

# National Code Of Practice For Customer Interface 4th Edition 2008



Networks

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# FOREWORD

This National Code of Practice for Customer Interface – 4th edition, March 2008, replaces the 3rd edition.

The purpose of this National Code of Practice for Customer Interface is to have one single interpretation of ESB Networks requirements.

It is a consensus document agreed between people involved in the electrical industry and ESB Networks.

Contractors Associations, Consulting Engineers, Switchboard Assembler's, Electrical Wholesalers, Distributors, Regulatory Bodies, ETCI and ESB Networks staff made a very positive contribution in the compiling of this Code.

It is important that everyone working at the ESB Networks/Customer Interface or designing electrical equipment for that interface fully understands the Code and works to it.

Each ESB Networks 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 always essential to refer to the latest version of The National Code of practice at [www.esb.ie/esbnetworks/ncp](http://www.esb.ie/esbnetworks/ncp)

## SCOPE

The National Code of Practice for Customer Interface relates to situations where an interface exists between the customer and ESB Networks at 230/400 volts and/or MV exists.

The aim of the Code Book is to assist in achieving a single interpretation of the requirements for metering/connection.

ESB Networks are fully supportive of ETCI, CER and the regulatory bodies in their efforts to improve safety and standards of electrical installations.

ESB Networks 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. (See "ESB Networks involvement in Completion Certificate Process" on page V and VI.)

# SITE SAFETY

- **Be aware of your working environment and your responsibilities to yourself and others.**
- **Contractors, Builders, Developers and ESB Networks must meet all statutory requirements in order that site conditions and site practices provide a safe working environment.**
- **Electrical Contractors and ESB Networks staff should 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 installation.**

## Remember the Five Electrical Safety Rules

- 1. Disconnect Completely**
- 2. Secure against Reconnection**
- 3. Verify the installation is “dead”.**
- 4. Carry out earthing and short - circuiting (where appropriate).**
- 5. Provide protection against adjacent “live” parts.**

# ESB NETWORKS INVOLVEMENT IN THE COMPLETION CERTIFICATE PROCESS

ESB Networks are not involved in, or responsible for, testing a customer's electrical installation. To comply with current legislation a completion certificate is required for all new electrical installations and some alterations to existing installations. This certificate is issued to the customer by the electrical contractor indicating that the installation is constructed and tested to meet Electro Technical Council of Ireland's (ETCI) requirements.

## **THE CERTIFICATE SHOULD ONLY BE ISSUED AT THE COMPLETED STAGE OF THE ELECTRICAL WORK**

The completion certificate is required to allow ESB Networks to proceed with their work for the customer.

**It is essential that the correct MPRN (Meter Point Reference Number) is recorded on the certificate and the address of the installation matches the MPRN address.**

This MPRN number is readily available on correspondence the customer receives from ESB Networks regarding their application for a new connection/ alterations/rewires etc.

ESB Networks require completion certificates, submitted through the regulatory body, for the following types of Electrical Work:

- All new installations/re-wires requiring connection to ESB Network
- All alterations to existing installations involving changes to the wiring between ESB Networks connection point/meter and the customer's distribution board.
- In multi-tenanted / multi-metered situations a completion certificate is required for each ESB Networks connection, i.e. one certificate per customer connection point.
- Where installations such as school signs, phone kiosks, bus shelters etc. are connected to ESB Networks network, a completion certificate is required for each connection at the interface.
- All Medium Voltage installations require a completion certificate (Note a declaration of fitness is also required by ESBN)
- A completion certificate is required before connection will be restored to an installation that has been disconnected for more than 6 months.

# ESB NETWORKS INVOLVEMENT IN THE COMPLETION CERTIFICATE PROCESS

**In situations requiring close co-operation between ESB Networks and the Electrical Contractor e.g. Work outside normal hours, The following procedure is required:**

- It is important to contact the local ESB Networks supervisor at an early stage in the planning of the work.
- The Customer should ensure that any payments required by ESB Networks have been paid. ( this will ensure that a service order is in existence.)
- The Electrical Contractor must contact the relevant regulatory body with the specific certificate number he/she intends to use to certify the finished work. The specific details required are: Certificate number, type, Customers correct MPRN, name and address,
- The Regulatory Body will record this initial information which will allow the ESB Networks service order for this work to be released.
- The Electrical Contractor should use the certificate reserved for the electrical work to record the test results after the electrical work is completed.
- Afterwards the fully completed certificate should be sent (without delay) to the relevant Regulatory Body.

**Any contractor working in close proximity to live ESB Networks sealed equipment (where no main isolator exists) should contact the local ESB Networks office if he/she requires isolation of that equipment to allow the work to proceed prior to certification.**



# GENERAL REQUIREMENTS

## 1 CONSULTATION WITH ESB Networks OFFICE

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

## 2 LOAD THRESHOLDS

### (a) New Installations:

Single phase whole current meters will be used to measure loads up to 80A per phase. In general, three phase whole current meters will be used to measure loads over three phases up to 80A per phase. Current transformers with matching meters will be used to measure loads in excess of 80A per phase. Allowances for potential load growth should always be made.

### (b) Extensions/Renovations to Existing Metering:

Discuss with local ESB Networks Office beforehand, where, in certain circumstances, three phase whole current metering at 100A per phase may be considered.

ESB Networks will connect and fit a main fuse unit for total loads within a building up to 300A (200 kVA).

ESB Networks will normally require a Substation for loads in excess of 300A (200kVA). Customer will supply and fit a main circuit breaker. New loads in excess of 500kVA will in general be supplied at medium voltage. **N.B. Some loads of less than 200kVA may require a substation in urban locations depending on available capacity.**

## 3 ENCLOSURES FOR METERING EQUIPMENT

### (a) Particular to Domestic installations.

- (i) ESBN equipment should only be fitted in the outdoor metering cabinet. The only exception being where the customer's main Isolation/over current device is fitted in the cabinet. Where fitted, the device must be located at the bottom RHS of the enclosure (marked \* page 1) to allow future ESBN equipment modifications. **N.B. see ETCI ET101 requirements**
- (ii) Page 1 shows a typical outdoor Metering cabinet. This is the standard method for new Metering.
- (iii) Where it is clearly impossible to fit ESB Networks' equipment into an accessible outdoor location, the ESBN Design office must be consulted at the planning stage, to determine the most suitable location.
- (iv) Where indoor locations are permitted an enclosure shall be provided for ESB Networks' equipment. See page 21 for details on enclosures.

**(b) Whole Current Metering:** Whole current meters and ESB Networks equipment are installed by ESB Networks in an enclosure supplied and fitted by the customer. (See page 21).

# GENERAL REQUIREMENTS

Whole current meter enclosures shall have a (vertically) hinged cover or visor and standard 8mm Triangular lock.

ESB Networks 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.

**(c) Current Transformer (CT) Metering:** Customer shall supply and fit a sealable enclosure to accept ESB Networks' CTs. Where a main switchboard is installed this enclosure should be within the switchboard. C.T. Meter Cabinets (supplied and fitted by ESB Networks) are installed on a wall adjacent to the main switchboard. **In some situations consideration will be given to incorporate ESB Networks CT Meters into the main Switchboard. See page 20. Discuss with Local ESB Networks staff at the design stage of the Switchboard.**

**Note: 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 ESB Networks side of the customers 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.) (Note: For wall mounted Meter Cabinets, CT Secondary cable run shall not exceed 15 Metres and shall be accessible.)  
**See 5.**

## 4 REQUIREMENTS FOR METERING ENCLOSURES. USED OUTDOORS

**(a) 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.

**N.B. 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 ESBN at the planning stage to locate centralised multi-customer metering outdoors, the following minimum requirements described in (i) and (ii) shall apply :

(i) The switchboard housing the metering equipment shall be manufactured from polyester or other suitable non conductive material. A minimum rating of IP44 shall apply, subject to the environmental influences in the location selected. The switchboard internal construction shall comply with the standards required for normal locations.

(ii) In addition all switchboards shall be protected against vandalism/interference by one of the following methods described in (iii) and (iv) :

(iii) The switchboard shall be installed in a concrete structure that is completely weatherproof e.g. Where installed on the outside wall of a building it may comprise of

# GENERAL REQUIREMENTS

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 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. In addition the requirements listed at (v) below shall also apply.

(iv) 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. In addition the requirements listed at (v) below shall also apply.

(v) 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. A key safe (see page XIV) shall be fitted to the enclosure, the key safe is supplied by ESNB as part of the agreed design of the electricity services.

## **(b) 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 ESB Networks equipment in outdoor locations, the following minimum specifications shall apply.

**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.**

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. 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. The locking device shall be manufactured from high grade non corrosive metal.

# GENERAL REQUIREMENTS

Where vandal proof locks are specified, a keysafe (see page XIV) shall be fitted to the unit, the keysafe is supplied by ESB Networks as part of the design of the electricity services.

## **5 PROTECTION FOR SECONDARY CABLES FROM ESB Networks METERING CTS WITHIN MAIN SWITCHBOARD**

Trunking or conduit (min. 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 (MIN. 100mm) shall be provided from the switchboard to the CT metering cabinet AND MUST BE SEALABLE. See paragraph 9 r.e. ESB Networks seals

## **6 ACCESS TO METERING EQUIPMENT**

ESB Networks meters should be grouped in one easily accessible location (Centralised). Where access to metering has to be restricted, a Keysafe is required see page XII paragraph 17 for further details. ESB Networks whole current meters and CTs should be located 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 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. Access to ESB Networks equipment must be available at all times. **All enclosures used for ESB Networks meters shall have a standard 8mm triangular lock fitted. A clear space of at least 1.2m must be left in front of ESB Networks equipment.**

## **7 UNACCEPTABLE LOCATIONS FOR ESB Networks MAIN FUSES AND METERS**

ESB Networks main fuses and Meters 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.

## **8 CUSTOMER MATERIALS**

The customer shall provide: all trunking, cables and connectors beyond the ESB Networks main cable terminations. Load cables for connection to ESB Networks main fuse unit, whole current meters or CTs to 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.

# GENERAL REQUIREMENTS

## 9 ESB Networks SEALS

All access to unmetered enclosures, unmetered fuses, C.T. enclosures, secondary wiring and busbar 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 ESB Networks. Seals should be visible for inspection at all times.

**Note:** Sealing holes drilled in cover which allow sealing wire enter the enclosure are unacceptable.

### NOTE TO CONTRACTORS REGARDING ESB Networks SEALS

**Electrical contractors are reminded that it is an offence under the “(Energy) Miscellaneous Provisions act 1995”, to break ESB Networks seals or to interfere with ESB Networks equipment.**

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

## 10 LABELLING

Metering equipment shall be labelled ‘ESB Networks Whole Current meters.’ or ‘ESB Networks 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.

A fire fighting connection taken from the live side of the main circuit breaker should be suitably labelled, and clearly visible to a person operating the main breaker. Labels shall be fitted onto the fixed sections of a switchboard so as to eliminate the potential danger where labelled doors/covers are interchangeable. (See page 39 for details)

In Multi-Metering installations a permanent label is required for the relevant Apartment/Unit number, the Fuse before the Meter, the Meter and the outgoing switchfuse/MCB. In Relay installations all control wiring shall be permanently labelled. These labels shall be fitted at the meter, the relays and the outgoing switchfuse/MCB before connection.

# GENERAL REQUIREMENTS

## 11 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. NOTE: The customer or consultant acting on customer's behalf should ensure the correct tariff applies to the installation.

## 12 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.

## 13 MULTI-CUSTOMER PREMISES

For Connections up to 200kVA, the specified fuse units (pages 17-18) shall be supplied and fitted by the customer before ESB Networks whole current meters and ESB Networks metering current transformers (CTs). Above 200kVA the customer's circuit breaker is fitted before the CTs. All meters and metering equipment for each customer shall be located at one central point, normally at the termination of ESB Networks connection cable. In all new indoor installations suitable enclosures shall be provided to accept ESB Networks' equipment.

**Fuses for Whole Current Metering are supplied by ESB Networks**

## 14 BUSBARS

If more than two connections are required at the main isolator, then a Busbar chamber is required.

## 15 MAIN PROTECTIVE CONDUCTOR CONNECTION (NEUTRALISING)

The customer's Main Protective Conductor is connected to the ESB Networks neutral at the Main Connection point in a TNCS system. **N.B. Customer's main earth terminal must not be within ESB Networks' sealed enclosure.**

## 16 MAIN CONNECTION POINT

ESB Network's responsibility extends up to customers Main Connection point: The Customer / Customers representative has responsibility for the electrical installation from that Main Connection point. The Main connection point is normally:

### In Major Installations:

- (a) At ESB Networks main fuses
- Or
- (b) On Incoming side of customer's main circuit breaker

# GENERAL REQUIREMENTS

## **In other installations:**

- (a) At connection point of customer's tails.  
Or
- (b) On Customer's side of ESB Networks isolator

**In indoor locations where ESB Networks Main Fuse Unit is fitted it shall be located close to an external door (i.e. within 2mts).**

## **17 ACCESS TO ESB Networks EQUIPMENT ON CUSTOMER'S PREMISES:**

Specific arrangements may have to be made for particular premises using key safes which are available from ESB Networks. Contact local ESB Networks office for information. (Key safe information - See page XIV)

## **18 REMOTE READING OF METERING EQUIPMENT:**

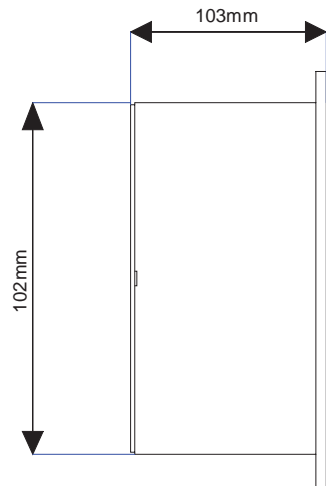
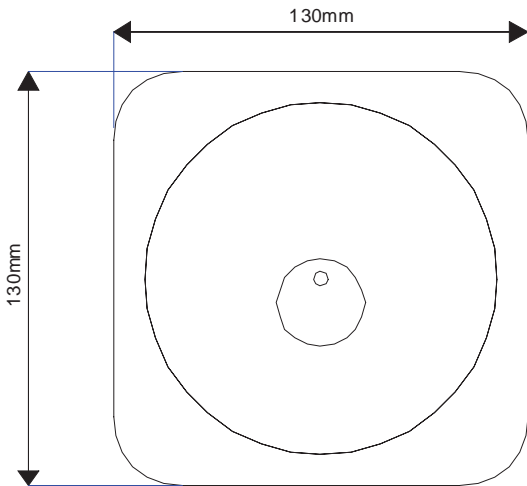
**All Connections at 200kVA and above are read remotely using GSM equipment.**

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.

## **19 CUSTOMER SWITCHING SIGNALS:**

Where ESBN provide a switching signal to customer's equipment, e.g. contactor coil for NSH, the maximum permissible current shall be  $\leq 80\text{mA}$ .

# Key Safe



- Installed flush with wall to a depth of 103mm
- Available from Local ESB Networks Depot.
- For full specification, refer to current information from ESB Networks
- Keysafe codes: Base: 911551 Cover plate: 911552



# SYMBOLS USED THROUGHOUT THIS PUBLICATION

## COLOUR CODING USED THROUGHOUT BOOK



SUPPLIED BY ESB NETWORKS

SUPPLIED BY CUSTOMER



ESB METER



ESB  
TIMESWITCH



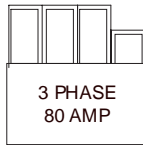
ESB ISOLATOR  
METER



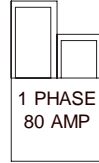
SPECIAL ESB  
ISOLATOR



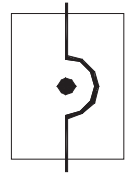
ESB CUTOUT



ESB CUTOUT



ESB CUTOUT



CURRENT  
TRANSFORMER



SWITCHFUSE/MCB



FUSE



ISOLATOR



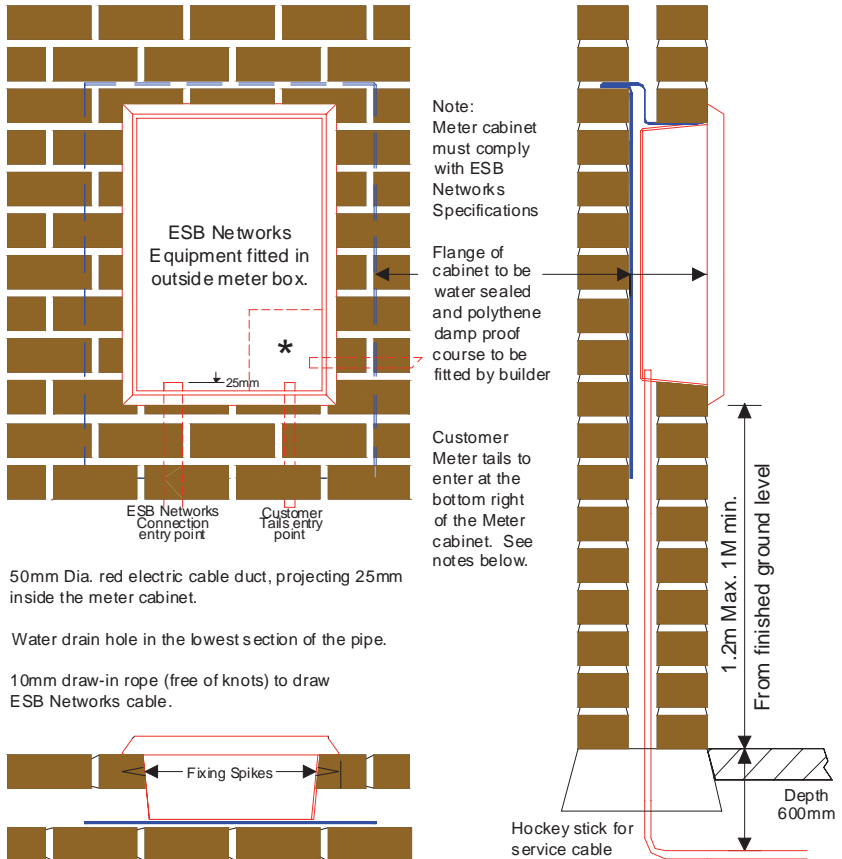
RELAY



MAIN CIRCUIT  
BREAKER

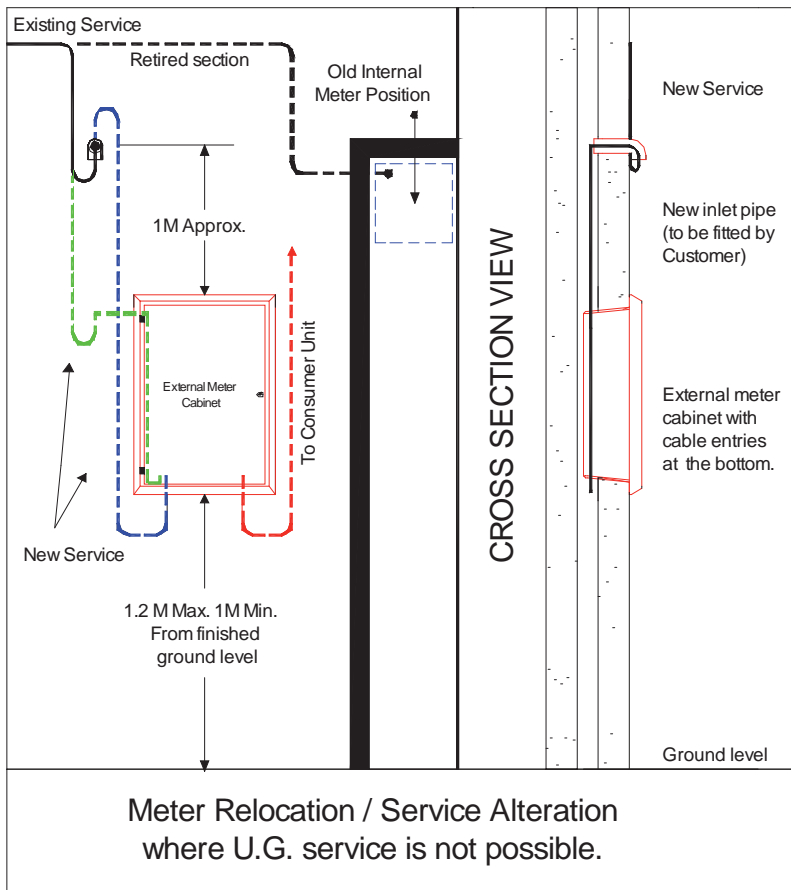
# OUTDOOR METERING CABINET

## Typical method of installation of outdoor Meter Cabinet



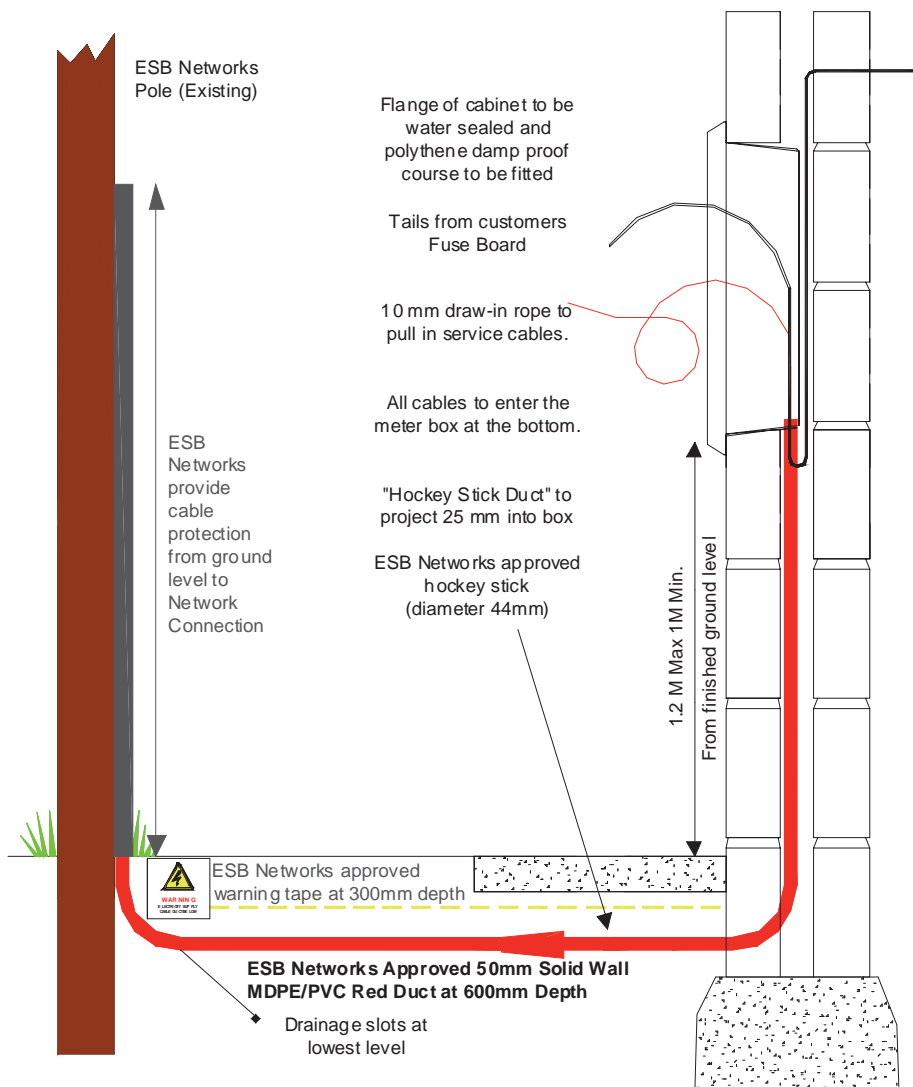
- To Comfortably accept the above cabinet, builders should provide an opening of 606mm (h) x 402 (w) x 155 (d)
- Where applicable, ensure that door hangs so as to allow latch to fall into closed position
- For ESB Networks O/H connection situation see Sketch/photograph on pages 3/4 and/or contact local ESB Networks office before fitting box
- The meter cabinet must 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 I.D. should be in place at service installation stage. See photo 1 page 4 for correct entry points.**

# SERVICE ALTERATION



- New Service cable to be installed in cavity. If no cavity exists, the service cable may be clipped on surface to enter meter cabinet at top left hand side.
- Service cables must have mechanical protection when installed in cavity.
- In all cases ETCI rules will apply.

