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<tr>
<td>Construction code guide - Recloser / ABS / HV Equipment / Metal Guard</td>
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</table>

**Quick Reference**

- Quick reference for earthing of nailed & steel butted wood poles | 1841/1 |
- Quick reference for earthing of nailed & steel butted wood poles | 1841/2 |

**MEN Earthing Construction to Steel Butted Wood Pole**

- EBMEN | MEN earth to steel butted wood pole - Material | 1837/1 |
- EBMENX | MEN earth to steel butted wood pole | 1837/2 |
- EA | |
- EAR | |
- EBMG | Metal LV cable guard to MEN earth | 1842 |

**Transformer Earthing Construction to Steel Butted Wood Pole**

- EBPT/SEP | Transformer separate earth - Material | 1798/1 |
- EA | Transformer separate earth - Construction | 1798/2 |
- EAR | Transformer remote HV separate earth - Const. | 1798/3 |
- ERA | |
- EBPT/RSEP | |

**Quick Reference for Earthing of Nailed & Steel Butted Wood Poles**

- EBPT/SEP/DD | Transformer separate earth - deep drilled - Material | 1799/1 |
- EBADD | Transformer separate earth - deep drilled - Const. | 1799/2 |
- ERAADD | Transformer remote separate earth - deep drilled - Const. | 1799/3 |
- EBPT/RSEP/DD | |

**Transformer Common Earth & Remote Common Earth Deep Drilled**

- EBPT/COM | Transformer common earth & remote common earth - material | 1800/1 |
- EA | Transformer common earth - Construction | 1800/2 |
- EAR | Transformer remote common earth - Const. | 1800/3 |
- ERA | |

**Transformer Common Earth Deep Drilled**

- EBPT/COM/DD | Transformer common earth & remote common earth deep drilled - Material | 1801/1 |
- EBADD/DD | Transformer common earth deep drilled - Const. | 1801/2 |
- ERAADD/DD | Transformer remote common earth deep drilled - Const. | 1801/3 |

**SWER Transformer Earthing Construction to Steel Butted Wood Pole**

- EBPTS | SWER Transformer Earth - New Pole | 1818/1 |
- EBPTSX | SWER Transformer Earth - Existing Pole | 1818/2 |
- EA | |
- EAR | |

**SWER Transformer Earth Deep Drilled**

- EBPTS/DD | SWER Transformer Earth Deep Drilled - New Pole | 1819/1 |
- EBPTSX/DD | SWER Transformer Earth Deep Drilled - Existing Pole | 1819/2 |
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<td>EBACRS/DD</td>
<td>SWER Recloser (with VT) Earth Deep Drilled - New Pole</td>
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<tr>
<td>EBACRX/DD DD</td>
<td>SWER Recloser (with VT) Earth Deep Drilled - Existing Pole</td>
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<td>HV Equipment Earth - New Pole</td>
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<td>HV Equipment Earth - Existing Pole</td>
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<tr>
<td>EBHVEMG/RCOM</td>
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<td>SWER TRANSFORMER EARTHING ARRANGEMENT</td>
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<td>ENPV</td>
<td>HV Equipment / Metal Guard &amp; MEN Common Earth Arrangement - New Pole Nail</td>
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<td>HV Equipment / Metal Guard &amp; MEN Separate Earth Arrangement - New Pole Nail</td>
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<td>ENPV</td>
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<td>ENPV</td>
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</table>
SINGLE AND THREE PHASE TRANSFORMER EARTHING - CONSTRUCTION CODE

Code shown within dashed box appears on relevant construction detail drawings in this manual.

EN PT/COM/DD

EARTH
EN = Earth bond nailed pole
EB = Steel butted wood pole

TRANSFORMER
PT = Pole Transformer

SYSTEM
COM = Common
SEP = Separate
RCOM = Remote common
RSEP = Remote HV separate

TYPE
DD = Deep drilled
(Omit where driven rods used)

EXAMPLES:-
EN PT/COM/DD = Earth Bond Nailed Wood Pole transformer with common earth system (CMEN), deep drilled.
EB PT/RSEP = Earth Steel Butted Wood Pole transformer with remote HV separate and LV earth systems, driven rods.

ADDITIONAL EARTHING - CONSTRUCTION CODE

Code shown within dashed box appears on relevant construction detail drawings in this manual.

EA

EARTH
E

ADDITIONAL TYPE
A = Additional (Single depth rod assembly)
AR = Additional Rod (Extra depth rod)
ADDC = Additional Deep Drilled (Cable type)
RA = Remote Additional (Single depth rod assembly)
RADDC = Remote Additional Deep Drilled (Cable type)
ADDCC = Additional Deep Drilled (Cable & 'C' crimp type)

EXAMPLES:-
E AR = Earthing, with additional extra depth rod.
**M.E.N. EARTHING - CONSTRUCTION CODE**

Code shown within dashed box appears on relevant construction detail drawings in this manual.

**EB MEN/ABC**

- **EARTH**
  - EB = Steel butted wood pole

- **SYSTEM**
  - MEN = MEN - New Pole
  - MENX = MEN - Existing Pole
  - MG = Metal Guard (on LV cable)

- **MAINS**
  - ABC = LVABC Mains
  - Al. = Bare Aluminium Mains
  - Cu. = Bare Copper Mains

**EXAMPLE:**
EB MEN / AI = Earthing steel butted wood pole, MEN - new, with bare Aluminium mains.
**SWER Transformer / Reactor Earthing - Construction Code**

Code shown within dashed box appears on relevant construction detail drawings in this manual.

- **EB PTS/DD**
  - **EARTH**
    - EB = Earth Steel Butted Wood Pole
  - **TRANSFORMER**
    - PTS = Pole Transformer SWER
    - PTSX = Pole Transformer SWER - Existing Pole
    - PREAS = Pole Reactor SWER
    - PREASX = Pole Reactor SWER - Existing Pole
  - **TYPE**
    - DD = Deep drilled
    - (Omit where driven rods used)

**Example:**

EB PTS/DD = Earth steel butted wood pole, pole transformer SWER, deep drilled.

---

**Earth Bond Nailed Pole - Construction Code**

Code shown within dashed box appears on relevant construction detail drawings in this manual.

- **EN/PT**
  - **EARTH**
    - EN = Earth Bond Nailed Pole
  - **EQUIPMENT / PLANT**
    - ABS = Air Break Switch
    - HVEMENMG = High Voltage Equipment, MEN and Metal Guard
    - PT = Pole Transformer
    - PTS = Pole Transformer SWER
    - HVE = High Voltage Equipment

**Example:**

EN/PT = Earth bond nailed pole, pole transformer.
POLE LIGHTNING PROTECTION EARTHING - CONSTRUCTION CODE

Code shown within dashed box appears on relevant construction detail drawings in this manual.

**EXAMPLES:**
- **EB GAPX** = Earth steel butted wood pole, Gapped bands existing rebutted pole

OVER HEAD EARTHWIRE - CONSTRUCTION CODE

Code shown within dashed box appears on relevant construction detail drawings in this manual.

**EXAMPLES:**
- **EB OHIT** = Earth steel butted wood pole, Overhead On New Pole, Intermediate / Termination.
SWER/SINGLE AND THREE PHASE RECLOSER EARTHING - CONSTRUCTION CODE

EB ACRS/DD

EARTH
EB = Earth steel butted wood pole

RECLOSER
ACRS = Recloser SWER
ACRSX = Recloser SWER - Existing Pole

TYPE
DD = Deep drilled
(Omit where driven rods used)

EXAMPLES:- EB ACRS/DD = Earth steel butted wood pole, SWER recloser earth system, deep drilled.

