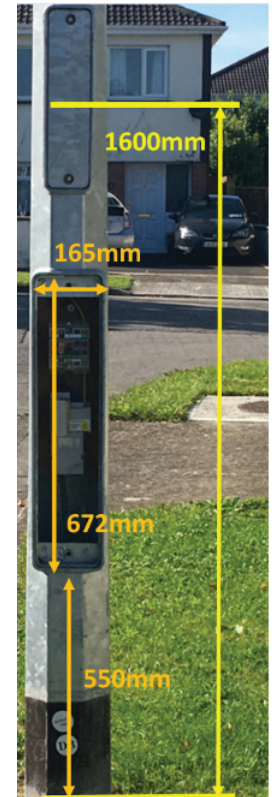
This column may be used as the injection point on new P/L connection to reduce the amount of street furniture.

The DSO cut out and isolator shall be installed in the bottom opening. The bottom opening (DSO) shall be of external dimension 672 x 175mm at a minimum height of 550mm above ground level.

The DSO cut out shall be a minimum of 600mm above ground level.



6m, 8m or 10m octagonal or stepped tubular columns are permitted.



6.2 Metered Connection

Connections that do not meet the requirement of a single phase verified constant load not exceeding 2kVA as specified in 6.1 shall be metered. Metered connections shall meet the following requirements:

- Warning label “Live electricity” required on doors.
- 8mm triangular locks required on doors.
- Vertically hinged door for access to DSO equipment.
- Fire retardant back plate.
- Enclosure shall have no sharp edges.
- Outside enclosures used for housing DSO equipment shall be either non-metallic, stainless steel or hot dip galvanised and have a minimum IP44 rating.
- See 2.5 for requirements in relation to protection against corrosion.
- Gland plate must be fitted to prevent moisture ingress and allow for minimum dimensions for DSO equipment.
- Trunking to enclose DSO service cable required.
- Approved sealant must be installed in base of pillar.

Type of installation	Option 1	Option 2	Option 3
W/C Metering	Preferred Option	Other Options	N/A
CT Metering	N/A	N/A	Preferred Option

Option 1: Customer Service Pillar - W/C Meter Connection

Minimum Overall Dimensions

1250mm high above ground level x 500mm wide x 225mm deep

Root depth: 350mm

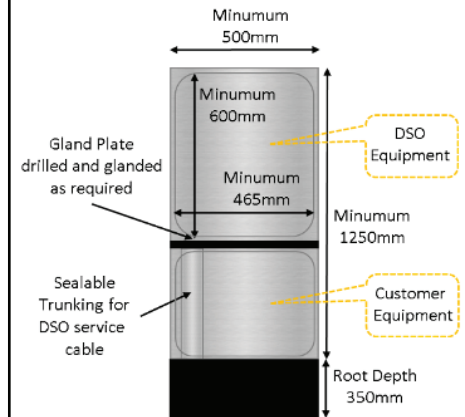
Minimum Dimensions for DSO Equipment

600mm high x 220mm wide x 225mm deep

Additional Requirements

Minimum 600mm from ground level to the bottom of DSO compartment.

The DSO equipment shall be fitted in the upper compartment of the enclosure with its own door. The customer equipment shall be fitted in the lower compartment of the enclosure with its own door. The exception to this, is a steel sealable trunking provided on the left-hand side of the customer compartment to allow the DSO service cable to access the DSO compartment.



Option 2: Integrated Enclosure in customer equipment

To reduce the amount of street furniture, the DSO has agreed to allow its equipment to be installed in a separate enclosure that forms part of a single piece of street furniture.

The enclosure shall have, as a minimum, dimensions equal to those in Option 1. If the customer requires additional secure locking, they shall incorporate a Keysafe to hold the key to the secure lock.



Option 3: Customer Service Pillar - CT Meter Connection

Minimum Overall Dimensions

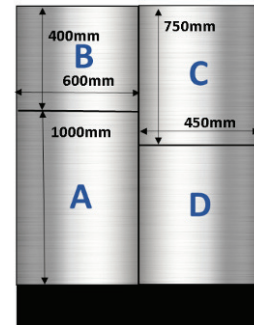
High as shown x wide as shown x 225mm deep

Root depth: 350mm

Compartments A, B and C are for housing the DSO fuse unit, DSO CTs and DSO meter respectively.

Compartment D is for the customer equipment.

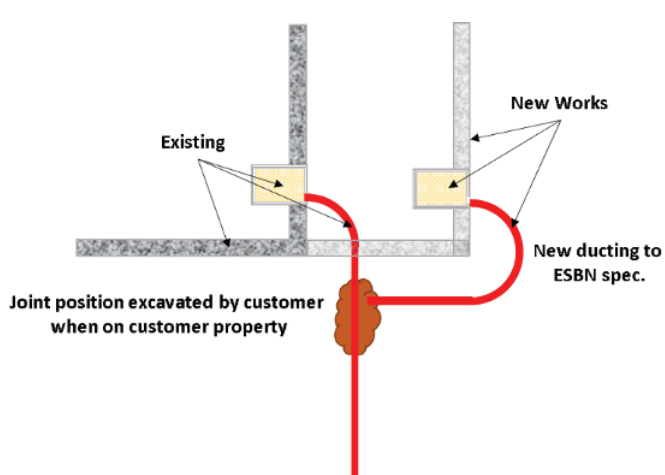
The customer shall supply, own and maintain the enclosure. If the customer requires additional secure locking, they shall incorporate a Keysafe to hold the key to the secure lock.



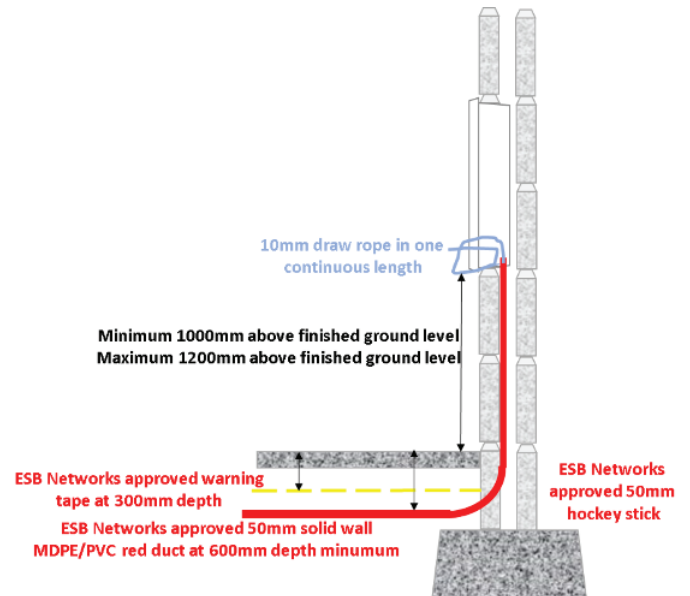
7. Service Alteration

7.1 Domestic

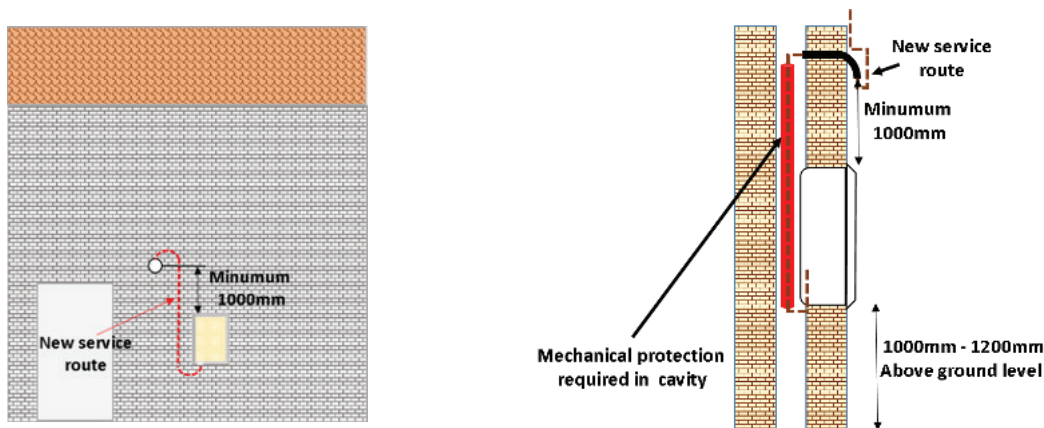
When a customer is carrying out work on their electrical installation, they should review the location of the DSO equipment. Contact shall be made with the local DSO office to discuss a new location.



Where the DSO service is underground the customer shall provide an agreed route from the exist service route to the new outside meter location.



Where the existing service is fed from overhead, if possible, it shall be converted to an underground connection. If it has to remain as an overhead connection the customer shall provide a route through the cavity for the new service cable. The new service cable shall be mechanically protected in the cavity.



7.2 Commercial/Industrial

When a customer is carrying out work on their electrical installation, they should review the size of their additional load and the impact this will have on the level and type of supply from the DSO. When a customer requires an increase in their supply from the DSO, contact shall be made with the local DSO office as early as possible as the increase may require significant changes to the customer's electrical installation, particularly at the interface between the customer and the DSO.

8. Agricultural/Horticultural Premises



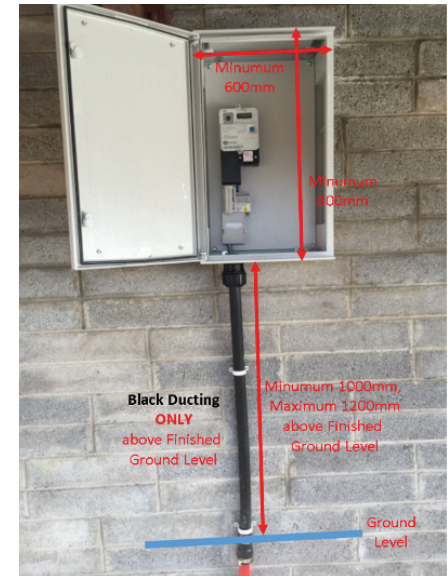
It is essential that these requirements are complied with by Customer/Contractor to ensure prompt installation of ESB Networks connection cables.

All service terminations shall be enclosed within an IP 55 rated enclosure. Entries into such enclosures shall be glanded to maintain IP55 standards.

A vertically hinged IP55 enclosure (800 x 600 x 200 minimum) e.g. Polyester / Stainless steel is required for a single -phase connection. This is provided and installed by the customer to house ESB Networks equipment. For other metering arrangements a larger enclosure will be required. The location of the Cabinet should be agreed with the local ESB Networks office beforehand, whether indoor OR outdoor.

8.1 Specification for Standard Underground Service Supplied from Overhead Network

A suitable size red electric cable duct to be provided by Customer in a 600mm deep (minimum conditions) trench from the meter cabinet to ESB Networks pole. The duct should have a minimum radius bend of 450mm. The duct should contain a 10mm, strong draw rope to facilitate the pulling in of ESB Networks service cable.

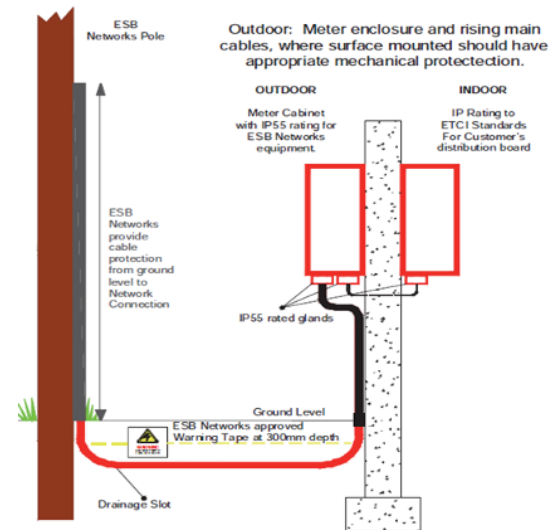


ESB Networks approved warning tape “Electric cables below” should be laid 300mm above the duct inside customer’s property. The installation of meter cabinet and duct(s) should be in accordance with best building practices, this code, and NSAI IP standard.



Your attention is drawn to the potential danger of working in close proximity to electric lines. If there is an existing line nearer than 25 meters to your proposed building (including TV aerial) no construction work shall commence until ESB Networks have checked the situation.

- Standard Domestic Meter Cabinets are not acceptable for this application.
- Enclosure shall be stainless steel or non-conductive minimum IP55
- Customer’s Earths must not be within 25m of ESB Networks poles.



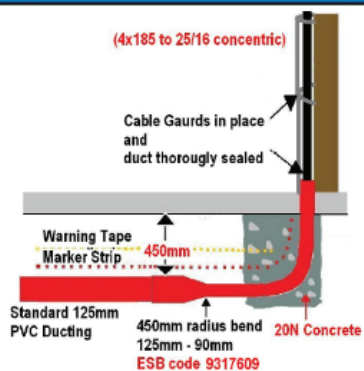


For ducting layouts see: Summary of Standard Specification for ESB networks MV/LV Ducting DTIS-230908-BUV

24D

LV Cable End Pole Position - Elevation

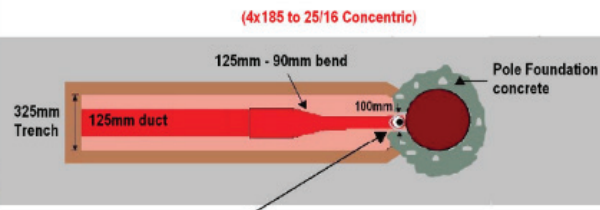
Ducting For LV Mains and LV Service Cable



24E

LV Cable End Pole Position - Plan View

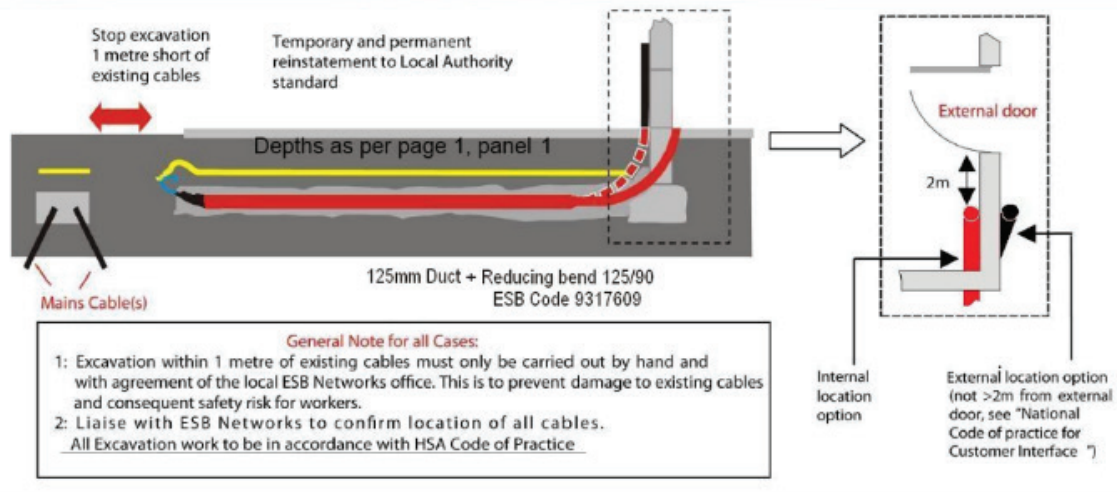
Ducting for LV Mains and LV Service Cable



1. Cut channel into pole concrete foundation to allow for the vertical section of the duct bend to lie against the pole
2. Place duct bend into position
3. Backfill and support bend with 20N concrete mix as per elevation view