# SPECIFICATION FOR SINGLE UNDER GROUND SERVICE CONNECTED TO OVERHEAD NETWORK



- Where specified by ESB Networks, a cable run longer than 50m (approx.) may require a larger duct and or an approved service vault or both.
- If a 125mm service duct is specified, an ESB Networks approved Service vault will be required at the interface with the hockey stick
- See **Current** "ESB Networks Specification for underground Service" .
- 10mm Draw rope in one continuous length.
- In all cases ETCL rules will apply. Circuits shown are for example only.

# OUTDOOR BOX LAYOUT/LOCATIONS

Typical layout within outside box. Note: cable entry and exits at bottom of box.



Photo 1

Customer cable may also enter through drilled hole at bottom right hand side of box.

Photo 2

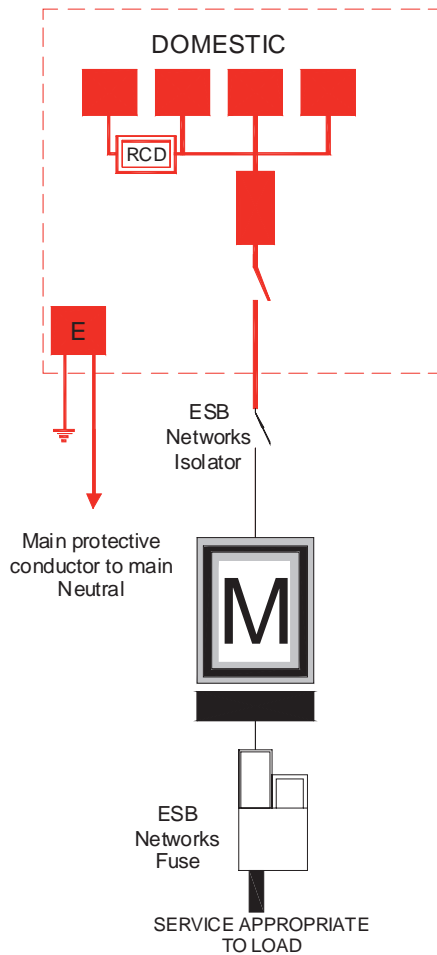
Typical location of outside box at side of house in front of security gates.

**See page 1 for location requirements**



# DOMESTIC STANDARD SETUP

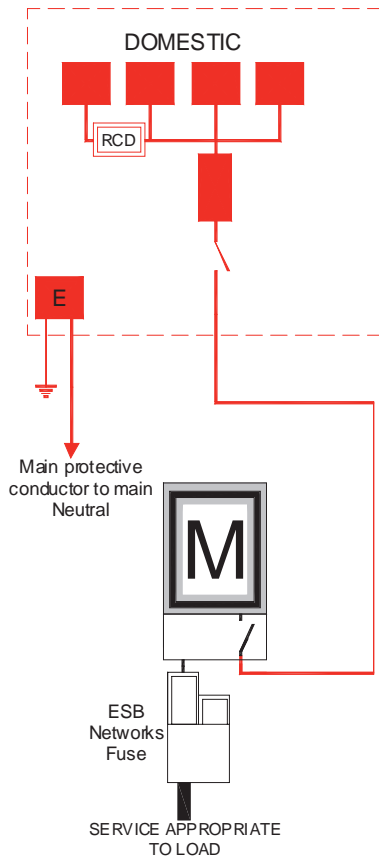
## Separate Meter and Isolator



- In all cases ETCI rules will apply. Circuits shown are for example only.

# DOMESTIC STANDARD SETUP

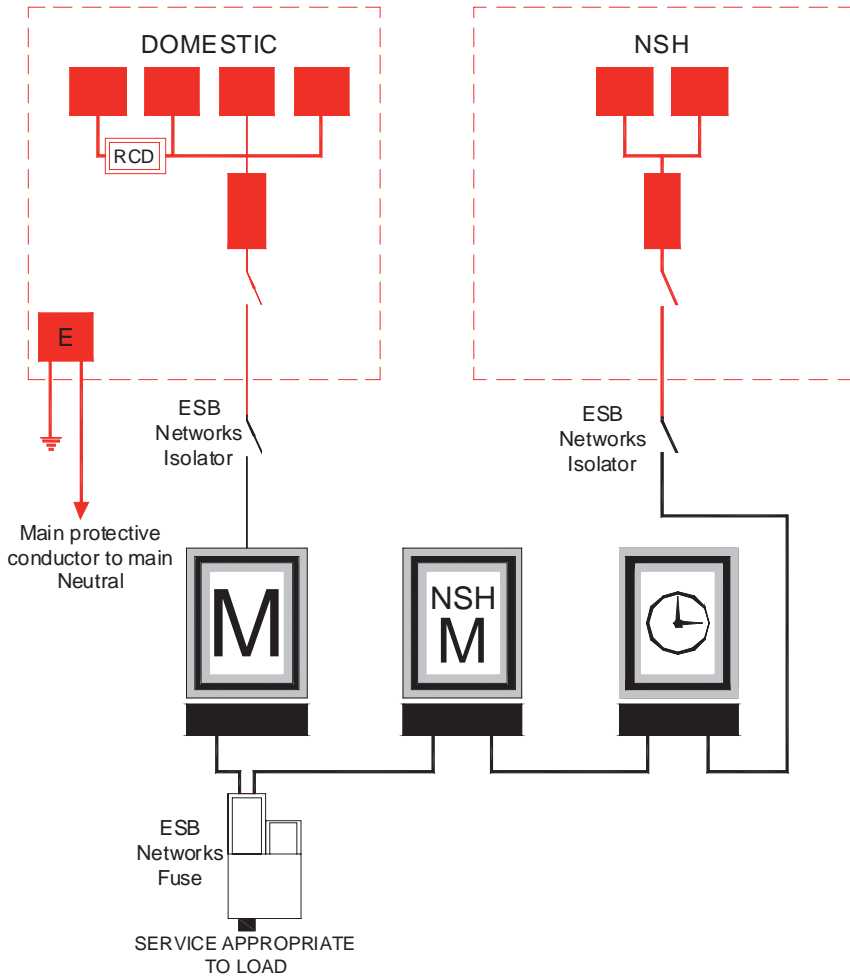
## Combined Meter and Isolator



- N.B. Do not operate isolator on load.
- In All cases ETCI rules will apply. Circuits are shown for example only.

# DOMESTIC PLUS STORAGE HEATING

## DOMESTIC PLUS SEPARATE NSH METER UP TO 13kW NSH\*



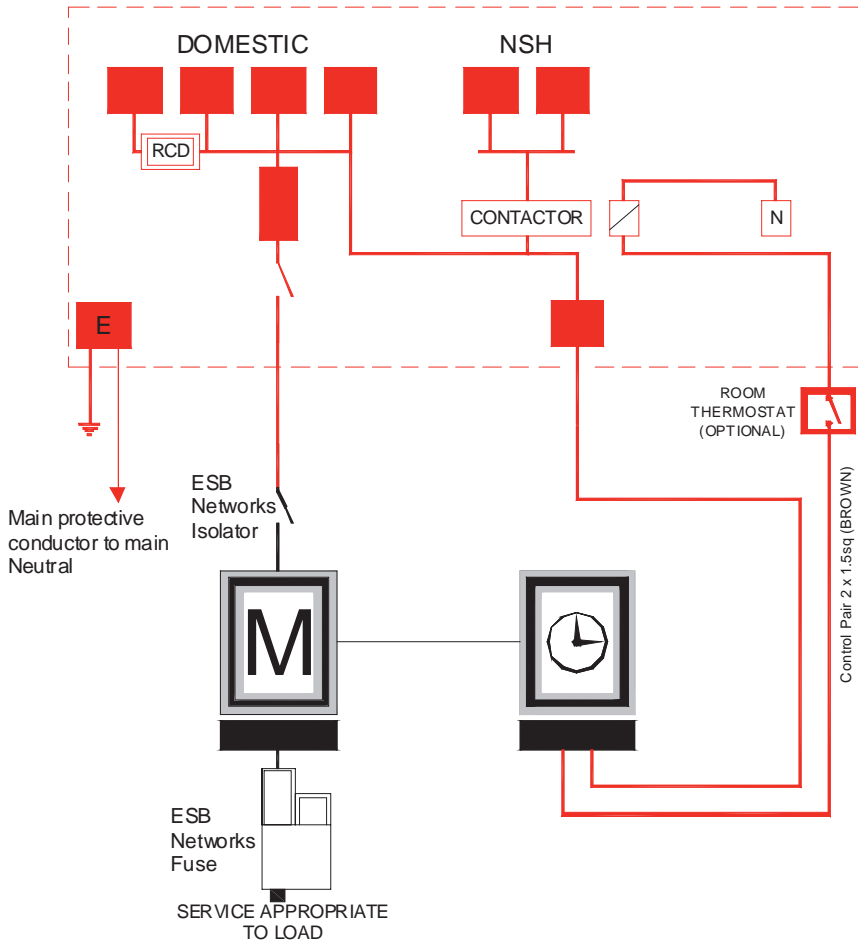
\*Installations involving more than a total of 3kW of NSH Load require advance application to ESB Networks. A charge may apply.

- Combination Meter/isolator may be used
- In All cases ETCl rules will apply. Circuits are shown for example only.



# DOMESTIC - DAY/NIGHT

## DOMESTIC PLUS UP TO 8kW NSH\* SWITCHING THROUGH CONTACTOR

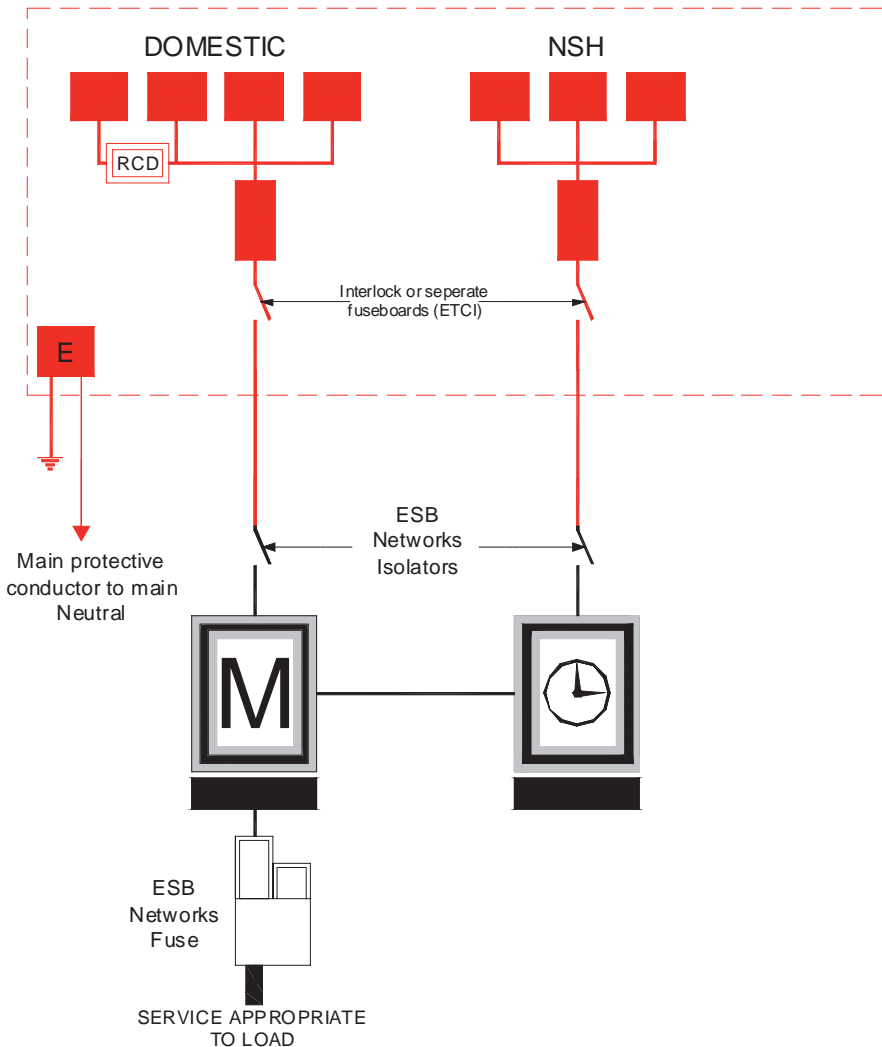


\*Installations involving more than a total of 3kW of NSH Load require advance application to ESB Networks. A charge may apply.

- Double Tariff Meter/Isolator combination also available.
- In all cases ETCI rules will apply. Circuits shown are for example only.
- Maximum permissible switching current to customer's contactor shall be  $\leq 80\text{mA}$ .

# DOMESTIC - DAY/NIGHT Method 1

## DOMESTIC PLUS UP TO 13kW NSH\* Direct switching at NSH Time switch

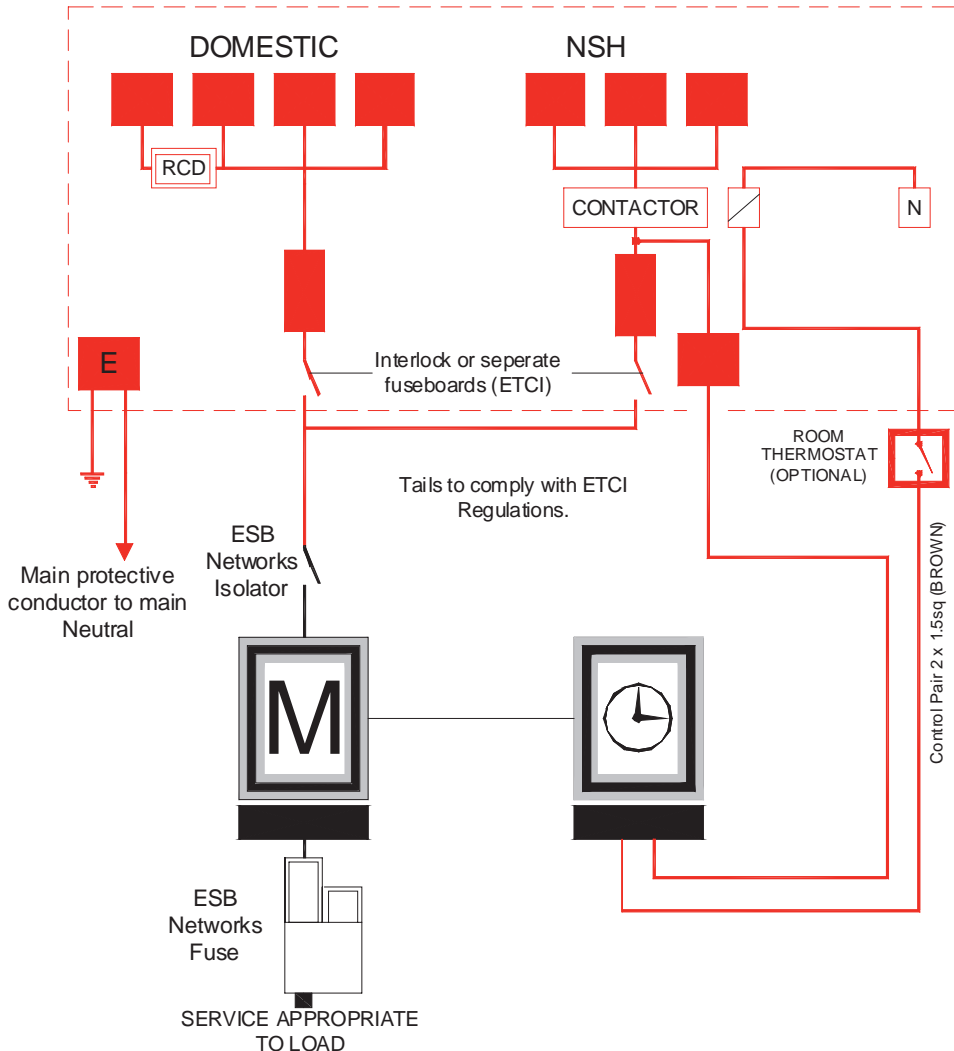


\*Installations involving more than a total of 3kW of NSH Load require advance application to ESB Networks. A charge may apply.

- Single Domestic Connection plus 13kW NSH. (No looped service to other customer).
- Looped Domestic Connection a combined total of 13kW (across both connections)
- In all cases ETCI rules will apply. Circuits shown are for example only.

# DOMESTIC - DAY/NIGHT Method 2

## DOMESTIC PLUS UP TO 13kW NSH\* Contactor switching NSH

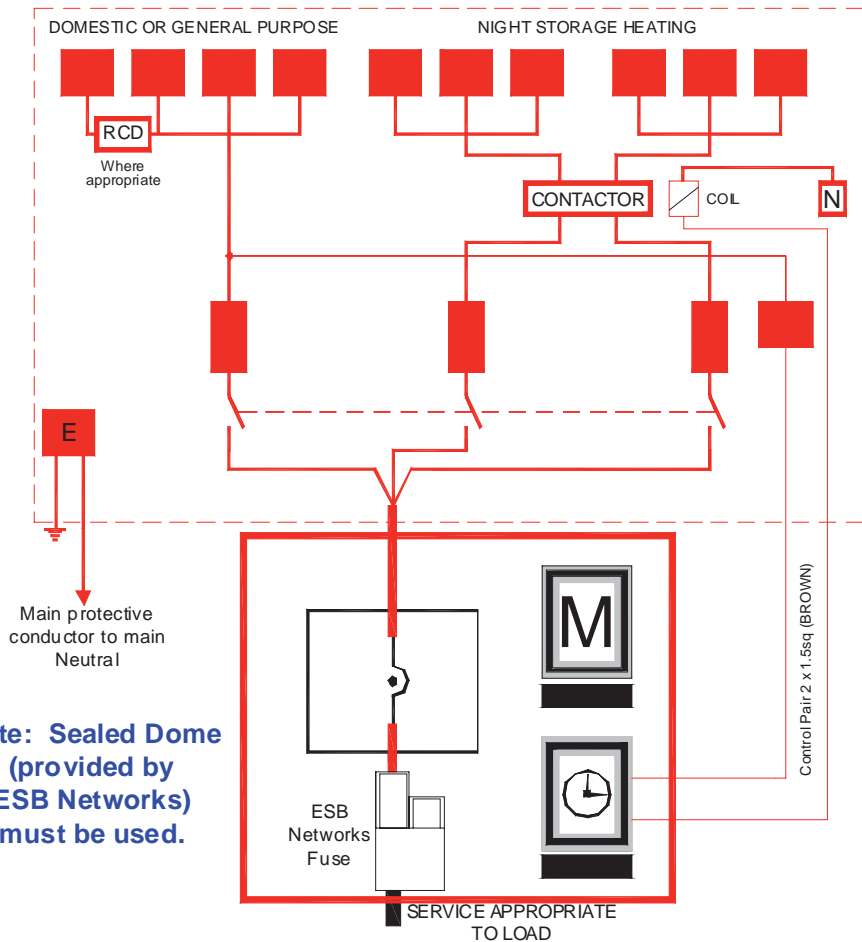


\*Installations involving more than a total of 3kW of NSH Load require advance application to ESB Networks. A charge may apply.

- In all cases ETCI rules will apply. Circuits shown are for example only.
- Maximum permissible switching current to customer's contactor shall be  $\leq 80\text{mA}$ .

# DOMESTIC OR COMMERCIAL WITH NSH LOADS IN EXCESS OF 13kW

## SINGLE PHASE C.T. METERING (3 PHASE CONNECTION NOT AVAILABLE)

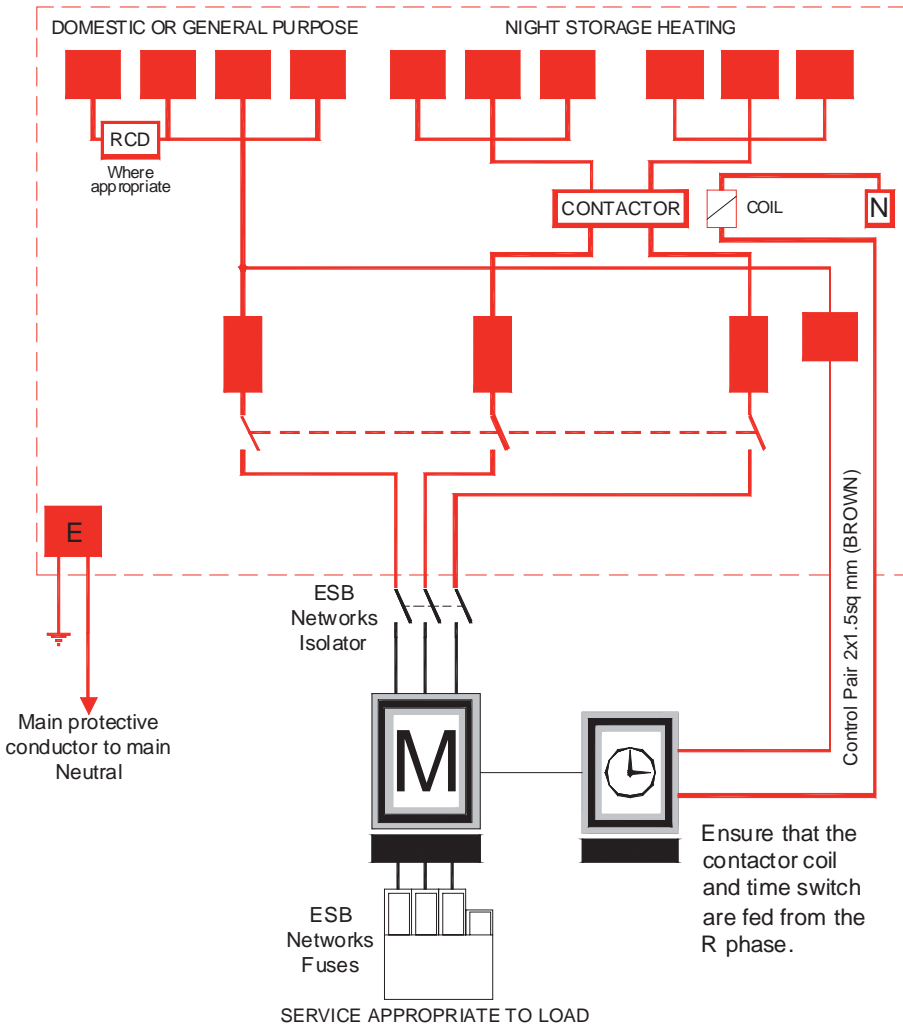


\*Installations involving more than a total of 3kW of NSH Load require advance application to ESB Networks. A charge may apply.

- Service appropriate to Load
- In outdoor locations standard outdoor cabinet with 150A window type CT in suitable box 125 x 125mm with sealing bush. No file terminals.
- In indoor locations standard CT cabinet with file terminals should be used.
- An option of separate night storage heating meter is available.
- In all cases ETCL rules will apply. Circuits shown are for example only.
- Maximum permissible switching current to customer's contactor shall be  $\leq 80\text{mA}$ .

# DOMESTIC OR COMMERCIAL WITH NSH LOADS IN EXCESS OF 13kW

## 3 PHASE CONNECTION AVAILABLE Day/Night Metering



**\*Installations involving more than a total of 3kW of NSH Load require advance application to ESB Networks. A charge may apply.**

- ESB Networks isolator will only apply up to 80amp service.
- See page 21/22 for space required for ESB Networks main fuse.
- In all cases ETCI Rules will apply. Circuits shown are for example only.
- An option of separate night storage heating meter is available.
- Maximum permissible switching current to customer's contactor shall be  $\leq 80\text{mA}$ .

