<table>
<thead>
<tr>
<th>CONSTRUCTION DESCRIPTION</th>
<th>DWG No.</th>
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<tbody>
<tr>
<td>Earthing Construction Codes</td>
<td>5-10-2-1</td>
</tr>
<tr>
<td>Additional Earthing Codes</td>
<td>5-10-2-2</td>
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<tr>
<td>ECEGR00</td>
<td>5-10-3-1</td>
</tr>
<tr>
<td>ECEPCSC/XC</td>
<td>5-10-4-1</td>
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<td>ECEDDSC/EADD</td>
<td>5-10-5-1</td>
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<tr>
<td>ECECP00</td>
<td>5-10-6-1</td>
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</tbody>
</table>
Concrete pole earthing folder in subtransmission construction manual

POLE TYPE
- C: Conductive poles (Concrete or steel)

EARTHING - STANDARD CONFIGURATIONS

ROD SPEC
- 0: Nil
- S: Standard length
- X: Extended (2 rods)
- D: Deep drilled

ELECTRODE TYPE
- 0: Not applicable
- C: Copper Clad

SUBSIDIARY CONSTRUCTION
- Pole Connection: connect earth electrode to concrete pole
- Concrete Pole with OHEW: Grading Ring
- Concrete Pole with OHEW: Counterpoise
- Single Concrete Pole with OHEW: Air-break switch
- Double Concrete Pole with OHEW: Air-break switch
- Double Concrete Pole with OHEW: Motorised air-break switch
- Concrete Pole with OHEW: 66kV Cable termination
- Concrete Pole with OHEW: Subsidiary Cable termination
- Concrete Pole with no OHEW: Remote locations
- Concrete Pole with OPGW: Deep Drilled Earthing
- Concrete pole with OPGW: Deep Drilled earthing

EARTHING:
Small world object type: Earth
EARTHING - ADDITIONAL EARTHING

Additional earthing folder in subtransmission construction manual

ELECTRODE TYPE

C Copper Clad

ROD SPEC

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<table>
<thead>
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<tr>
<td>0</td>
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<td>X</td>
<td>Extended (2 rods)</td>
</tr>
<tr>
<td>D</td>
<td>Deep drilled</td>
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EARTHING:
Small world object type: Earth

DRAWING NUMBER: 5-10-2-2

VOLUME | FOLDER | PAGE | ISSUE
-------|--------|------|------
      5  |      10 |    2-2 |    0B
MATERIAL

ASSY | DESCRIPTION | QTY
--- | --- | ---
1251-1 | Grading ring arrangement | 1

SEPARATION FROM COMMUNICATIONS:
- Provide the following minimum separation to communications manholes, pillars, pits etc:
  - Earth rod = 15m
  - Bare earth cable = 15m
  - Concrete pole = 15m
- Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
  - Earth rod = 1m
  - Bare earth cable = 1m
  - Concrete pole = 1m
- Minimum separation to gas pipeline
  12.5m from concrete pole, stay anchor, earth rod or earth cable:

For separation from other communications assets refer Standards Section.

Notes:
1. Burial depths
   - In Soil - Inner - 300mm
   - In Soil - Outer - 600mm
   - In Rock - Both - 200mm
2. To allow for soil movement all risers shall contain 300 slack.
3. Copper conductor to be dry wire-brushed clean, and then liberally coated with electrical grease before making connection. Bend earth conductors to make connection. DO NOT CUT
4. Refer power co-ordinator guidelines agreement between Ergon Energy & Telstra

OVERHEAD SUB-TRANSMISSION
EARTHING
GRADING ARRANGEMENT
CONCRETE POLE

HARD COPY
UNCONTROLLED

Ergon Energy Corporation Ltd
ABN 50 087 646 062

Approved
P DE SOUSA ROQUE
Date
28/05/2015
Checked
R MARGANI
Drawn
L BURTON

CONSTRUCTION CODE
ECEGR00
MATERIAL

<table>
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<tr>
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<th>DESCRIPTION</th>
<th>ECEPCSC</th>
<th>ECEPCXC</th>
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<tr>
<td>1252-1</td>
<td>Driven Earth Rod</td>
<td>1</td>
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<tr>
<td>1252-2</td>
<td>Additional Earthing</td>
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SEPARATION FROM COMMUNICATIONS:

- Provide the following minimum separation to communications manholes, pillars, pits, non-insulated metal sheathed cable etc:
  - Earth rod = 15m
  - Bare earth cable = 15m
  - Concrete pole = 15m

- Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
  - Earth rod = 1m
  - Bare earth cable = 1m
  - Concrete pole = 1m

- Minimum separation to gas pipeline
  12.5m from concrete pole, stay anchor, earth rod or earth cable:

For separation from other communications assets refer Standards Section.

Notes:

1. To allow for different pole soil movement, all risers shall contain approximately 300 slack.
2. If ferrule is recessed pack out with flat s/s washers as required to ensure flat contact surface.
3. Copper conductor to be dry wire-brushed clean, and then liberally coated with electrical grease before making connection. Bend earth conductors for additional earthing. (DO NOT CUT)
4. Refer power co-ordinator guidelines agreement between Ergon Energy & Telstra.
NOTES:

1. Earthing to run in direction of mains.

2. **DEEP DRILLED EARTH TESTING:**
   Specified earth resistance may not be achieved for some days after earthing is installed. Where specified resistance is not achieved prior to completion of work on site the installation shall be tested after 7 days and additional earthing added as necessary.