25 A

LV Ducting for Non Domestic Connections Duct laid to Mains Cable

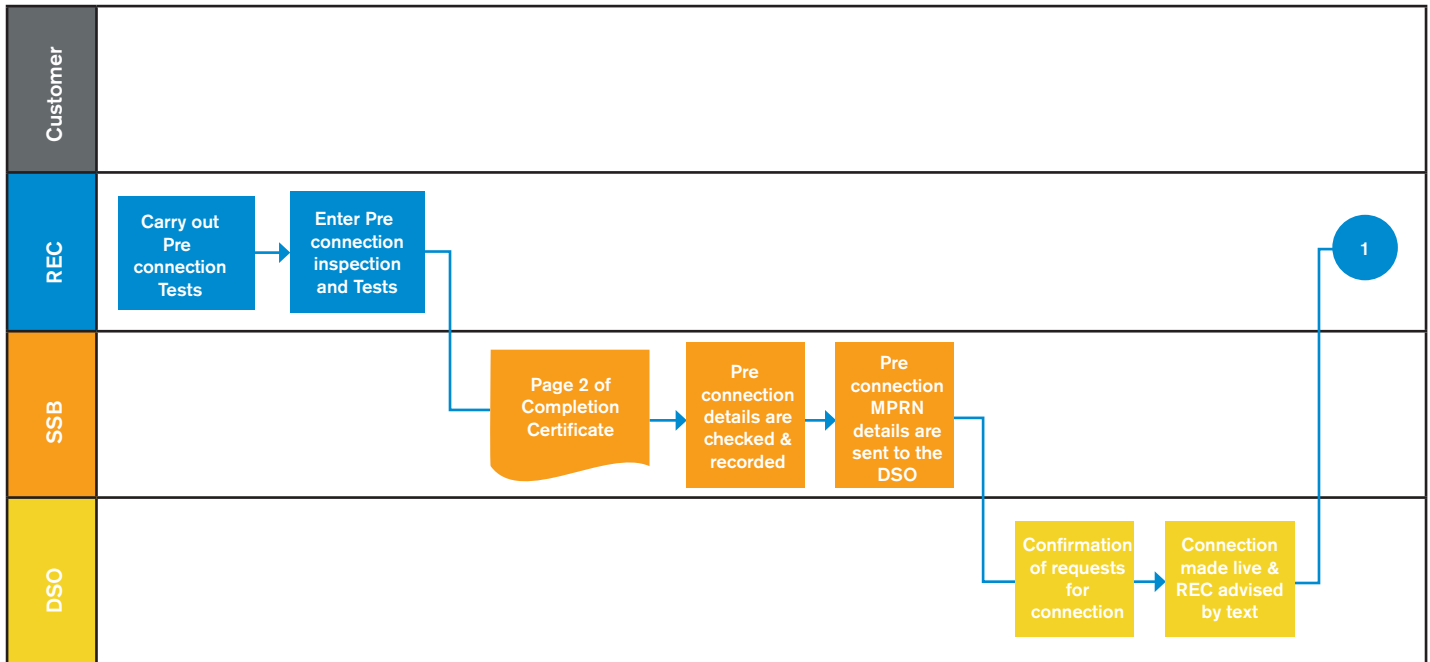


Annex A.(Informative) CRU Certification Procedures

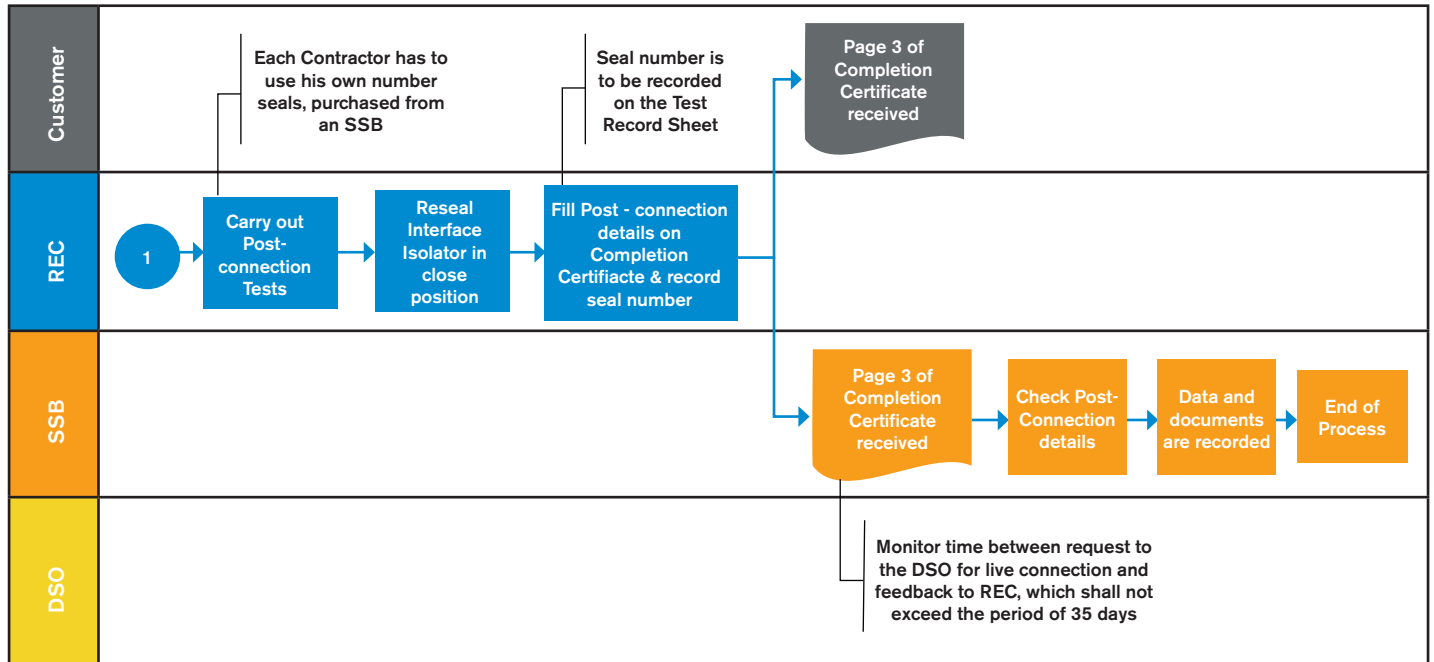
The information contained in this Annex has being reproduced with the permission of CRU.

A.1. Process No 1: Connection / Reconnection Required

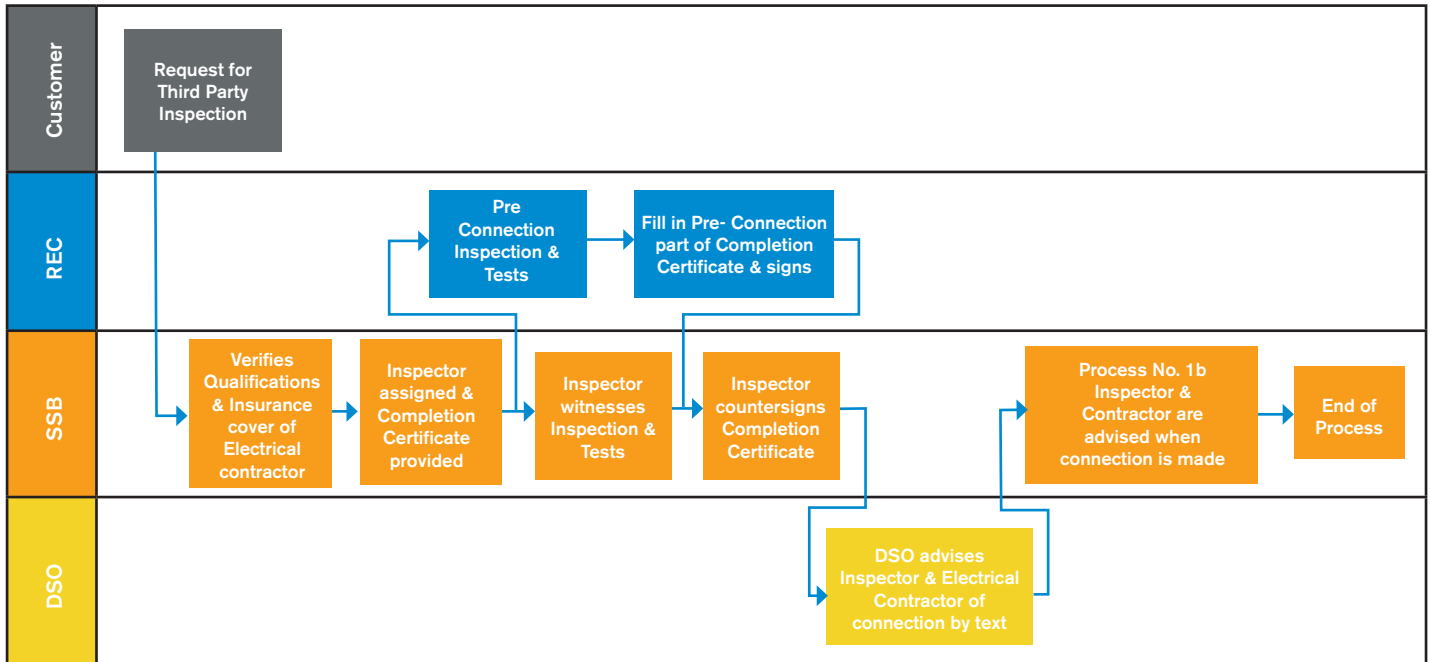
Process No 1a



Process No 1b

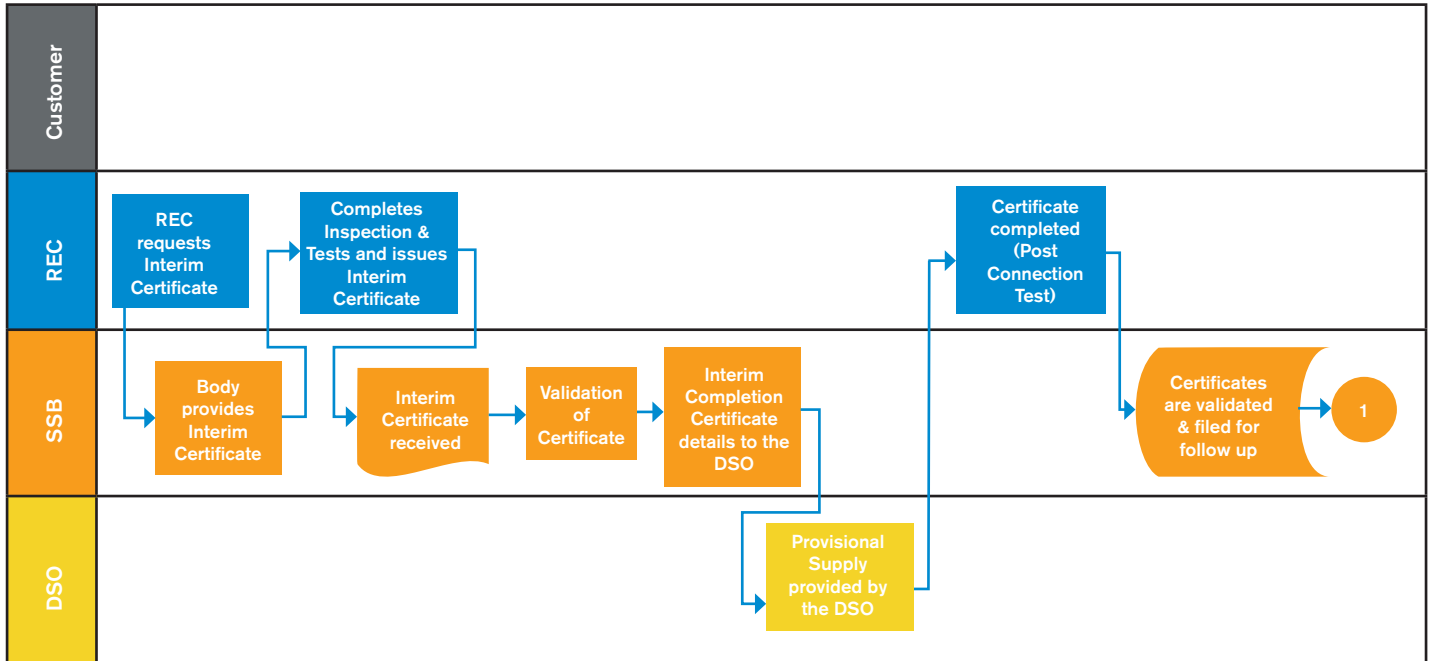


A.2. Process No 2: REC without Self-Certification Privileges – Third party Connection

