



Underground Distribution Construction Manual


Section E7 – Earthing

Approved by: A. Bletchly

ELECTRICAL

SECTION E7 - EARTHING

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EARTHING

1. INSTALLATION

Detailed earthing information may be found in the Distribution Earthing Manual - BMS 03535.

Earthing systems shall be installed and tested in accordance with: -

- Procedures outlined in SWP 34 "Inspection, Testing, Installation and Maintenance of Network Earthing Systems", and
- The requirements outlined in the clauses of this document below.

2. ELECTRICITY SUPPLY PILLARS AND PITS

Earthing at electricity supply pits and above ground electricity supply pillar shall be constructed in accordance with the following :-

- All above ground link pillars installed in new underground residential developments shall be earthed.
- Electricity supply pits or pillars at the end of low voltage distribution cable radials shall be earthed.
- Low voltage distribution feeders shall be earthed at every 5th pillar or every 250 'cable route' meters (whichever is lesser).
- Electricity supply pillars for a dedicated C&I supply from a ground or padmount transformer.
- Electricity supply pillars on mains extensions from older cable systems (eg Consac) where a higher probability of corrosion

and fault current may cause a floating neutral on the extension.

- In areas with poor soil resistivity, it may be necessary to earth electricity supply pits and supply pillars more frequently to achieve the required MEN reading.

3. MINIMUM EARTH RESISTANCE

If the minimum earth resistance of 30 ohms cannot be achieved with one earth electrode, additional electrodes shall be installed in accordance with SWP 34 "Inspection, Testing, Installation and Maintenance of Network Earthing Systems".

4. HV CABLE, POLE TERMINATIONS


The earthing of HV cable pole terminations shall be in accordance with the Overhead Construction Manual and drawings therein.

5. LV CABLE, POLE TERMINATIONS

The earthing of LV cable pole terminations shall be in accordance with the Overhead Construction Manual and drawings therein.

6. PUBLIC LIGHTING

The earthing of public lighting columns shall be in accordance with the Public Lighting Policy Manual.

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| APP'D | A.Smith de Perez | | | ELECTRICAL EARTHING GENERAL REQUIREMENTS | APP'D | R. ENGLISH | 6229-A4 D | | | |
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| ATHR | J Lansley | | | | REC'D | | Sheet 1 of 2 | | | |
| Additional earthing circumstances Sect 2. | | | | | CKD | D.Taylor | | | | |
| | | | AUTHR | | A. McCook | | FILE | udc-E7-1.1D.doc | | |

7. PADMOUNTED SUBSTATIONS

7.1 Common Earthing

Local individual earth resistance, shall not exceed:

*10 ohms for ground mounted plant.

*30 ohms for pole mounted plant.

Construction drawings illustrate the electrical connections, a materials list and earth grid required.

A minimum of 3 distribution transformer L.V neutral circuits (approx. 100 earth rods) shall be interconnected and an overall earthing resistance of less than 1 ohm be achieved at any earthing point.

7.2 Separate Earthing

HV Earthing:

The HV earthing system shall be used to earth all exposed metal work associated with the high voltage works, including any surge arresters and cable sheaths and shall have a resistance to ground of not more than

- 10 Ohms for ground mounted plant
- 30 Ohms for pole mounted plant

LV Earthing:

The LV earthing system shall

be used to earth the low voltage neutral and any LV surge arresters and shall have a resistance to ground of not more than 10 ohms overall 30 ohms for local individual earths .

The separate earthing scheme arrangement is shown in the construction drawings including transformer separate earth grid construction and a list of materials.

Where a separate earthing scheme is adopted, modifications in accordance with the construction drawings shall be made to the LV cable connections and GPO provision.


HV & LV earth conductors shall be PVC insulated (or similar)

and earth rods shall have a minimum separation of:

- 4 m for overhead plant
- 5 m for ground mounted plant

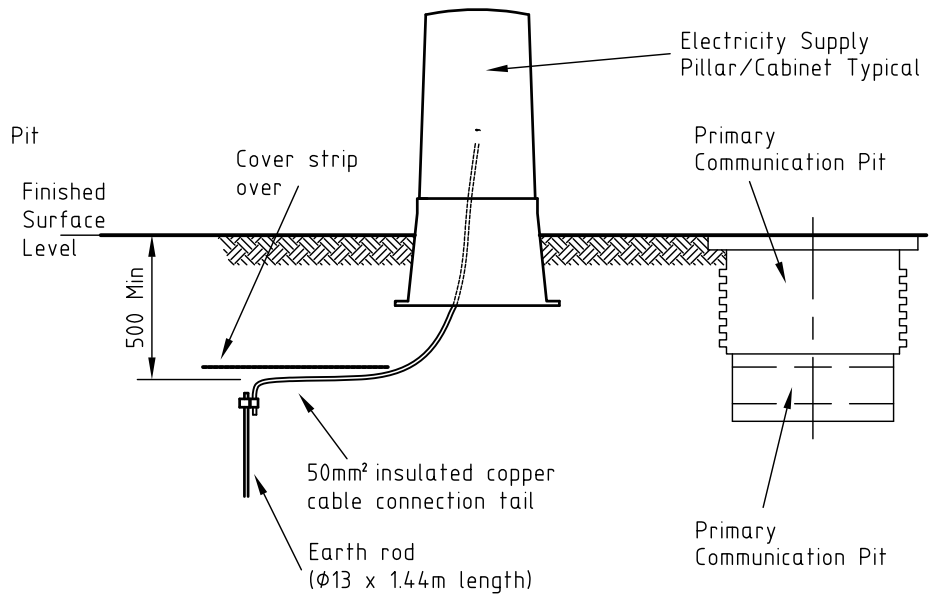
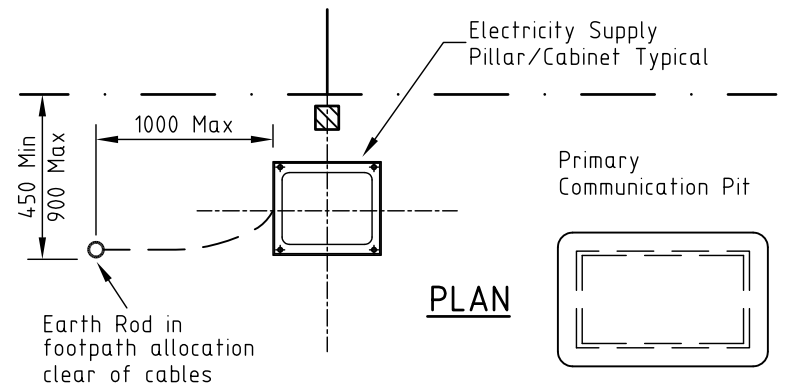
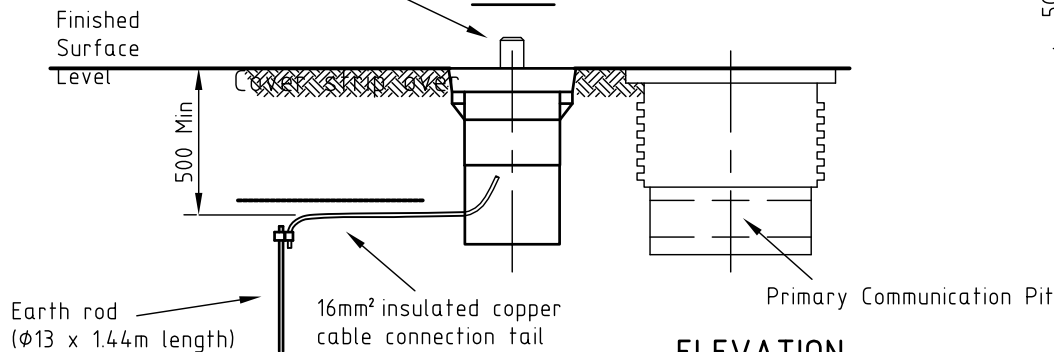
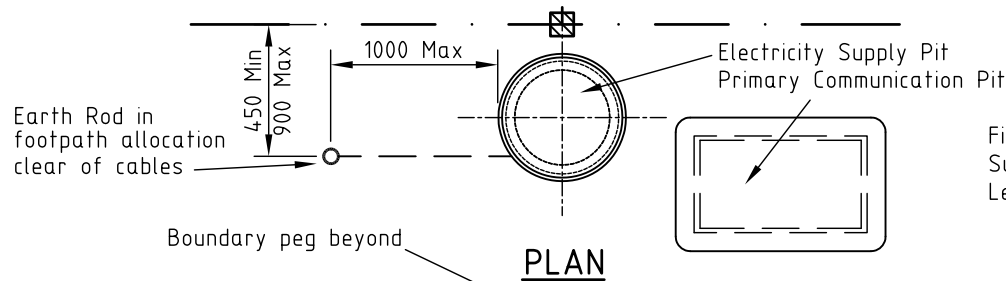
7.3 Consumer's Earth

Consumer's earth can only be connected to substation earth where the substation incorporates common earthing. In general the consumer's earth shall be separate to the substation earth unless physical separation is not practical.

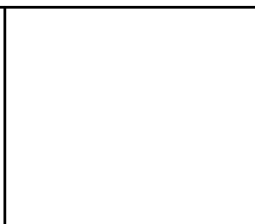
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| | CKD | D.Taylor | | | | Sheet 2 of 2 | | | |
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NOTES

1. Earth resistance of 30 ohms or less shall be obtained.
2. If the minimum earth resistance of 30 ohms cannot be achieved with one electrode, refer to SWP 34 "Inspection, Testing Installation and Maintenance of Network Earthing System"
3. For electrical components refer to electrical assemblies.
4. Supervising officer must approve location of earth rod outside the 1000mm radius, and record location on 'As Constructed' drawings.
5. All above ground link pillars installed in new underground residential developments shall be earthed.
6. Electricity supply pit or pillars at the end of any low voltage distribution cable radial shall be earthed.
7. A radial is considered to be 3 or more pillars/pits connected in series.
8. Low voltage distribution feeders shall be earthed every 5th pillar or 250m interval (whichever is the lessor)
9. In areas with poor soil resistivity, it may be necessary to earth electricity supply pillars/pits more frequently to achive the required MEN reading.
10. All LV distribution supply cabinets installed shall be earthed.



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UNDERGROUND DISTRIBUTION CONSTRUCTION MANUAL

ELECTRICAL EARTHING

LV SUPPLY PILLARS, CABINETS & PITS

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