ABS, HV EQUIPMENT & METAL GUARD EARTHING - CONSTRUCTION CODE

EB HVEMGMENX/SEP/ABC

EARTH
EB = Earth steel butted wood pole

EQUIPMENT
HVE = High Voltage Equipment - New Pole
HVEX = High Voltage Equipment - Existing pole
HVEMG = High Voltage Equipment and Metal Guard - New Pole
HVEMGX = High Voltage Equipment and Metal Guard - Existing pole
HVEMGXN = High Voltage Equipment and Metal Guard with connection to LV maims - New Pole
HVEMGXEN = High Voltage Equipment and Metal Guard with connection to LV maims - Existing Pole
OP = Operation Point - New pole
OPX = Operation Point - Existing pole
HVEMEN = High Voltage Equipment with Connection to LV Mains

SYSTEM
SEP = Separate
COM = Common
RSEP = Remote HV Separate
RCOM = Remote Common

MAIN'S (Neutral)
ABC
AL
CU
(Omit if no MEN req'd)

EXAMPLES:- EB HVEMGMENX/SEP/ABC = Earth steel butted wood pole, HV Equipment & Metal Guard with MEN on existing pole, separate earth system, connected to ABC mains neutral.
### QUICK REFERENCE GUIDE FOR EARTHING OF NAILED & STEEL BUTTED WOOD POLES

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<th>Type of Earthing System</th>
<th>Steel Butted Wood Poles Dwg Number</th>
<th>Nailed Poles Dwg Number</th>
<th>Type of Earthing System</th>
<th>Steel Butted Wood Poles Dwg Number</th>
<th>Nailed Poles Dwg Number</th>
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<tbody>
<tr>
<td>Pole Mounted Distribution Transformer</td>
<td>1798 or 1799</td>
<td>1805</td>
<td>S.W.E.R Reactor (Standard and Deep Drilled)</td>
<td>1821 or 1822</td>
<td>Do Not Use</td>
</tr>
<tr>
<td>• HV &amp; LV (Separate)</td>
<td></td>
<td></td>
<td>Do NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pole Mounted Distribution Transformer</td>
<td>1800 or 1801</td>
<td>1838</td>
<td>S.W.E.R Recloser (With VT)</td>
<td>1820 or 1824</td>
<td>Do NOT BOND</td>
</tr>
<tr>
<td>• HV &amp; LV (CMEN)</td>
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<td></td>
<td>Do NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
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<tr>
<td>ABS</td>
<td>Do Not Use</td>
<td>1805</td>
<td>S.W.E.R Recloser (oil circuit)</td>
<td>1825</td>
<td>Do NOT BOND</td>
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<tr>
<td>Includes CMEN, Separate &amp; Metal Cable Guards</td>
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<td></td>
<td>Do NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
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<tr>
<td>SWER Isolator</td>
<td>1819</td>
<td>1838</td>
<td>S.W.E.R (Gapped Bands)</td>
<td>1775</td>
<td>Do NOT BOND</td>
</tr>
<tr>
<td>SWER Regulator</td>
<td>Do Not Use</td>
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<td>Do NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
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<tr>
<td>S.W.E.R Distribution Transformer (Standard and Deep Drilled)</td>
<td>1818 or 1819</td>
<td>1838</td>
<td>S.W.E.R (Darverter)</td>
<td>Do Not Use</td>
<td>Do NOT BOND</td>
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<td>Do NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
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</tbody>
</table>

**NOTES:**
- Do NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit.
- Installed in HFT conduit.
- Downlead by 50mm if not from insulated HV earth.
- Pole nail to be separated.
- Do Not Use.
# Quick Reference Guide for Earthing of Nailed & Steel Butted Wood Poles

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<tr>
<th>Type of Earthing System</th>
<th>Steel Butted Wood Poles Dwg Number</th>
<th>Nailed Poles Dwg Number</th>
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<td>HV equipment (Arrester, tank, sectionaliser, gas load break switch)</td>
<td>1825</td>
<td>DO NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
</tr>
<tr>
<td>HV Operational Earthing Point</td>
<td>1835</td>
<td>DO NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
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<tr>
<td>HV 3 Phase Recloser</td>
<td>1825</td>
<td>DO NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
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<tr>
<td>HV 3 Phase Regulator</td>
<td>Do Not Use</td>
<td>DO NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
</tr>
<tr>
<td>HV Equipment &amp; Metal Cable Guard (Separate)</td>
<td>1827</td>
<td>1840</td>
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<thead>
<tr>
<th>Type of Earthing System</th>
<th>Steel Butted Wood Poles Dwg Number</th>
<th>Nailed Poles Dwg Number</th>
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<tbody>
<tr>
<td>HV Equipment, Metal Cable Guard &amp; MEN (Separate)</td>
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<td>HV Equipment, Metal Cable Guard &amp; MEN (CMEN)</td>
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<td>1839</td>
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<tr>
<td>HV Equipment Common</td>
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<tr>
<td>Overhead Earth Wire</td>
<td>1823</td>
<td>DO NOT BOND Pole nail to be separated from insulated HV earth downlead by 50mm if not installed in HFT conduit</td>
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<tr>
<td>LV Earth Only (MEN)</td>
<td>1837</td>
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</tr>
<tr>
<td>Metal LV Cable Guard to Pole with LV Earth Only</td>
<td>1842</td>
<td>No Action Required</td>
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**OVERHEAD DISTRIBUTION**

EARTHING NAILED & STEEL BUTTED WOOD POLES
QUICK REFERENCE GUIDE FOR EARTHING OF NAILED & STEEL BUTTED WOOD POLES

**Ergon Energy Corporation Ltd**
ABN 50 087 646 062

**FILE:** 5 27 18412

**Dwg 1841 Sh2**
### NOTES:

1. Earthing to run in direction of mains.

2. If disconnection test point required, fit connector.
   (connector not included in material list)

3. Number of earths:
   - Not counting consumer's earths:
     - There should be as a general rule:
       - One earth at the remote end of each line,
       - NOT required at end of cross street service.
       - A minimum of 2 earths per kilometre of line.
     - Earths at such intermediate points that will ensure no consumer's installation is more than 200m line distance from an M.E.N. earth.

4. Separation from communication equipment:
   - Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes/payphones or miscellaneous earths:
     - LV earth rod or cable = 0.3m
   - Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - LV earth rod or cables = 0.3m
   - For separation from other communications assets refer Standards Section.

5. Earth bonds to steel butted wood poles are not required on poles with LV earths only

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### MATERIAL

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<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>10</td>
</tr>
<tr>
<td>18-5</td>
<td>Connector IPC 25/95mm² main to 6/35mm² tap</td>
<td>1</td>
</tr>
<tr>
<td>87-3</td>
<td>Connector PG Al/Steel-Cu.</td>
<td>1</td>
</tr>
<tr>
<td>87-10</td>
<td>Connector PG Cu/Cu.</td>
<td>1</td>
</tr>
<tr>
<td>103-5</td>
<td>Earth MEN to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard LV to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>238-5</td>
<td>Bandit strap to steel butted wood pole</td>
<td>1</td>
</tr>
</tbody>
</table>

### MATERIAL - ADDITIONAL EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>104-1</td>
<td>Earth rod additional</td>
<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
<td>AR</td>
</tr>
</tbody>
</table>
To L.V. Neutral
Connector Assy Selection 87-3 or 10 or 18-5

Assy 103-5

Assy 105-5
(Saddles at 500 Intervals)

Assy 238-5

Bandit straps at 500 intervals on steel section

Trench sections. Refer EARTHING Dwg. 1238

Caution tape

Additional earthing if required.
If more than 4 additional earrods required, contact local Ergon branch.
Assy selection 104-5 or 104-1 and 5

4.0m Min. (Single rod)

2.0m

8.0m Min. (Double rod)

Construction Type
EBMEN
EBMENX
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
M.E.N. EARTH TO
STEEL BUTTED WOOD POLE

DATE 12.1.13
PASSED C. Avenell
DRAWN L. Burton

FILE: 5 27 1837 2
### NOTES:

1. **LV Metal cable guard must be connected to an M.E.N. earth system.**
   
   Where a M.E.N. earth is not existing, one is to be installed in accordance with earthing nailed & steel butted wood pole drawing 1837. Construction types EBMEN or EBMENX.