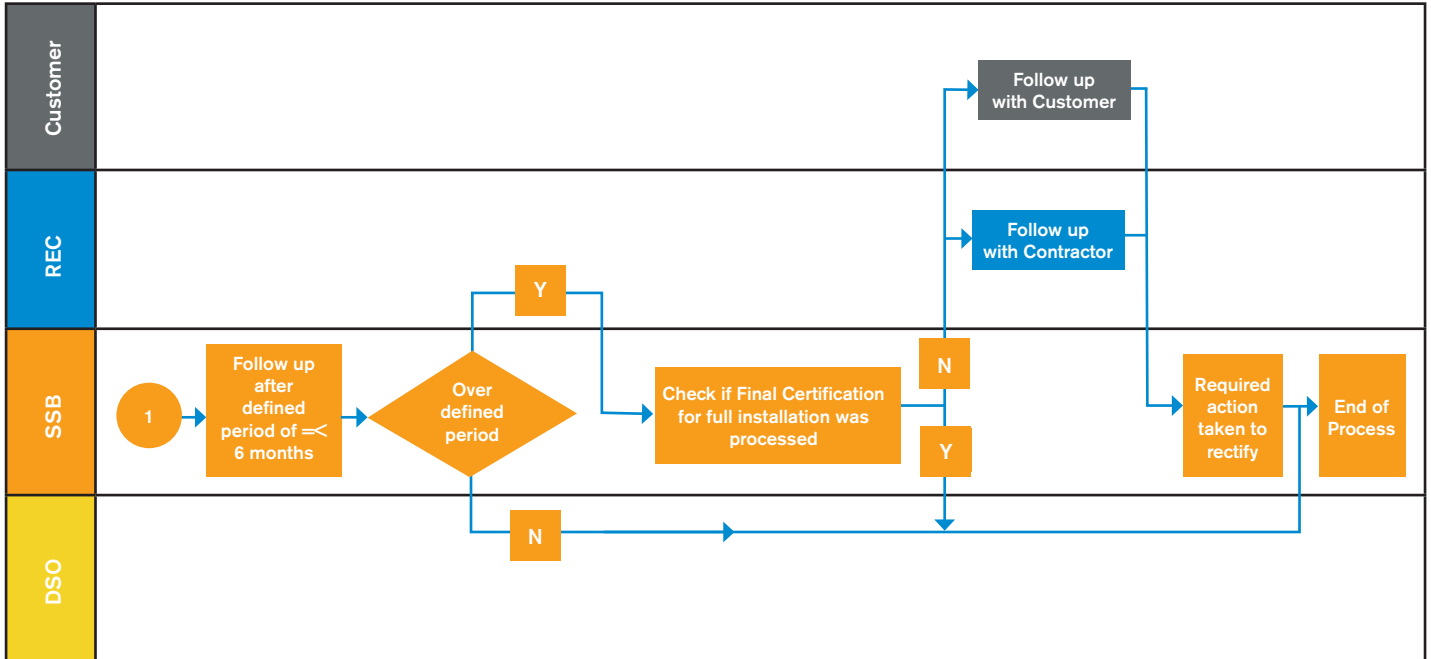


A.3. Process No 4: Interim Certificates / For Connections / Reconnection

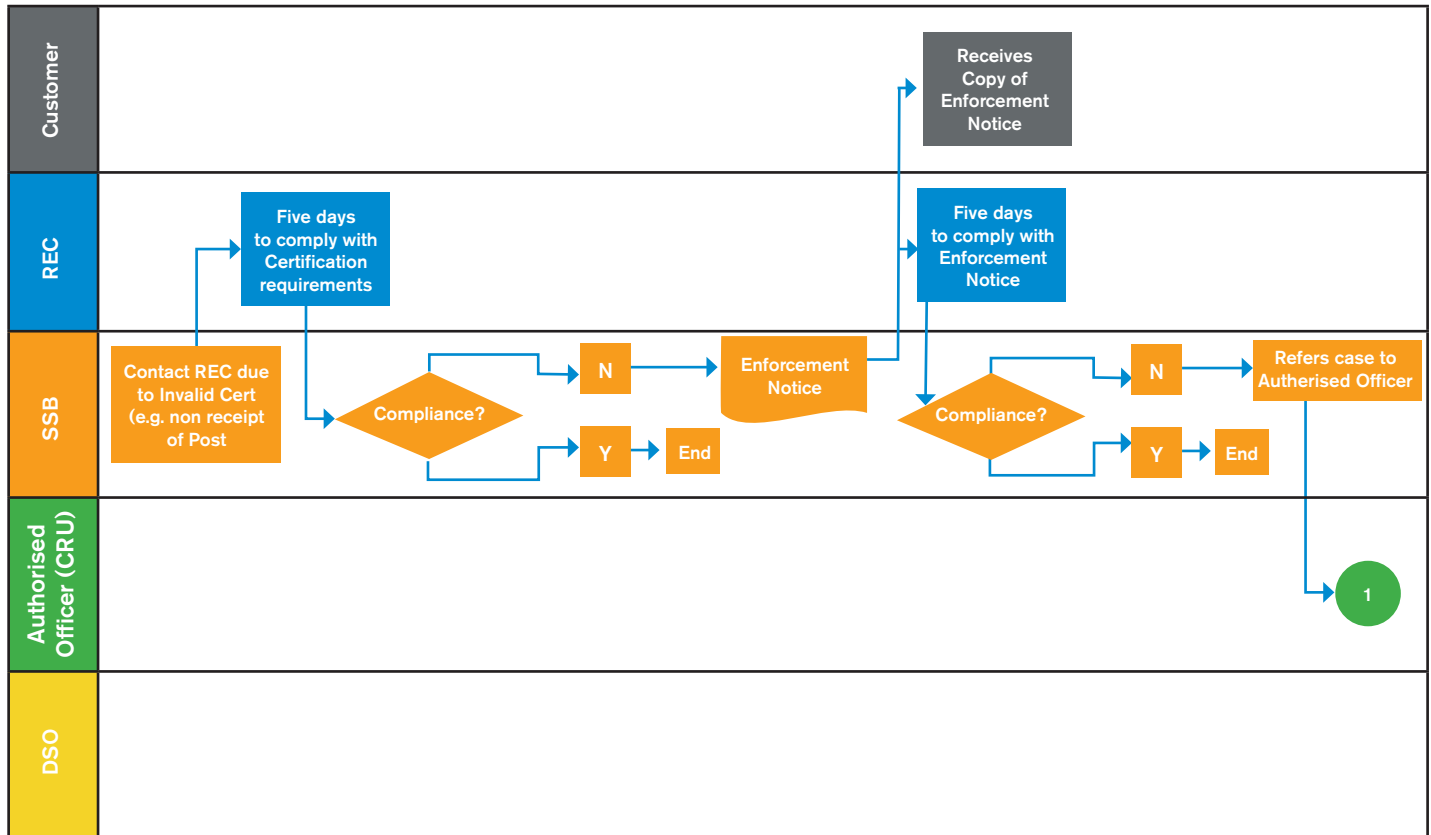
Process No 4a

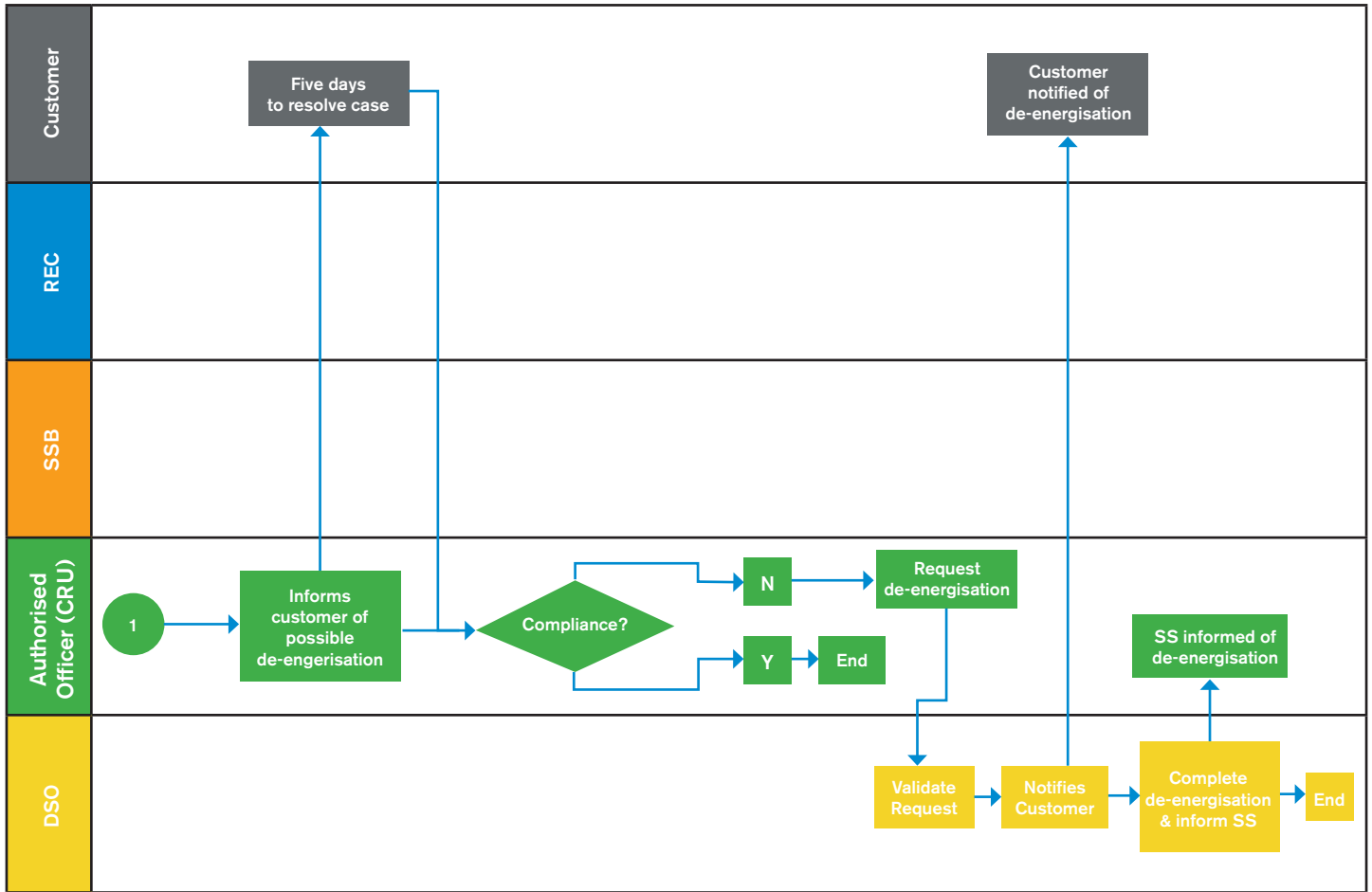


Process 4b



A.4. Process for De-Energisation of Installation from the DSO Network

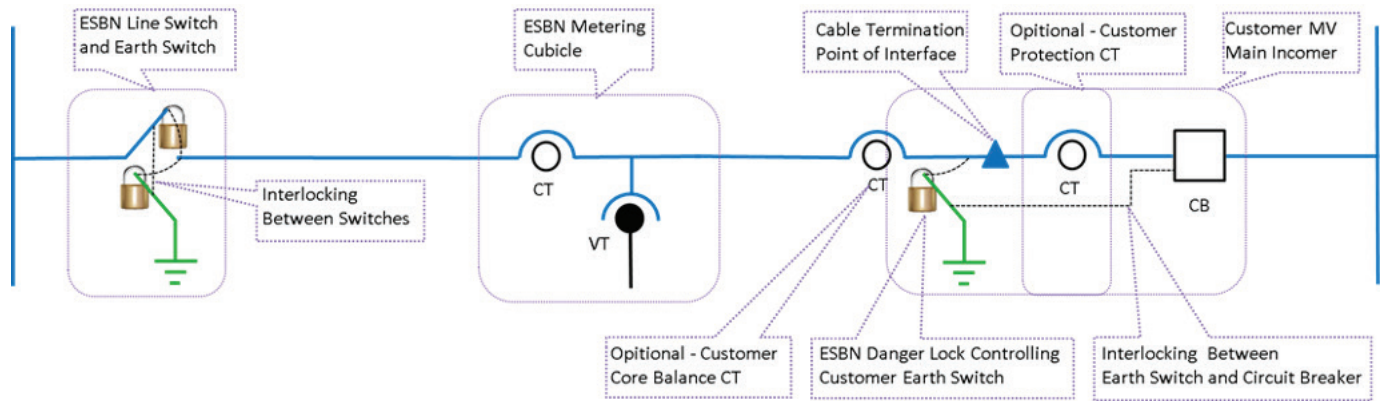




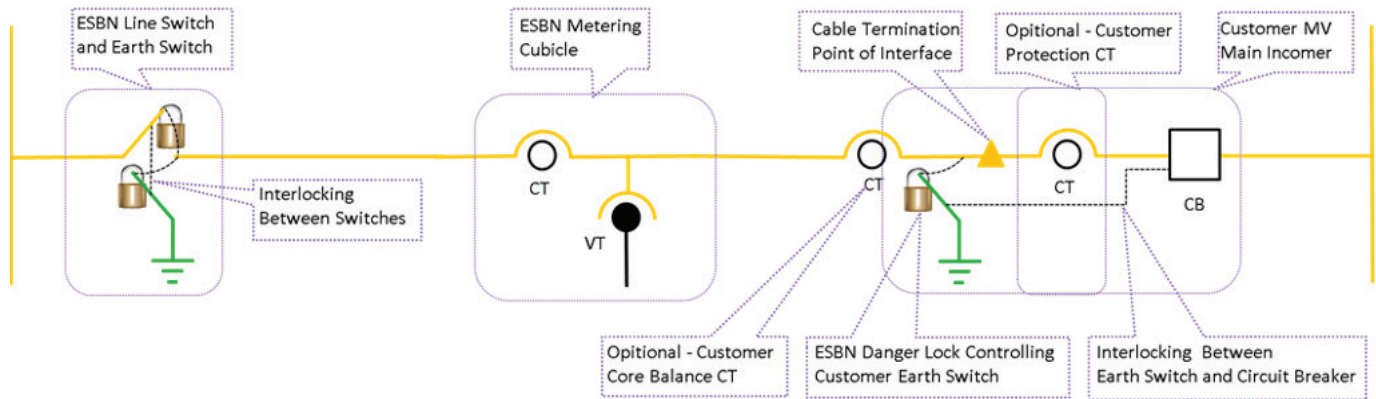
Annex C.(Informative) HV Connection – Single Line Diagram

C.1. Single Feed Customer

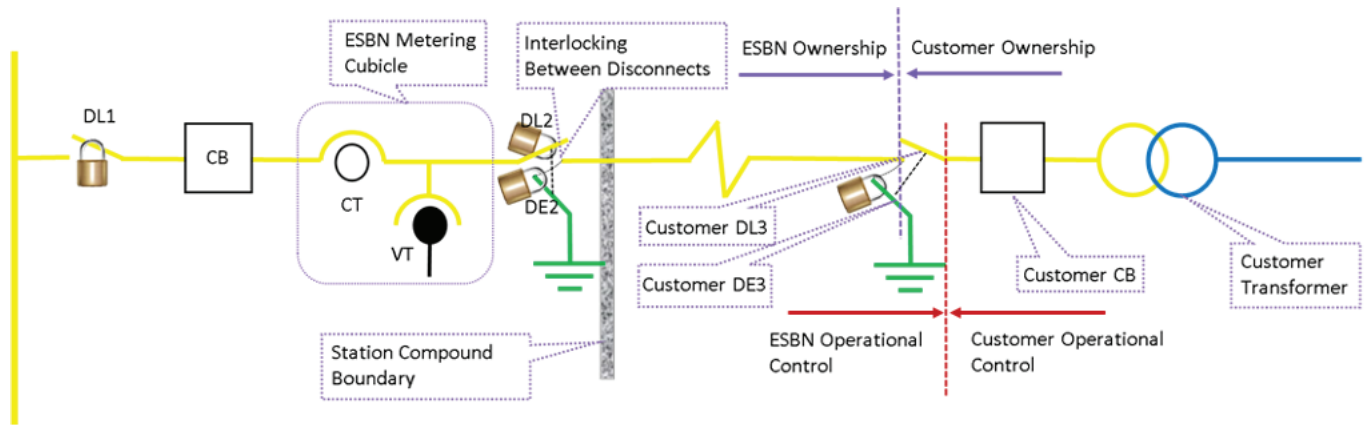
C.1.1. 10kV Interface



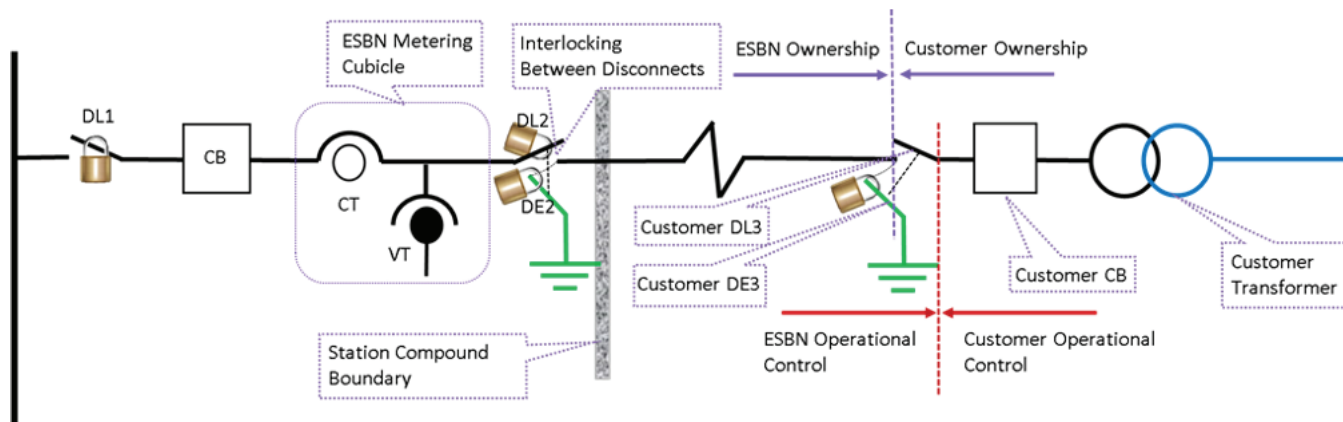
C.1.2. 20kV Interface



C.1.3. 38kV Interface



C.1.4. 110kV Interface

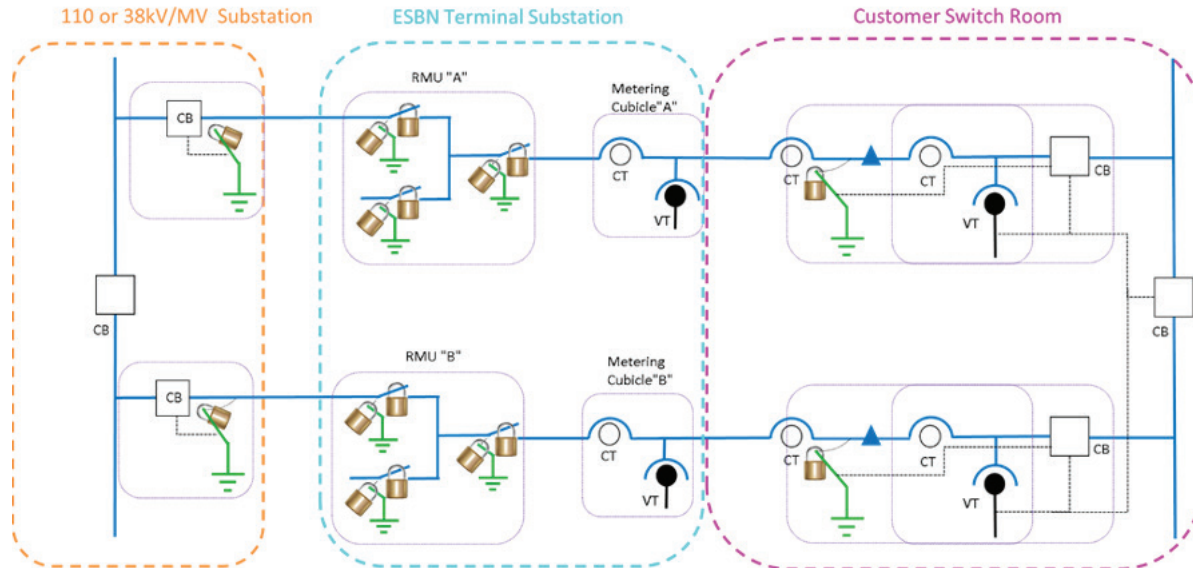


110/10kV connection shown for illustration purposes. Identical lay out for 110/20kV connection

C.2. Multi – Feed Customer

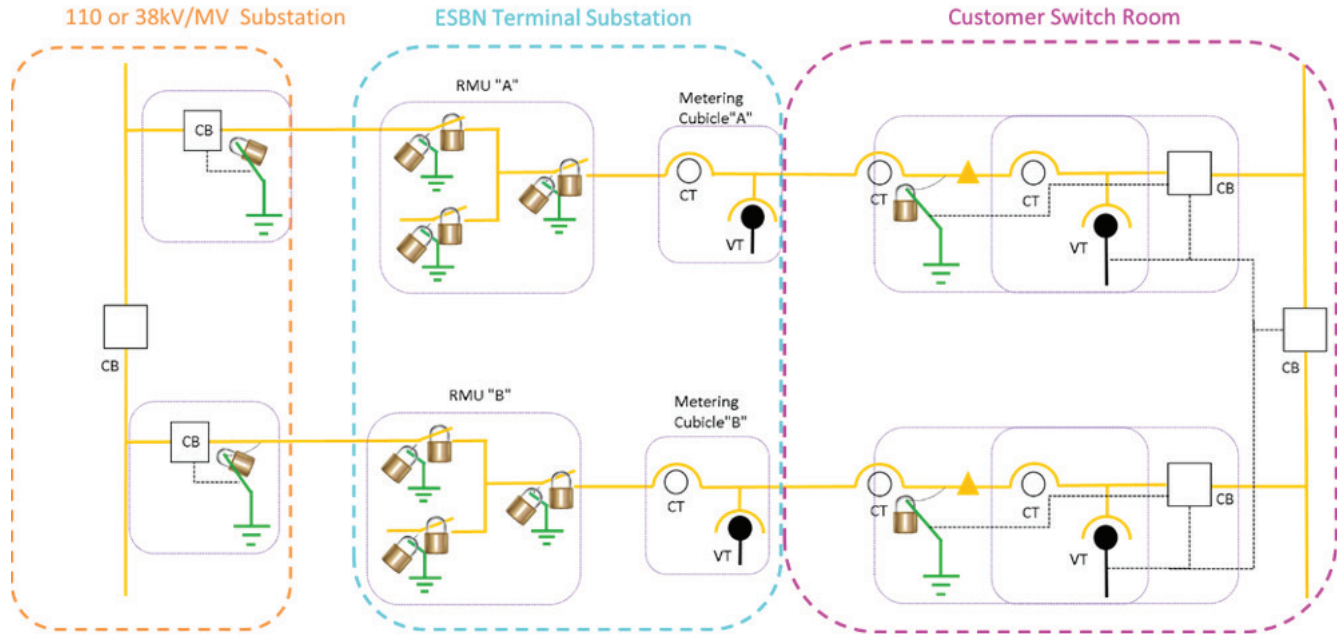
These connections are only available in limited circumstances.