# CONNECTION CHECKLIST

- Application for Connection submitted to ESB Networks?
- Correct level of Connection Capacity applied for?
- Maximum Import Capacity (MIC)
- Have you registered with a Supplier?  
Terms for Connection issued by ESB Networks and accepted by customer?.
- Suitable location for Connection agreed with ESB Networks?
- Is there sufficient space provided for ESB Networks equipment?
- Are trenches, ducts and ways, provided for the installation of ESB Networks cable to the correct specification?
- Access arrangements for ESB Networks staff to premises/building.
- Have you returned your signed connection agreement(If required)
- Is the installation completed?
- Completion certificate?

## Specific to Multi-Metering Connections

- All temporary connections to Multi Meter Board must be removed before ESB Networks staff commence work.
- All unconnected tails within Metering Cabinet must not be energised from another source and must be insulated to prevent accidental contact with the conductor.
- All apartment doors must have permanent numbers fitted.
- All un-metered fuses and outgoing switch fuses must be permanently labelled with the relevant apartment numbers.
- Permanent numbers must be available for each meter.
- Circuits to the apartments, including the control wiring must be checked out before certification.
- All unmetered equipment to be sealable.
- Code of Practice requirements must be complied with including the height of ESB Networks equipment from the floor. Permanent access to the metering equipment must be in place. This will normally require the installation of a Key Safe. See page XIV.

# ASSEMBLER'S CHECKLIST

**All single customer, outside enclosures for ESB Networks metering equipment shall comply with ETCI “Code of Practice for the Design and Erection of Low Voltage Switchgear Assemblies”.**

**All outside enclosures used for ESB Networks' equipment must be IP55 and either non-metallic, stainless steel or hot dip galvanised. Where multi-customer centralised metering is permitted outdoors, please refer to page VIII for special minimum requirements.**

**N.B. Customer's main earth terminal bar must not be within ESB Networks' sealed enclosure.**

## **1. Provide sealing facilities at :**

- Main Isolator.
- Un-metered cable/busbar sections.
- Un-metered fuses. (individual sealing)
- Shrouding around un-metered fuse units.
- Meter mounting plate.
- All surface mounted trunking used for un-metered wiring.excluding panel trunking
- All un-metered equipment.

## **2. Shrouding (At Unmetered Fuses)**

- 80/125 Amp front loading fuses must have a front loading cover that has one continuous piece with separate windows cut at 20mm spacing between each fuse
- NH type Fuse units shrouding to minimum IP2X.

## **3. Dividers**

- Metered and un-metered sections separated.
- Un-metered fuse sections separated from other live equipment. (To allow replacement in safety)

## **4. Customers Outgoing File Terminals:**

- All terminals shrouded.

## **5. Labelling :**

- On un-metered fuses
- On meters
- On control wiring
- On time-switches
- On Customers outgoing switchfuse or MCB

# ASSEMBLER'S CHECKLIST

## 6. Relays (**Not for new installations**):

- Are in self contained sealable compartments?
- Numbered tags (Apartment/Unit) on control wiring at relays, meters, and outgoing file terminal connections.
- Time switch fused at 10A. This fuse must be located in the same section of the board as the customer's unmetered fuses.

## 7. ESB Networks Time Switch :

- Locate with ESB Networks meters.
- On non relay installations: meter and Time Switch adjacent.
- D/T Dial control cables in place.

## 8. Holes for Meter and Time-switches :-

- To specified spacing. (Available from local metering supervisor)
- Hole size 3 to 4mm
- Provide 3 to 4mm x 10mm stub ended screws. (Posi-drive, self tappers etc.) These fixing screws for whole current. meters are supplied by the Assembler. If longer screws are required, they are supplied by ESB Networks.

## 9. Meter Tails / Unmetered Cables :

- Ferrules must be fitted on multi stranded cables.
  - 16sq. Cable - Ferrule 28mm long incl. insulation -16x28
  - 25sq. Cable - Ferrule 28mm long incl. insulation -25x28
- Tails are identified and permanently marked. (Apartment/Unit)
- **Each Neutral to be identified at bus bar and meter position**
- Where cables are concealed they shall be accessible for inspection. This access shall be gained through the removal of an ESB Networks seal. These cables should not be clipped or tied, so that individual cables can be replaced readily.

## 10. Unmetered Fuses: (pages 17-18)

- Whole current: - ESB Networks will provide fuses.
- C.T.s: - Assembler provides NH fuses in Units to IP20.
- **Fuses should not be loaded before connection.**



# ASSEMBLER'S CHECKLIST

## 11. 300A Connection:

- Multi stranded cable is acceptable for all new 300 Amp ESB Networks cut outs.
- Note: Where connection is required to existing older type ESB Networks cut outs, stranded or solid (Soldered) tails may be required. Consult with local ESB Networks.

## 12. Over 300A connection:

- Copper bars tinned to accept ESB Networks Connection cables. (Pages 25,26 or 36)

## 13. Customers circuits:

- Under no circumstances should customer circuits pass through un-metered sections.

## 14. C.T.s : (Pages 24-26)

- Neutral and Earth terminals adjacent to C.T.s
- Double support on busbars.
- Main isolator should be adjacent to Connection Point.
- Sizings/spacings comply.
- In self-contained units fit separators top and bottom.

## 15. Locks:

- Triangular, 8mm.

## 16. On site :

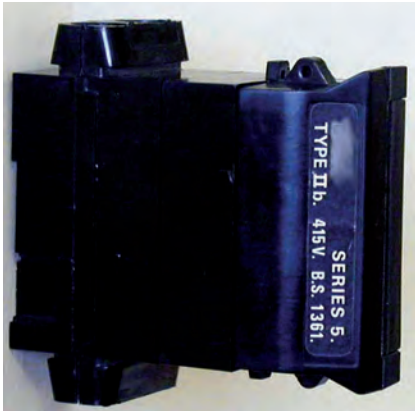
ESB Networks main connection cut out:

- Is provision required for it within the board? (See page 23)
- Will ESB Networks connection be to left, right, top or bottom of board?
- Main isolator should be adjacent to connection.
- For connection over 300amps, Main circuit breaker must be directly over the incoming duct from ESB Networks substation.
- Is all metering equipment at correct height?  
(See page VII, including paragraph 3 item b)

## 17. Colour Coding: -

- To ETCl wiring rules. - Reference ET 101.

# FUSES BEFORE WHOLE CURRENT METERS IN MULTI-METERING INSTALLATIONS



80 Amp Fuse units conforming to BS7657 which accept RH/RHL cartridge fuses approved to either BS 1631 or BS 88 part 3.

All must be individually sealable.



80/125A front loading unit with 22 x 58 fuse link conforming to IEC 408-269.2

All must be individually sealable.

A 20mm (min) space being left between each unit.

For 3 Phase Metering the units may be ganged to accommodate one seal.

# FUSES BEFORE CT METERS IN MULTI-METERING INSTALLATIONS

UP TO 200 kVA

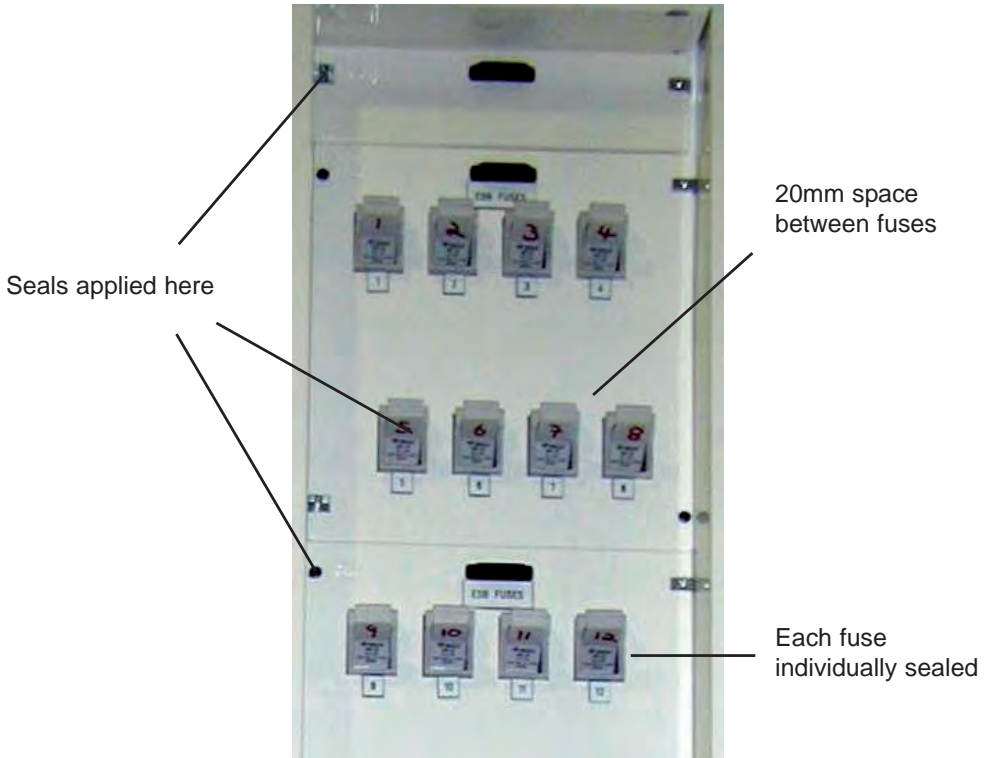


NH type units conforming to IEC/EN 60269-2-1 and DIN 43620, with shrouding conforming to IP 2X enclosing all terminals.

NH pull down disconnecter approved for connections over 80 Amp and up to 300Amp

Access cover of enclosure containing NH units must be sealable.

# REQUIREMENTS FOR FRONT LOADING FUSE UNITS



The shrouding at unmetred fuses must be one continuous piece with separate windows cut at 20mm spacing between each Fuse Unit.

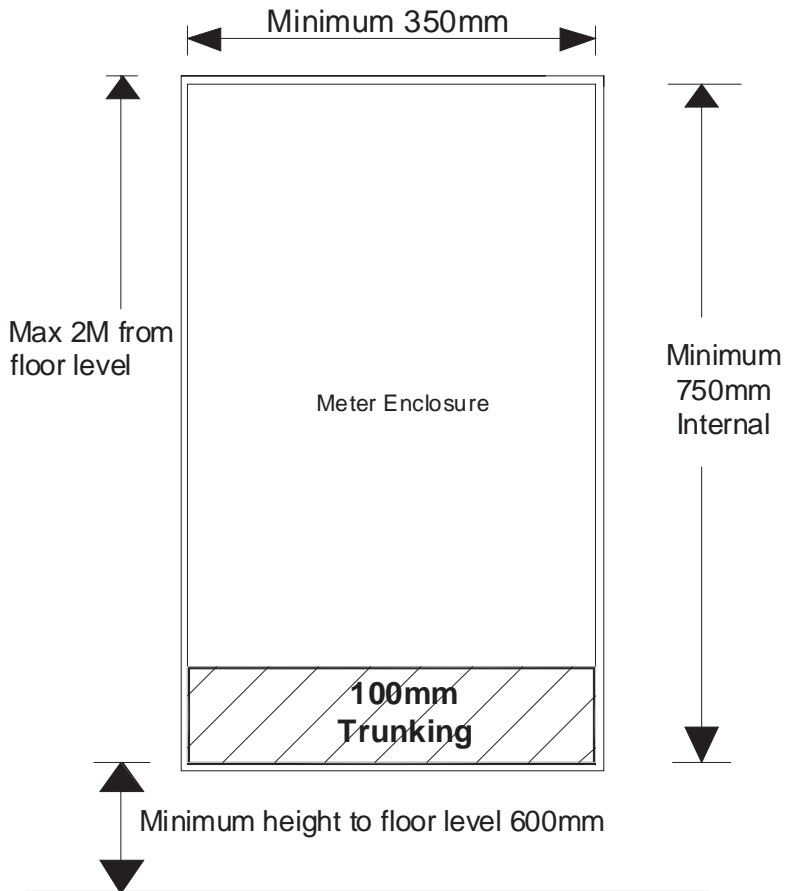
Each Fuse Unit must be individually sealable.

Shrouding at Fuses must be sealable.

Fuses should not be loaded before connection.

# USEFUL GENERAL DIMENSIONS

## CT Meter Cabinet Incorporated in Main Panel Enclosure Dimensions

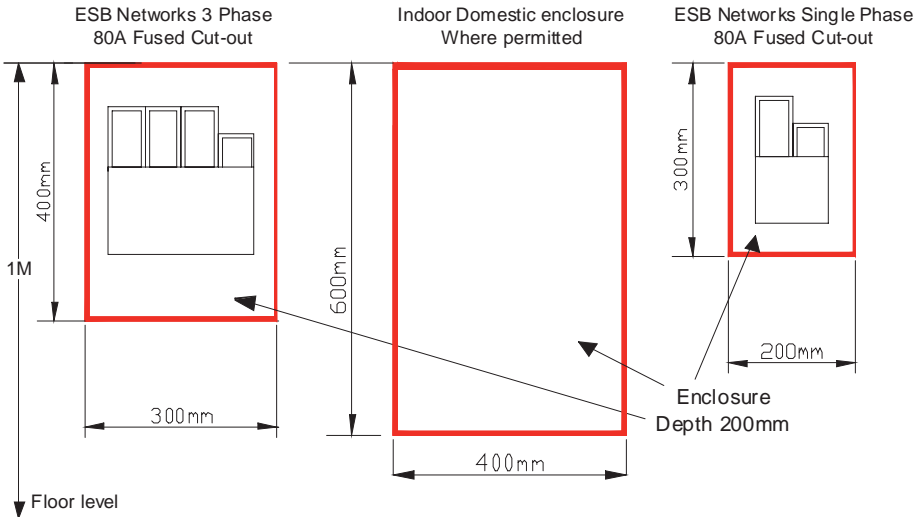
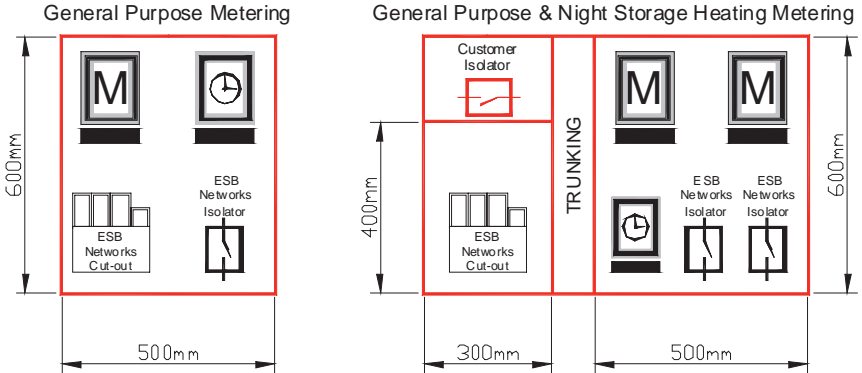


- **Enclosure must be located directly adjacent to CT enclosure on left or right hand side or above.**
- **For the left or right option, bottom of meter enclosure must be at the same level as bottom of CT enclosure.**
- Minimum depth 200mm clearances from back plate to nearest intrusion on inside of door.
- Maximum depth 250mm (back plate to door).
- 100mm Trunking installed as shown.
- Secondary cables from CT enclosure must enter 100mm trunking.
- Enclosure to have hinged door, 8mm triangular lock.
- In all cases ETCI rules will apply. Circuits shown are for example only

# USEFUL GENERAL DIMENSIONS

## For Cabinets/Boxes

For indoor use in Industrial/Commercial single customer installations

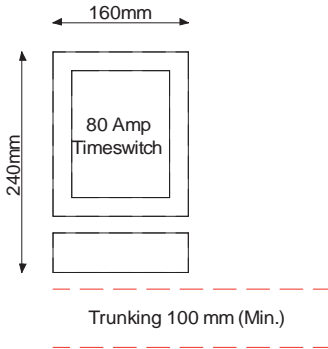
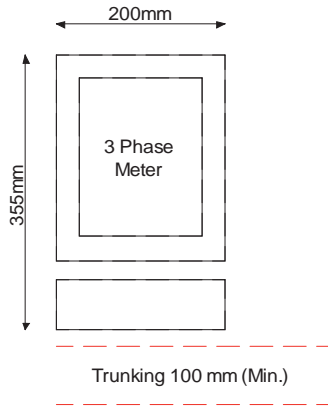
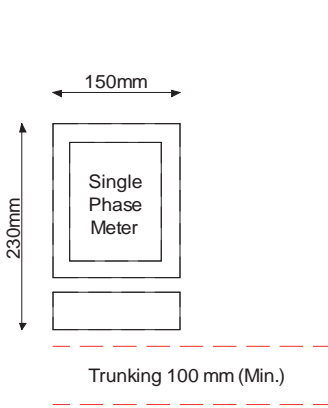


Note: The above dimensions are the minimum acceptable.

- In all cases ETCI rules will apply. Equipment layout shown is for example only and is not to scale.

# USEFUL GENERAL DIMENSIONS

## For Multi Metering Panels



For Multi metering Panels

150mm clear space must be left from meter mounting surface to nearest intrusion inside door.

100mm Trunking (min) to be used as indicated

### ESB Networks Isolator dimensions:

- 3Ph 120 x 115 x 80mm
  - 1Ph 120 x 70 x 80mm (type 1)
  - 1Ph 90 x 90 x 80mm (type 2)
- In all cases ETCI rules will apply.

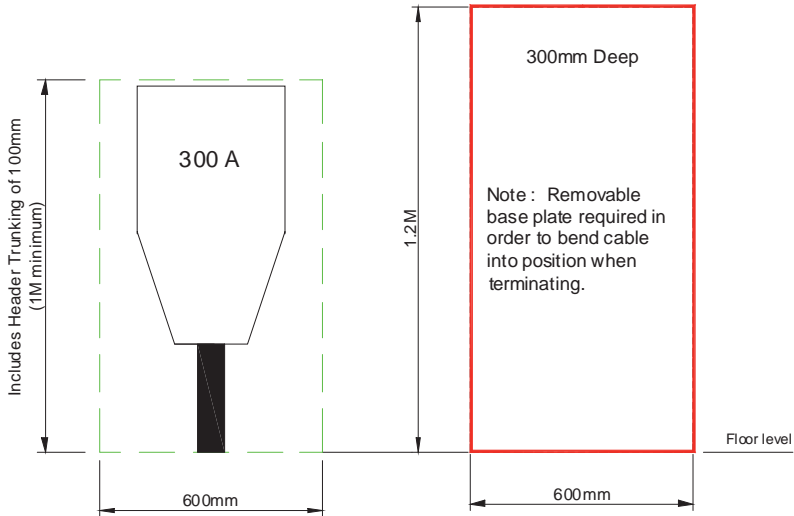
# USEFUL GENERAL DIMENSIONS

## SPACE REQUIRED FOR ESB Networks

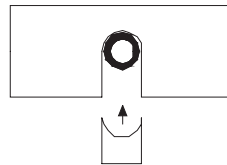
### CABLE TERMINATIONS < 300A

**Preferred Option**  
**Wall mounted outside**  
**switchboard Minimum**  
**space required as below**

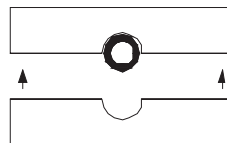
If required to install in an enclosure, Minimum dimensions as below. Please see enclosure base options for cable entry



Option 1  
 Slotted Base to accommodate cable installation.



Option 2  
 Split Base to accommodate cable installation.

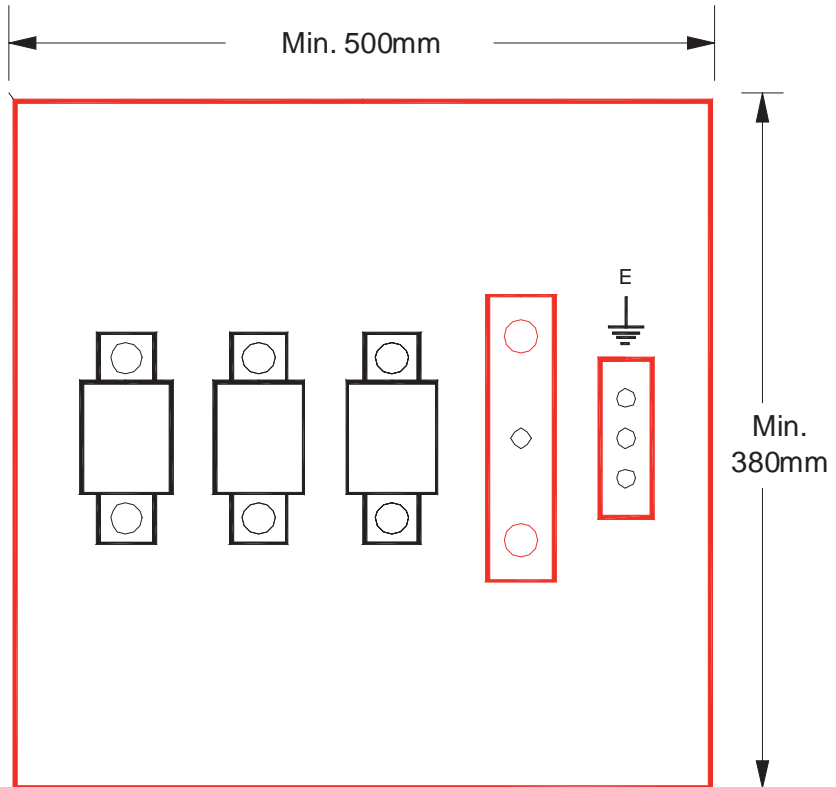


- Where cut out is wall mounted outside switchboard, adequate mechanical protection must be provided for incoming cable
- The slot for cable entry is required in base plate only.
- In all cases ETCI rules will apply.



# USEFUL GENERAL DIMENSIONS FOR CT ENCLOSURES

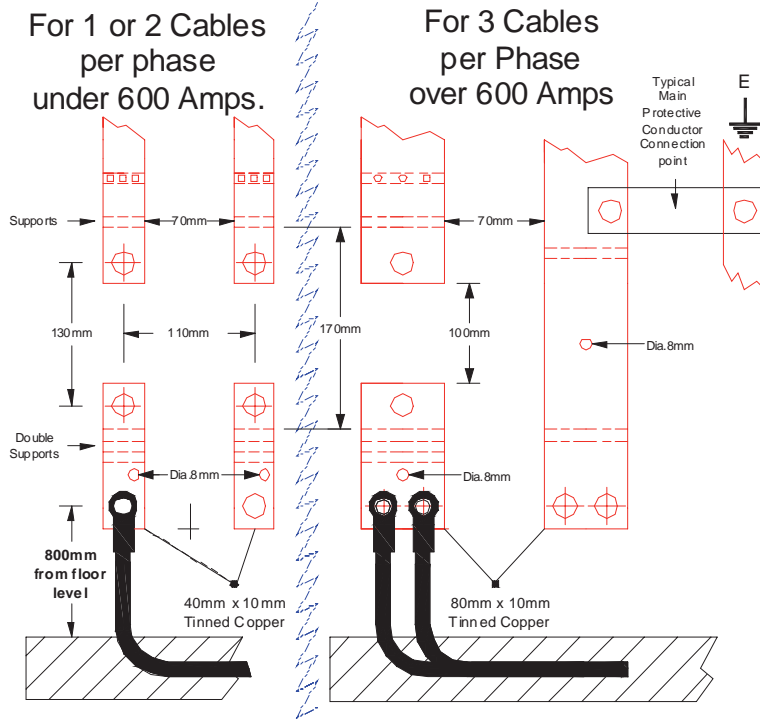
## 250/5A C.T. Enclosure



- 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.
- Height and width dimensions of CT enclosure may be reversed
- Maximum depth of mounting surface 250mm.
- **Note: in Multi CT meter installations, the MINIMUM height above floor level for mounting the the CTs is 600mm.**
- In all cases ETCI rules will apply.