2. **Separation from communication equipment:**
   
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes payphones or miscellaneous earths:
     - LV earth rod or cable = 0.3m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - LV earth rod or cables = 0.3m
   
   For separation from other communications assets refer Standards Section.

3. **Earth bonds to steel butted wood poles are not required on poles with LV earths only**

### MATERIAL

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>2</td>
</tr>
<tr>
<td>86-12</td>
<td>Setscrew fixing M12 x 25 S/S</td>
<td>1</td>
</tr>
<tr>
<td>87-12</td>
<td>Connector PG Cu/Cu. (PG5)</td>
<td>1</td>
</tr>
<tr>
<td>140-6</td>
<td>Cable insulated hard drawn Cu. 35mm²</td>
<td>1</td>
</tr>
<tr>
<td>141-14</td>
<td>Lug, compression 35mm² M12</td>
<td>1</td>
</tr>
<tr>
<td>238-5</td>
<td>Cable guard earth to steel butted wood pole</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**Construction Type**

**EBMG**

---

**OVERHEAD DISTRIBUTION**

**EARTHING NAILED & STEEL BUTTED WOOD POLE**

**METAL LV CABLE GUARD TO M.E.N. EARTH ON NEW OR EXISTING STEEL BUTTED WOOD POLE**
### Notes:

1. Earthing to run in direction of mains.

2. Separation from communication equipment:
   - Provide the following minimum separation to communications pillars/
     cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - LV earth rod or cable = 0.3m
     - HV earth rod = 15.0m
     - HV bare earth cable = 15.0m
   - Provide the following minimum separation to communications cable:
     - LV earth rod or cable = 0.3m
     - HV bare earth cable (site earth) = 0.3m
   - For separation from other communications assets refer Standards Section.

3. Attach warning sign beside remote HV earth lead.

4. A remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-3

5. Steel butt must be bonded to LV earth.

6. HV earth lead must be insulated from steel.

---

### Material - Separate Earth

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>20</td>
</tr>
<tr>
<td>102-1</td>
<td>Earth LV 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>103-1</td>
<td>Earth HV 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>2</td>
</tr>
<tr>
<td>87-12</td>
<td>Conductor PG Cu./Cu. (PG5)</td>
<td>1</td>
</tr>
<tr>
<td>233-5</td>
<td>Earth to steel butted wood pole</td>
<td>1</td>
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</tbody>
</table>

### Material - Remote Separate Earth

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>20</td>
</tr>
<tr>
<td>102-1</td>
<td>Earth LV 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>223-1</td>
<td>Earth remote HV separate 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>2</td>
</tr>
<tr>
<td>87-12</td>
<td>Conductor PG Cu./Cu. (PG5)</td>
<td>1</td>
</tr>
<tr>
<td>233-5</td>
<td>Earth to steel butted wood pole</td>
<td>1</td>
</tr>
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### Material - Additional Earth

<table>
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<tr>
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<tr>
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<td>Earth rod additional</td>
<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
<td>AR</td>
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</table>

### Material - Additional Earth Remote

<table>
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<tr>
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<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
<td>AR</td>
</tr>
<tr>
<td>225-3</td>
<td>Earth rod remote HV additional</td>
<td>1</td>
</tr>
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</table>
Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus. The minimum separation shall not be less than 50mm.

Strip insulation for portable earth connection

LV DISCONNECTED

10 ohm Max.

Additional earthing if required.
If more than 4 additional earrods required, contact local Ergon branch.
Assy selection 104-5 or 104-1 and 5

4.0m Min. (Single rod)
8.0m Min. (Double rod)

Construction Type
EBPT/SEP
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE TRANSFORMER SEPARATE EARTH
STEEL BUTTED WOOD POLE - CONSTRUCTION
Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus. The minimum separation shall not be less than 50mm.

Assy 14-1 (500 Intervals)

HV. CONNECTED
H.V. Earth wire
must not be broken

Assy 102-1

Refer sheet 1
note 3

Assy 105-5
(Saddles at 500
Intervals on wood section)

Bandit straps at
500 intervals on steel section

LV DISCONNECTED

10 ohm
Max.

Trench sections
Refer EARTHING Dwg. 1238

Additional earthing if required. If more than 4 additional earthrods required, contact local Ergon branch. Assy selection 104-5 or 104-1 and 5

4.0m Min. (Single rod)

8.0m Min. (Double rod)

Remote HV
earth pit

Refer note 4 sheet 1.

Additional earthing if required. If more than 4 additional earthrods required, contact local Ergon branch. Assy selection 104-5 and 225-3

Construction Type

EBPT/RSEP
EAR (Additional)
ERA (Additional rod)

HARD COPY UNCONTROLLED

A ORIGINAL ISSUE

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
TRANSFORMER REMOTE HV SEPARATE EARTH
STEEL BUTTED WOOD POLE - CONSTRUCTION

C. Noel

Ergon Energy Corporation Ltd
ABN 50 087 646 062

Dwg 1798 Sh 3

FILE: 5 27 1798 3

FILE: 5 27 1798 3

APPROVED
C. Noel

DATE
6/6/12

PASSED C. Avenell

DRAWN L. Burton
<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>20</td>
</tr>
<tr>
<td>123-1</td>
<td>Earth LV 35mm² to wood pole - deep drilled</td>
<td>1</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>2</td>
</tr>
<tr>
<td>125-1</td>
<td>Earth HV to wood pole - deep drilled</td>
<td>1</td>
</tr>
<tr>
<td>87-12</td>
<td>Conductor PG Cu./Cu. (PG5)</td>
<td>1</td>
</tr>
<tr>
<td>233-5</td>
<td>Earth to steel butted wood pole</td>
<td>1</td>
</tr>
</tbody>
</table>

**NOTES:**

1. Earthing to run in direction of mains.
2. Separation from communication equipment:
   - *Provide the following minimum separation to communications pillars/ cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - LV earth rod or cable = 0.3m
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
     - *Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - LV earth rod or cable = 0.3m
     - HV bare earth cable (site earth) = 0.3m
   For separation from other communications assets refer Standards Section.
3. Attach warning sign beside remote HV earth lead.
4. A remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-7.
5. 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.
6. H.V. & L.V. electrodes:
   - 35mm² bare copper cable deep drilled to a minimum of 20m unless good moisture is reached.
   - Good moisture is defined as extracted bore hole soil containing adequate proportion of water so that when squeezed by hand it holds its form and releases water content - similar to mud.
   - A drilling rig using nominal 75mm bit is required.
   - The holes are to be refilled immediately with dry earth enhancing compound. **DO NOT ADD WATER**
7. The additional earthing if required must be spaced at least two times the depth of adjacent earthing electrode. For example if adjacent earthing is at 20m, then the additional earthing must be spaced at least 40m.
8. Pole steel butt must be bonded to LV earth.
9. HV earth lead must be insulated from steel butt.
Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus. The minimum separation shall not be less than 50mm.

Strip insulation for portable earth connection

LV DISCONNECTED

Ref: 10 ohm Max.

H.V. CONNECTED

H.V. Earth wire must not be broken

30 ohm Max.

Trench sections
Refer EARTHING Dwg. 1238

Additional earthing if required
Assy 124-1

Construction Type
EBPT/SEP/DD
EADDC (Additional)
Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus. The minimum separation shall not be less than 50mm.

Additional earthing if required Assy 124-1

Refer note 8

Additional earthing if required Assy 225-7

Refer note 8

EBPT/RSEP/DD ERADDC (Additional)

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
TRANSFORMER REMOTE SEPARATE EARTH
DEEP DRILLED STEEL BUTTED WOOD POLE - CONST.