C.2.5. 10kV Interface



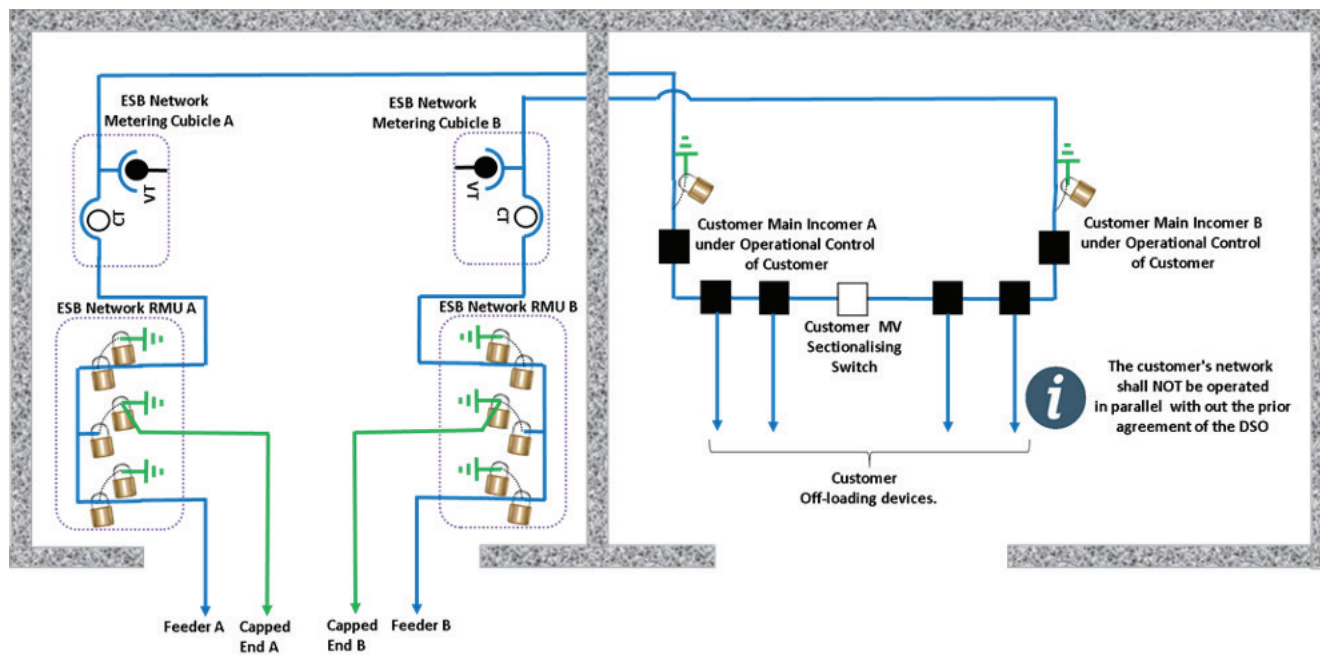
Where only one feed is switched out and earthed for work, the secondary wiring of the customer's associated VTs may still be energised via the LIVE feeder

C.2.6. 20kV Interface



Where only one feed is switched out and earthed for work, the secondary wiring of the customer's associated VTs may still be energised via the LIVE feeder





























C.2.7. Physical Layout



10kV connection shown for illustration purposes. Identical lay out for 20kV connection

Annex D.(Mandatory) LV Connections – Single Line Diagrams

The following the symbols are used in this document:

DSO owned, operated and maintained	Customer owned and maintained, DSO operated	Customer owned, operated and maintained		
 80A Single Phase Cut Out	 160A Single Phase Cut Out	 80A Three Phase Cut Out	 200A Three Phase Cut Out	 400A Three Phase Cut Out
 Single Phase W/C Meter	 Single Phase CT & Meter	 Three Phase W/C Meter	 Three Phase CT Enclosure	 Three Phase CT & Meter
 Single Phase Isolator	 Single Phase NSH Contactor	 Three Phase Isolator	 DSO Mini Pillar	 DSO Substation
 Keysafe	 DSO Conductor	 Outside Meter Box	 Single Phase DSO fuse	 Three Phase DSO fuse
 Customer Pillar	 Single Phase Main Protective Device	 Three Phase Main Protective Device	 Three Phase Switch Fuse/MCB	 Bus Bar Enclosure
 Customer Conductor	 EV Charging Point	 Customer NSH Contactor		



The drawings and graphics in this document are for Illustration purposes only.

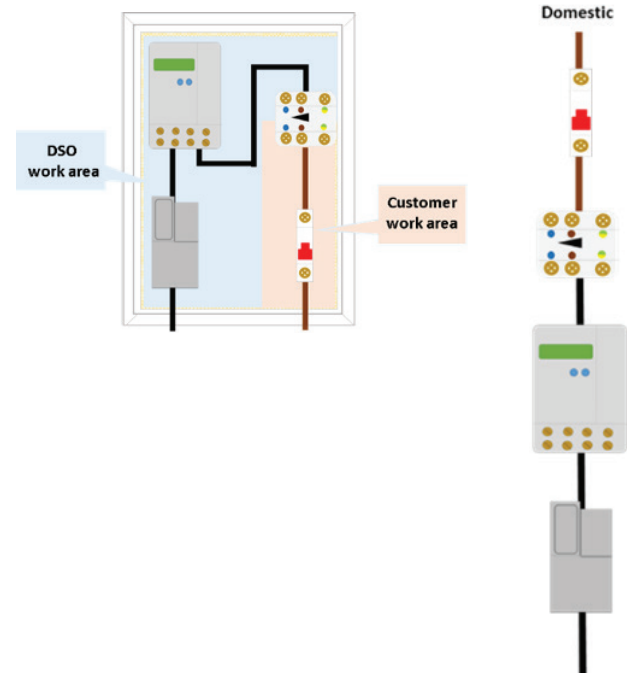
D.1. Single Phase Connection – W/C Metering

D.1.1. 12 & 16kVA Single Tariff

This SLD covers single phase new connections at 12 & 16kVA for single customer, single occupancy premises. With the DSO protection, W/C Meter, Isolator and customer Main Overcurrent Device shown. Physical layout in an outside meter box.



For 16kVA supplies the standard 100/80A cut out can be used with 35/25 YCY service cable or 70/50 YCY service cable (with reducer) depending on volt drop calculation.



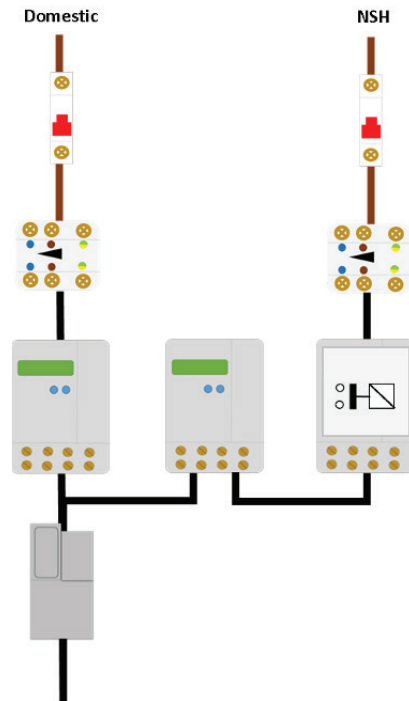
D.1.2. 12 & 16kVA Domestic & NSH Tariff (2 Meters)

This SLD covers single phase new connections at 12 & 16 kVA for single customer, single occupancy premises. With the DSO Protection, W/C Meter, Isolator and customer Main Overcurrent Device shown.

NSH load feed from its own meter via DSO Contactor.



For 16kVA supplies the standard 100/80A cut out can be used with 35/25 YCY service cable or 70/50 YCY service cable (with reducer) depending on volt drop calculation.



D.1.3. 12 & 16kVA Dual Tariff (1 Meter)

This SLD covers single phase new connections at 12 & 16 kVA for single customer, single occupancy premises. With the DSO Protection, W/C Meter, Isolator and customer Main Overcurrent Device shown.

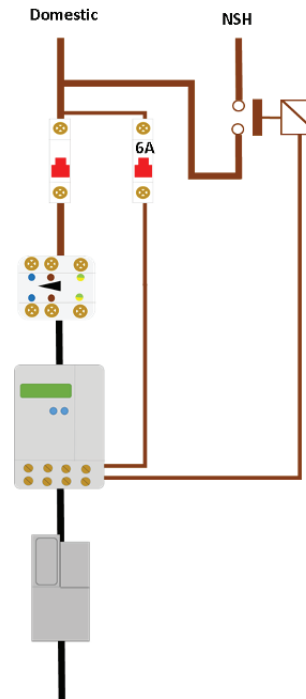
NSH load feed via control pair from DSO Meter



Maximum permissible switching current to the customer's contractor shall be $\leq 80\text{mA}$



For 16kVA supplies the standard 100/80A cut out can be used with 35/25 YCY service cable or 70/50 YCY service cable (with reducer) depending on volt drop calculation.

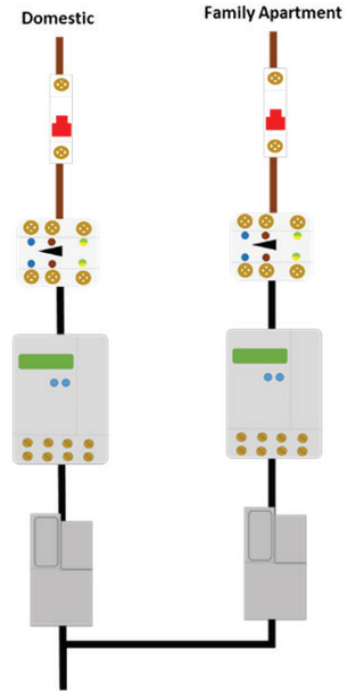


D.1.4. Family Apartment

This SLD covers single phase new connection of 12 kVA for an additional single customer at a single occupancy premises.

The commercial rules for this type of connection are available at: <https://www.esbnetworks.ie/new-connections/additional-domestic-connection>

For physical layout see H.1.1



D.2. Single Phase – CT Metering

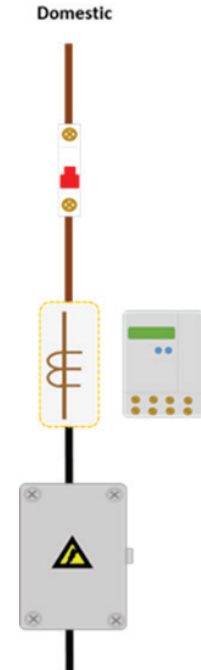
D.2.5. 20 & 29kVA Enhanced Supply Single Tariff

This SLD covers single phase new connections at 20 & 29 kVA for single customer, single occupancy premises.

With the DSO Protection, CT Meter, and customer Main Overcurrent Device shown.



For 20/29kVA single phase CT connections, the REC will be required to ensure that the conductors are long enough to connect to the DSO cut out via the CT enclosure.



D.2.6. 20 & 29kVA Enhanced Supply Dual Tariff

This SLD covers single phase new connections at 20 & 29 kVA for single customer, single occupancy premises. With the DSO Protection, CT Meter, and customer Main Overcurrent Device shown.

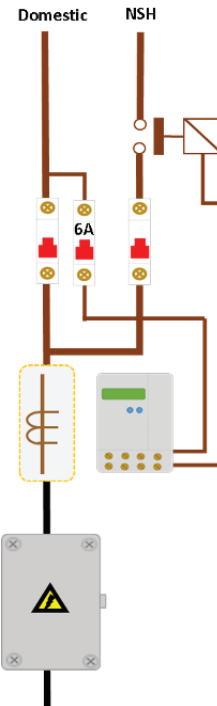
NSH load feed via control pair from DSO Meter.



Maximum permissible switching current to the customer's contractor shall be $\leq 80\text{mA}$



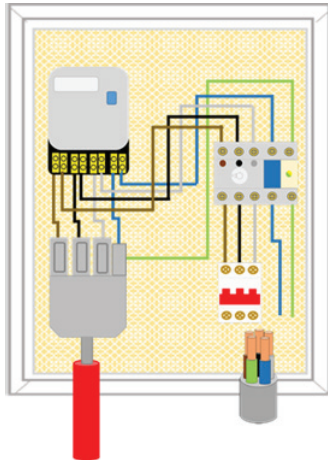
For 16kVA supplies the standard 100/80A cut out can be used with 35/25 YCY service cable or 70/50 YCY service cable (with reducer) depending on volt drop calculation.



D.3. Three Phase – W/C Metering

D.3.7. $\leq 29\text{kVA}$ Single Tariff

This SLD covers three phase new connection ≤ 29 kVA for single customer, single occupancy premises. With the DSO Protection, W/C Meter, Isolator and customer Main Overcurrent Device shown.



Physical Layout

3 Phase Load



Electrical Layout

D.3.8. ≤29kVA Dual Tariff

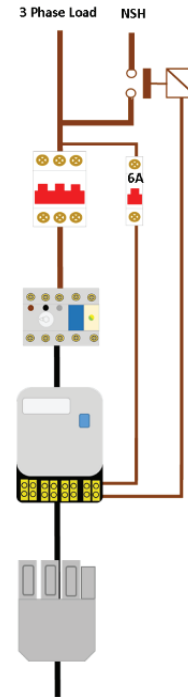
This SLD covers three phase new connection ≤ 29 kVA for single customer, single occupancy premises. With the DSO Protection, W/C Meter, Isolator and customer Main Overcurrent Device shown.

NSH load feed via control pair from DSO Meter.



Maximum permissible switching current to the customer's contractor shall be ≤ 80mA

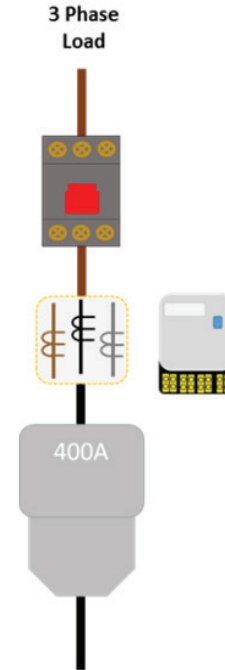
The REC shall ensure for single phase NSH load, that the control circuit and NSH circuits are feed from the same phase (L1).



D.4. Three Phase – CT Metering (Total Load less than 200kVA)

D.4.9. Single Connection

This SLD covers three phase new connections ≥ 50 kVA for single customer, single occupancy premises. With the DSO Protection, CT Meter, and customer Main Overcurrent Device shown.



D.4.10. Multi Connections – All W/C Meters

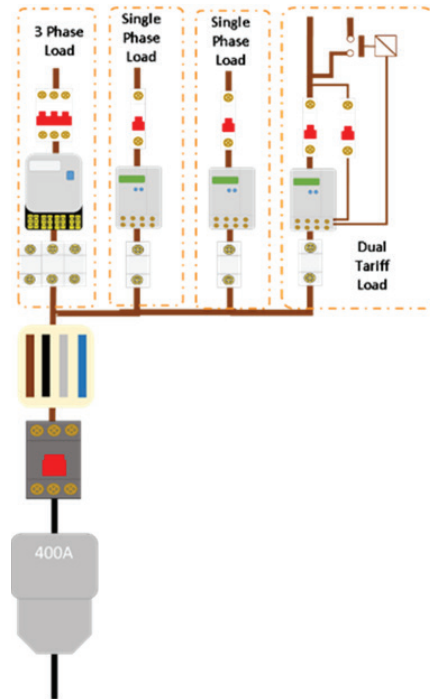
This SLD covers three phase new connections $\geq 50\text{kVA}$ for multi-customer, single occupancy premises.

With the DSO Protection (premises), Main Overcurrent Device (premises), Bus bar and individual DSO Protection, W/C Metering, and Main Overcurrent Device per customer shown.

The enclosure(s) containing DSO equipment is owned and maintained by the premises owner or their agent.

The conductors between the customer side of the Main Overcurrent Device (premises) and the customer side of the DSO metering are owned and maintained by the premises owner or their agent.

The checklists contained in ANNEX E shall be complied with.



D.4.11. Multi Connections – All CT Meters

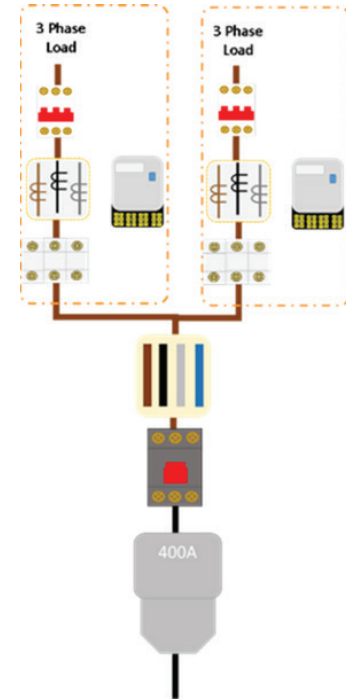
This SLD covers three phase new connections ≥ 50 kVA for multi-customer, multi-occupancy premises. All individual connections are CT connections.

With the DSO Protection (premises), Main Overcurrent Device (premises), bus bar and individual DSO Protection, CT Metering, and Main Overcurrent Device per customer shown.

The enclosure(s) containing DSO equipment is owned and maintained by the premises owner or their agent.

The conductors between the customer side of the Main Overcurrent Device (premises) and the customer side of the DSO metering are owned and maintained by the premises owner or their agent.

The checklists contained in ANNEX E shall be complied with.



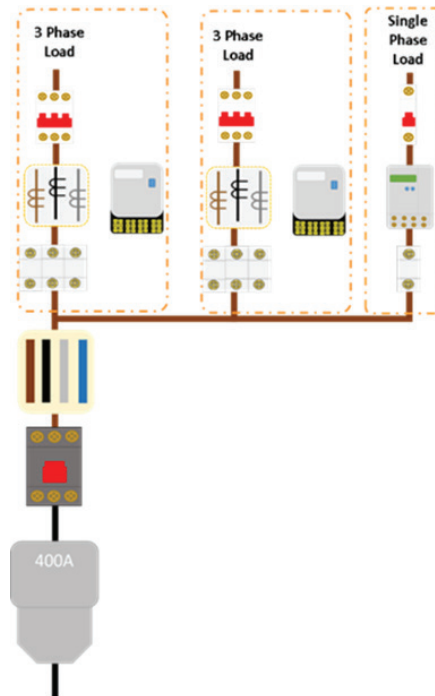
D.4.12. Multi Connections – Mix of W/C & CT Meters

This SLD covers three phase new connections for multi-customer, multi-occupancy premises, with a mixture of CT and W/C connections. With the DSO Protection (premises), Main Overcurrent Device (premises), Bus bar and individual DSO Protection, CT or W/C Metering, and Main Overcurrent Device per customer shown.