# USEFUL GENERAL DIMENSIONS CT CONNECTIONS

## PROVISION AT CUSTOMER CIRCUIT BREAKER FOR 250/5 and 600/5 CTs



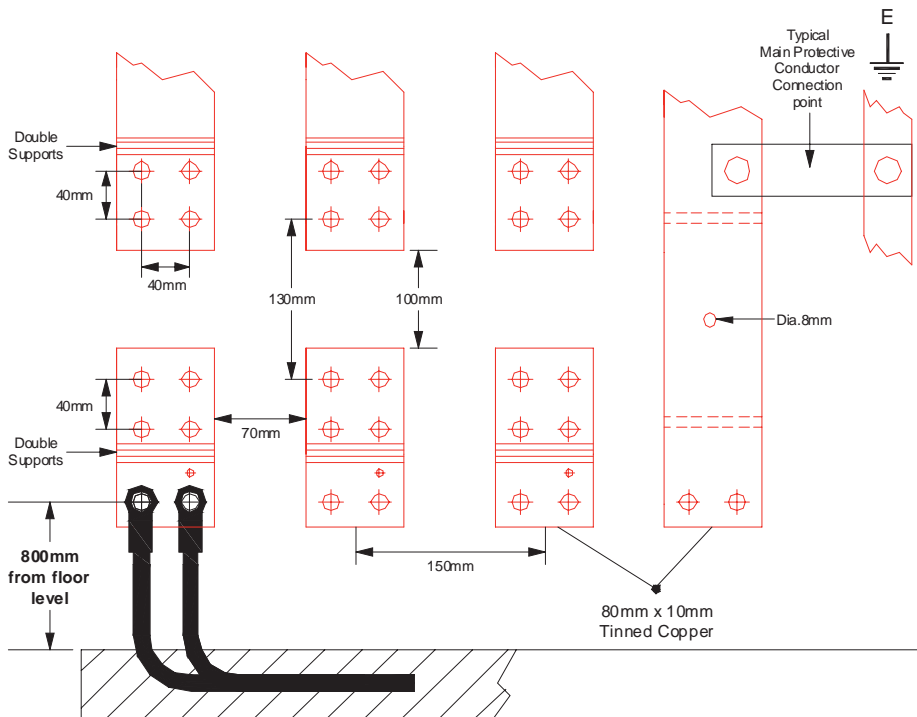
Detail for back to back cable connection



- For angled drops from CB 100mm spacing must be maintained.
- Coppers to be mounted with 60mm clearance from front or back
- Copper bars must be tinned because there are aluminium lugs on the Networks cable.
- Neutral bar and Earth Bar can be accommodated at bottom of enclosure
- When this enclosure is metal it shall be hinged as well as sealable.
- Cable connection bolt hole diameter 16mm
- CT bolt hole diameter 12 mm
- **Note: in Multi CT meter installations, the MINIMUM height above floor level for mounting the the CTs is 600mm.**
- Current Transformers rated at 250/5A can safely carry currents of up to 400A
- Current Transformers rated at 600/5A can safely carry currents of up to 1000A
- In all cases ETCL rules will apply.

# USEFUL GENERAL DIMENSIONS CT CONNECTIONS

## PROVISION AT CUSTOMER'S CIRCUIT BREAKER FOR 1500/5 CTs



Detail for back to back cable connection

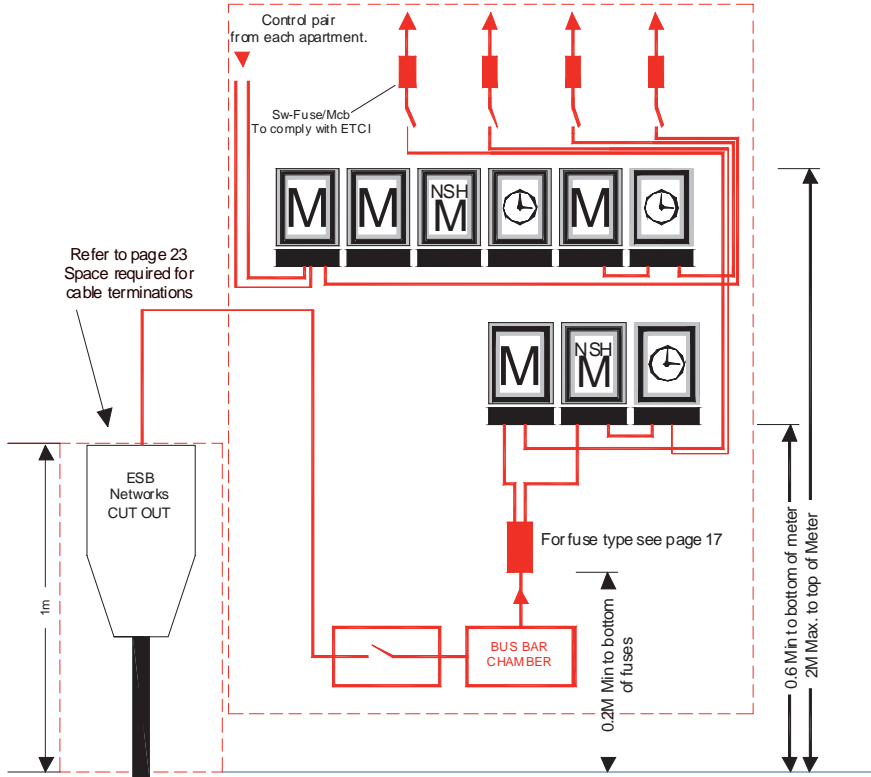


- For angled drops from CB 100mm spacing must be maintained.
- Copper bars must be tinned because there are aluminium lugs on the Networks cable.
- Coppers to be mounted with 60mm clearance from front or back.
- Where this enclosure is metal it shall be hinged as well as sealable.
- Cable connection bolt hole diameter 16mm
- CT bolt hole diameter 12 mm
- Main protective conductor connection point shall be within the sealed enclosure.
- In all cases ETCI rules will apply.

# DOMESTIC PLUS NSH

## DAY/NIGHT METERING OR DOMESTIC PLUS SEPARATE NSH METERING

(will also suit small industrial/commercial premises)

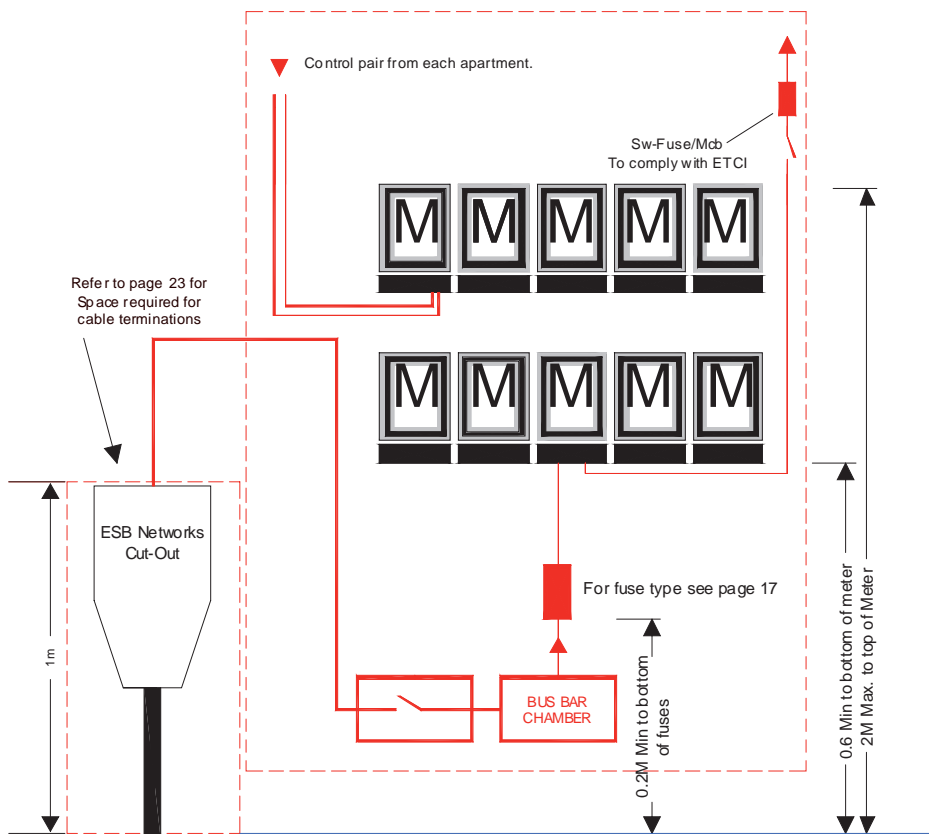


### • Switchboard assemblers note:

- Minimum spaces allocated for each meter per page 22
- **Labelling:** Fuses, Meters and Isolators MUST have permanent labels before connection.
- Apartments must be permanently numbered before connection.
- All surface mounted trunking used for unmetered wiring must be sealable except for panel trunking.
- All unmetered equipment must be sealed.
- Refer to Assembler's Checklist page 14.
- Service size appropriate to load.
- See Pages 21 and 23 for space required for ESB Networks main fuse cut-out
- **Where multi-metering is permitted outside, special minimum requirements for the enclosure are mandatory. See page VIII for details.**
- Main protective conductor connection point shall be at main ESB Networks Cut-Out.
- In all cases ETCI rules will apply. Circuits shown are for example only.

# APARTMENTS DAY/NIGHT ELECTRONIC METERING FROM 2008

## DAY/NIGHT METERING TO SWITCH NSH CONTACTORS. (Will also suit small industrial/commercial premises)



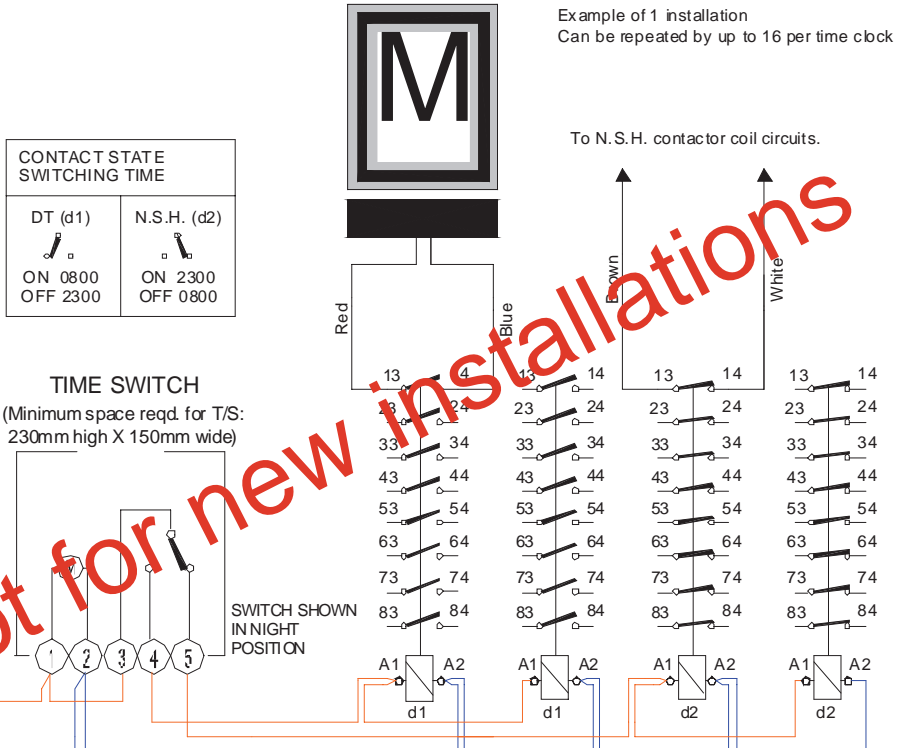
- **Labelling:** Fuses, Meters and Isolators MUST have permanent labels before connection.
- Apartments must be permanently numbered before connection.
- All surface mounted trunking used for unmetered wiring must be sealable except panel trunking.
- All unmetered equipment must be sealed.
- Refer to "Assembler's Checklist" page 14.
- Service size appropriate to load.
- See Pages 21 and 23 for space required for ESB Networks main fuse Cut-Out.
- Where multi-metering is permitted outside, special minimum requirements for the enclosure are mandatory. See page VIII for details.
- Main protective conductor connection point shall be at main ESB networks Cut-Out.
- In all cases ETCl rules will apply. Circuits shown are for example only

# RELAY CONTROL DIAGRAM

## NOT FOR NEW INSTALLATIONS

### SUITABLE FOR DAY/NIGHT MULTIMETERING

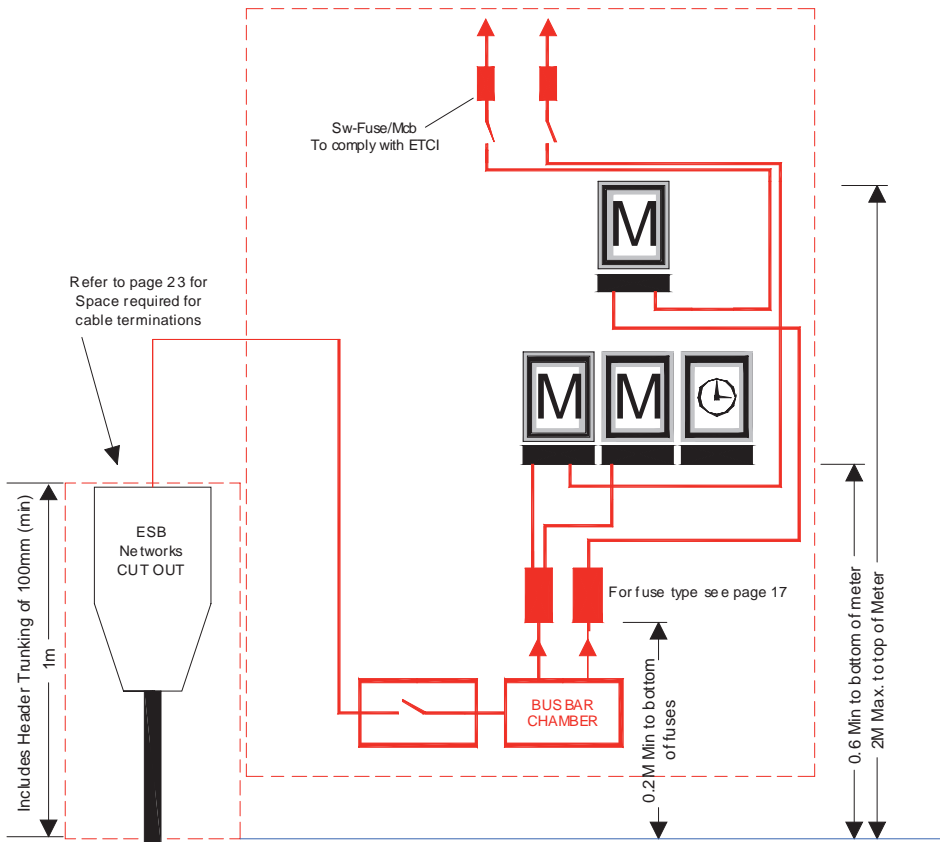
**Note: All control wiring including connections to time switch and relay coils provided by customer.**



- 10 Amp fused feed to each time switch from unmetered connection (fuse supplied by customer) Labelled Time switch feed fuse **must be located** with all other unmetered fuses. Time Switch to be surface mounted at eye level.
- Relay wiring -  
1.5sq.mm flexible or stranded single P.V.C. cable. d1 red/blue d2 brown/white.  
**NOTE: all cable connections must be fitted with ferrules of the correct length.**
- Control cable to be labelled with flat/unit identifiers at outgoing file terminals, at both sides of the relay and at the meter.
- Relays to be in a sealed, **self contained** enclosure.
- Relays to be of an approved type with CE mark and must comply with IEC 60947, or equivalent EU National Standard e.g. BS, VDE.
- Relays to be interchangeable and mounted on Din Rail.
- Relay coils to be rated at 230V, with 8 normally open contacts rated at 400V.
- In all cases ETCL rules will apply. Circuits shown are for example only.

# COMMERCIAL/INDUSTRIAL PLUS SEPARATE NSH up to 300A (200kVA)

**MULTI - CUSTOMERS - WHOLE CURRENT  
PHYSICAL LAYOUT (Will also suit industrial premises)**



- Labelling: Fuses, Meters and Isolators MUST have permanent labels before connection.
- Units must be permanently identified before connection.
- All surface mounted trunking used for unmetered wiring must be sealable except panel trunking.
- All unmetered equipment must be sealed.
- Refer to Assembler's Checklist page 14.
- **Where multi-metering is permitted outside, special minimum requirements for the enclosure are mandatory. See page VIII for details.**
- Main protective conductor connection point shall be at main ESB Networks Cut-Out.
- In all cases ETCI rules will apply. Circuits shown are for example only.

# PARTICULAR TO APARTMENT/OFFICE BLOCKS

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

2. Page 37 will cater for Multi-Customers.

Pages 32, 33 or 35 will cater for One Customer occupying the entire building with Metering before the customer's main circuit breaker.

**3. Centralised metering is the preferred option.**

**De-centralised Metering using unmetered mains is acceptable in some "Limited" situations.**

**If it is agreed with ESNB to have de-centralised metering through the use of unmetered mains, you must contact the local ESB Networks Design Manager and get agreement before finalising your electrical design.**

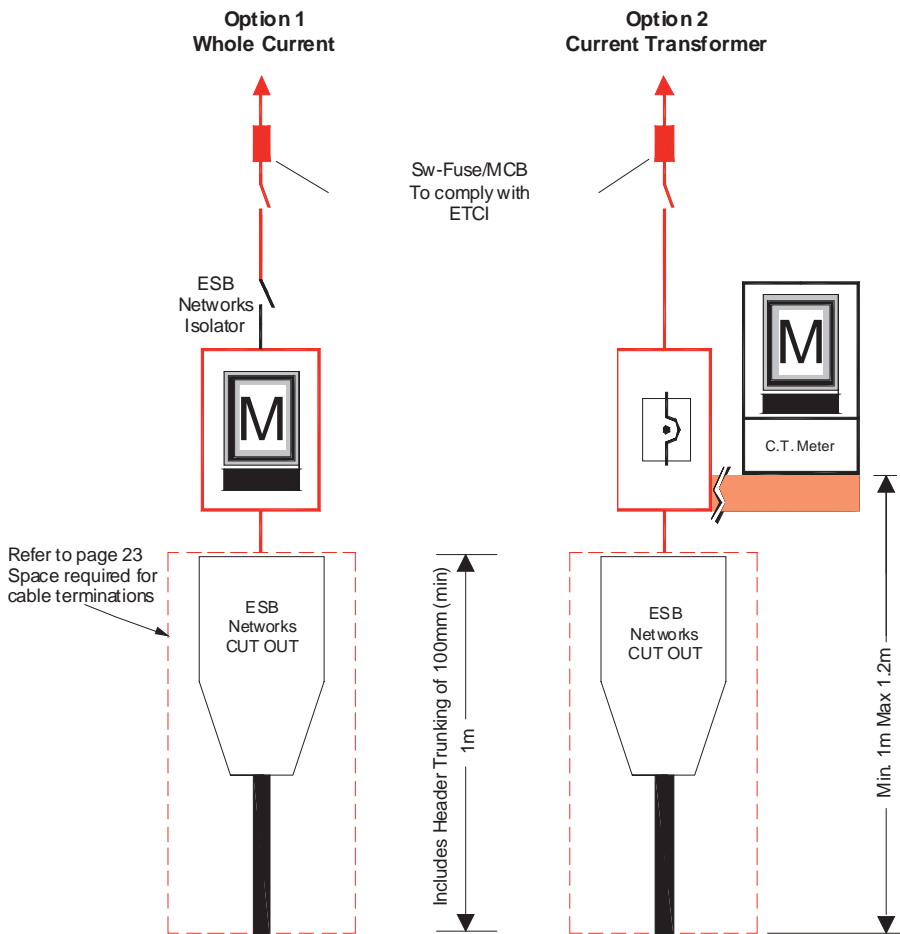
**NOTE: The installation/design of unmetered mains is specified by ESNB**

**NOTE: The customer or agent acting on customer's behalf should consult with the supplier to ensure the correct tariff applies to the installation.**



# ESB NETWORKS MAIN CONNECTION FUSED UP TO 300A (200KVA)

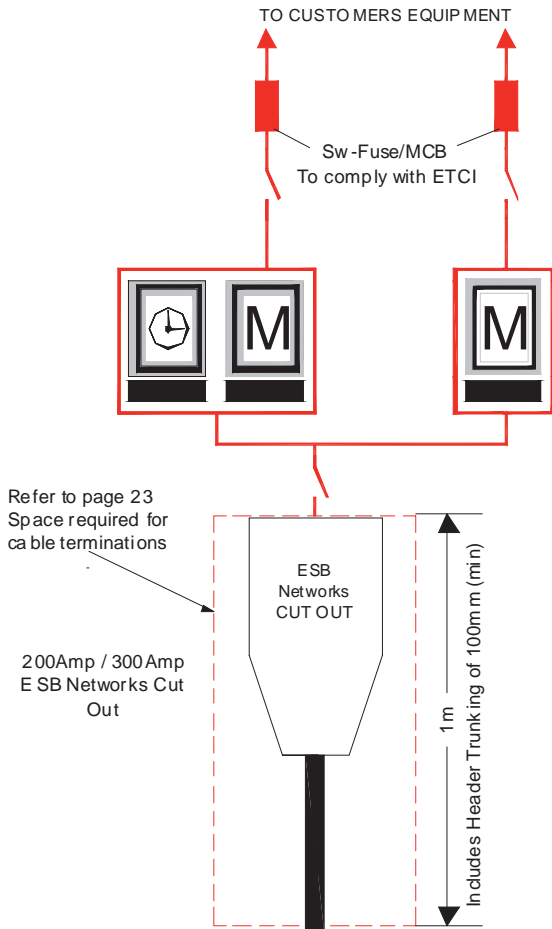
## ARRANGEMENT FOR ONE CUSTOMER BULK TARIFF



- In indoor locations ESB Networks Main Fuse Unit shall be located close to an external door (i.e. within 2m).
- ESB Networks supply and fit Time switches to control meter dials and off peak load.
- For Whole Current Metering up to 100A. ESB Networks Isolator to be used
- If Fire Fighting equipment is installed, please refer to page 38.
- For meter cabinet sizes please see pages 20, 22 and 40.
- In all cases ETCI rules will apply. Circuits shown are for example only.