3. To allow for different pole soil movement, all risers shall contain approximately 300 slack.

4. If ferrule is recessed pack out with flat s/s washers as required to ensure flat contact surface.

5. Copper conductor to be dry wire-brushed clean, and then liberally coated with electrical grease before making connection. Bend earth conductors to make connection. (DO NOT CUT)

6. Refer power co-ordinator guidelines agreement between Ergon Energy & Telstra.

**SEPARATION FROM COMMUNICATIONS:**

- Provide the following minimum separation to communications manholes, pillars, pits etc:
  - Earth rod = 15m
  - Bare earth cable = 15m
  - Concrete pole = 15m

- Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
  - Earth rod = 1m
  - Bare earth cable = 1m
  - Concrete pole = 1m

- Minimum separation to gas pipeline 12.5m from concrete pole, stay anchor, earth rod or earth cable:

For separation from other communications assets refer Standards Section. Construction Code **ECAADD**
**MATERIAL**

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<tr>
<td>1253-1</td>
<td>Counterpoise earthing to concrete pole</td>
<td>1</td>
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</table>

**SEPARATION FROM COMMUNICATIONS:**

- Provide the following minimum separation to communications manholes, pillars, pits etc:
  - Earth rod = 15m
  - Bare earth cable = 15m
  - Concrete pole = 15m

- Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
  - Earth rod = 1m
  - Bare earth cable = 1m
  - Concrete pole = 1m

- Minimum separation to gas pipeline
  12.5m from concrete pole, stay anchor, earth rod or earth cable:

For separation from other communications assets refer Standards Section.

**Notes:**

1. Burial depths as directed by superintendent gradient control & grading ring earthing in soil
   - inner 200
   - outer 300
   - in rock - 200

   Counterpoise 750 in soil suitable for cultivation
   - 300 in soil unsuitable for cultivation
   - 200 in rock

   All trenches to be backfilled with original material

2. To allow for different pole soil movement, all risers shall contain approximately 300 slack.

3. Copper conductor to be dry wire-brushed clean, and then liberally coated with electrical grease before making connection.

   Bend earth conductors to make connection. (do not cut)

4. For agricultural areas earthing cable to be run down pole & through 50mm conduit in backfill.

5. If ferrule is recessed pack out with flat s/s washers as required to ensure flat contact surface.

6. Refer power co-ordinator guidelines agreement between Ergon Energy & Telstra

---

Additional earthing to stay within the easement.
Extend earthing away from metallic services (pipelines, fences, cables etc).

Caution tape

Assy 1253-1

Unless specified otherwise footing resistance with OHEW disconnected and additional earthing connected to pole:
5Ω within 1km of substation or 1km from transition to unearthed overhead line. 10Ω elsewhere

---

**Construction Code**

ECECP00
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Ergon Energy Corporation Ltd
ABN 50 087 646 062

OVERHEAD SUB-TRANSMISSION
EARTHING
GRADING ARRANGEMENT - ABS CONSTRUCTION
CONCRETE POLE

DRAWING NUMBER: 5-10-7-1
VOLUME FOLDER PAGE ISSUE
5 10 7-1 0A

Approved
P DE SOUSA ROQUE
Date
16/08/2017
Checked
R MARGANI
Drawn
T BORG

Assy 1256-1

SEPARATION FROM COMMUNICATIONS:

- Provide the following minimum separation to communications
  manholes, pillars, pits etc:
  - Earth rod = 15m
  - Bare earth cable = 15m
  - Concrete pole = 15m

- Provide the following minimum separation to communications
  cable plastic sheathed / jacketed or in plastic conduit:
  - Earth rod = 1m
  - Bare earth cable = 1m
  - Concrete pole = 1m

- Minimum separation to gas pipeline 12.5m from concrete pole,
  stay anchor, earth rod or earth cable:

For separation from other communications assets refer Standards Section.

Notes:

1. Burial depths
   - In Soil - Inner = 300mm
   - Outer = 600mm
   - In Rock - Both = 200mm

2. To allow for soil movement all risers shall contain 300 slack.

3. Copper conductor to be dry
   wire-brushed clean, and then
   liberally coated with electrical grease
   before making connection. Bend
   earth conductors to make connection.
   DO NOT CUT

4. Refer power co-ordinator guidelines
   agreement between Ergon Energy
   & Telstra

Notes:

1. Burial depths
   - In Soil - Inner = 300mm
   - Outer = 600mm
   - In Rock - Both = 200mm

2. To allow for soil movement all risers shall contain 300 slack.

3. Copper conductor to be dry
   wire-brushed clean, and then
   liberally coated with electrical grease
   before making connection. Bend
   earth conductors to make connection.
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4. Refer power co-ordinator guidelines
   agreement between Ergon Energy
   & Telstra

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<tr>
<td>1256-1</td>
<td>Grading ring arrangement - ABS construction</td>
<td>1</td>
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</tbody>
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Notes:

1. Burial depths
   - In Soil - Inner = 300mm
   - Outer = 600mm
   - In Rock - Both = 200mm

2. To allow for soil movement all risers shall contain 300 slack.

3. Copper conductor to be dry
   wire-brushed clean, and then
   liberally coated with electrical grease
   before making connection. Bend
   earth conductors to make connection.
   DO NOT CUT

4. Refer power co-ordinator guidelines
   agreement between Ergon Energy
   & Telstra