The enclosure(s) containing DSO equipment is owned and maintained by the premises owner or their agent.

The conductors between the customer side of the Main Overcurrent Device (premises) and the customer side of the DSO metering are owned and maintained by the premises owner or their agent.

The checklists contained in ANNEX E shall be complied with.



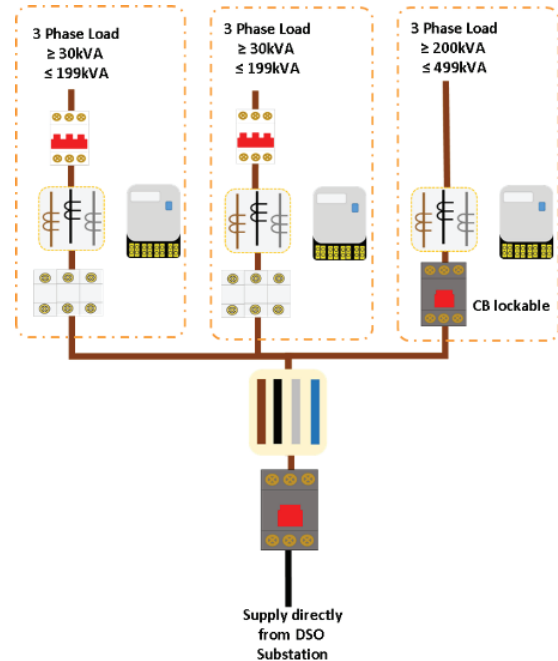
D.5. Three Phase – CT Metering (Total Load greater than 200kVA)

D.5.13. Commercial / Industrial – Centralised Metering

The supply shall feed directly from the DSO substation into an adjoining purpose-built room containing at a minimum a single device for the isolation of the complete premises.

The enclosure(s) containing DSO equipment is owned and maintained by the premises owner or their agent.
The conductors between the customer side of the Main Overcurrent Device (premises) and the customer side of the DSO metering are owned and maintained by the premises owner or their agent.

The checklists contained in ANNEX E shall be complied with.



D.5.14. Residential Block – Centralised Metering

The supply shall feed directly from the DSO substation into an adjoining purpose-built room containing a single device for the isolation of the complete premises and protection devices for the circuits which are going to the individual centralised meter locations and the landlord's connection which may also be in this room.

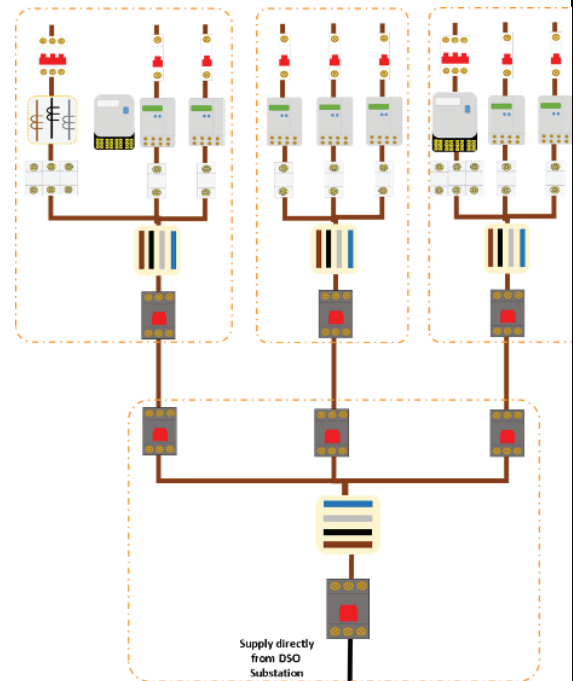
There shall be a centralised meter location provided for each independent block/core of apartments.

This centralised meter location shall be easily accessible to DSO staff or their agents, a Keysafe (ANNEX M) may be utilised to provide this accessibility.

The circuit feeding each centralised meter location shall have its own protective device as per IS 10101 (current version).

The enclosure(s) containing DSO equipment is owned and maintained by the premises owner or their agent.

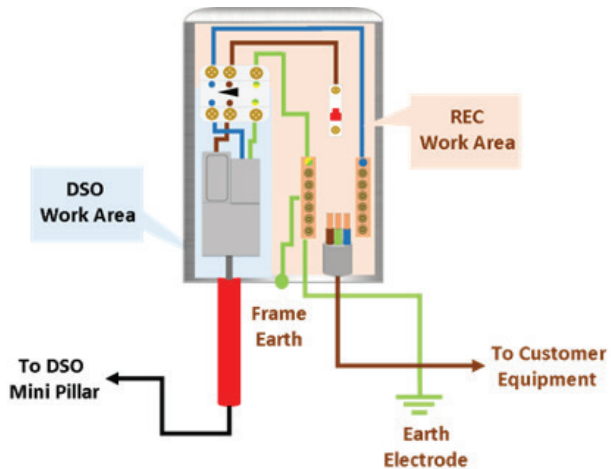
The conductors between the customer side of the Main Overcurrent Device (premises) and the customer side of the DSO metering are owned and maintained by the premises owner or their agent. The checklists contained in ANNEX E shall be complied with.



D.6. Miscellaneous

D.6.15. Un-Metered Connection

The main criteria for an un-metered connection is, a single phase verified constant load not exceeding 2kVA.



Physical Layout

Verified Load



Electrical Layout

Annex E.(Mandatory) Checklist

E.1.1. All Connections		
1	Application for Connection submitted to ESB Networks?	<input type="checkbox"/>
2	Correct level of Connection Capacity applied for?	<input type="checkbox"/>
3	Maximum Import Capacity (MIC)?	<input type="checkbox"/>
4	Have you registered with a supplier?	<input type="checkbox"/>
5	Terms for Connection issued by DSO and accepted by customer?	<input type="checkbox"/>
6	Suitable location for Connection agreed with ESB Networks?	<input type="checkbox"/>
7	Is there sufficient space provided for DSO equipment?	<input type="checkbox"/>
8	Are trenches, ducts and ways, provided for the installation of DSO conductor to the correct specification?	<input type="checkbox"/>
9	Access arrangements for DSO staff to premises/building?	<input type="checkbox"/>
10	Have you returned your signed connection agreement (If required)?	<input type="checkbox"/>
11	Is the installation completed?	<input type="checkbox"/>
12	Completion certificate?	<input type="checkbox"/>
13	All temporary connections to Multi Meter Board shall be removed before DSO staff commence work.	<input type="checkbox"/>
14	All unconnected tails within Metering Cabinet shall not be energised from another source and shall be insulated to prevent accidental contact with the conductor.	<input type="checkbox"/>
15	All apartment/unit doors shall have permanent numbers fitted.	<input type="checkbox"/>
16	All un-metered fuses and overcurrent devices shall be permanently labelled with the relevant apartment numbers.	<input type="checkbox"/>
17	Permanent numbers must be available for each meter.	<input type="checkbox"/>
18	Circuits to the apartments, including the control wiring must be checked out before certification.	<input type="checkbox"/>
19	All unmetered equipment to be sealable.	<input type="checkbox"/>
20	Code of Practice requirements must be complied with including the height of DSO equipment from the floor.	<input type="checkbox"/>
21	Permanent access to the metering equipment shall be in place. This may require the installation of a Keysafe.	<input type="checkbox"/>

E.2. Assembler's Checklist

E.2.2. Specific to Multi-Metering Connections



All outside enclosures used for DSO equipment must be IP55 and either non-metallic, stainless steel or hot dip galvanised. Where multi-customer centralised metering is permitted outdoors see 2.5 REQUIREMENTS FOR METERING ENCLOSURES USED OUTDOORS.



Customer's main earth terminal bar must not be within DSO sealed enclosure.

Provide sealing facilities at:	
Main Isolator.	<input type="checkbox"/>
Un-metered cable/bus bar sections.	<input type="checkbox"/>
Un-metered fuses (individual sealing).	<input type="checkbox"/>
Shrouding around un-metered fuse units.	<input type="checkbox"/>
Meter mounting plate.	<input type="checkbox"/>
All surface mounted trunking used for un-metered wiring excluding panel trunking.	<input type="checkbox"/>
All un-metered equipment.	<input type="checkbox"/>
Shrouding (At Unmetered Fuses)	
80/125 A front-loading fuses must have a front-loading cover that has one continuous piece with separate windows cut at 20mm spacing between each fuse	<input type="checkbox"/>

NH type fuse units shrouding to minimum IP2X.	
Dividers	
Metered and un-metered sections separated.	<input type="checkbox"/>
Un-metered fuse sections separated from other live equipment to allow replacement in safety.	<input type="checkbox"/>
Customer's Outgoing File Terminals	
All terminals shrouded.	<input type="checkbox"/>
Labelling	
On un-metered fuses.	<input type="checkbox"/>
On time-switches.	<input type="checkbox"/>
On meters.	<input type="checkbox"/>
On customer's outgoing switch fuse or MCB.	<input type="checkbox"/>
On control wiring.	<input type="checkbox"/>
DSO Time Switch	
Locate with DSO meters.	<input type="checkbox"/>
On non-relay installations: meter and time switch adjacent.	<input type="checkbox"/>
D/T Dial control cables in place.	<input type="checkbox"/>
Holes for Meter and Time-switches	
To specified spacing (Available from local metering supervisor).	<input type="checkbox"/>
Hole size 3 to 4mm.	<input type="checkbox"/>
Provide 3 to 4mm x 10mm stub ended screws. (Posi-drive, self-tappers etc.) These fixing screws for W/C meters are supplied by the Assembler.	<input type="checkbox"/>
Meter Tails / Unmetered Cables	
Ferrules must be fitted on multi-stranded cables.16sq. Cable - Ferrule 28mm long incl. -16x28.	<input type="checkbox"/>

25sq. Cable - Ferrule 28mm long incl. Insulation -25x28.	<input type="checkbox"/>
Tails are identified and permanently marked (Apartment/Unit).	<input type="checkbox"/>
Each Neutral to be identified at bus bar and meter position	<input type="checkbox"/>
Where cables are concealed, they shall be accessible for inspection. This access shall be gained through the removal of an DSO seal. These cables should not be clipped or tied, so that individual cables can be replaced readily.	<input type="checkbox"/>
Unmetered Fuses	
Whole current: - DSO will provide fuses.	<input type="checkbox"/>
CTs: - Assembler provides NH fuses in Units to IP20.	<input type="checkbox"/>
 <div style="border: 1px solid red; padding: 5px; display: inline-block;"> <p>Fuses shall not be loaded into their carriers prior to energisation.</p> </div>	<input type="checkbox"/>
300A Connection	
Multi stranded cable is acceptable for all new 300A DSO cut outs	<input type="checkbox"/>
 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>Where connection is required to existing older type DSO cut outs, stranded or solid (Soldered) tails may be required. Consult with local DSO office.</p> </div>	<input type="checkbox"/>
Over 300A Connection	
Copper bars tinned to accept DSO conductors.	<input type="checkbox"/>
Customer Circuits	
Under no circumstances should customer circuits pass through unmetered sections.	<input type="checkbox"/>
CTs	
Neutral and Earth terminals adjacent to CTs	<input type="checkbox"/>
Double support on bus bars.	<input type="checkbox"/>
Main isolator should be adjacent to Connection Point.	<input type="checkbox"/>

Sizing/spacing comply.	<input type="checkbox"/>
In self-contained units fit separators top and bottom.	<input type="checkbox"/>
Locks	
Triangular, 8mm.	<input type="checkbox"/>
CTs On-Site; DSO Main Connection cut out	
Is provision required for it within the board.	<input type="checkbox"/>
Will DSO connection be to left, right, top or bottom of board?	<input type="checkbox"/>
Main isolator should be adjacent to connection.	<input type="checkbox"/>
For connection over 300amps, Main circuit breaker must be directly over the incoming duct from DSO substation.	<input type="checkbox"/>
Is all metering equipment at correct height.	<input type="checkbox"/>
Colour Coding	
To NSAI current version of "National Rules for Electrical Installations".	<input type="checkbox"/>

Annex F. (Mandatory) Spacing Requirements

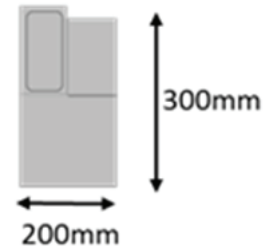


DSO require a clear unobstructed area of 1200mm in front of both the DSO equipment and any enclosures containing DSO equipment to allow for DSO staff to operate and work on the DSO equipment.

F.1. Single Phase Equipment

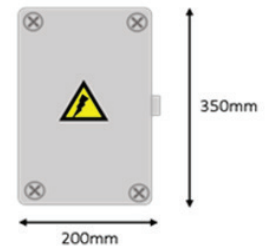
F.1.1. Single Phase Cut Out (16kVA max.)

Standard spacing required for a Single phase cut out is 200mm x 300mm x 200mm (W x H x D)



F.1.2. Enhanced Service Cut Out (29kVA max.)

Standard spacing required for an Enhanced Service, single phase cut out is 200mm x 350mm x 200mm (W x H x D).

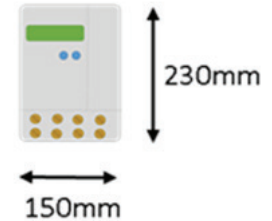


F.1.3. Single Phase W/C Meter

Standard spacing required for a Single-phase W/C meter is 150mm x 230mm x 150mm (W x H x D).

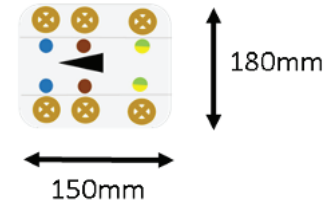


In Multi-Metering Panels, a depth of 150mm shall be left from the meter mounting surface to the nearest intrusion inside door



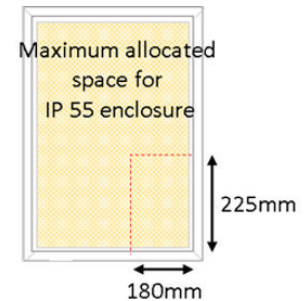
F.1.4. Single Phase Isolator

Standard spacing required for a Single-phase Isolator is 120mm x 180mm x 100mm (W x H x D).



F.1.5. IP55 Enclosure

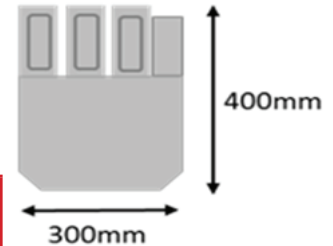
The allotted space in the outside meter box for the IP 55 enclosure containing the customer's Protective Device is 180mm x 225mm (W x H) in the bottom right hand corner of the outside meter box.



F.2. Three Phase Equipment – W/C

F.2.6. Three Phase Cut Out

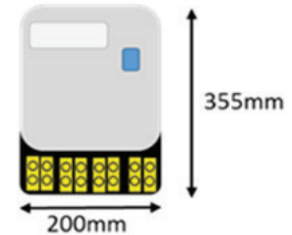
Standard spacing required for a Three phase cut out is 150mm x 230mm x 200mm (W x H x D).



In Multi-Metering Panels, a depth of 150mm shall be left from the meter mounting surface to the nearest intrusion inside door

F.2.7. Three Phase W/C Meter

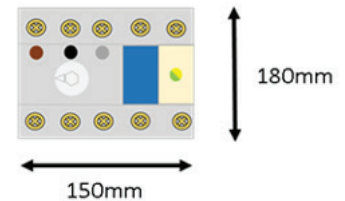
Standard spacing required for a Three phase W/C meter is 200mm x 355mm x 150mm (W x H x D).



In Multi-Metering Panels, a depth of 150mm shall be left from the meter mounting surface to the nearest intrusion inside door

F.2.8. Three Phase Isolator

Standard spacing required for a Three phase Isolator is 150mm x 180mm x 100mm (W x H x D).



F.3. Three Phase Equipment CT

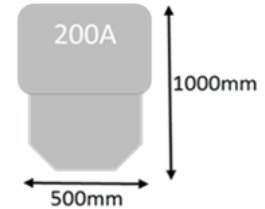
F.3.9. Three Phase cut Out (100kVA max.)

Standard spacing required for a three phase 200A cut out is 500mm x 1000mm x 300mm (W x H x D).

Where cut out is wall mounted outside a switchboard, adequate mechanical protection shall be provided for the DSO incoming cable.

In Multi-Metering Panels, a depth of 300mm shall be left from the cut out mounting surface to the nearest intrusion inside door.

In Multi-Metering panels either a slotted or split base can be used to accommodate the DSO cable.



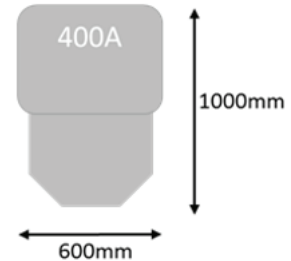
F.3.10. Three Phase Cut Out (200kVA max.)

Standard spacing required for a three phase 400A cut out is 600mm x 1000mm x 300mm (W x H x D).

Where cut out is wall mounted outside a switchboard, adequate mechanical protection shall be provided for the DSO incoming cable.

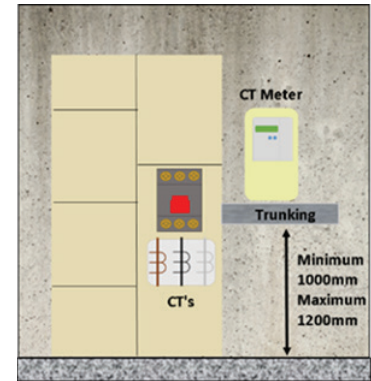
In Multi-Metering Panels, a depth of 300mm shall be left from the cut out mounting surface to the nearest intrusion inside door.