# ESB NETWORKS MAIN CONNECTION FUSED UP TO 300A (200KVA)

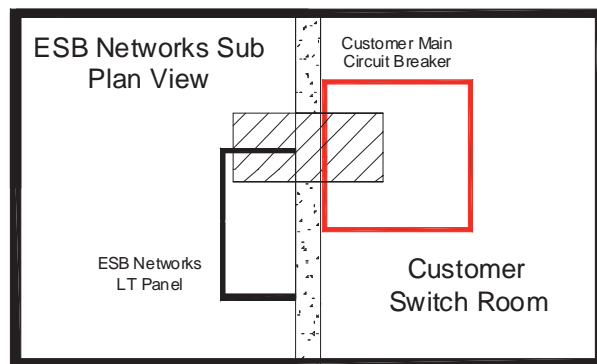
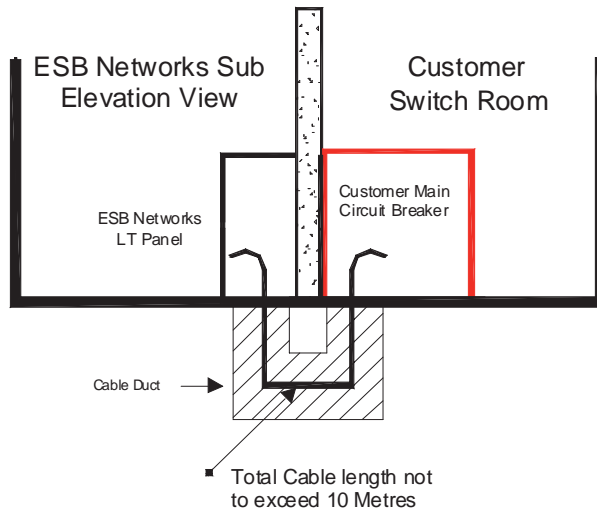
## ARRANGEMENT FOR ONE CUSTOMER MULTI-TARIFF



- In indoor locations, ESB Networks Main Fuse Unit shall be located close to an external door (i.e. within 2m).
- The ESB Networks service cable should penetrate no more than 2m on the horizontal from the inside of the main external wall.
- If Fire Fighting equipment is installed, please refer to page 38.
- For Cabinet sizes please see page 20, 22 and 40.
- **Where multi-metering is permitted outside, special minimum requirements are mandatory. See page VIII for details.**
- In all cases ETCl rules will apply. Circuits shown are for example only.

# CONNECTION OVER 300 AMPS (200kVA)

**N.B. Some loads of less than 200kVA may require a substation in urban locations.  
Direct connection from Sub Station**

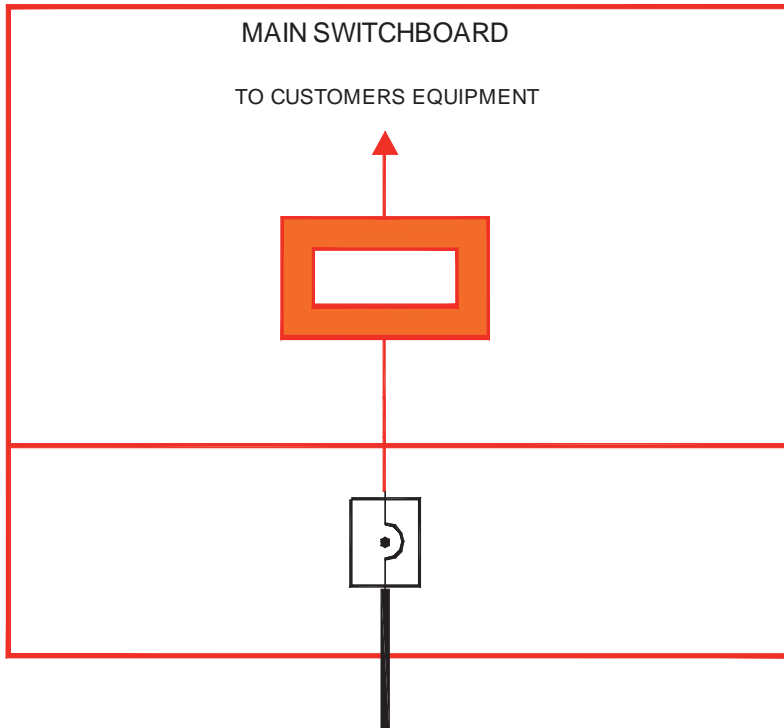


- Customer switch room must be adjoining ESB Networks substation.
- Customer's Main circuit breaker must be located directly over the incoming service duct from ESB Networks substation at the point where it enters the customer's main switch room.
- ESB Networks cable run to Customer Main Circuit Breaker must not be more than 10 metres in total length and no more than 3 metres within the customer's Switch Room. (ETCI requirement)
- See current general specification for MV substation buildings.
- In all cases ETCI rules will apply. Circuits shown are for example only.

# CONNECTION OVER 300 AMPS

## ESB NETWORKS CONNECTION DIRECT TO CUSTOMERS MAIN CIRCUIT BREAKER

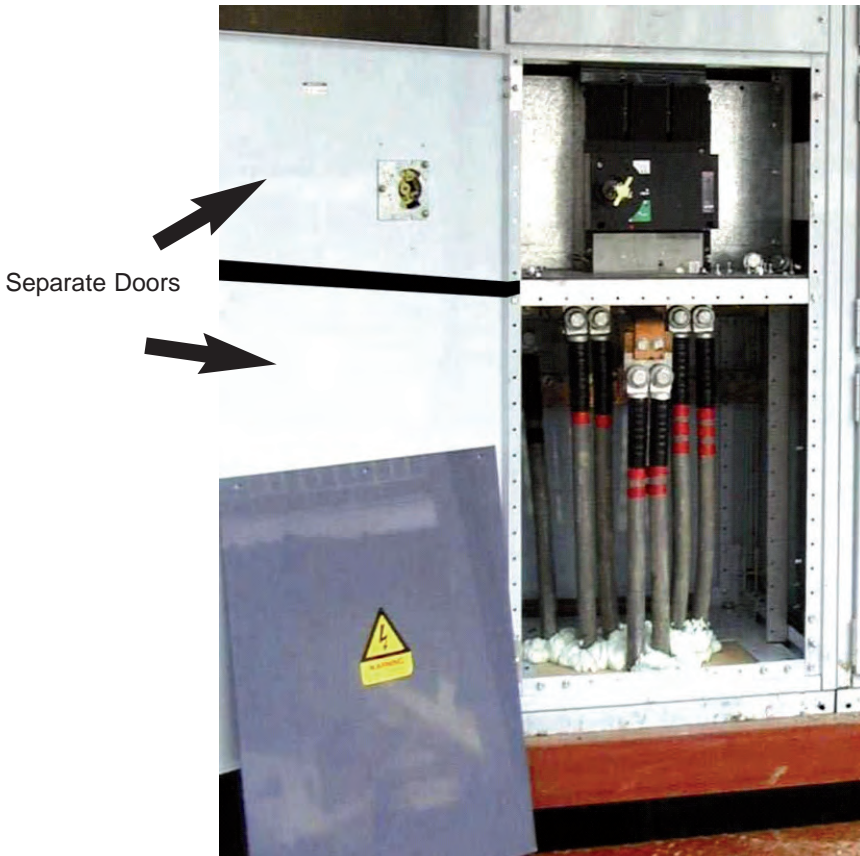
### ONE CUSTOMER



- Labelling: All switchgear including metering equipment must be permanently labelled before connection.
- See pages 25-26 for information on CT Connections.
- If Fire Fighting equipment is installed, please refer to page 38.
- Refer to page 34 re: max cable run.
- Customer's main earth terminal bar must not be within ESB Networks' sealed enclosure
- Where incoming service cables are fed from above, it is permissible to terminate these cables into the top of the switch board. All cables must be adequately glanded to prevent ingress of moisture.
- In all cases ETCL rules will apply. Circuits shown are for example only.

# CONNECTION OVER 300 AMPS

Where ESB Networks cables terminate directly onto incoming main Circuit Breaker

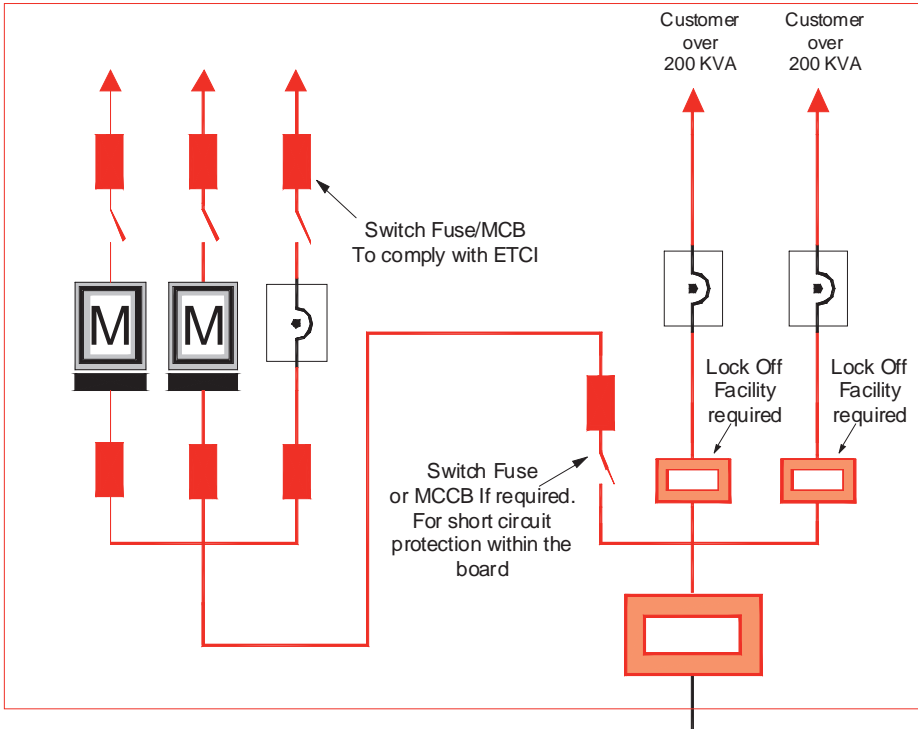


- Approved Sealant required at cable entry
- Copper bars must be tinned because there are aluminium lugs on the Networks cable.
- Above photograph shows connection to multi-customer installation. Multi-metering arrangement as per page 37
- In single customer installation CTs are fitted before main CB. The door on this enclosure **must not** be interlocked with main CB i.e. separate doors.
- Customer's main earth terminal bar must not be within ESB Networks' sealed
- In all cases ETCI rules will apply.
- For ESNB main incoming cable detail, please refer to pages 25 and 26 for busbar drilling details.

# CONNECTION OVER 300 AMPS

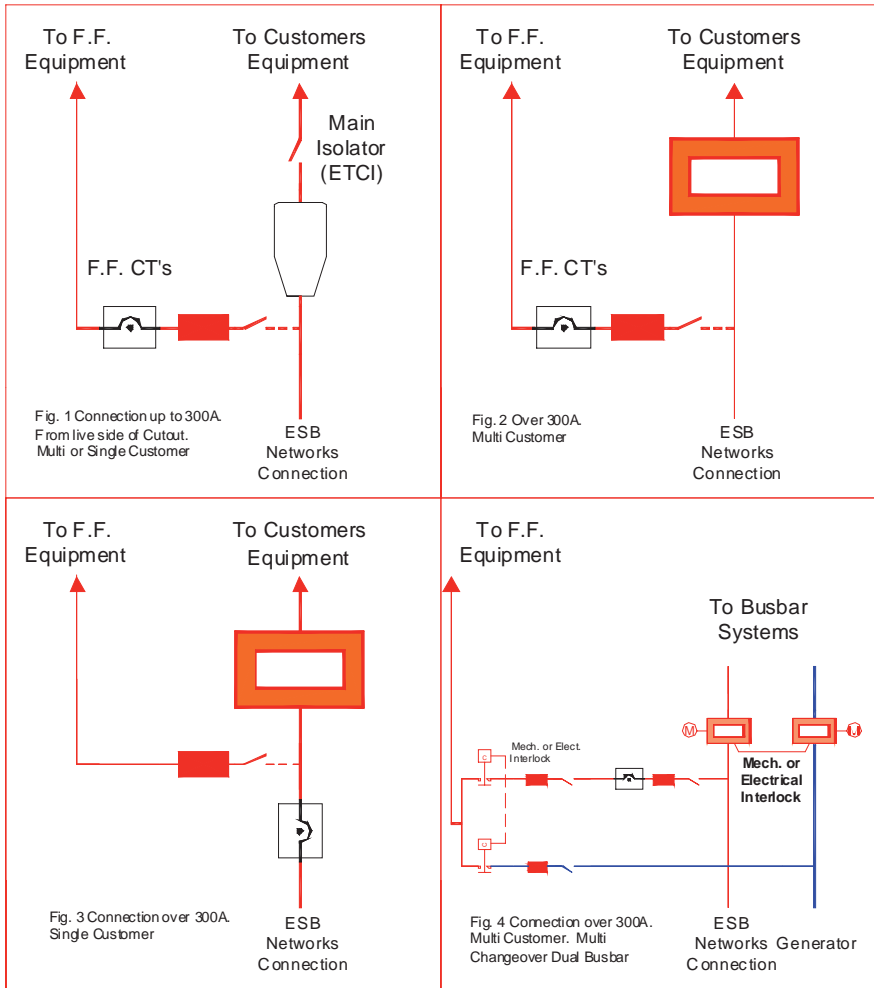
## CONNECTION DIRECT TO CUSTOMERS MAIN CIRCUIT BREAKER

### MULTI CUSTOMERS - CENTRALISED METERING



- Labelling: All switch gear including metering equipment must be permanently labelled before connection.
- Circuit mains connecting each customer must be numbered/labelled at both ends and correspond with unit/door numbers/labels.
- Protection / Short Circuit device controlling unmetered rising main shall be lockable in the OFF position.
- If Fire Fighting equipment is installed, please refer to page 38.
- Leave space for CT meter Cabinet.
- Refer to page 34 re. max. cable run.
- Customer's main earth terminal bar must not be within ESB Networks' sealed enclosure
- For connection greater than 200kVA (300A), the Circuit Breaker must have a lock off facility.
- In all cases ETCI rules will apply. Circuits shown are for example only.

# ARRANGEMENTS FOR FIRE FIGHTING CONNECTION



- Switch Fuse to be fitted as near as possible to ESB Networks incoming connection.
- Warning labels to be applied to Main CB and FF switch fuse  
See page 39 for wording
- **The isolation/overcurrent device (including the incoming conductors), for fire fighting supplies shall have an adequate short circuit rating.**
- In all cases ETCI rules will apply. Circuits shown are for example only.

# FIRE FIGHTING SAFETY LABELS

**Wording required on Fire Fighting (F/F) Labels.  
Labels to be securely fitted at appropriate points.**

## Labels for fig. 1 page 38

(a) Label for E.S.B Networks Cut Out

**DANGER**  
Connection to F/F  
fed from live side of  
E.S.B Networks  
Cut out Fuses

(b) Label for F/F Switch Fuse

**DANGER**  
Fed from  
live side of E.S.B  
Networks  
Cut out Fuses

## Labels for fig. 2 and fig. 3 page 38

(a) Label for Main Circuit Breaker

**DANGER**  
Connection to F/F  
fed from live side of  
Main CB

(b) Label for F/F Switch Fuse

**DANGER**  
Fed from  
live side of  
Main CB

## Labels for fig. 4 page 38

(a) Label for Main Circuit Breaker,  
Fire fighting Fuse and Switch Fuse

**DANGER**  
Connection to F/F  
fed from live side of  
Main CB

(b) Label for Generator Main Circuit Breaker  
and Stand-by F/F Switch Fuse

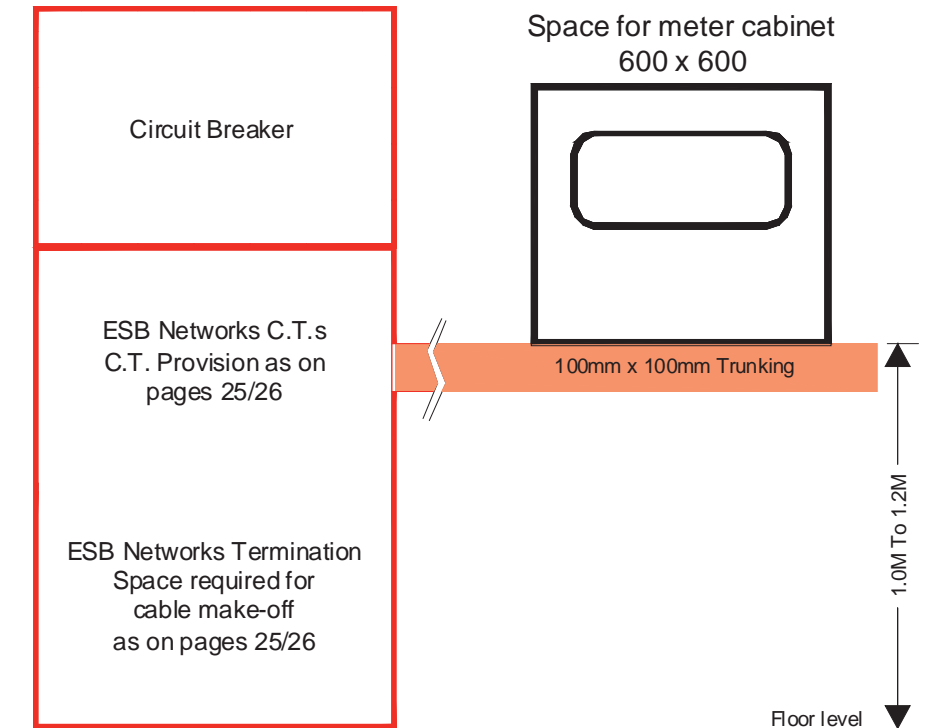
**DANGER**  
Connection to F/F  
fed from live side of  
Generator CB



# ESB Networks MAIN CONNECTION OVER 300A (200kVA)

## PHYSICAL LAYOUT FOR SINGLE CUSTOMER

### Wall Mounted Switchboard



- Separate doors for CTs and CBs.
- A clear working space of 1.2m in front of ESB Networks equipment.
- In all cases ETCL rules will apply.

# SHOPPING CENTRES AND COMMERCIAL/INDUSTRIAL UNITS

**Discussion with local ESB Networks office is essential during the planning stage, at which time the appropriate method of connection/metering will be agreed.**

## **Shopping Centres:**

Experience has shown that Meters fitted inside each unit will inevitably be covered up by permanent shelving and / or display units. Therefore the only suitable and safe location is a centralised switch room.

Centralised Metering is the preferred method See Page 42.

If Centralised metering cannot be achieved, agreement must be sought from the ESB Networks Design Manager regarding metering location.

## **Commercial/Industrial Units:**

Centralised metering. See Page 42.

Alternative method: individual connections from ESB Networks. Page 43 shows mini-pillar application

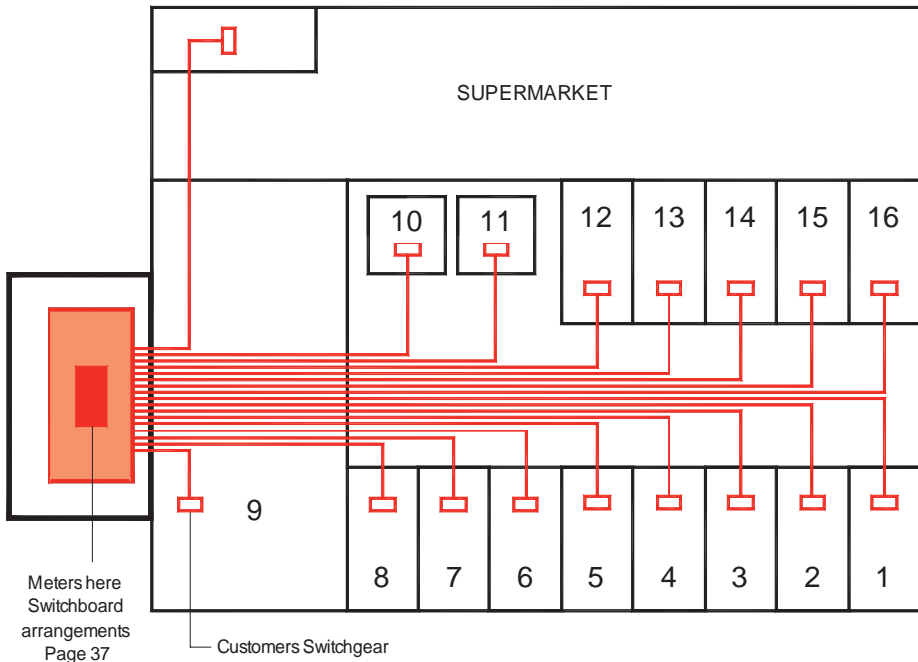
## **General**

A clear space of 1.2m must always be left in front of ESB Networks equipment.

Standard locking device (8mm Triangular Key outdoor cabinet type) shall be fitted by Customer to provide access to all enclosures containing ESB Networks meters/main fuse units.

# SHOPPING CENTRES or COMMERCIAL/INDUSTRIAL UNITS

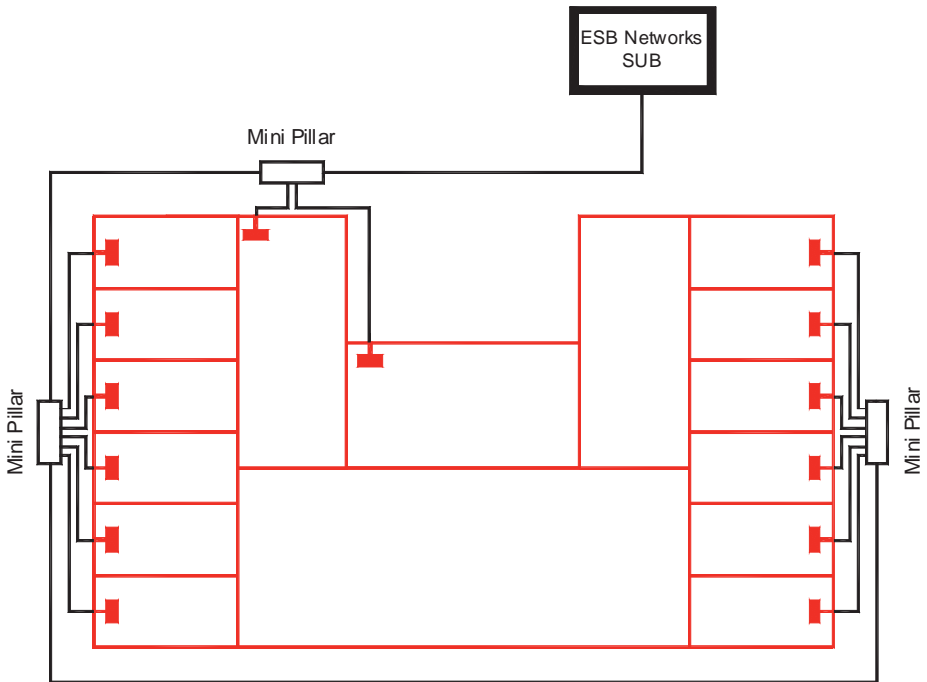
## CENTRALISED METERING



- Centralised Metering is the preferred option.
- In exceptional circumstances de-centralised metering will be considered.
- Units requiring connection, must be permanently numbered.
- Sufficient space shall be provided for ESB Networks equipment.
- Refer to page 21 and 23 for space required for ESB Networks main fuse units.
- Refer to page 30 for min/max height of meters.
- A clear space of 1.2m shall be left in front of ESB Networks equipment.
- **Completion Certificates submitted for connection to an individual unit must be for the completed wiring of the unit and all associated cables from the meter position.**
- In all cases ETCI rules will apply.