C. Noel
6/6/12
PASSED
C. Avenell
DRAWN
L. Burton

DATE
PASSED
DRAWN
FILE: 5 27 1799 3
Dwg 1799 Sh 3

ERADDC Ergon Energy Corporation Ltd
ABN 50 087 646 062

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UNCONTROLLED

L. Burton
### NOTES:

1. Earthing to run in direction of mains.

2. Separation from communications equipment:
   * Provide the following minimum separation to communications manholes, pillars, pits etc:
     - Earth rod = 2.0m
     - Bare earth cable = 2.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - Earth rod = 0.3m
     - Bare earth cable = 0.3m
   For separation from other communications assets refer Standards Section

3. Attach warning sign beside remote CMEN earth lead.

4. A remote earth identification pit to be installed at first remote earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-3.
To Transformer
L.V. Neutral bushing
Assy 140-14
141-18
To Transformer tank
Assy 14-1
(500 Intervals)
Assy 102-1
Assy 87-12
Assy 233-5
Assy 105-5
(Saddles at 500 Intervals on wood section)
Strip insulation for portable earth connection
Bandit straps at 500 intervals on steel section

Caution tape

Additional earthing if required.
If more than 4 additional earthrods required, contact local Ergon branch.
Assy selection 104-5 or 104-1 and 5

Trench sections
Refer EARTHING Dwg. 1238

Construction Type
EBPT/COM
EA (Additional)
EAR (Additional rod)

Dis-N-Earth - CONSTRUCTION

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
TRANSFORMER COMMON EARTH
STEEL BUTTED WOOD POLE - CONSTRUCTION

C. Noel
29.5.09
C. Avenell
L. Burton

1 ohm Max.
30 ohm Max.

4.0m Min. (Single rod)
8.0m Min. (Double rod)
To Transformer L.V. Neutral bushing
Assy 140-14
141-18
To Transformer tank
Assy 14-1
(500 Intervals)
Assy 223-3
Assy 87-12
Assy 233-5

To Transformer tank

Strip insulation for portable earth connection

Refer sheet 1 note 3
Assy 105-5
(Saddles at 500 Intervals on wood section)

Bandit straps at 500 intervals on steel section

HV Earth

Telstra pit

Detail Top View

Trench sections
Refer EARTHING Dwg. 1238

Remote HV earth pit
Telstra pit or equipment

EBPT/RCOM
EAR (Additional)
ERA (Additional rod)

Construction Type

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
TRANSFORMER REMOTE COMMON EARTH
STEEL BUTTED WOOD POLE - CONSTRUCTION

Additional earthing if required.
If more than 4 additional earthrods required, contact local Ergon branch.
Assy selection 104-5 and 225-3
4.0m Min. (Single rod)
8.0m Min. (Double rod)

Remote HV

earth pit

Pass
C. Noel

Date
6/6/12

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Hard Copy

UNCONTROLLED

PASSED
C. Avenell

Drawn
L. Burton

A

ORIGINAL ISSUE

HARD COPY

UNCONTROLLED

Ergon Energy Corporation Ltd
ABN 50 087 646 062

FILE: 5 27 1800 3

Dwg 1800 Sh 3
# 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 earth testing 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. Separation from communication equipment:
   - Provide the following minimum separation to communications conduit:
     - Earth rod = 2.0m
     - Bare earth cable = 2.0m
   - Provide the following minimum separation to communications cable plastic sheathed/jacketed or in plastic conduit:
     - Earth rod = 0.3m
     - Bare earth cable = 0.3m

4. Attach warning sign beside remote CMEN earth lead

5. A remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required, an identification pit is to be installed at last electrode position. Refer assy 225-7.

6. **H.V. & L.V. electrodes**
   - 35mm² bare copper cable deep drilled to a minimum of 20m unless good moisture is reached.
   - Good moisture is defined as extracted bore hole soil containing adequate proportion of water so that when squeezed by hand it holds its form and releases water content - similar to mud.
   - A drilling rig using nominal 75mm bit is required.
   - The holes are to be refilled immediately with dry earth enhancing compound. **DO NOT ADD WATER.**

7. The additional earthing if required must be spaced at least two times the depth of adjacent earthing electrode. For example, if adjacent earthing is at 20m, then the additional earthing must be spaced at least 40m.

---

## Material - Common Earth

<table>
<thead>
<tr>
<th>ASSY</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>10</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
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<tr>
<td>123-2</td>
<td>Earth HV 35mm² to wood pole - deep drilled</td>
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<tr>
<td>140-14</td>
<td>Cable insulated annealed Cu. 70mm²</td>
<td>1</td>
</tr>
<tr>
<td>141-18</td>
<td>Lug, compression 70mm² M12</td>
<td>2</td>
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<tr>
<td>87-12</td>
<td>Connector P.G. Cu. - Cu. (PG5)</td>
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</tr>
<tr>
<td>233-5</td>
<td>Earth to steel butted wood pole</td>
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## Material - Remote Common Earth

<table>
<thead>
<tr>
<th>ASSY</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>10</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>1</td>
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<tr>
<td>224-3</td>
<td>Earth rempte CMEN (35mm²) deep drilled to wood pole</td>
<td>1</td>
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<tr>
<td>140-14</td>
<td>Cable insulated annealed Cu. 70mm²</td>
<td>1</td>
</tr>
<tr>
<td>141-18</td>
<td>Lug, compression 70mm² M12</td>
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<tr>
<td>87-12</td>
<td>Connector P.G. Cu. - Cu. (PG5)</td>
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<td>233-5</td>
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## Material - Additional Earth

<table>
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<tr>
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<th>Description</th>
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<tbody>
<tr>
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## Material - Additional Earth Remote

<table>
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<tbody>
<tr>
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</tr>
<tr>
<td>225-7</td>
<td>Earth remote HV additional - deep drilled</td>
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</tbody>
</table>

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**Overhead Distribution**

**Earthencing Nailed & Steel Butted Wood Pole**

**Transformer Common Earth & Remote Common Earth**

**Deep Drilled Steel Butted Wood Pole - Material**

---

**FILE:** 5  27 1801 1

**Dwg** 1801  **Sh** 1  **C**
To Transformer
L.V. Neutral bushing
Assy 140-14
141-18
To Transformer tank
H.V.
Assy 14-1
(500 Intervals)
Assy 123-2
Assy 87-12
Assy 105-5 on wood section
(Saddles at 500 Intervals)
Assy 233-5
2600
2400
Min.
100
Bandit at 500mm intervals
on steel section
Strip insulation for portable
earth connection
Trench sections. Refer
EARTHING Dwg. 1238
Caution tape
Additional earthing
if required
Assy 124-1
2.0m
Refer note 7

Construction Type
EBPT/COM/DD
EADDC (Additional)

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
TRANSFORMER COMMON EARTH DEEP DRILLED
STEEL BUTTED WOOD POLE - CONSTRUCTION

Ergon Energy Corporation Ltd
ABN 50 087 646 062

FILE: 5 2718012
Dwg 1801 Sh 2 B
The minimum separation shall not be less than 50mm.

If more than 4 additional earthrods required, contact local Ergon branch.

Assy selection 104-5 or 104-1 and 5 required, contact local Ergon branch.

Additional earthing if required.

HV Earth wires must not be broken

(Minimum of 3 electrodes)

DISTRIBUTION S/STN

<table>
<thead>
<tr>
<th>kVA</th>
<th>11kV</th>
<th>12.7kV</th>
<th>19.1kV</th>
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<tbody>
<tr>
<td>10</td>
<td>13Ω</td>
<td>15Ω</td>
<td>22Ω</td>
</tr>
<tr>
<td>25</td>
<td>6Ω</td>
<td>7Ω</td>
<td>10Ω</td>
</tr>
<tr>
<td>50</td>
<td>3.3Ω</td>
<td>3.5Ω</td>
<td>5Ω</td>
</tr>
<tr>
<td>100</td>
<td>2Ω</td>
<td>2.3Ω</td>
<td>3.4Ω</td>
</tr>
</tbody>
</table>

Construction Type

EBPTS
EBPTSX
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. TRANSFORMER EARTH
TO STEEL BUTTED WOOD POLE

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.