In Multi-Metering panels either a slotted or split base can be used to accommodate the DSO cable.



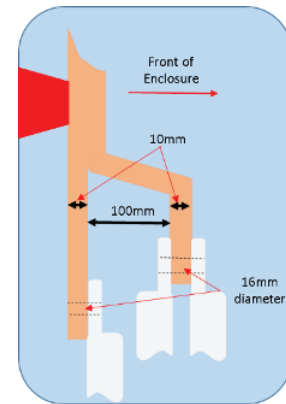
F.3.11. Three Phase CT Meter

Standard spacing required for a three phase CT meter is 350mm x 650mm (W x H). There shall be 1200mm of free space in front of both the CT enclosure and the CT meter. There shall be 100mm x 100mm (minimum size) sealable steel trucking provided to house the DSO secondary cabling. The DSO secondary cables shall NOT pass through customer enclosures in the panel.



F.3.12. Second Copper plate per phase

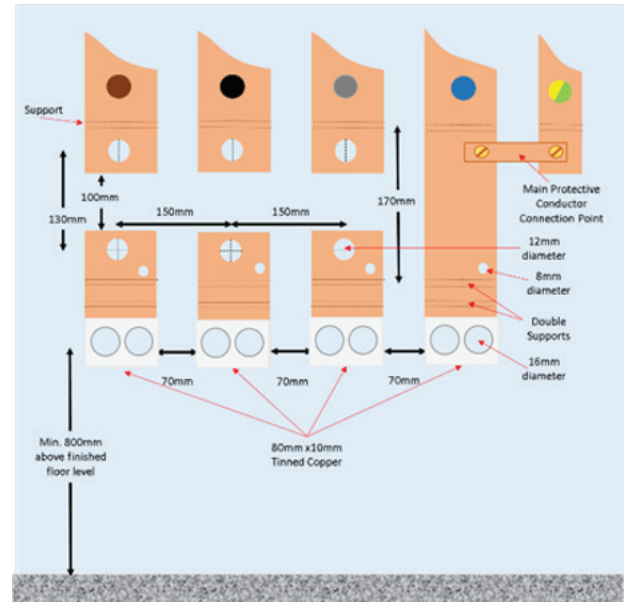
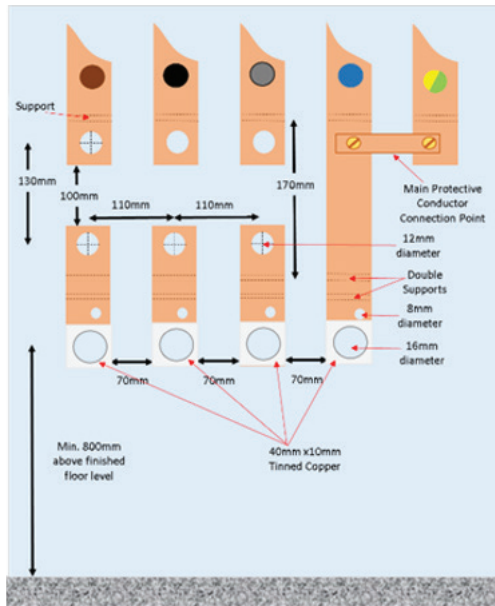
If there is a requirement for a second copper plate per phase to allow for the connection of DSO conductors, 100mm spacing shall be maintained between the closest faces of the two copper plates.



F.3.14. Single Customer CT Connection – CT's prior to the Main Isolating Switch

A minimum of 60mm shall be maintained from the rear of the copper bar to the mounting surface and a minimum of 60mm shall be maintained from the front of the copper bar to the nearest intrusion on inside of door.

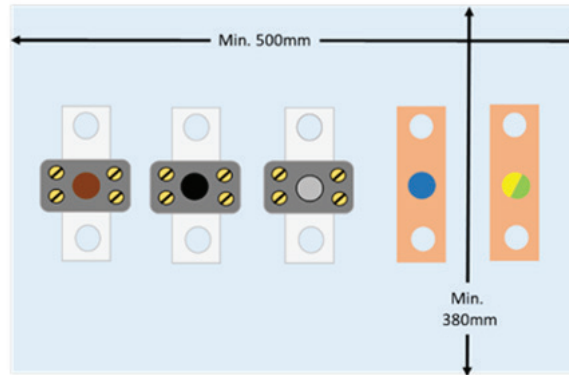
Copper bars shall be tinned at the point of connection of the DSO cables. Neutral bar and Earth Bar can be accommodated at bottom of enclosure. The door to this enclosure shall be vertically hinged as well as sealable. Cable connection bolt hole diameter 16mm. CT bolt hole diameter 12 mm.



F.3.15. Three Phase CT Enclosure in a Customer Panel

Standard spacing required for a Three CT enclosure is 500mm x 380mm x 250mm (W x H x D).

Height and width dimensions of CT enclosure may be reversed. Maximum depth of mounting surface 250mm. CTs shall be enclosed under a sealable cover. Where this enclosure is metal it shall be hinged as well as sealable. Load Neutral and Earth Bar to be provided in enclosure.



In Multi-metering CT installations, the minimum height above floor level for the mounting of CT's is 600mm.

Annex G.(Mandatory) Switch Rooms



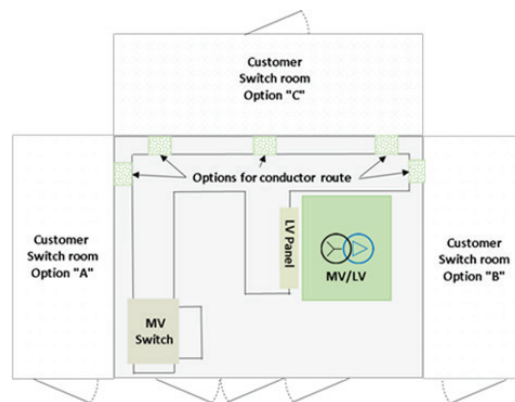
The DSO substation shall be constructed in accordance with Construction Standards for MV Substation Buildings. Some loads of less than 200kVA may require a substation in certain locations. The customer's room shall meet the requirements as set out in the relevant parts of the National Rules for Electrical Installations and the Building Regulations.

G.1. Independent Building

G.1.1. Customer Switch Room

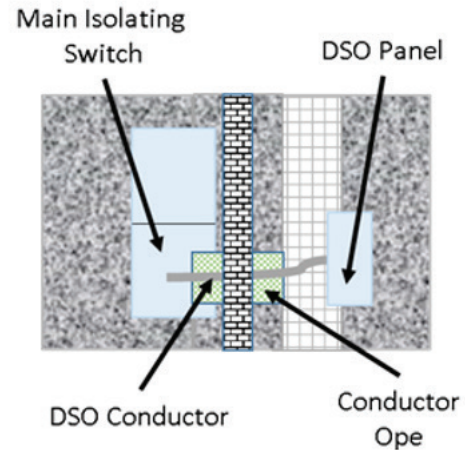
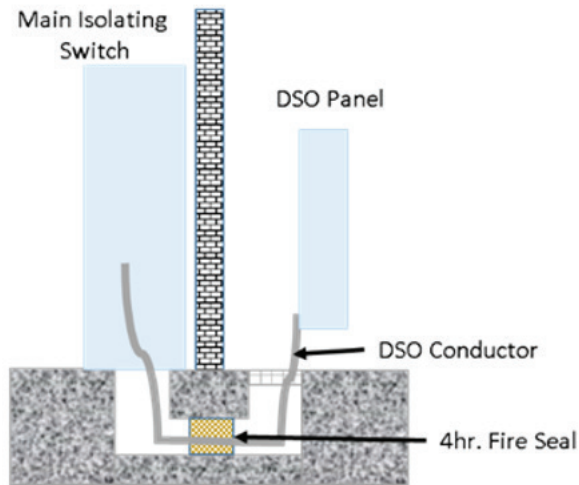
For an independent DSO substation, the room containing the customer's Main Isolating Switch shall be positioned directly adjacent to one of the substation walls (except the wall containing the substation doors).

Depending on the location of the room, one conductor route shall be provided for the DSO conductor to feed the customer's Main Isolating Switch.



The customer's Main Isolating Switch shall be positioned directly above the point at which the DSO supply conductors enter the room.

The DSO supply conductors shall be no greater than 10m in length and no greater than 3m in length in the customer's switch room. In the event of the customer's Main Isolating Switch being greater than 2m from the external door, a means of Emergency Isolation of the customer's Main Isolating Switch shall be located as close as practical to the external door within 2m of the external door.



Following the installation of the DSO conductors, the opening shall be sealed to provide 4-hour fire protection.

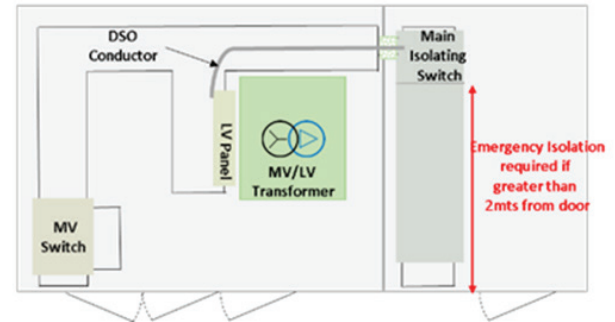
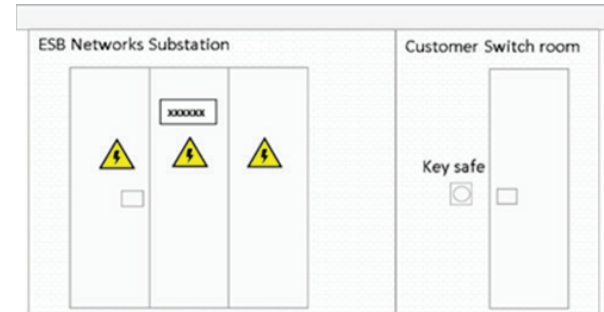
G.2. Incorporated In a Building

G.2.2. Single Switch Room

Access to the customer's switch room should ideally be at a location that is easily accessible from a public external area.

As this room is the single disconnection point for a premises, that may contain multiple customers, the requirements of the relevant parts of the current version of the National Rules for Electrical Installation should be taken into account as well as the relevant parts of the "Building Regulations".

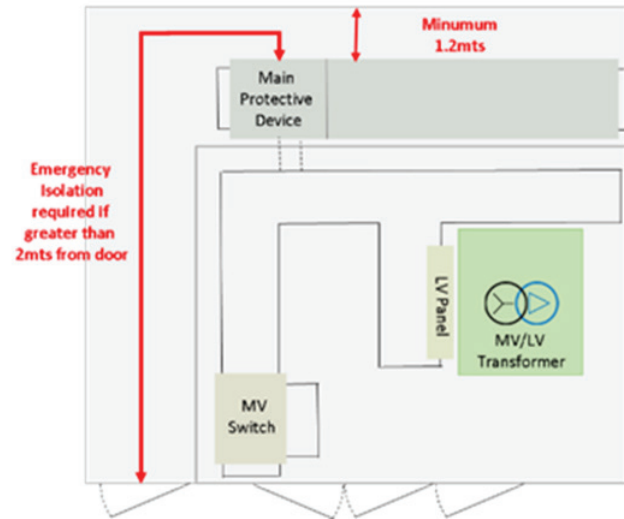
The positioning of the customer's Main Isolating Switch shall be as contained in the previous pages on customer switch room in an independent substation.



G.2.3. Single Switch Room Restricted Access

In certain situations, a customer's switch room may be to the rear of the DSO substation but has access via a corridor of suitable design with a door in an external wall that is accessible directly from outdoors.

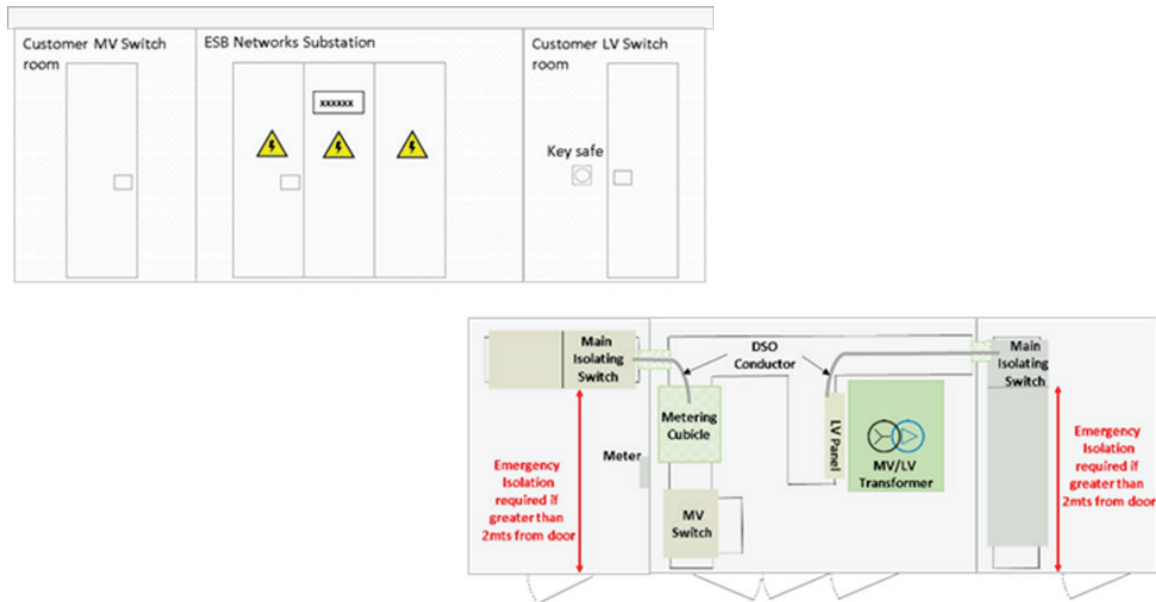
As this room is the single disconnection point for a premises, that may contain multiple customers, the requirements of the relevant parts of the current version of the National Rules for Electrical Installation should be taken into account as well as the relevant parts of the "Building Regulations". The positioning of the customer's Main Isolating Switch shall be as contained in the previous pages on customer switch room in an independent substation.



G.2.4. Dual Switch Rooms

Access to the customer's switch rooms should be at a location that is easily accessible from a public external area.

As these rooms are disconnection points for a premises, that contains multiple customers, the requirements of the relevant parts of the current version of the National Rules for Electrical Installation should be taken into account as well as the relevant parts of the "Building Regulations". The positioning of the customer's Main Isolating Switch shall be as contained in the previous pages on customer switch room in an independent substation.



Annex H.(Mandatory) Metering Panels

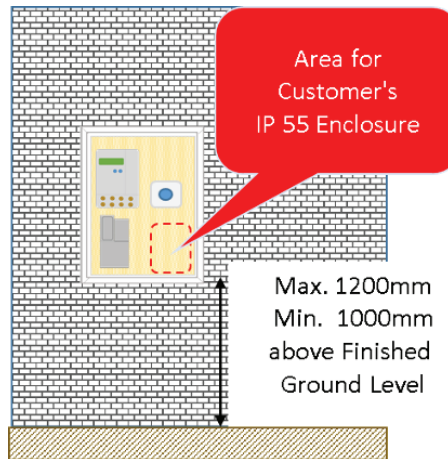
H.1. W/C Metering - Single Phase Meter Location

H.1.1. Outside Meter Box

To accept the above cabinet, builders shall provide an opening of 600mm x 400mm x 155mm (H x W X D).

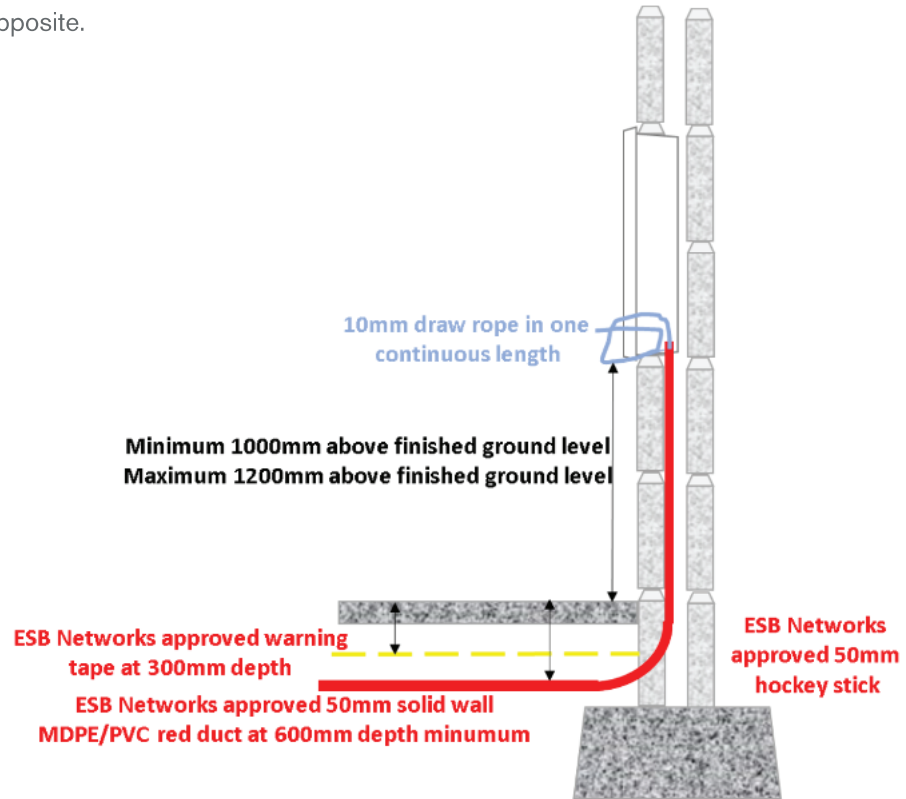
The meter cabinet shall be directly accessible from the main entrance driveway. A position on the house wall facing the driveway, or within 2m of either corner of this wall is normally acceptable subject to proper access.