# COMMERCIAL/INDUSTRIAL UNITS

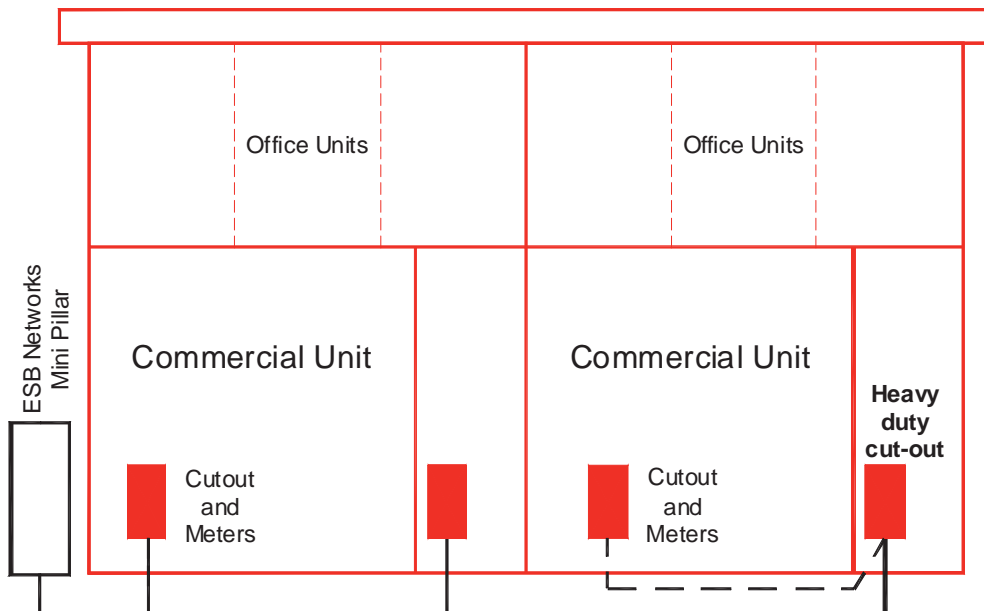
## ALTERNATIVE METHOD SHOWING INDIVIDUAL CONNECTIONS FROM ESB Networks



- **ESB networks equipment shall be fitted within 2 metres of shop/unit door.**
- Units requiring connection, must be permanently identified.
- Circuit mains connecting each unit must be identified/labelled at both ends and correspond with unit/identification.
- Sufficient space shall be provided for ESB Networks equipment.
- Refer to page 21 and 23 for space required for ESB Networks main Fuse Units.
- Refer to page 30 for min/max height of meters.
- In all cases ETCI rules will apply.

# GROUPS OF SHOPS/OFFICES

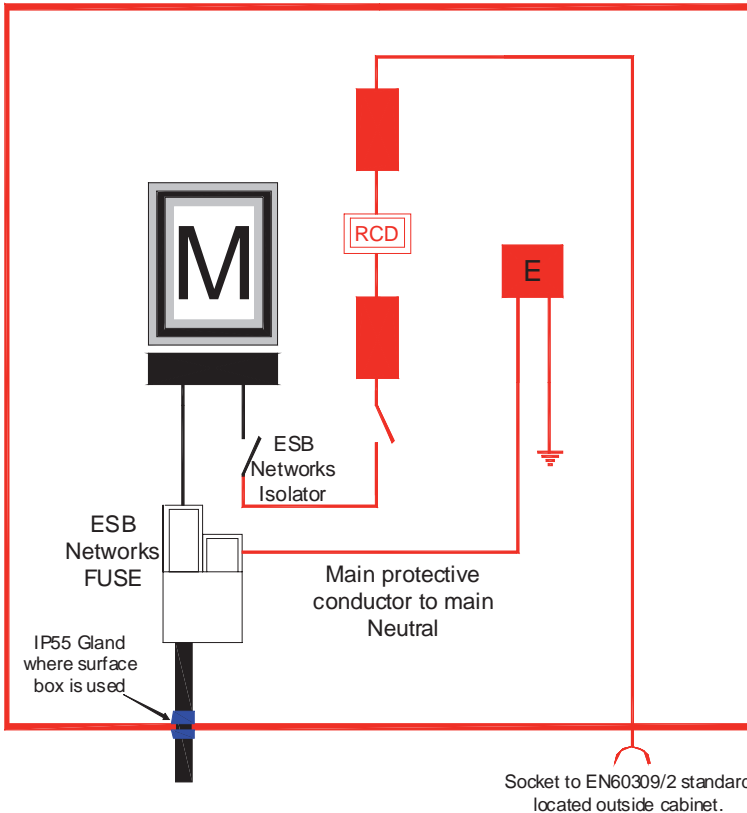
## FACING ONTO PUBLIC ROADWAY



- The appropriate method of connection and metering will be confirmed by the local ESB Networks design office at the planning stage.
- **ESB Networks equipment must be fitted within 2m of commercial unit door.**
- Units must be permanently identified.
- Circuit mains connecting each unit must be identified/labelled at both ends and correspond with unit/door identification.
- Sufficient space shall be provided for ESB Networks equipment.
- Refer to page 21 and 23 for space required for Cut Outs.
- Refer to pages VII and VIII paragraph 3B for min/max height of metering equipment.
- A clear space of 1.2m must be left in front of ESB Networks equipment.
- In all cases ETCl rules will apply.

# CONNECTION FOR COMMERCIAL TEMPORARY INSTALLATION

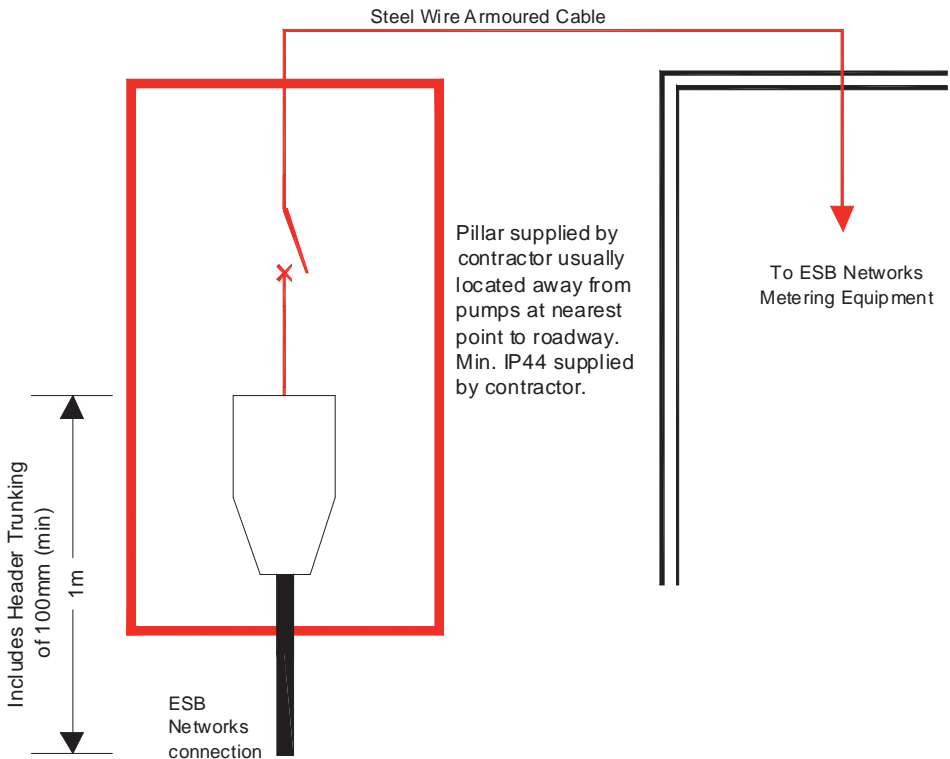
This is the only situation where customer's equipment will be mounted in the same enclosure as ESB Networks equipment.  
Note: Customer's equipment to be mounted on Right Hand Side



• **N.B. This layout can only be used for Commercial Temporary supplies**

- This interface **shall not** be located at the permanent metering location
- Connections for temporary installations should not be installed either within or on the exterior of any temporary building or structure e.g. portacabins, containers etc. They should only be installed within or on a robust permanent structure that will not be moved as part of any site works e.g. boundary wall, existing building or specially constructed concrete housing. See Appendix E at back of this publication.
- Enclosures used to house such connections must be made from non-conducting material.
- **Standard outdoor meter cabinets - surface mounted - are not suitable for use in any situation.**
- All installations must comply with ETCI rules. Circuits shown are for example only.

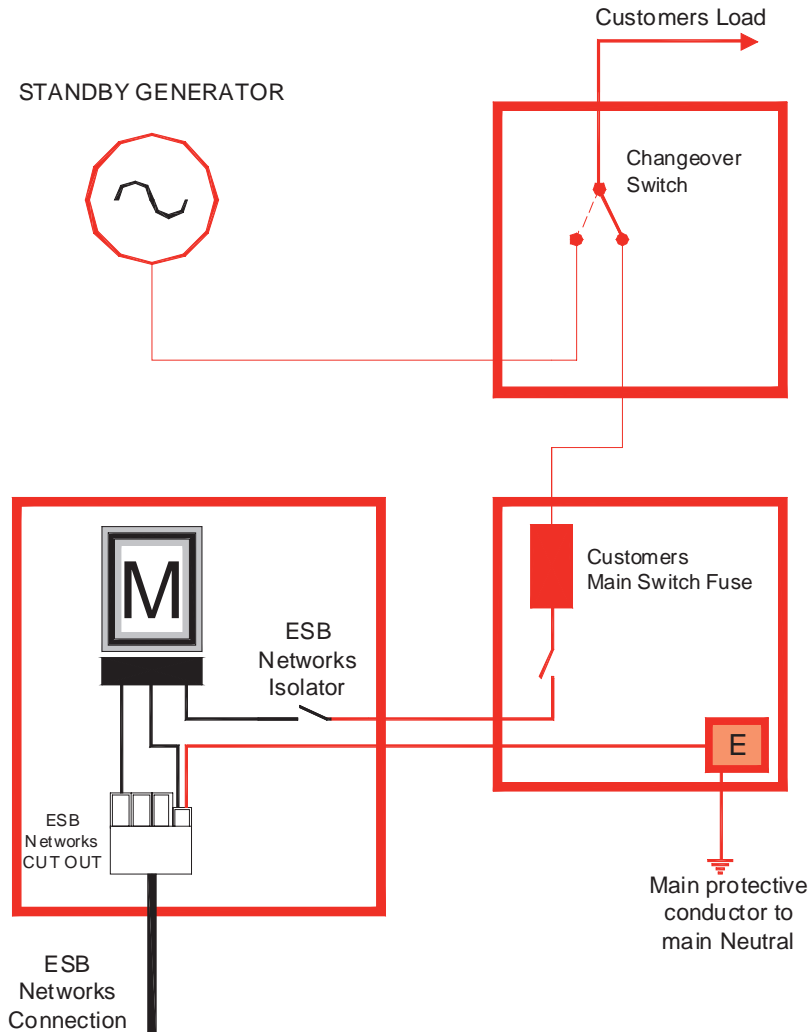
# PETROL STATIONS



- See pages 21 or 23 for space required for ESB Networks Main Fuse Unit.
- Control of standby generator shall be arranged to prevent generator start-up if main isolator is switched off for emergency/maintenance.
- Note: enclosure should be sized to allow adequate space for the customer's equipment and the ESB Cut out.
- N.B. Outside enclosures used for housing ESB Networks' equipment must be either non-metallic, stainless steel or hot dip galvanised and have a Minimum IP44 rating. See specific requirements 4 (b) page IX
- In all cases ETCL rules will apply.

# STAND-BY GENERATORS

## Manual Changeover



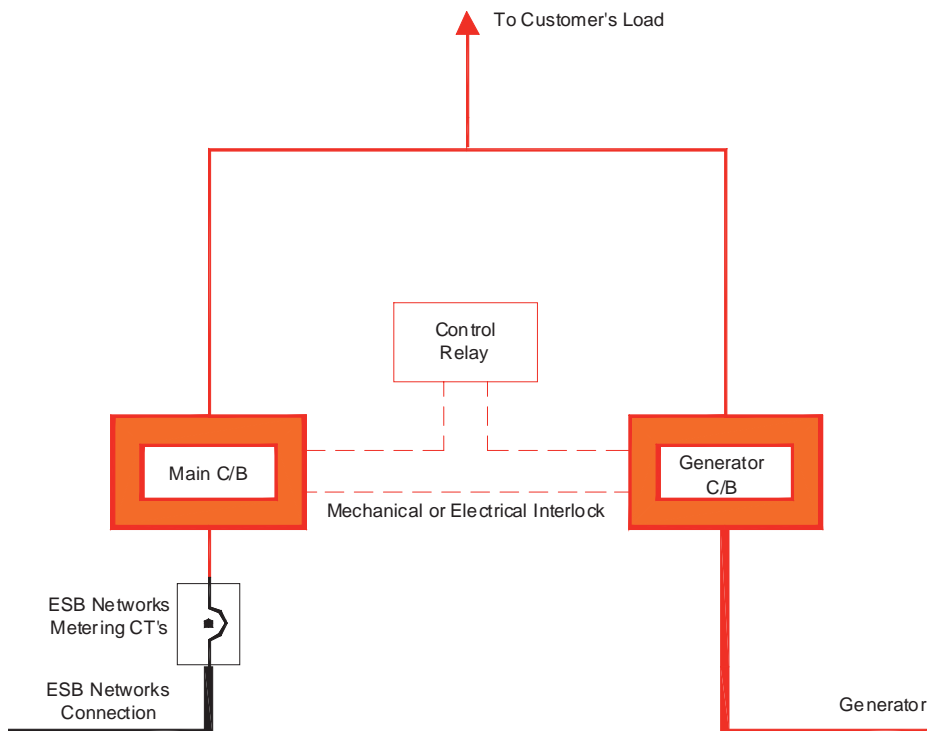
- See page 48 for Auto Change Over installations
- See page 49 for standby generator in multi customer situation
- In all cases change over must occur after ESB Networks meters
- **Control of standby generator shall be arranged to prevent generator start-up if main isolator is switched off for emergency / maintenance.**
- In all cases ETCL rules will apply. Circuits shown are for example only



# STAND-BY GENERATORS

## Auto Changeover

For Auto Change Over Generator installations please see the current ETCI Rules

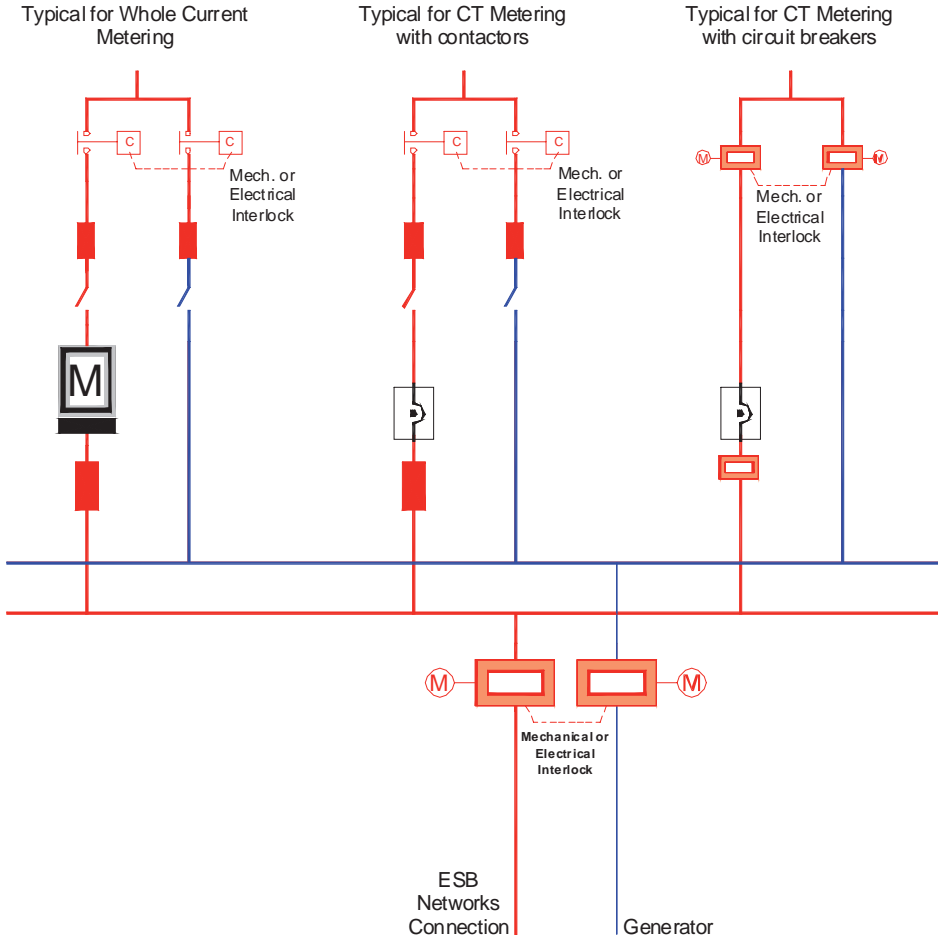


- See page 49 for standby generator in multi customer situation
- In all cases change over must occur after ESB Networks meters
- Control of standby generator shall be arranged to prevent generator start-up if main isolator is switched off for emergency /maintenance.
- In all cases ETCI rules will apply. Circuits shown are for example only

# STAND-BY GENERATORS

## Multi Customer

For Auto Change Over Generator installations  
please see the current ETCI Rules



- In all cases change over must occur after ESB Networks meters.
- If Fire Fighting (F/F) equipment is installed, see page 38.
- **Control of standby generator shall be arranged to prevent generator start-up if main isolator is switched off for emergency /maintenance.**
- In all cases ETCI rules will apply. Circuits shown are for example only.

# AGRICULTURAL/HORTICULTURAL PREMISES

NOTE: 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 must be glanded to maintain IP55 standards.**

**An (IP55) METER ENCLOSURE (600 x 400 x 200 minimum) e.g. Polyester/Stainless, steel is required for one single phase meter (and time switch if required.). This is provided and installed by customer to house ESB Networks equipment. For other metering arrangement 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.**

## 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.

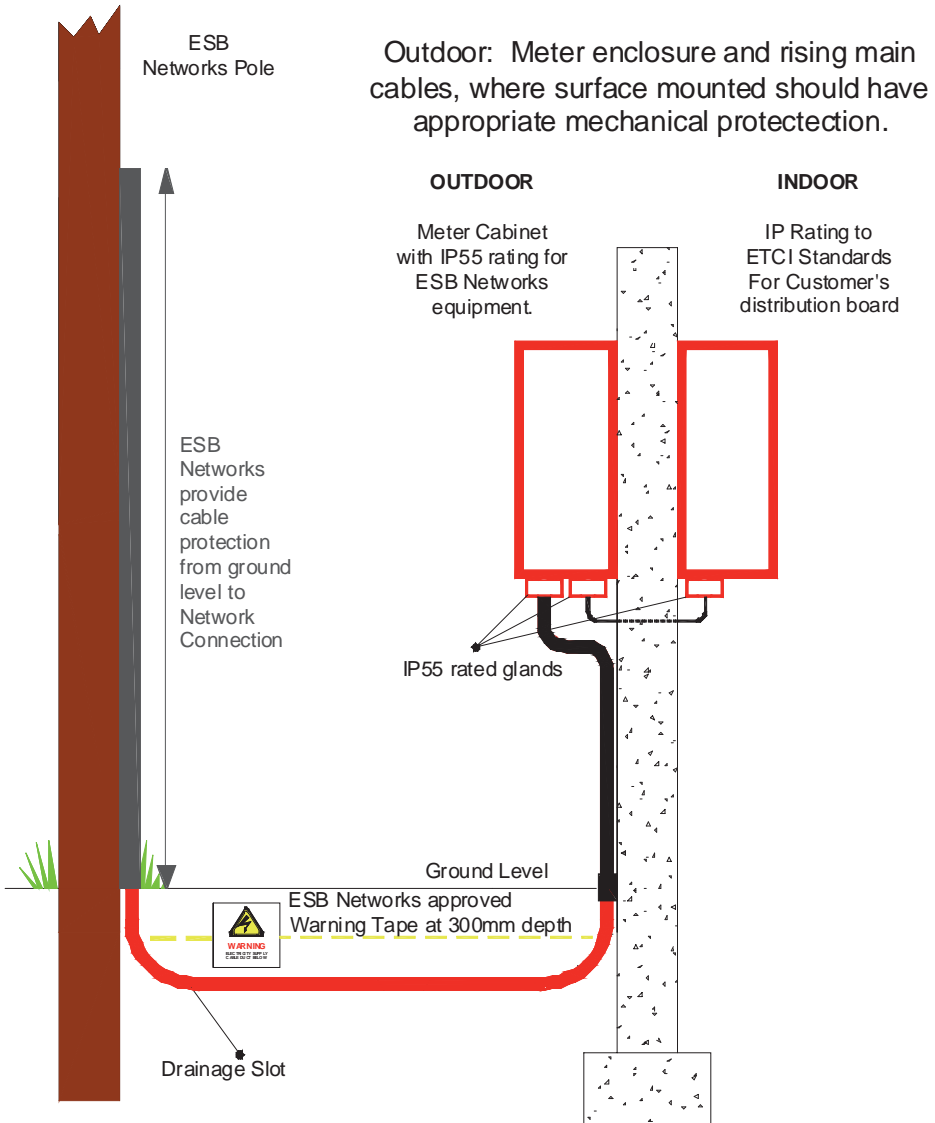
The installation of meter cabinet and duct(s) should be in accordance with best building practices, this code, and ETCl IP standards.

**ABOVE ELECTRICAL INSTALLATIONS REQUIRE IP55 STANDARD TO COMPLY WITH ESB NETWORKS REQUIREMENTS**

**Safety Note: 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 should commence until ESB Networks have checked the situation.**

\* In all cases ETCl rules will apply

# REMOTE BUILDINGS AND ELECTRIC FENCES



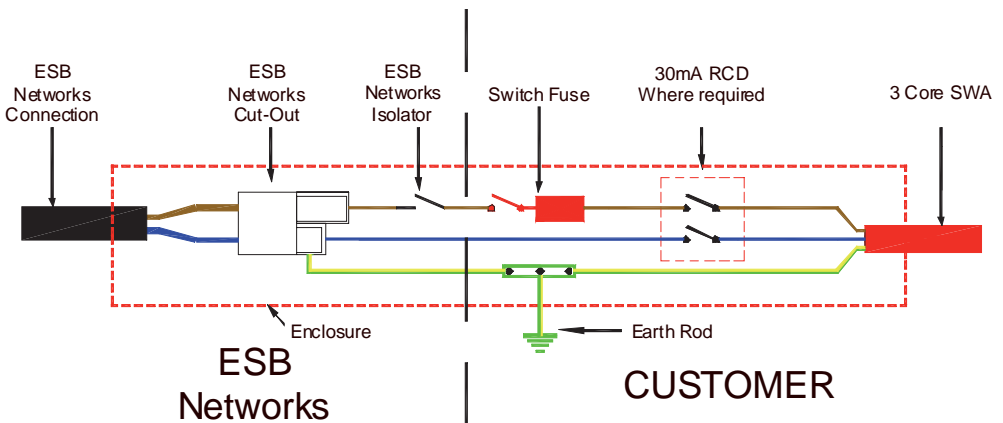
- Standard Domestic Meter Cabinets are not acceptable for this application.
- Enclosure shall be stainless steel or non conductive minimum IP55
- Customer's Earths must not be within 25m of ESB Networks poles.
- \*In all cases ETCI rules will apply. Circuits shown are for example only.

# SPECIAL SITUATIONS FUNDAMENTAL REQUIREMENTS AT THE CUSTOMER INTERFACE

**In general all installations connected to ESB Networks are metered.**

There are, however, situations where this does not apply. Single phase loads not exceeding 2kVA will be considered for unmetered connections. At application stage ESB Networks will decide if the connection is to be metered or unmetered.

The majority of special situation un-metered connections are for free-standing street furniture (bus shelters, phone kiosks, traffic controls, signs etc). The drawing below shows the typical connection sequence for such installations. For preferred interface options see matrix on page 53.