Strip insulation on both HV Earth downleads

EARTHING NAILED & STEEL BUTTED WOOD POLE

Pole

Caution tape

Warning Sign

Assy 102-1

Phantom bushing

Assy 102-1

To T/former

L.V. Neutral bushing

Assy 105-10

Assy 121-1

Assy 121-1

To Transformer tank

150 20

Pole

60

To Transformer E.R. bush

Refer note Assy 114

Strip insulation on both HV Earth downleads

H.V. CONNECTED MAX. RESISTANCE

H.V. Earth wires must not be broken

(Minimum of 3 electrodes)

Additional earthing if required.

Additional earthing if required.

Trench sections

Refer EARTHING Dwg. 1238

Construction Type

EBPTS
EBPTSX
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. TRANSFORMER EARTH
TO STEEL BUTTED WOOD POLE

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.

Strip insulation on both HV Earth downleads

H.V. CONNECTED MAX. RESISTANCE

H.V. Earth wires must not be broken

(Minimum of 3 electrodes)

Additional earthing if required.

Additional earthing if required.

Trench sections

Refer EARTHING Dwg. 1238

Construction Type

EBPTS
EBPTSX
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. TRANSFORMER EARTH
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Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.

Strip insulation on both HV Earth downleads

H.V. CONNECTED MAX. RESISTANCE

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(Minimum of 3 electrodes)

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Additional earthing if required.

Trench sections

Refer EARTHING Dwg. 1238

Construction Type

EBPTS
EBPTSX
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. TRANSFORMER EARTH
TO STEEL BUTTED WOOD POLE

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.

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(Minimum of 3 electrodes)

Additional earthing if required.

Additional earthing if required.

Trench sections

Refer EARTHING Dwg. 1238

Construction Type

EBPTS
EBPTSX
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION

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S.W.E.R. TRANSFORMER EARTH
TO STEEL BUTTED WOOD POLE

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.

Strip insulation on both HV Earth downleads

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H.V. Earth wires must not be broken

(Minimum of 3 electrodes)

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Trench sections

Refer EARTHING Dwg. 1238

Construction Type

EBPTS
EBPTSX
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION

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S.W.E.R. TRANSFORMER EARTH
TO STEEL BUTTED WOOD POLE

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.

Strip insulation on both HV Earth downleads

H.V. CONNECTED MAX. RESISTANCE

H.V. Earth wires must not be broken

(Minimum of 3 electrodes)

Additional earthing if required.

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Trench sections

Refer EARTHING Dwg. 1238

Construction Type

EBPTS
EBPTSX
EA (Additional)
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S.W.E.R. TRANSFORMER EARTH
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EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. TRANSFORMER EARTH
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OVERHEAD DISTRIBUTION

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EBPTS
EBPTSX
EA (Additional)
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OVERHEAD DISTRIBUTION

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EA (Additional)
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S.W.E.R. TRANSFORMER EARTH
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S.W.E.R. TRANSFORMER EARTH
TO STEEL BUTTED WOOD POLE

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Strip insulation on both HV Earth downleads

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H.V. Earth wires must not be broken

(Minimum of 3 electrodes)

Additional earthing if required.

Additional earthing if required.

Trench sections

Refer EARTHING Dwg. 1238

Construction Type

EBPTS
EBPTSX
EA (Additional)
EAR (Additional rod)
NOTES
1. Do not bond earth leads to steel butt
2. LV earth to be insulated from steel butt with HV heatshrink
3. Earthing to run in direction of mains.
4. L.V. earthing system to be connected to L.V. neutral (M.E.N. system).
5. H.V. earthing system to be connected to H.V. Earth bushing and tank earth. Earth leads to run down opposite side of the pole and must be insulated and continuous from H.V. earth bushing to first H.V. electrode and from tank earth to first H.V. electrode on opposite side of pole.
6. The H.V. Earth system is to be a minimum of 1.0m from any insulated communication cable and 15.0m from any communications manhole, pit or pillar.
7. Customer Underground Mains are not allowed on S.W.E.R. poles carrying H.V. Earths.
8. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - LV earth rod or cable = 0.3m
     - HV earth rod = 15.0m Distribution Transformer / 25.0m Isolating Transformer
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - LV earth rod or cable = 0.3m
     - HV earth cable (site earth) = 1.0m
   For separation from other communications assets refer Standards Section.
9. If the required separations can not be obtained between Telstra equipment and Ergon SWER earths contact Lines Standards.
10. A minimum 2.0m separation shall be maintained between the HV earth system and any conductive structure.
MATERIAL

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>30</td>
</tr>
<tr>
<td>122-1</td>
<td>Earth H.V. SWER (35mm²) to wood pole - deep drilled</td>
<td>1</td>
</tr>
<tr>
<td>123-1</td>
<td>Earth LV 35mm² to wood pole - deep drilled</td>
<td>1</td>
</tr>
<tr>
<td>238-5</td>
<td>Bandit strap to steel butted wood pole</td>
<td>1</td>
</tr>
<tr>
<td>239-3</td>
<td>LV earth guard (20mm) with HV heatshrink insulation to wood pole</td>
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</table>

MATERIAL - ADDITIONAL EARTH LV

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MATERIAL - ADDITIONAL EARTH HV

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<tr>
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<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>124-2</td>
<td>Earth additional HV - deep drilled</td>
<td>AR</td>
</tr>
</tbody>
</table>

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

To Transformer L.V. Neutral bushing
Assy 123-1
Assy 14-1 (500 Intervals)

To Transformer
tank
Assy 122-1

L.V. DISCONNECTED

10 Ohm Max.

Strip insulation for portable earth connection
Additional earthing if required
Assy 124-1 Refer note 8

Warning Sign

H.V. CONNECTED MAX. RESISTANCE
(H.V. Earth wires must not be broken (Minimum of 3 electrodes))

<table>
<thead>
<tr>
<th>kVA</th>
<th>11kV</th>
<th>12.7kV</th>
<th>19.1kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>14Ω</td>
<td>16Ω</td>
<td>25Ω</td>
</tr>
<tr>
<td>25</td>
<td>6Ω</td>
<td>7.5Ω</td>
<td>11Ω</td>
</tr>
<tr>
<td>50</td>
<td>3.5Ω</td>
<td>4Ω</td>
<td>6Ω</td>
</tr>
<tr>
<td>100</td>
<td>2Ω</td>
<td>2.3Ω</td>
<td>3.4Ω</td>
</tr>
</tbody>
</table>

ISOLATING S/STN

<table>
<thead>
<tr>
<th>kVA</th>
<th>11kV</th>
<th>12.7kV</th>
<th>19.1kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1Ω</td>
<td>1.2Ω</td>
<td>1.9Ω</td>
</tr>
</tbody>
</table>

Earth additional
Assy 124-2

Additional earthing if required
Assy 124-2 Refer note 8

H.V. Earth wires must not be broken (Minimum of 3 electrodes)

OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. TRANSFORMER EARTH DEEP DRILLED TO STEEL BUTTED WOOD POLE

Construction Type

EBPTS/DD
EBPTSX/DD
EADDCC (Additional)
EADDCC (Additional)