Each outside box must have identification to associate it with a particular installation/address, this ID shall be in place at service installation stage.



The DSO service cable shall enter the outside meter box via an approved 50mm red duct in the bottom left hand side of the outside meter box.

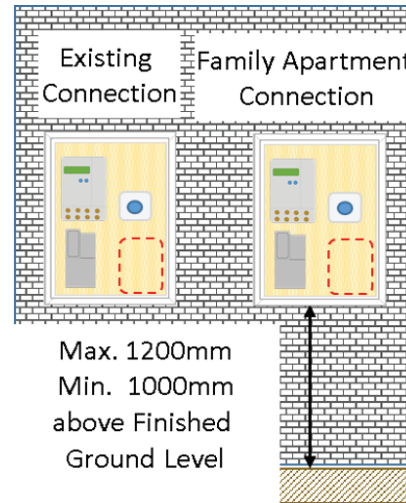
The duct shall be installed as opposite.



H.1.2. Family Apartment Connection

Where the commercial conditions have been met to allow for a “Family Apartment” connection. The second connection shall be given from the live side of the original DSO service with a second DSO protective device and meter used to supply the “Family Apartment” connection.

This normally means the use of a second outside meter box adjacent to the original outside meter box, the customer shall provide an approved duct between the two outside meter boxes.



If a domestic customer requires an independent meter for EV charging under the “Alternative Fuel Directive”, this configuration shall be used

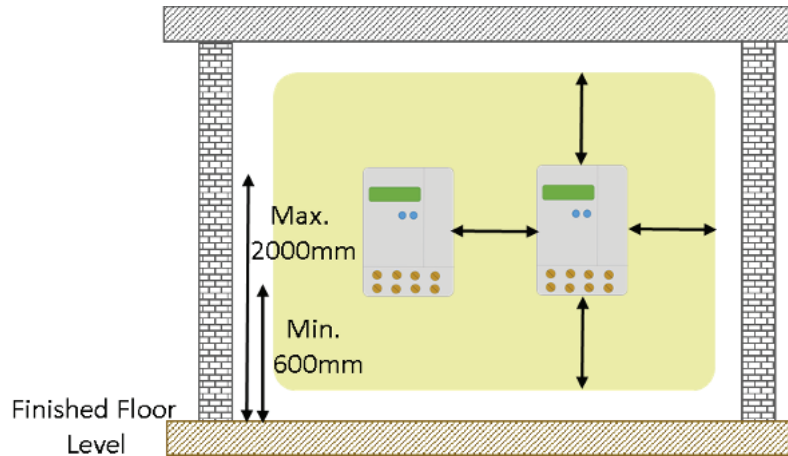
H.1.3. Single Phase Meter in a Multi-Metering Panel

In a multi-metering panel, there shall be a minimum distance of 150mm from the mounting surface for the meter to the nearest intrusion on the inside of the meter panel door.

The bottom of the meter shall be greater than 600mm above finished floor level.

The top of the meter shall be less than 2000mm above finished floor level.

The panel shall be designed to allow the space requirements as included in ANNEX F



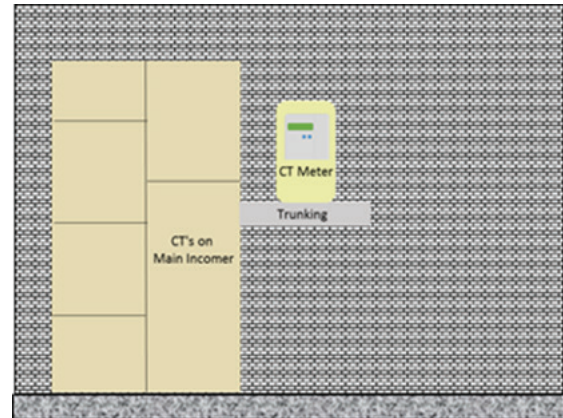
H.2. CT Metering

H.2.4. Single Customer Connections

For a single customer feed from either a DSO cut out or directly from a DSO substation, the DSO CTs shall be on the DSO side of the Main Isolating Switch. The DSO meter shall be located as close as practical to the enclosure containing the DSO CTs.

H.2.5. Three Phase CT Meter

Standard spacing required for a three phase CT meter is 350mm x 650mm (W x H). There shall be 1200mm of free space in front of both the CT enclosure and the CT meter. There shall be 100mm x 100mm (minimum size) sealable steel trunking provided to house the DSO secondary cabling.



H.2.6. Multi-customer Connections

Where there are Multi - Customers feed from either a DSO Cut Out or directly from a DSO substation, there shall be a Main Isolating Switch and bus bar enclosure for the complete electrical installation.

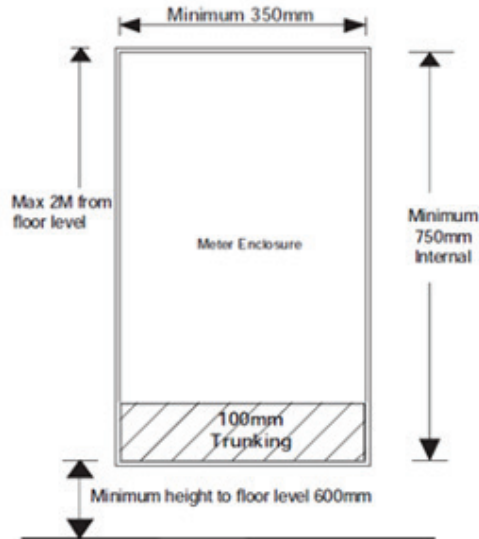
Each customer shall have individual DSO protection, DSO metering and customer Main Overcurrent Device.

H.2.7. Multi – Customer – Total Load less than 200kVA

The DSO secondary CT cabling shall be enclosed behind DSO seals in the metering panel.

H.2.8. Three Phase C/T Meter incorporated in Main Panel Enclosure

CT Meter Enclosure shall be located directly adjacent to CT enclosure on left or right-hand side or above. For the left or right option, bottom of meter enclosure shall be at the same level as bottom of CT enclosure. Clearances from back plate to nearest intrusion on inside of door shall be between 200mm and 250mm. 100mm Trunking installed as shown. Secondary cables from CT enclosure must enter 100mm trunking. Enclosure to have hinged door, 8mm triangular lock.



Annex I.(Mandatory) E- Transport Connections

There are four types of electric vehicle (EV) charging that can be connected to the DSO network, they are:

- Home charging
- Location charging
- On street charging
- Rapid charging

No matter which type of EV charging a customer is looking for, the EV charger shall be connected via a DSO meter to the DSO network.



All EV electrical installations shall be completed in accordance with the current version of the National Rules for Electrical Installations (NSAI).

I.1. Home Charging



For existing domestic electrical installations, a new EV electrical installation may be connected via the outside meter box provided the requirements of the current version of the NSAI National Rules for Electrical Installations are met.

If a customer wishes to install an EV charger (up to 32A) at a standard (12kVA) domestic connection, the following options are available to the customer:

1. The customer can get a REC to install the required equipment off the customer's existing own electrical installation and include control equipment to ensure that customer MIC is not breached.
2. The customer can get a REC to install the required equipment off the customer's existing own electrical installation and apply for an increase in their MIC.
3. The customer can get a REC to install the required equipment as a new electrical installation and apply for an additional EV connection under the "Alternative Fuel Directive".

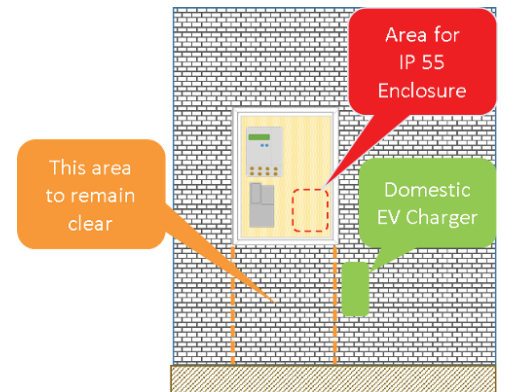
In all the above options the electrical work at the customer installation shall be completed by a REC and the required "Certificate" as defined in the current version of the National Rules for Electrical Installations shall be issued.

I.1.1. Home Charging

Option 1

The customer's REC connects the EV charger to the existing distribution board. The REC installs control equipment to ensure the larger loads in the installation do not operate at the same time.

This is like the existing practice of priority control on a second instantaneous electrical shower on a standard 12kVA single phase connection.



Option 2

If the customer requires an increase in their MIC to allow for connection of their EV load, they shall apply for an increase in their MIC via the standard application process (NC 2 form).

On completion of the MIC increase the EV Load can be connected to the DSO supply.

ESB NETWORKS **FORM NC2**
SINGLE DOMESTIC DWELLING OR FARM PREMISES

ESB Networks DAC requires the information requested on this application form to enable us to set up and manage your electricity supply connection. As the Application System Operator, your information is also required to enable ESB Networks DAC to manage the electricity network. The first condition is ESB Networks DAC. Please refer to our privacy policy at [http://www.esb.ie/privacy-policy](#)

APPLICATION FOR:
Domestic Connection **FOR OFFICIAL USE ONLY**
Farm Connection Domestic WAP
Increase Capacity (MIC) Renewal
WAP WDC
Connection WDC

Please fill in ALL sections in BLOCK CAPITALS

1 APPLICANT'S FULL NAME & SITE ADDRESS FOR CONNECTION / MIC CHANGE

Title: Mr Mrs Ms Company / Other

Address: _____

Mobile number: _____ Landline: _____
You will receive an SMS text to the mobile number provided above regarding your application.
Email: _____

2 CONTRACT NAME & ADDRESS FOR CORRESPONDENCE (if different from above)

Contract Name: _____
Address: _____
Mobile number: _____ Landline: _____

3 NEW CONNECTION

Single house Apartment Farm Family Apartment Pump House
Other Please explain: _____
How far back was site not to activity: _____

4 CONNECTION CAPACITY REQUIREMENT

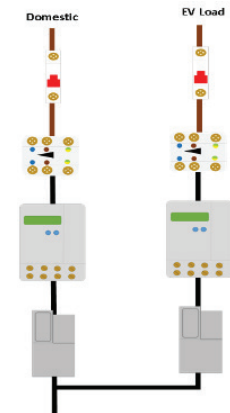
Please select one with reference to the capacity your register and section 8.

12 kW Maximum (Standard) 16 kW Maximum (Standard)

Option 3

Under the "Alternative Fuel Directive" a customer has the right to have a second supplier for the supply of EV charging. This requires a second DSO billing meter to be installed.

See "Family Apartment" connection for physical layout in H.1.1



I.2. Location Charging

Location charging is defined as EV charging in locations where the customer has a car parking area that forms part of their premises i.e. workplaces, hotels, supermarkets and apartment blocks.

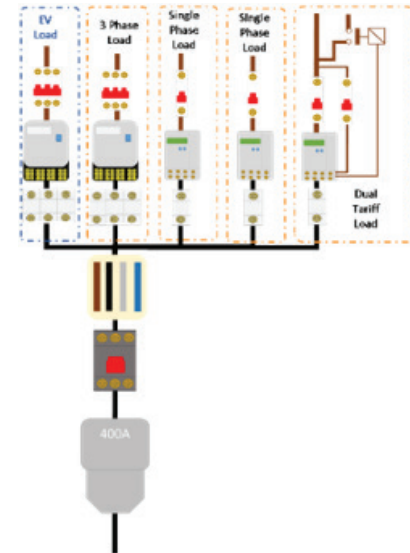
Privately owned car park that forms part of the customer premises's.

- a. The customer or their agent shall involve the local DSO office from the design stage of the work, to ensure that the existing electrical installation has capacity to allow for the required MIC increase.
- b. Under the "Alternative Fuel Directive" an "EV Aggregator".

I.2.2. Location Charging

The owner of the premises or a separate entity permitted by the owner apply for a new three phase business connection for EV charging.

The existing distribution panel shall be altered to accommodate the additional DSO and customer equipment required to supply the EV Charging equipment.



Capacity NOT available on LV Network

If the local LV network has NOT sufficient capacity to feed the new EV load, this may require work by the DSO in the feeding MV/LV substation and associated network e.g. cables to provide the required capacity. If the capacity in the MV/LV substation cannot be increased, this will mean a new MV/LV substation shall be required.

The customer will be charged for the work required to provide the EV MIC. The customer shall be asked to provide a site for the substation if that is the “Least Cost Technically Acceptable” option.



Due to the size of EV load, the customer is reminded to pay attention to the earthing requirements of the EV charger unit.

I.3.3. On-Street Charging

Basic Principles

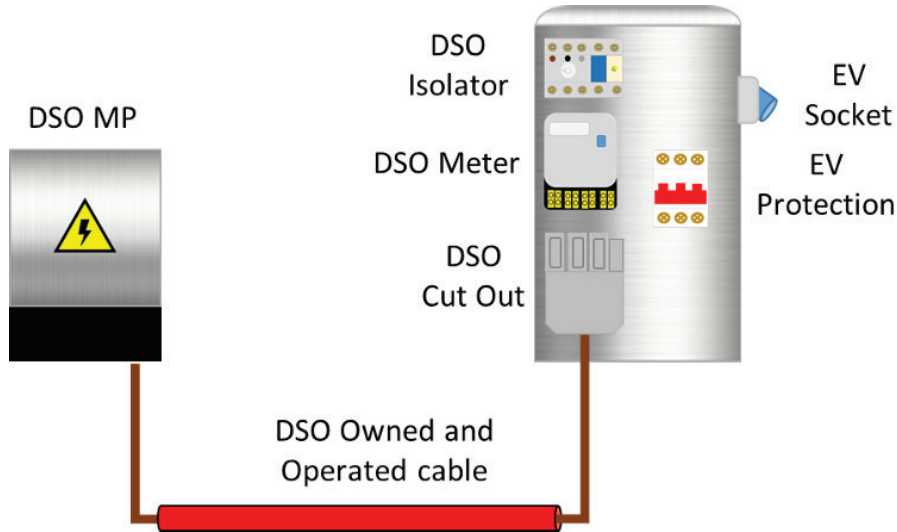
The customer shall install a suitable outdoor enclosure to house the DSO equipment, as per diagrams below. This enclosure shall be directly adjacent to the EV Charging point or the enclosure shall be a separate individual compartment in the EV Charging point.

The size of enclosure will depend on the required EV load, with a minimum size as per 6.2

The customer will require permission from the relevant local authority to install the EV infrastructure in the public area.

Space Available in EV Charging Post

- DSO equipment shall be in an Independent compartment in EV Charging post.
- DSO Enclosure shall be as specified in 6.2 Option 2
- Suitable up to maximum 16kVA per phase



This is the preferred option for EV street charging of up to 2 x22kW units per EV Charging column

I.4. Rapid Charging

Rapid charging connections are normally connections in excess of 500kVA and are a single point MV connection to the customer.

To date, these connections are normally requested as an independent connection on an area of land that previously was part of another electrical installation (existing service station).



To date, these connections are normally requested as an independent connection on an area of land that previously was part of another electrical installation (existing service station).

The customer will be supplied from a substation either built for purpose or an existing substation that can be altered to add the additional new EV customer load.



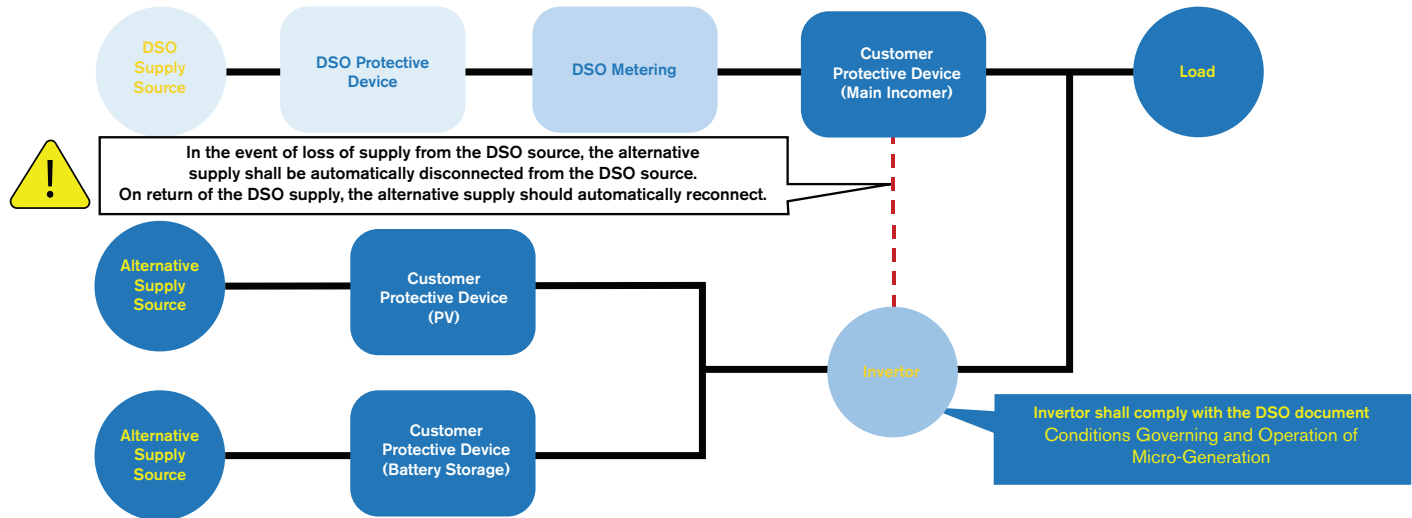
The location of both the substation and chargers shall be agreed as NOT to impinge on the ATEX area of the existing connection as defined in I.S. EN60079-14:2014 & AC:2016.