- Some situations require the installation of RCDs.
- In all cases ETCI rules will apply. Circuits shown are for example only

# TYPICAL APPLICATIONS OF SPECIAL SITUATIONS LAYOUT

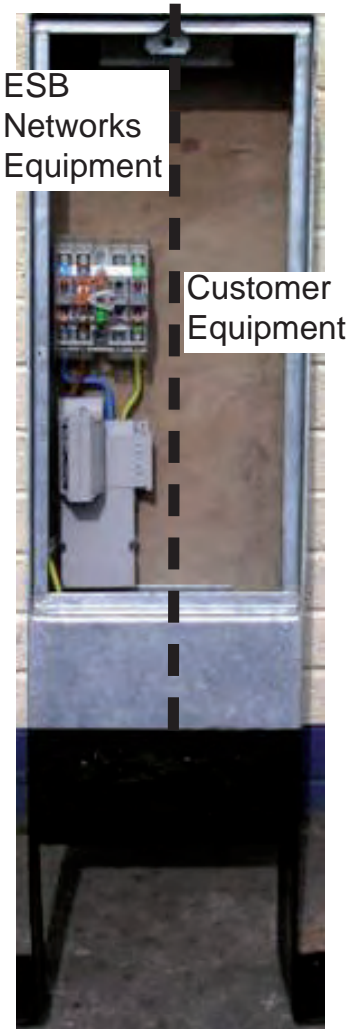
The list below shows the preferred option and acceptable alternatives. See page 52 for electrical circuit requirements.

<b>Unmetered</b>			
Type of installation	Page 54	Page 55	Page 56
Advertising Hoarding	◆	◆	◆
Advertising Kiosks	◆	◆	◆
Bus Shelters	◆	◆	◆
Garda Cameras (CCTV)	◆	◆	◆
Ice Detecting Stations	◆	◆	◆
School Signs	◆		◆
Telephone Kiosk	◆	◆	◆
Traffic Counting Stations	◆	◆	◆
TV Booster	◆	◆	
Water Metering Points	◆	◆	◆
<b>Metered</b>			
Type of installation	Page 57		
Festive Lighting	◆		
Mobile Comms. Sites	◆		
Sewage Pumping	◆		
Water Pumping	◆		
<b>Public Lighting Unmetered/Metered</b>			
Unmetered		Pages 58 - 61	
Metered		Page 62	

◆ = Preferred Option

◆ = Other Options

# SPECIAL SITUATIONS (Unmetered)



## Minimum Dimensions

150mm deep x 250mm wide x 600mm high/above ground  
(Root depth: 320mm)

## Minimum opening size

220mm wide x 510mm high

## Space requirements

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

## Equipment shown

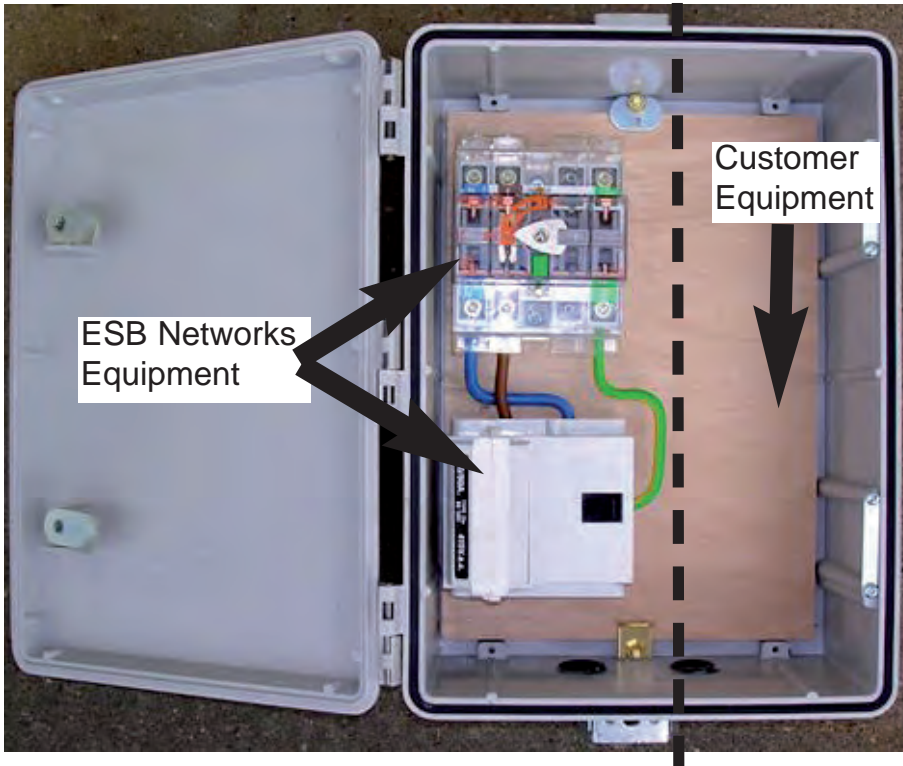
ESB Networks Single Phase Cut Out  
ESB Networks Single Phase Isolator

[See page IX section 4 \(b\) for requirements in relation to protection against corrosion.](#)

- Warning label “Live electricity” required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.



# SPECIAL SITUATIONS (unmetered)



Dimensions (Minimum working envelope):  
320mm High x 220mm Wide x 120 Deep

Equipment shown:

ESB Networks Single Phase Cut Out

ESB Networks Single Phase Isolator

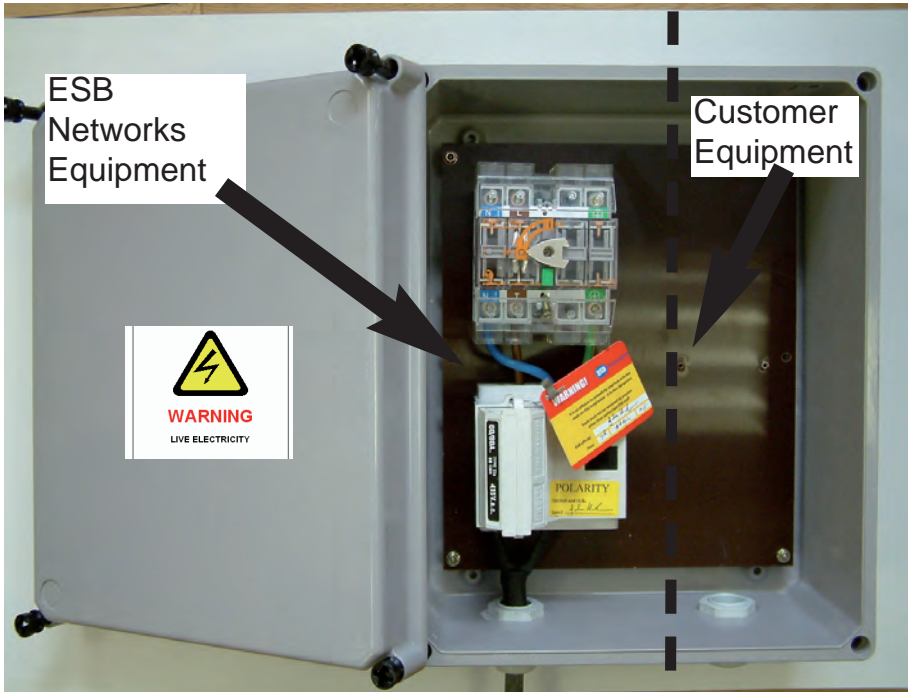
See page IX section 4 for requirements in relation to protection against corrosion.

- Warning label “Live electricity” required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges
- Suitable for Wall/Pole mounting
- **N.B. Outside enclosures used for housing ESB Networks' equipment must be either non-metallic, stainless steel or hot dip galvanised and have a Minimum IP44 rating. See specific requirements 4 (b) page IX**





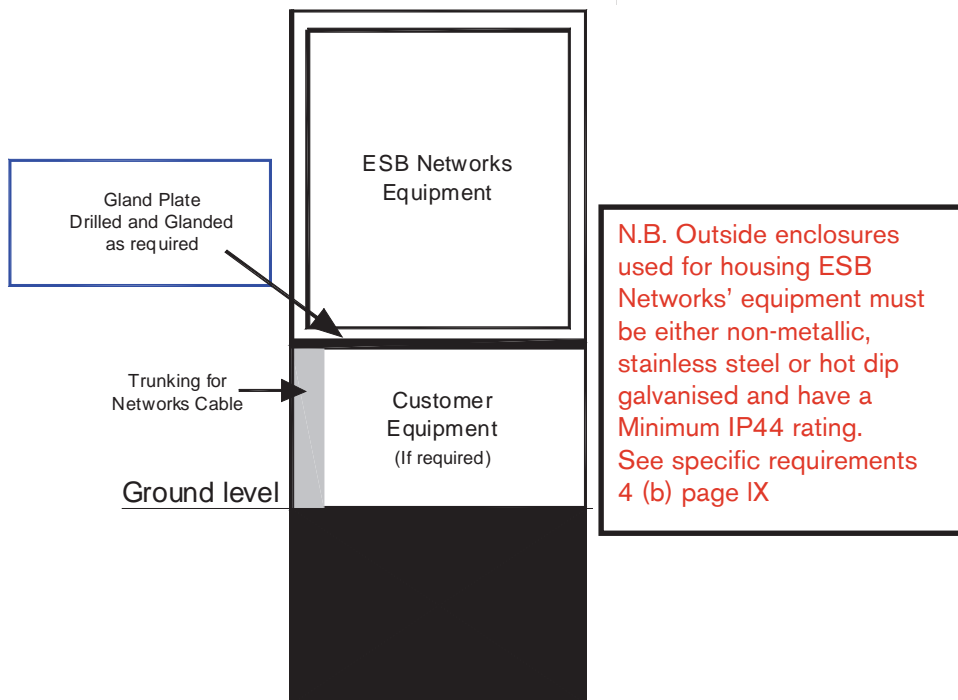
# SPECIAL SITUATIONS (Unmetered)



- Warning label “Live electricity” required on doors.
- Suitable for underground connections for use with cable vault.
- The Photograph shows an IP67 enclosure.
- Note the use of glands to maintain IP rating of cable entries
- **N.B. Outside enclosures used for housing ESB Networks’ equipment must be either non-metallic, stainless steel or hot dip galvanised and have a Minimum IP44 rating. See specific requirements 4 (b) page IX**



# SPECIAL SITUATIONS (Metered)



## Minimum overall dimensions:

500mm wide x 1250mm high x 225mm deep.

600mm Minimum to bottom of Meter.

Root depth 350mm

## Minimum dimensions for ESB Networks equipment:

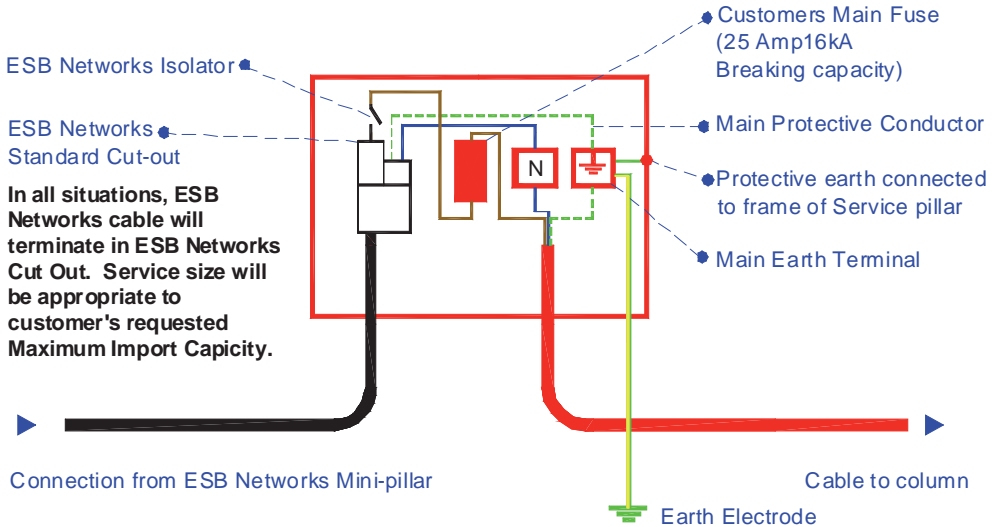
465mm wide 600mm high x 225 deep.

**Note:** Vertically hinged door for access to ESB Networks equipment.

- Warning label “Live electricity” required on doors.
- 8mm triangular locks required on hinged doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.
- **Gland plate must be fitted to prevent moisture ingress and allow for minimum dimensions for ESB Networks equipment**
- **Trunking to enclose Networks cables required**
- **Approved sealant must be installed in base of pillar.**



# SPECIAL SITUATIONS PUBLIC LIGHTING



In all situations, ESB Networks cable will terminate in ESB Networks Cut Out. Service size will be appropriate to customer's requested Maximum Import Capacity.

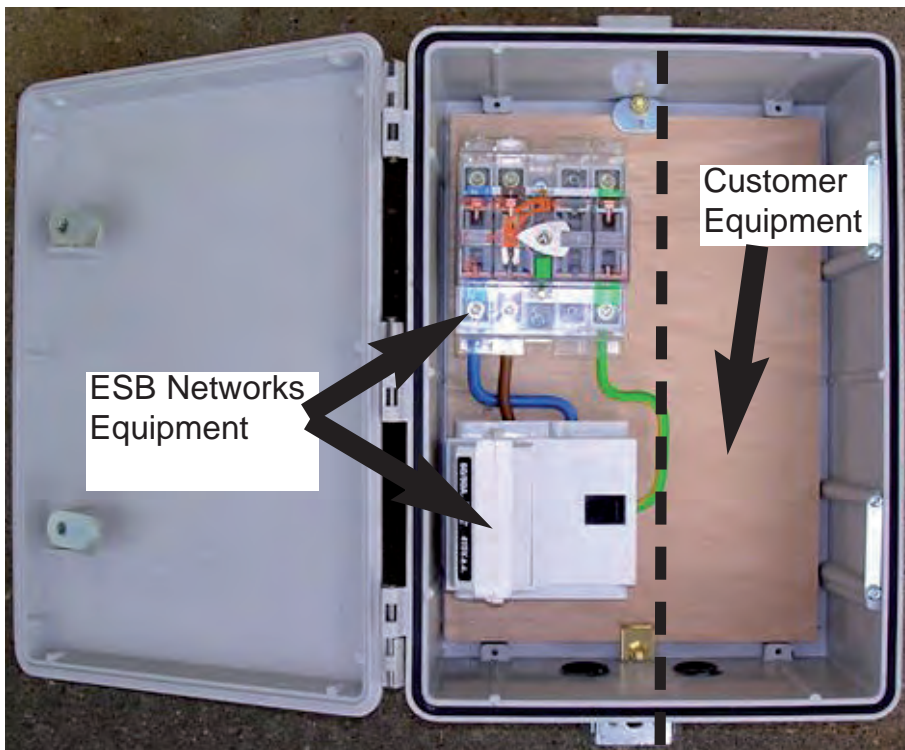
**There should be a separation of at least 2 metres between the ESB Networks mini pillar and the customer's service pillar**

The purpose of this requirement is to avoid conflict and ensure segregation between the ESB Networks cable vault/ducts and the public lighting ducting e.g. the public lighting circuits cannot pass through the mini pillar cable vault.

**Note:** This distance may be reduced if segregation is ensured. In this situation the mini pillar and customer's service pillar must be cross bonded.

• In all cases ETCI Rules will apply. Circuits shown are for example only.

# Unmetered Public Lighting Single Connection on Networks Pole



Dimensions (Minimum working envelope):  
320mm High x 220mm Wide x 120 Deep

Equipment shown:

ESB Networks Single Phase Cut Out

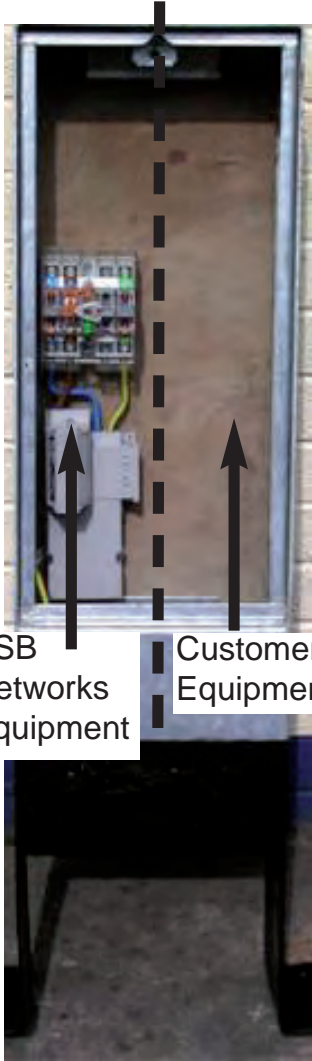
ESB Networks Single Phase Isolator

[See page IX section 4 for requirements in relation to protection against corrosion.](#)

- Warning label “Live electricity” required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges
- Suitable for Wall/Pole mounting
- **N.B. Outside enclosures used for housing ESB Networks’ equipment must be either non-metallic, stainless steel or hot dip galvanised and have a Minimum IP44 rating. See specific requirements 4 (b) page IX**



# Unmetered Public Lighting Single Phase Pillar



ESB  
Networks  
Equipment

Customer  
Equipment

## Minimum Dimensions

150mm deep x 250mm wide x 600mm  
high/above ground  
(Root depth: 320mm)

## Minimum opening size

220mm wide x 510mm high

## Space requirements

ESB Networks: 125mm wide **LHS**

Customer: 125mm wide **RHS**

## Equipment shown

ESB Networks Single Phase Cut Out

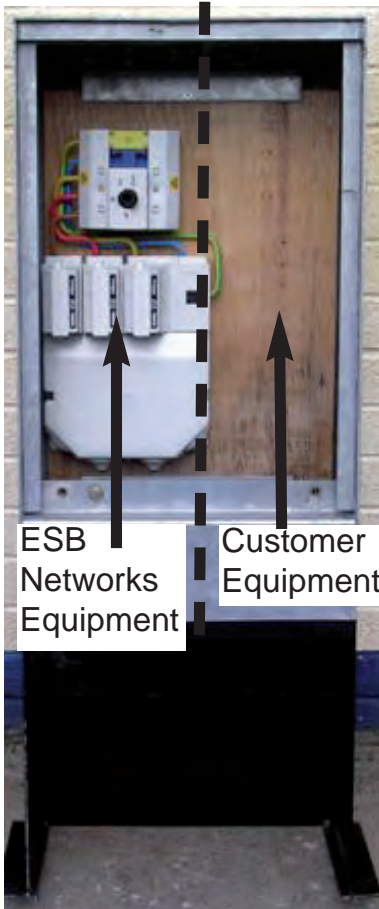
ESB Networks Single Phase Isolator

[See page IX section 4 \(b\) for requirements in relation to protection against corrosion.](#)

- Warning label “Live electricity” required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.



# Unmetered Public Lighting Three Phase Pillar



## Minimum Dimensions

215mm deep x 370mm wide x 660mm high/above ground  
(Root depth: 360mm)

## Minimum opening size

330mm wide x 480mm high

## Space requirements

ESB Networks: 230mm wide **LHS**

Customer: 140mm wide **RHS**

## Equipment shown

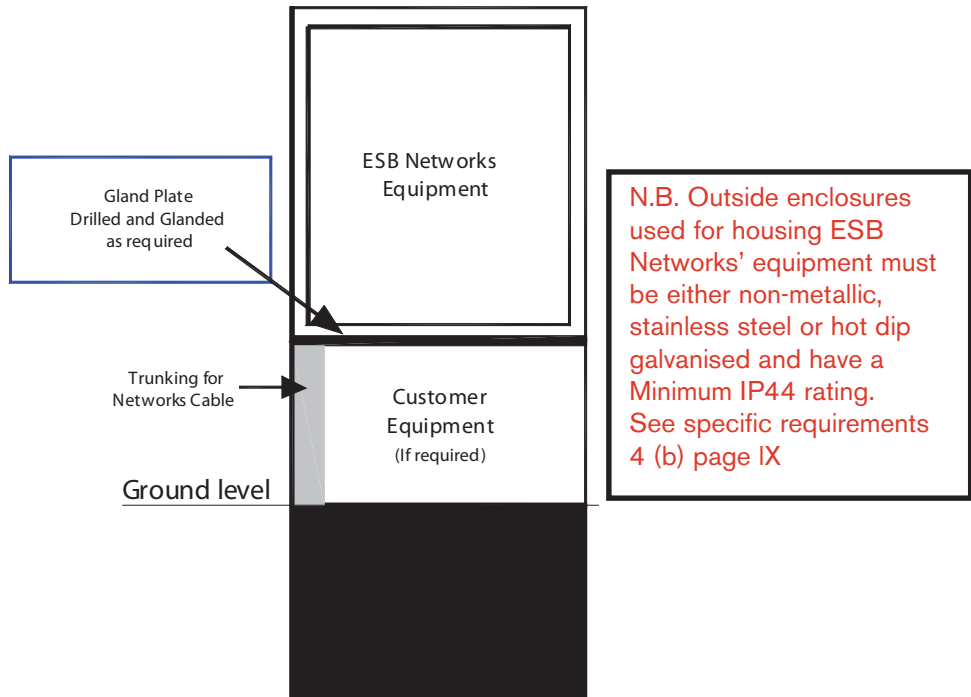
ESB Networks Three Phase Cut Out  
ESB Networks Three Phase Isolator

[See page IX section 4 \(b\) for requirements in relation to protection against corrosion.](#)

- Warning label "Live electricity" required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.



# Metered Public Lighting Three phase/Single Phase Pillar



Minimum overall dimensions:

500mm wide x 1250mm high x 225mm deep.

600mm Minimum to bottom of Meter.

Root depth 350mm

Minimum dimensions for ESB Networks equipment:

465mm wide 600mm high x 225 deep.

Note: Vertically hinged door for access to ESB Networks equipment.

- Warning label "Live electricity" required on doors.
- 8mm triangular locks required on hinged doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.
- **Gland plate must be fitted to prevent moisture ingress and allow for minimum dimensions for ESB Networks equipment**
- **Trunking to enclose Networks cables required**
- **Approved sealant must be installed in base of pillar.**



# REQUIREMENTS FOR CONNECTION AT MEDIUM VOLTAGE (MV)

In processing the application for connection the ESB Networks will, in consultation with the customer, specify the voltage level of the connection

**New loads in excess of 500kVA will in general be supplied at Medium Voltage. Medium Voltage refers to 10kV/20kV. This document refers to the standard connection requirements for 10kV/20kV.**

If connection is to be made available at MV the following information will facilitate the consultant / customer in pursuing the application for connection.

- The customer's installation must comply with current S.I. requirements.
- ETCI requirements shall prevail.
- ESB Networks Specification 13320 "General Specification for MV substation". (available from ESB Networks)
- ESB Networks document: "Conditions Governing Connection to the Distribution System for Medium Voltage Connections." (available from ESB Networks)
- ESB Networks Document "Medium Voltage - Dual Radial Supply." (available from ESB Networks)

The above ESB Networks documents list out ESB Networks requirements relating to MV customers. In addition, please see required procedures on following pages.



# REQUIREMENTS FOR CONNECTION AT MEDIUM VOLTAGE (MV)

## PROCEDURE:

**A meeting to co-ordinate arrangements for energising the connection shall take place at least 5 working days before connection is required. Contractors involved in the construction and commissioning of the MV equipment shall be represented at this meeting.**

The following shall be provided to ESB Networks at least two working days before energisation is required :

- (a) Primary and Secondary Test Sheets for the Main Incomer Circuit Breakers Protection Relays .  
**Primary tests to be completed on site.**
- (b) Confirmation of customers protection relay settings controlling the main incomer circuit breaker. (as specified by local ESB Networks Design office in terms for supply)
- (c) Details of ratio of customer's protection CTs and protection relay type.
- (d) Earthing has been installed as per requirements
- (e) ETCI Completion Certificate.
- (f) A declaration of fitness certificate for the MV installation that is to be connected to the ESB Networks MV system.

**This will normally be the final document given to ESB Networks immediately before the connection is energised,** and shall state that the proposed MV system is fit for service from a safety, technical and operations perspective.

## OPERATION

In the interests of safety, access to the customer's medium voltage switch room shall be restricted to competent personnel only.

Operation and maintenance of the customer's equipment shall be carried out by fully trained and competent personnel.

The customer's switch panel shall indicate clearly the connection sequence of all equipment connected to it.

A durable Single Line Diagram shall be mounted in the customer's switch room in a prominent location. Operating procedures shall be agreed between local ESB Networks and customer.