Dwg 1819 Sh 1
NOTES

1. Do not bond earth leads to steel butt.
2. LV earth to be insulated from steel butt with HV heatshrink.
3. Earthing to run in direction of mains.
4. LV earthing system to be connected to LV neutral (M.E.N. system).
5. HV Earthing system to be connected to HV earth bushing and tank earth.
   HV Earth leads to run down opposite sides of the pole and must be insulated and continuous from HV earth bush and tank earth to first HV electrode.
6. HV & LV electrodes - 35mm² bare copper cable deep drilled to a minimum of 20m unless good moisture is reached.
   - Good moisture is defined as extracted bore hole soil containing adequate proportion of water so that when
     squeezed by hand it holds its form and releases water content - similar to mud.
   - A drilling rig using nominal 75mm bit is required.
   - HV earthing electrode shall be installed to the same depth
   - The holes are to be refill immediately with dry earth enhancing compound. DO NOT ADD WATER.
7. DEEP DRILLED EARTH TESTING - Specified earth resistance may not be achieved for some days after earthing is installed. Where specified resistance is not chieved prior to completion of work on site the installation shall be tested after 7 days and additional earthing added as necessary.
8. The additional earthing if required must be spaced at least two times the depth of adjacent earthing electrode.
   For example if adjacent earthing is at 20m, then the additional earthing must be spaced at least 40m.
10. Separation from communication equipment:
    * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
      - LV earth rod or cable = 0.3m - HV earth rod = 15.0m Distribution Transformer / 25.0m Isolating Transformer
      - HV bare earth cable (site earth) = 15.0m Distribution transformer / 25.0m Isolating transformer
    * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
      - LV earth rod or cable = 0.3m - HV earth cable (site earth) = 1.0m. For separation from other communications assets refer Standards Section.
11. If the required separations can not be obtained between Telstra equipment and Ergon SWER earths contact Lines Standards.
12. A minimum 2.0m separation shall be maintained between the HV earth system and any conductive structure.
MATERIAL

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>20</td>
</tr>
<tr>
<td>105-10</td>
<td>Earth guard SWER to wood pole</td>
<td>2</td>
</tr>
<tr>
<td>121-1</td>
<td>Earth H.V. SWER (35mm²) to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>238-5</td>
<td>Bandit strap to steel butted wood pole</td>
<td>1</td>
</tr>
</tbody>
</table>

MATERIAL - ADDITIONAL EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>104-1</td>
<td>Earth rod additional</td>
<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
<td>AR</td>
</tr>
</tbody>
</table>

H.V. CONNECTED MAX. RESISTANCE

<table>
<thead>
<tr>
<th>REACTOR</th>
<th>kVAr</th>
<th>11kV</th>
<th>12.7kV</th>
<th>19.1kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>6Ω</td>
<td>7Ω</td>
<td>10Ω</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3.3Ω</td>
<td>3.5Ω</td>
<td>5Ω</td>
<td></td>
</tr>
</tbody>
</table>

Trench sections
Refer EARTHING Dwg. 1238

Additional earthing if required.
If more than 4 additional earthrods required, contact local Ergon branch.
Assy selection 104-5 or 104-1 and 5

Construction Type
EBPREAS (Reactor)
EBPREASX (Reactor)
EA (Additional)
EAR (Additional rod)

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. REACTOR EARTH TO STEEL BUTTED WOOD POLE

H.V. Earth wires must not be broken
(Minimum of 3 electrodes)

Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.
NOTES:

1. Do not bond earth leads to steel butt.
2. Earthing to run in direction of mains.
3. H.V. earthing system to be connected to H.V. Earth bushing and tank earth. Earth leads to run down opposite sides of the pole and must be insulated and continuous from H.V. earth bushing to first H.V. electrode and from tank earth to first H.V. electrode on opposite side of pole.
4. The minimum requirements for electrodes is that they be copper clad electrodes.
5. The spacing of additional earth electrodes to be equal to twice the earth electrode length installed.
6. Separation from communication equipment:
   - Provide the following minimum separation to communications pillars/
cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
   - Provide the following minimum separation to communications cable
     plastic sheathed / jacketed or in plastic conduit:
     - HV earth cable (site earth) = 1.0m
   For separation from other communications assets refer Standards Section
7. If the required separations can not be obtained between Telstra equipment and Ergon SWER earths contact Lines Standards.
8. A minimum of 2m separation shall be maintained between the HV earth system and any conductive structure.
The minimum separation shall not be less than 50mm.

Additional earthing if required
Assy 124-2
Refer note 6

Caution tape

Strip insulation on both HV Earth downleads

Assy 105-10
(Saddles at 500 Intervals)

Assy 14-1
(500 Intervals)

Assy 122-1

Warning Sign

Trench sections
Refer EARTHING Dwg. 1238

Construction Type
EBPREAS/DD (Reactor)
EBPREASX/DD (Reactor)
EADDCC (Additional)

H.V. CONNECTED MAX. RESISTANCE

H.V. Earth wires must not be broken
(Minimum of 3 electrodes)

<table>
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<tr>
<th>REACTOR</th>
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<td>6Ω</td>
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</tr>
<tr>
<td></td>
<td>50</td>
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<td>4Ω</td>
<td>6Ω</td>
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Maintain as much separation as possible between HV earthwire downleads & LV cables & apparatus.

HARD COPY
UNCONTROLLED

Ergon Energy Corporation Ltd
ABN 50 087 646 062

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
SWER REACTOR EARTH DEEP DRILLED TO STEEL BUTTED WOOD POLE

Dwg 1822 Sh 1

FILE: 5 27 1822.1

C. Noel
C. Avenell
L. Burton

APPROVED
DATE
PASSED
DRAWN

31/10/12

C

EBPREAS/DD (Reactor)
EBPREASX/DD (Reactor)
EADDCC (Additional)
NOTES

1. Do not bond earth leads to steel butt.
2. Earthing to run in direction of mains.
3. H.V. Earthing system to be connected to H.V. earth bushing and tank earth. H.V. Earth leads to run down opposite sides of the pole and must be insulated and continuous from H.V. earth bush and tank earth to first H.V. electrode.
4. H.V. electrodes - 35mm² bare copper cable deep drilled to a minimum of 20m unless good moisture is reached.
   - Good moisture is defined as extracted bore hole soil containing adequate proportion of water so that when squeezed by hand it holds its form and releases water content - similar to mud.
   - A drilling rig using nominal 75mm bit is required.
   - HV earthing electrode shall be installed to the same depth
   - The holes are to be refilled immediately with dry earth enhancing compound.
5. 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.
6. The additional earthing if required must be spaced at least two times the depth of adjacent earthing electrode.
   For example if adjacent earthing is at 20m, then the additional earthing must be spaced at least 40m.
7. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - HV earth rod = 15.0m - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - HV earth cable (site earth) = 1.0m
     For separation from other communications assets refer Standards Section
8. If the required separations can not be obtained between Telstra equipment and Ergon SWER earths contact Lines Standards
9. A minimum of 2m separation shall be maintained between the HV earth system and any conductive structure.
H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

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<td>104-1</td>
<td>Earth rod additional</td>
<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
<td>AR</td>
</tr>
</tbody>
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Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

HOVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. RECLOSER (WITH VT) EARTH TO STEEL BUTTED WOOD POLE

Construction Type

OVERHEAD DISTRIBUTION

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

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Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

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Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

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The minimum separation shall not be less than 50mm.

Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
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<tbody>
<tr>
<td>104-1</td>
<td>Earth rod additional</td>
<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
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</tr>
</tbody>
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Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

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Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

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EBACRSX
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EAR (Additional rod)

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(Minimum of 3 electrodes)
Recloser - 25 ohms max.

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Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

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EBACRSX
EA (Additional)
EAR (Additional rod)

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(Minimum of 3 electrodes)
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Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

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Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

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Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

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Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

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Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

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Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Overhead Distribution
Earth Nailed & Steel Butted Wood Pole
S.W.E.R. Recloser (With VT) Earth to Steel Butted Wood Pole

EBACRS
EBACRSX
EA (Additional)
EAR (Additional rod)

H.V. CONNECTED
H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.
NOTES:
1. Do not bond earth leads to steel butt
2. Earthing to run in direction of mains.
3. H.V. earthing system to be connected to H.V. Earth bushing and tank earth. Earth leads to run down opposite sides of the pole and must be insulated and continuous from H.V. earth bushing to first H.V. electrode and from tank earth to first H.V. electrode on opposite side of pole.
4. The minimum requirements for electrodes is that they be copper clad electrodes.
5. The spacing of additional earth electrodes to be equal to twice the earth electrode length installed.
6. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/
cabinets, cable pits/manholes, payphones or miscellaneous earths:
   - HV earth rod = 15.0m
   - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable
     plastic sheathed / jacketed or in plastic conduit:
   - HV earth cable (site earth) = 1.0m
     For separation from other communications assets refer Standards Section
7. If the required separations can not be obtained between Telstra equipment and Ergon SWER earths contact Lines Standards.
8. A minimum of 2m separation shall be maintained between the HV earth system and any conductive structure.
H.V. CONNECTED

H.V. Earth wires must not be broken

(Minimum of 3 electrodes)
Recloser - 25 ohms max.