Annex J. (Mandatory) Generator Connections

J.1. Micro-Generation

Micro-generation is defined as a source of electrical energy and all associated equipment, rated up to and including:

- 25A at low voltage(230V), when the DSO network connection is single-phase.
- 16A at low voltage(230/400V), when the DSO network connection is three-phase and designed to operate in parallel with the DSO LV system.



i A customer may have more than one form of Micro-Generation as part of their electrical installation

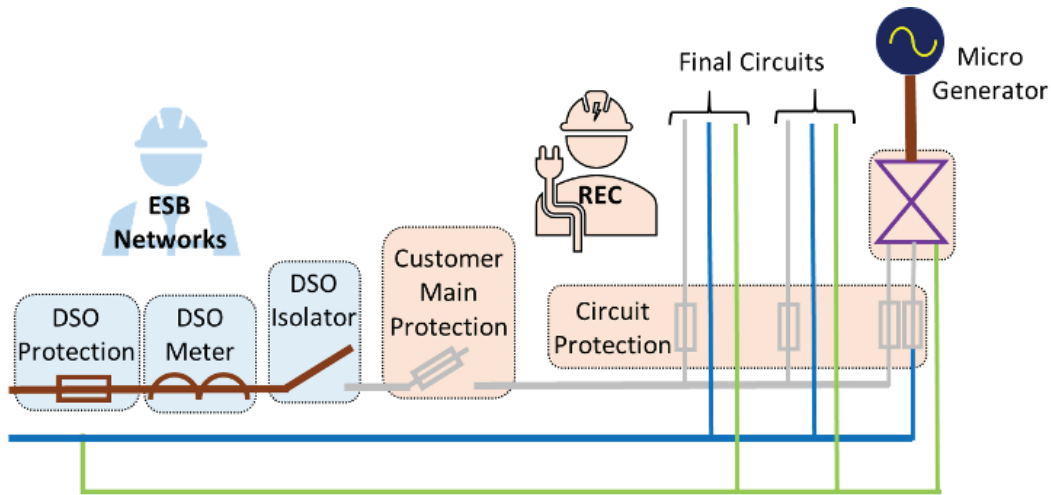
Where multiple generating sources (of the same or varied technologies) are on the same site and share access to the same DSO connection point, the aggregate rating must not exceed:

- 25A at low voltage, when the DSO network connection is single-phase.
- 16A at low voltage, when the DSO network connection is three-phase.

There is no explicit reference to any specific form of generating technology but the interface with the DSO LV system shall not be capable of connecting the generation source, to the DSO LV system, if the DSO LV supply is not present and within parameters in Conditions Governing Connection and Operation of Micro-Generation.

Any form of generation whose interface with the DSO system does not comply with this provision, is considered outside the scope of micro-generation.

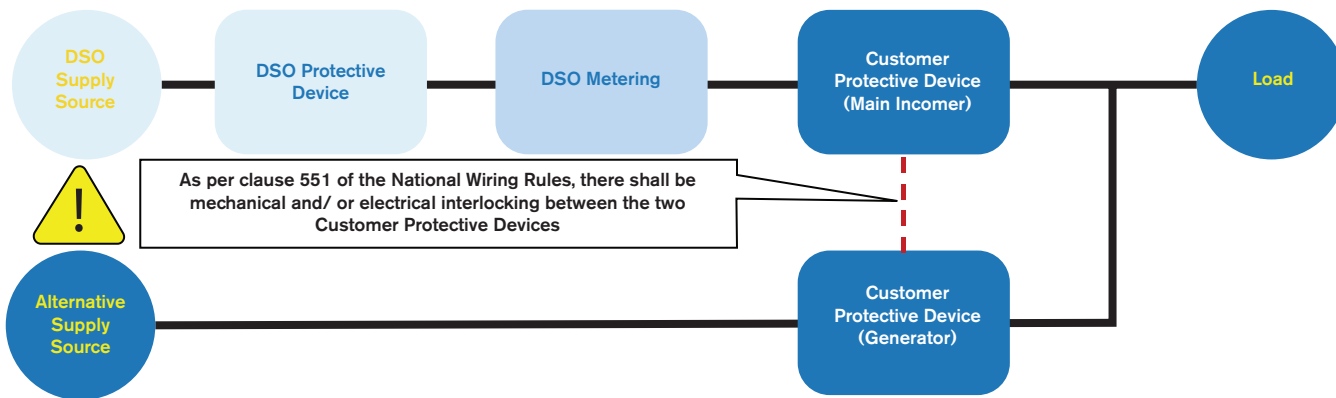




The micro-generator shall NOT discharge back into the DSO network when the DSO network is de-energised.

J.2. Stand-By Generator Connection (No Parallel Operation)

Changeover shall occur after the DSO metering equipment. If an electrical installation requires an alternate source of supply, the alternate supply shall be dedicated to that electrical installation.

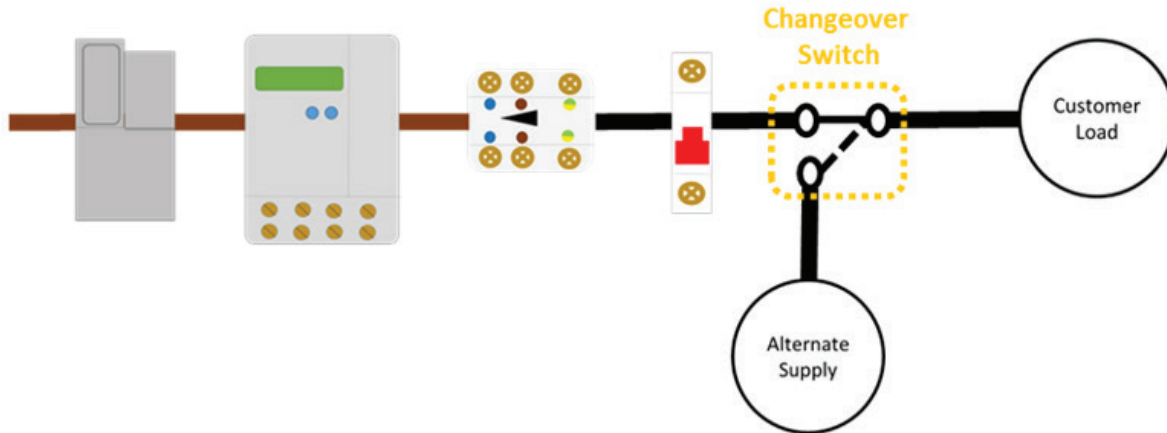


The stand-by generator shall be connected to the customer's electrical installation in accordance with the relevant clauses in part 551 of the current edition of the National Rules for Electrical Installations.

In particular the clauses in part 551.6 of the current edition of the National Rules for Electrical Installations.

DSO guidelines can be found at the link below:

<https://www.esbnetworks.ie/new-connections/generator-connections/connect-a-standby-generator>



J.3. Generator Connection (Parallel Operation)

Generation connections that are required to operate in parallel with the DSO LV and MV system shall comply with the specifications as contained in

<https://www.esbnetworks.ie/new-connections/generator-connections/connect-a-parallel-generator>

The generator shall be connected to the customer’s electrical installation in accordance with the relevant clauses in part 551 of the current edition of the National Rules for Electrical Installations.

In particular the clauses in part 551.7 of the current edition of the National Rules for Electrical Installations.

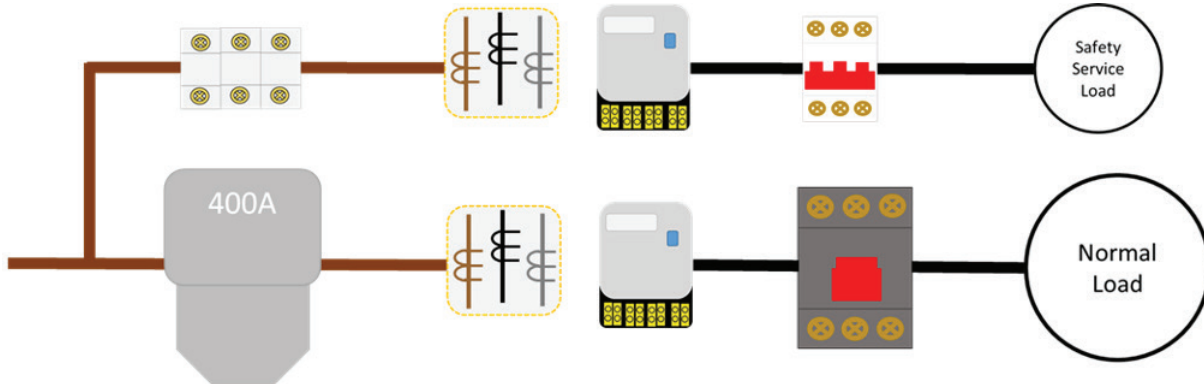
Annex K. (Mandatory) Safety Service Connections



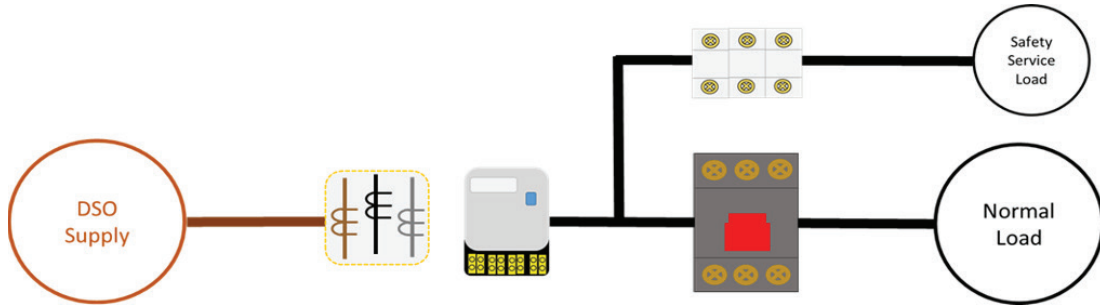
To date, these connections are normally requested as an independent connection on an area of land that previously was part of another electrical installation (existing service station).

- The connection to the Safety Service equipment shall be as near as possible to DSO incoming connection.
- Warning labels to be applied to DSO Cut Out, Main Overcurrent Protective Device (Main Incoming CB) and Safety Service Overcurrent Protective Device. (see below).
- The isolation/overcurrent device (including the incoming conductors), for Safety Service supply shall have a short circuit rating equivalent to the short circuit rating of the Main Overcurrent Protective Device.
- The Safety Service load shall be connected to the customer's electrical installation in accordance with part 56 of the current edition of the National Rules for Electrical Installations.

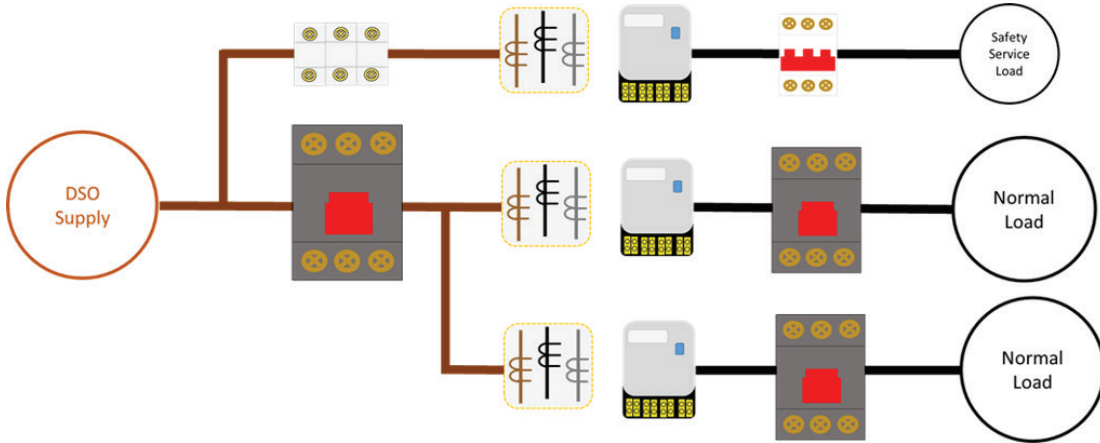
Connection less than 200kVA



Connection greater than 200kVA Single Customer



Connection greater than 200kVA Multi Customer



Required wording on Labels for Safety Service			
DSO Supply via Cut Out (connection \leq 200kVA)			
Danger Connection to S/S fed from live side of DSO Cut Out Fuses	Label for DSO Cut Out	Danger Fed from live side of DSO Cut Out Fuses	Label for Safety Service Overcurrent Protective Device
DSO Supply directly to Main CB (connection \geq 200kVA)			
Danger Connection to S/S fed from live side of Main CB	Label for Main CB.	Danger Fed from live side of Main CB	Label for Safety Service Overcurrent Protective Device
DSO and Alternate Supplies available			
Danger Connection to S/S fed from live side of Main CB	Label for Main CB and Safety Service Over- current Protective Device	Danger Connection to S/S fed from live side of Generator CB	Label for Generator CB

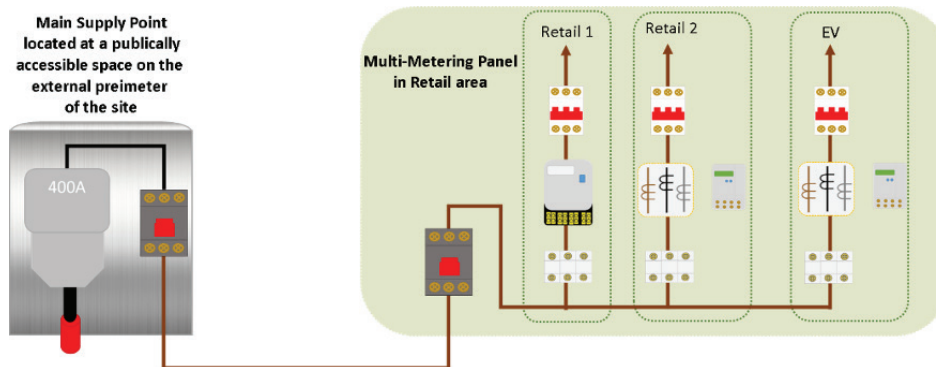
Annex L. (Mandatory) Petrol Stations



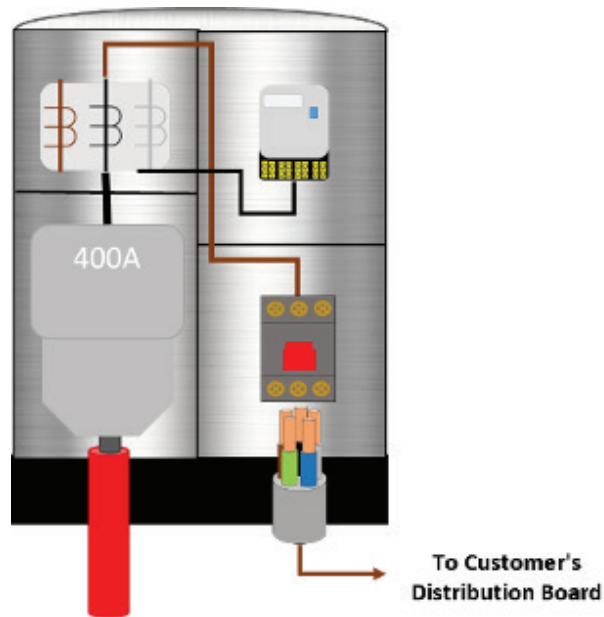
For EV Charging connections in Petrol Stations, see ANNEX I

An enclosure shall be provided as close as possible to the perimeter of the service station area, at a suitable location that is directly accessible from a public roadway, without having to cross a hazardous location.

The enclosure shall comply with the following:

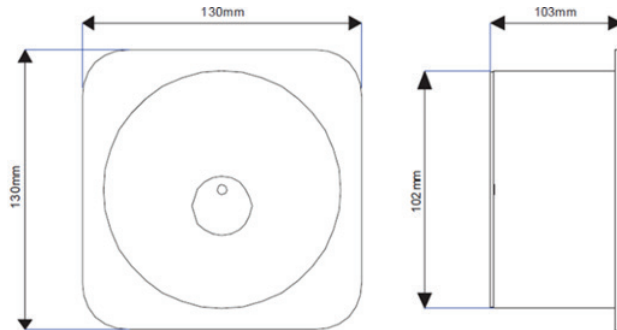


- Warning label “Live electricity” required on door(s).
- 8mm triangular locks required on door(s).
- Fire retardant back plate.
- Enclosure shall have no sharp edges.
- Outside enclosures used for housing DSO equipment must be either non-metallic, stainless steel or hot dip galvanised and have a Minimum IP44 rating.
- See 2.5 for requirements in relation to protection against corrosion.



Annex M. (Informative) Key safe

- Installed flush with wall to a depth of 103mm.
- Available from local DSO Office.
- Keysafe codes: Base: 911551 Cover plate: 911552



Derogations

No Derogations are recorded against the Requirements of this document.