# REQUIREMENTS FOR CONNECTION AT MEDIUM VOLTAGE (MV)

## ESB NETWORKS EARTHING REQUIREMENTS

Earthing facility required on main incomer cable.

## CABLE TERMINATIONS

The main incoming terminals to the circuit breaker shall be suitable for terminating three single core cables, XLPE insulated and black PE (polyethylene) sheath overall.

Customers shall confirm with ESB Networks the configuration and size applicable to their particular installation.

The customer or his agent shall provide suitable terminating kits for connection of the above cables to the main incoming terminals of the circuit breaker.

Adequate space shall be provided in the customer's switch room to enable ESB Networks staff to work on cable terminations.

## METERING

Space shall be provided for the MD Metering Cabinet as indicated by ESB Networks

## LABELLING

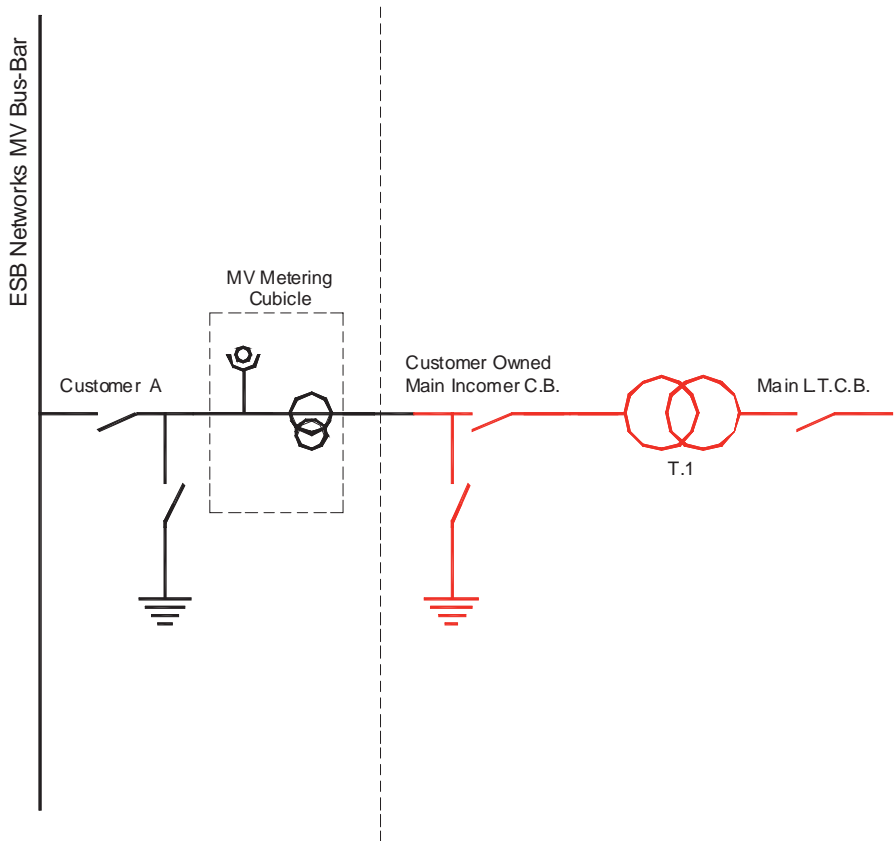
The main incoming circuit breaker must have a permanent label affixed.

NOTE: There must be no possibility of interchanging incoming and outgoing circuit labels.

# 10/20KV SINGLE TRANSFORMER

ESB Networks MV Substation

Customer's MV Switch room

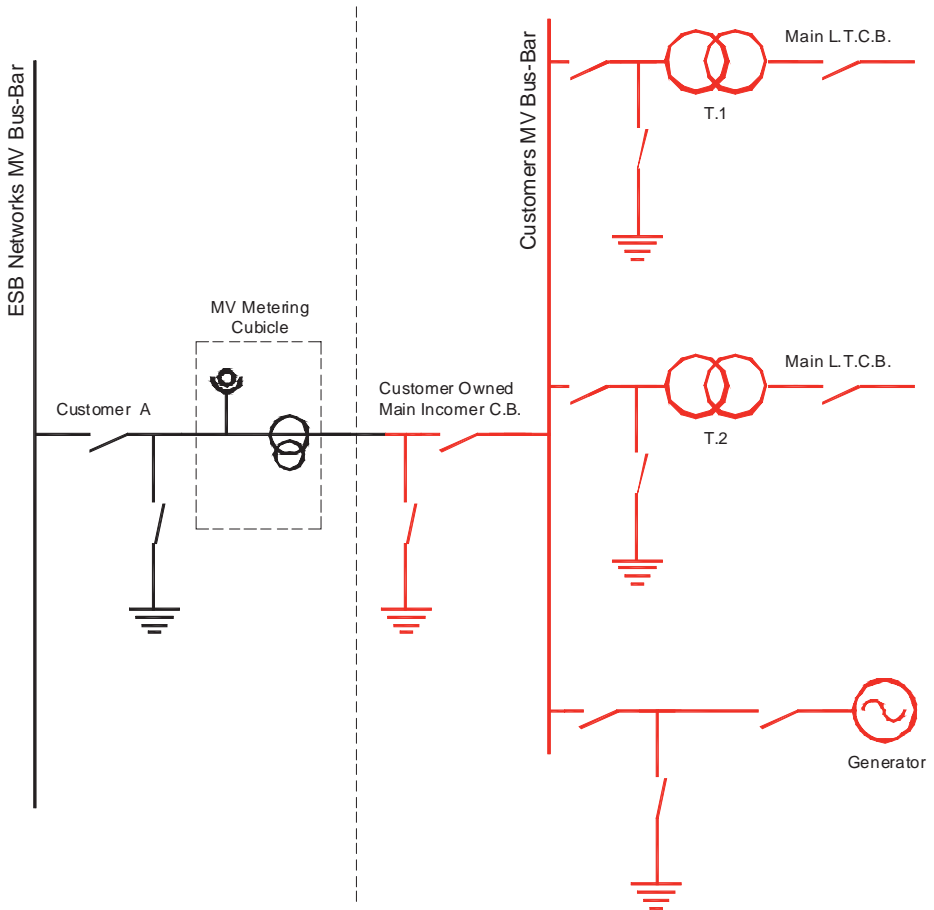


- Earthing facility required on main incomer cable

# 10/20KV MULTI TRANSFORMER

ESB Networks MV Substation

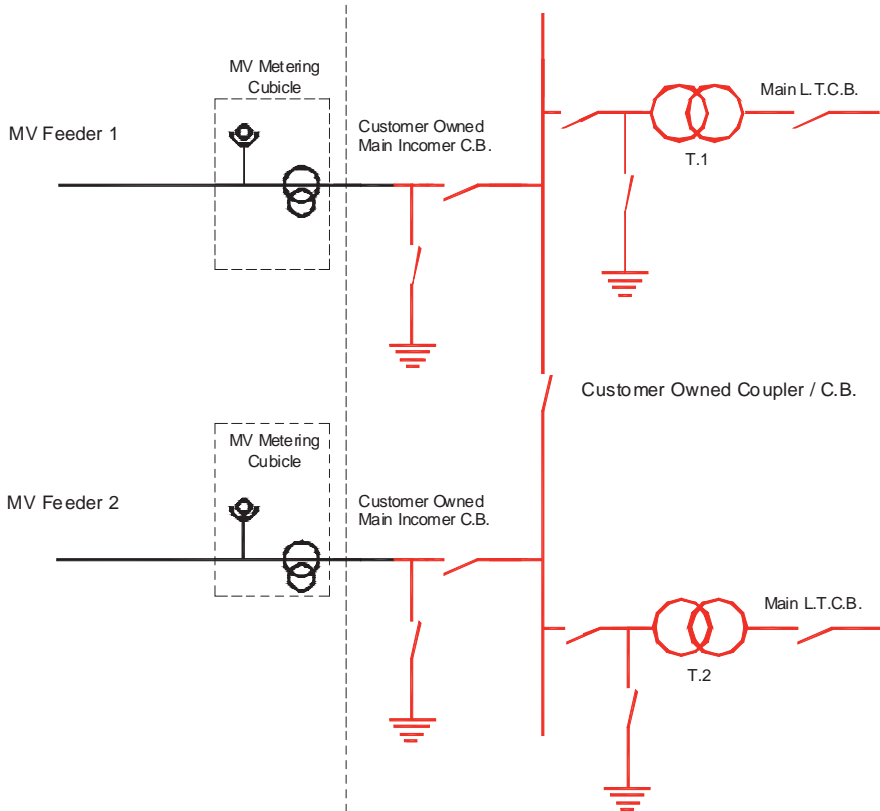
Customer's MV Switch room



- Earthing facility required on main incomer cable

# 10/20KV DUAL RADIAL CONNECTION

## Customers MV Switch room



- Earthing facility required on main incomer cable

# DECLARATION OF FITNESS FOR SERVICE

To: **Distribution System Operator, ESB Networks**

**Customer Name** : \_\_\_\_\_

**Address of Installation** : \_\_\_\_\_

: \_\_\_\_\_

## DETAILS OF INSTALLATION:

Reference No. (Job ID or MPRN.) \_\_\_\_\_

Connection Voltage \_\_\_\_\_

Number of circuit breakers (at connection voltage) \_\_\_\_\_

Length of cable (at connection voltage) \_\_\_\_\_

Number of Transformers (at connection voltage) \_\_\_\_\_

Other Equipment (at connection voltage) \_\_\_\_\_

Relay Settings (main incomer circuit breaker) \_\_\_\_\_

Generator installed capable of operating  
in parallel with ESB Networks Distribution system Y/N \_\_\_\_\_

## CERTIFICATION:

I certify that the MV electrical installation at the above address has been inspected and tested and complies with the relevant requirements of the current HSA S.I. document. I also confirm that the installation complies with the Distribution Code and is fit for connection to the ESB Networks System.

\_\_\_\_\_  
Signature of Customers Contractor/Technical Representative.

\_\_\_\_\_  
Name of Company and Position within Company.

\_\_\_\_\_  
Date.

## ADDITIONAL USEFUL INFORMATION

The following additional pages have been included in these appendices in order to amplify the information appearing in the main body of the code.

**Appendix A:** Typical design for installing a standard metering enclosure

**Appendix B:** Standard design for surface mounted metering enclosure on concrete plinth

**Appendix C:** Instructions for installation of commercial temporary supply.

**Appendix D:** Instructions for installation of customer's main overcurrent device if mounted in standard outside cabinet.

**Appendix E and F:** ESB Networks contact numbers

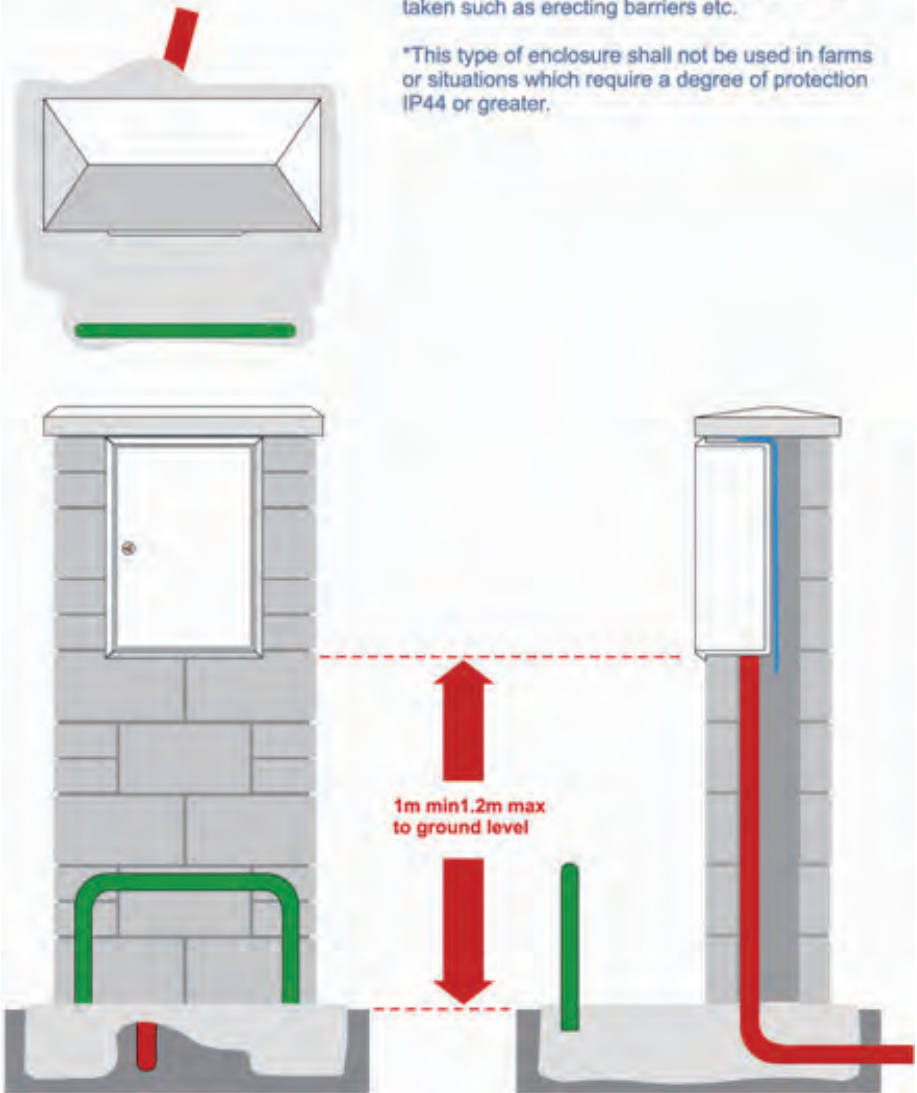
**Appendix G and H:** ESB Networks AREAS/DIVISIONS

# DESIGN FOR INSTALLING A STANDARD METERING ENCLOSURE FLUSH MOUNTED ON A CONCRETE PLINTH

## IMPORTANT

The installer must make an assessment of the risk of mechanical damage to the enclosure. If there is a clear risk then adequate precautions must be taken such as erecting barriers etc.

\*This type of enclosure shall not be used in farms or situations which require a degree of protection IP44 or greater.





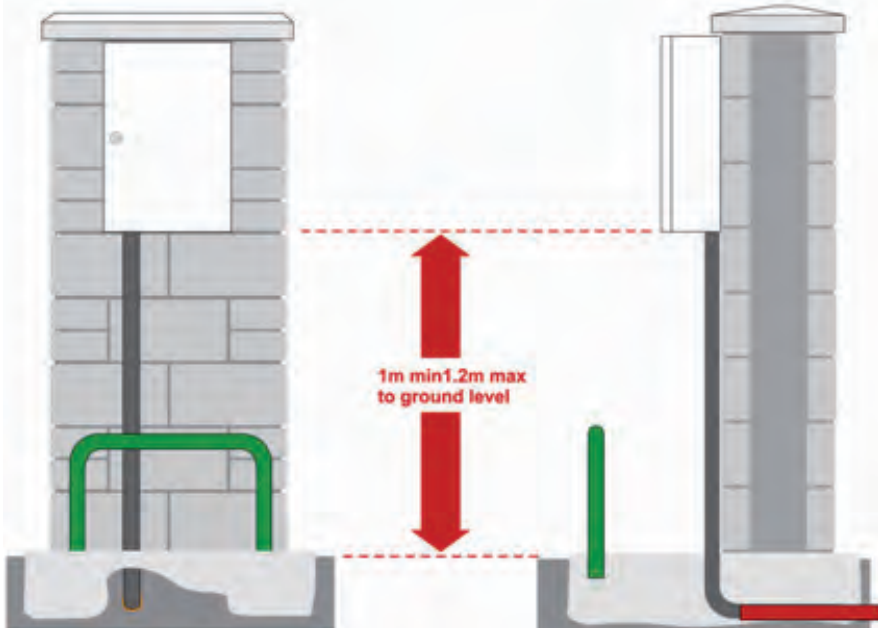
# DESIGN FOR SURFACE MOUNTED METERING ENCLOSURE ON A CONCRETE PLINTH

## IMPORTANT

The installer must make an assessment of the risk of mechanical damage to the enclosure. If there is a clear risk then adequate precautions must be taken such as erecting barriers etc.

The enclosure requires a degree of protection equivalent to IP55.

The material used for construction of the enclosure must be either non-conducting, stainless steel or high-grade sheet steel treated with hot-dip galvanising to EN ISO 1461



Appendix B

# COMMERCIAL TEMPORARY SUPPLY



**Networks**  
Serving all electricity customers

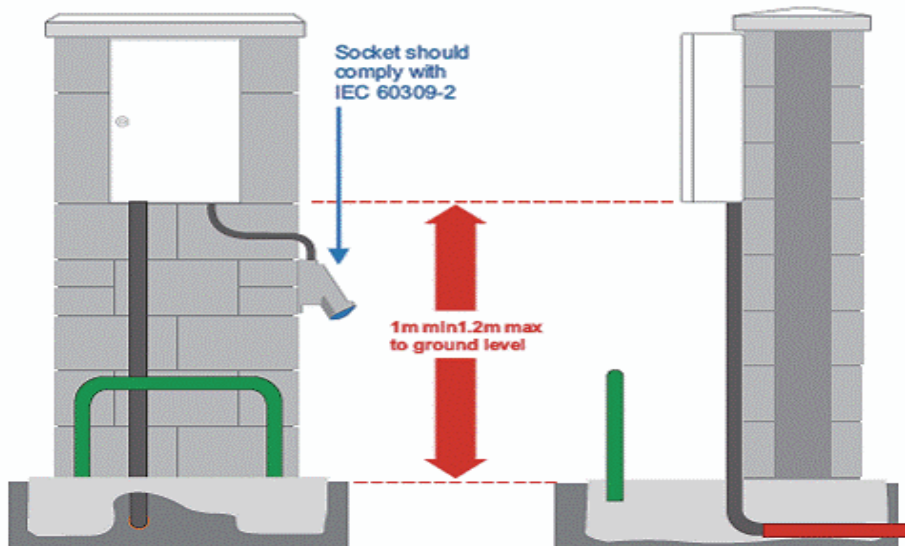
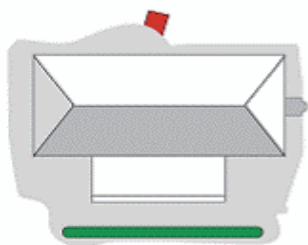
## Standard Design for Single-Phase Commercial Temporary Supply Surface Mounted Metering Enclosure on Concrete Plinth

### IMPORTANT

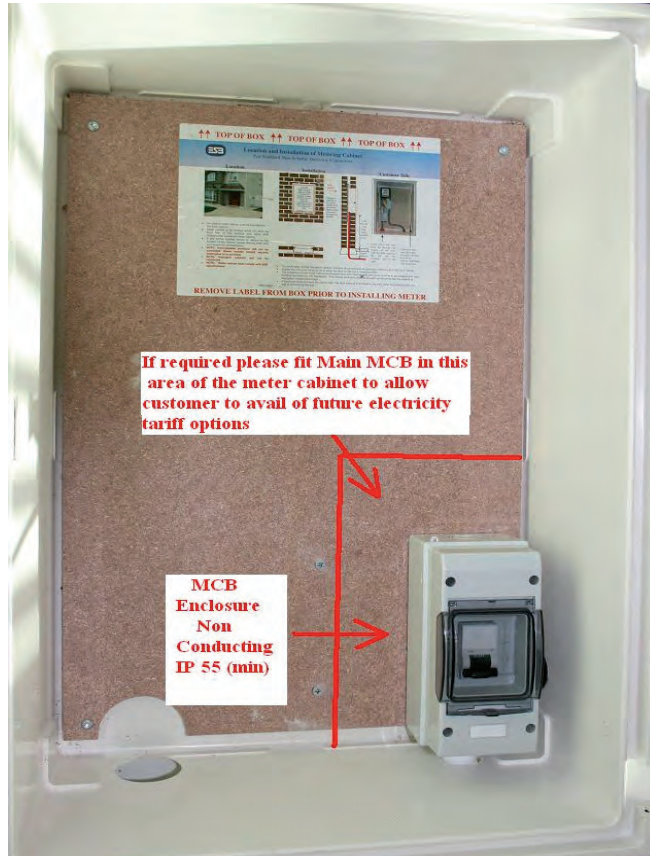
The installer must make an assessment of the risk of mechanical damage to the enclosure. If there is a clear risk then adequate precautions must be taken such as erecting barriers etc.

The enclosure requires a degree of protection equivalent to IP55.

The material used for construction of the enclosure must be non-conducting



# MAIN OVERCURRENT DEVICE MOUNTED IN STANDARD METER CABINET



**N.B.** If the main overcurrent device is located within the standard meter cabinet, it shall comply with the following requirements:

- In the case of installations with a maximum import capacity of less than 50kVA an MCB rated not less than 63A and having a multiple-operation short circuit breaking capacity of at least 9kA rms.
- The MCB shall be housed in an non conducting (self extinguishing 750° C) weatherproof enclosure rated IP55 min.
- A hinged transparent cover (IP55 min) shall give access for operating the MCB but no access to live terminals without the use of a tool.
- The enclosure shall be mounted only in the bottom right hand side of the meter cabinet as shown above to allow the further possibility of mounting additional equipment by the DSO as the need may arise.
- In all cases ETCI rules will apply.

## ESB NETWORKS CONTACT NUMBERS

Division	Area	D.D.I. No.
Dublin North	Design / Construction Finglas	01 6042248
Dublin North	Design / Construction Finglas	01 6042742
Dublin North	Finglas Metering Finglas	01 6042228
Dublin North	Dundalk / Drogheda Metering	042 9370648
Dublin North	Dundalk / Drogheda Design	042 9370622
Dublin North	Drogheda Areas	041 9802317
Dublin North	Mullingar / Enfield	044 9335535
Dublin North	Tullamore / Newbridge	057 9328416
Dublin South	Arklow	0402 29202
Dublin South	Enniscorthy Areas	053 9231034
Dublin South	Design Dublin Central-South Lots Road	01 6042680
Dublin South	Areas Dublin Central-South Lots Road	01 6042602
Dublin South	Dublin South-Leopardstown/Bray/Tallaght/Naas	01 6042864
Mid West	Athlone/Loughrea	090 6479394
Mid West	Galway Metering	091 741933
Mid West	Galway Design	091 741945
Mid West	Ennis/Kilrush	065 6897101
Mid West	Limerick	061 430435
Mid West	Newcastle West	069 66731
Mid West	Roscrea/Nenagh	0505 24501
Mid West	Tipperary/Thurles	062 82211
Mid West	Tralee	066 7195742
North West	Castlebar	094 9038707
North West	Tuam/Claremorris	093 60101
North West	Ballina/Belmullet/Swinford	096 60202
North West	Cavan/Monaghan/Carrickmacross	049 4372514
North West	Killybegs/Falcarragh	074 9741501
North West	Letterkenny/Buncrana	074 9167536
North West	Longford/Roscommon	043 43706
North West	Sligo/Carrick On Shannon	071 9114938

## ESB NETWORKS CONTACT NUMBERS

<b>Division</b>	<b>Area</b>	<b>D.D.I. No.</b>
South	Cork City - Design	021 4844201
South	Bandon	023 42351
South	Dunmanway/Bantry/Castletownbere	023 55834
South	Fermoy/Mallow/Midleton/Youghal	025 49705
South	Killarney/Kanturk/Caherciveen/Kenmare	064 20521
South	Clonmel/Dungarvan	052 83118
South	Kilkenny/Carlow	056 7760420
South	Portlaoise Design	057 8670104
South	Portlaoise Construction	057 8665794
South	Waterford Areas	051 305686

# ESB NETWORKS AREAS/DIVISIONS



# ESB NETWORKS AREAS/DIVISIONS