MATERIAL - ADDITIONAL EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>124-2</td>
<td>Earth additional HV - deep drilled</td>
<td>AR</td>
</tr>
</tbody>
</table>

Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Refer note 6

Additional earthing if required

Assy 124-2

OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
S.W.E.R. RECLOSER (WITH VT) DEEP DRILLED
EARTH - TO STEEL BUTTED WOOD POLE

EBACRS/DD
EBACRSX/DD
EADDCC (Additional)
NOTES:

1. Do not bond earth leads to steel butt.
2. Earthing to run in direction of mains.
3. H.V. Earthing system to be connected to H.V. earth bushing and tank earth. H.V. Earth leads to run down opposite sides of the pole and must be insulated and continuous from H.V. earth bush and tank earth to first H.V. electrode.
4. H.V. electrodes - 35mm² bare copper cable deep drilled to a minimum of 20m unless good moisture is reached.
   - Good moisture is defined as extracted bore hole soil containing adequate proportion of water so that when squeezed by hand it holds its form and releases water content - similar to mud.
   - A drilling rig using nominal 75mm bit is required.
   - HV earthing electrode shall be installed to the same depth
   - The holes are to be refilled immediately with dry earth enhancing compound. **DO NOT ADD WATER**
5. 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.
6. The additional earthing if required must be spaced at least two times the depth of adjacent earthing electrode. For example if adjacent earthing is at 20m, then the additional earthing must be spaced at least 40m.
7. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed/jacketed or in plastic conduit:
     - HV earth cable (site earth) = 1.0m
   For separation from other communications assets refer Standards Section
8. If the required separations can not be obtained between Telstra equipment and Ergon SWER earths contact Lines Standards.
9. A minimum 2.0m separation shall be maintained between the HV earth system and any conductive structure.
### MATERIAL - SEPARATE EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>10</td>
</tr>
<tr>
<td>103-1</td>
<td>Earth HV 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>87-12</td>
<td>Connection P.G. Cu-Cu</td>
<td>1</td>
</tr>
<tr>
<td>238-5</td>
<td>Bandit strap to steel butted wood pole</td>
<td>1</td>
</tr>
</tbody>
</table>

### NOTES:

1. Do not bond earth lead to steel butt
2. The earthing electrode of other apparatus mounted on the same pole should be located at least 3.0m clear of earth mat and the conductor insulated to avoid transfer potential.
3. For wood pole attachments and foundations refer to Construction Practices.
4. Earthing to run in direction of mains. For clarity, drawing shows earth trenching transverse to mains.
5. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes payphones or miscellaneous earths:
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - HV bare earth cable (site earth) = 0.3m
   For separation from other communications assets refer Standards Section
6. Attach warning sign beside remote HV earth lead.
7. A remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-3.

### OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
HV EQUIPMENT EARTH ARRANGEMENT TO
STEEL BUTTED WOOD POLE - MATERIAL
Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus. The minimum separation shall not be less than 50mm.

Additional earthing if required.
If more than 4 additional earthrods required, contact local Ergon branch.
Assy selection 104-5 or 104-1 and 5

4.0m min (single rod)
8.0m min (double rod)

30 ohm Max.

HV EQUIPMENT EARTH ARRANGEMENT TO
STEEL BUTTED WOOD POLE - CONSTRUCTION

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
HV EQUIPMENT EARTH ARRANGEMENT TO
STEEL BUTTED WOOD POLE - CONSTRUCTION

EBHVE
EBHVEX

Construction Type

Assy 87-12
To HV equipment (e.g. Arrester/Tank/Sectionaliser/Darverter)
Assy 103-1
To Control Cubicle
Assy 14-1
(Saddles at 500 intervals)
Assy 105-5
(Saddles at 500 intervals)
Assy 238-5
Bandit straps at 500 intervals on steel section

Trench sections
Refer EARTHING Dwg. 1238

Strip insulation
60
150
20
Pole

H.V. CONNECTED
H.V. Earth wire must not be broken

104-1 and 5

Additional earthrods if required.

1825

Dwg 1825 Sh 2
H.V. CONNECTED
H.V. Earth wire must not be broken

Refer EARTHING Dwg. 1238

To HV equipment (e.g. Arrester/Tank/Sectionaliser/Darverter)
Assy 223-1
To Control Cubicle
Assy 14-1
(Saddles at 500 intervals)
Assy 105-5
(Saddles at 500 intervals)

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus.
The minimum separation shall not be less than 50mm.

Refer sheet 1 note 6

Construction Type
EBHVE
EBHVEX
EAR (Additional)
ERA (Additional rod)

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
HV EQUIPMENT REMOTE EARTH ARRANGEMENT TO
STEEL BUTTED WOOD POLE - CONSTRUCTION

Additional earthing if required.
If more than 4 additional earthrods required, contact local Ergon branch.
Assy selection 104-5 and 225-3

Refer note 7 sheet 1
## MATERIAL - SEPARATE EARTH

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<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>20</td>
</tr>
<tr>
<td>86-12</td>
<td>Setscrew fixing M12 x 25 S/S</td>
<td>1</td>
</tr>
<tr>
<td>18-5</td>
<td>Connector I.P.C. 25/95mm² main to 6/35mm² tap</td>
<td>1</td>
</tr>
<tr>
<td>87-3</td>
<td>Connection P.G. Al./Steel - Cu. (PG2)</td>
<td>1</td>
</tr>
<tr>
<td>87-10</td>
<td>Connection P.G. Cu. - Cu. (PG4)</td>
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</tr>
<tr>
<td>87-12</td>
<td>Connection P.G. Cu. - Cu. (PG5)</td>
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<tr>
<td>103-1</td>
<td>Earth 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>103-5</td>
<td>Earth M.E.N to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>140-6</td>
<td>Cable, insulated hard drawn Cu. 35mm²</td>
<td>6m</td>
</tr>
<tr>
<td>141-14</td>
<td>Lug, compression Cu. 35mm² M12</td>
<td>1</td>
</tr>
<tr>
<td>238-1</td>
<td>Cable guard earth to steel butted wood pole</td>
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## MATERIAL - REMOTE SEPARATE EARTH

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<td>Setscrew fixing M12 x 25 S/S</td>
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<td>Connector I.P.C. 25/95mm² main to 6/35mm² tap</td>
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<td>Connection P.G. Al./Steel - Cu. (PG2)</td>
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<td>87-12</td>
<td>Connection P.G. Cu. - Cu. (PG5)</td>
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<tr>
<td>223-1</td>
<td>Earth remote HV separate 35mm² to wood pole</td>
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<tr>
<td>103-5</td>
<td>Earth M.E.N to wood pole</td>
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<td>238-1</td>
<td>Cable guard earth to steel butted wood pole</td>
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</table>

## NOTES:-

1. Do not bond HV equipment earth (eg. arrestor / tank) to steel butt.
2. Bond metal cable guard to steel butt.
3. The earthing electrode of other apparatus mounted on the same pole should be located at least 3.0m clear of earth mat and the conductor insulated to avoid transfer potential.
4. For wood pole attachments and foundations refer to Construction Practices.
5. Earthing to run in direction of mains. For clarity, drawing shows earth trenching traverse to mains.
6. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - HV earth rod = 15.0m, Cable guard = 0.3m
     - HV bare earth cable (site earth) = 15.0m
   * For separation from other communications assets refer Standards Section
7. Attach warning sign beside remote HV earth lead.
8. A remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-3.
9. The L.V. neutral is to be connected to the cable guard earth.
**H.V. CONNECTED**

H.V. Earth wire must not be broken

- 30 ohm Max.

HV equipment earth and Metal guard earth MUST NOT BE CONNECTED

**Trench sections**

Refer EARTHING Dwg. 1238

- Caution tape

**Steel Butted Wood Pole**

- Assay 103-5

- Assay 87-12

**Additional earthing if required.**

If more than 4 additional earthrods required, contact local Ergon branch.

Assay Selection 104-5 or 104-1 and 5.

**Construction Type**

EARTH TO STEEL BUTTED WOOD POLE

**M.E.N. SYSTEM**

RESISTANCE TO GROUND

- DISCONNECTED
  - 30 ohm Max.
  - 10 ohm Max.

- CONNECTED

Maintain as much separation as possible between HV earthwire downleads, LV cables & apparatus.

The minimum separation shall not be less than 50mm.

**Caution tape**

3.0m Min.

(Refer Note 3 on sheet 1)

4.0m Min. (Single rod)

8.0m Min. (Double rod)

**EBHVEMGMEN**

**EBHVEMGMENX**

**OVERHEAD DISTRIBUTION**

EARTHING NAILED & STEEL BUTTED WOOD POLE

HV EQUIPMENT, METAL GUARD AND M.E.N. SEPARATE EARTH TO STEEL BUTTED WOOD POLE

**FILE:** 1826 Dwg 1826 Sh 2

**DATE:** 20/11/12

**PASSED:** C. Avenell

**DRAWN:** L. Burton

**APPROVED:** C. Noel

**Ergon Energy Corporation Ltd**

ABN 50 087 646 062
### MATERIAL - ADDITIONAL EARTH REMOTE

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<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
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<td>225-3</td>
<td>Earth rod remote HV additional</td>
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</tr>
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<td>Earth rod additional depth</td>
<td>AR</td>
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### NOTES:-

1. Bond earth to steel butt.
2. For wood pole attachments and foundations refer to Construction Practices.
3. Earthing to run in direction of mains. For clarity, drawing shows earth trenching traverse to mains.
4. Separation from communication equipment:
   * Provide the following minimum separation to communications manholes, pillars, pits etc:
     - Earth rod = 2.0m
     - Bare earth cable = 2.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - Earth rod = 0.3m
     - Bare earth cable = 0.3m
   For separation from other communications assets refer Standards Section
5. Attach warning sign beside remote HV earth lead
6. A remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-3.
**Construction Type**

**Earthing Nailed & Steel Butted Wood Pole**

<table>
<thead>
<tr>
<th>Pole Type</th>
<th>Minimum Length</th>
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<tbody>
<tr>
<td>Steel Butted Wood Pole</td>
<td>4.0m Min. (Single rod)</td>
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<tr>
<td></td>
<td>8.0m Min. (Double rod)</td>
</tr>
<tr>
<td>Wood</td>
<td>8.0m Min. (Double rod)</td>
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</tbody>
</table>

**Earthing**

- **Additional earthing** if required.
- If more than 4 additional earthrods required, contact local Ergon branch. Assay Selection 104-5 or 104-1 and 5.

**Earthing Dwg. 1238**

- Caution tape
- **Trench sections**
- **Connected**: 1 ohm Max.
- **Disconnected**: 30 ohm Max.

**Additional Information**

- **Strip insulation**
- **Bandit straps at 500 intervals on steel section**
- **Assay 103-1**
- **Assay 105-5**
- **Assay 233-5**
- **Assay Selection 104-5 or 104-1 and 5.**
Trench sections
Refer EARTHING Dwg. 1238

Additional earthing if required.
If more than 4 additional earthrods required,
contact local Ergon branch.
Assy Selection 104-5 and 225-3.

Additional earthing if required.
If more than 4 additional earthrods required,
contact local Ergon branch.
Assy Selection 104-5 and 225-3.
### MATERIAL - SEPARATE EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>10</td>
</tr>
<tr>
<td>86-12</td>
<td>Setscrew fixing M12 x 25 S/S</td>
<td>1</td>
</tr>
<tr>
<td>103-1</td>
<td>Earth HV 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>103-5</td>
<td>Earth LV to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>87-12</td>
<td>Connection P.G. Cu-Cu</td>
<td>1</td>
</tr>
<tr>
<td>238-1</td>
<td>Cable guard earth to steel butted wood pole</td>
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### MATERIAL - REMOTE SEPARATE EARTH

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<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>10</td>
</tr>
<tr>
<td>86-12</td>
<td>Setscrew fixing M12 x 25 S/S</td>
<td>1</td>
</tr>
<tr>
<td>223-1</td>
<td>Earth remote HV separate 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>103-5</td>
<td>Earth LV to wood pole</td>
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</tr>
<tr>
<td>105-5</td>
<td>Earth guard HV/LV to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>87-12</td>
<td>Connection P.G. Cu-Cu</td>
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<tr>
<td>238-1</td>
<td>Cable guard earth to steel butted wood pole</td>
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### MATERIAL - ADDITIONAL EARTH

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<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
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### MATERIAL - ADDITIONAL EARTH REMOTE

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<tr>
<td>104-5</td>
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<td>AR</td>
</tr>
<tr>
<td>225-3</td>
<td>Earth rod remote HV additional</td>
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</tr>
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</table>

### NOTES:

1. Do not bond HV equipment earth (eg arrestor / tank) to steel butt.
2. Bond metal guard to steel butt.
3. The earthing electrode of other apparatus mounted on the same pole should be located at least 4.0m clear of earth mat and the conductor insulated to avoid transfer potential.
4. For wood pole attachments and foundations refer to Construction Practices.
5. Earthing to run in direction of mains. For clarity, drawing shows earth trenching transverse to mains.
6. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes payphones or miscellaneous earths:
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - HV bare earth cable (site earth) = 0.3m
   For separation from other communications assets refer Standards Section
7. Attach warning sign beside remote HV earth lead.
8. A Remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-3
The minimum separation shall not be less than 50mm.

HV equipment earth and Metal guard earth MUST NOT BE CONNECTED

Assy 14-1 (Saddles at 500 intervals)
Assy 105-5 (Saddles at 500 intervals)
Assy 103-1
Assy 86-12
Assy 238-1

Bandit straps at 500 intervals on steel section

LV / HV Cable Guard
Refer U/G Construction Manual

Trench sections
Refer EARTHING Dwg. 1238

4.0m Min. (Single rod)
4.0m Min. (Double rod)
8.0m Min. (Double rod)

Caution tape

Additional earthing if required. If more than 4 additional earthrods required, contact local Ergon branch. Assy Selection 104-5 or 104-1 and 5.

H.V. CONNECTED
H.V. Earth wire must not be broken

HV equipment earth and Metal guard earth MUST NOT BE CONNECTED

METAL GUARD CONNECTED
HV equipment earth and Metal guard earth MUST NOT BE CONNECTED

Strip insulation

Caution tape

Pole
HV. Earth wire must not be broken.
HV equipment earth and Metal guard earth MUST NOT BE CONNECTED.

Maintain as much separation as possible between HV & LV earthwire downleads, LV cables & apparatus. The minimum separation shall not be less than 50mm.

Refer note 7 sheet 1.

Additional earthing if required. If more than 4 additional earthrods required, contact local Ergon branch. Assay selection 104-5 and 225-3.

Refer EARTHING Dwg. 1238.

Trench sections Refer EARTHING Dwg. 1238.
## MATERIAL - COMMON EARTH

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<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
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</tr>
<tr>
<td>86-12</td>
<td>Setscrew fixing M12 x 25 S/S</td>
<td>1</td>
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<tr>
<td>18-5</td>
<td>Connector I.P.C. 25/95mm² main to 6/35mm² tap</td>
<td></td>
</tr>
<tr>
<td>87-3</td>
<td>Connection P.G. Al./Steel - Cu. (PG2)</td>
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</tr>
<tr>
<td>87-10</td>
<td>Connection P.G. Cu. - Cu. (PG4)</td>
<td></td>
</tr>
<tr>
<td>103-1</td>
<td>Earth HV 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>140-6</td>
<td>Cable, insulated hard drawn Cu. 35mm²</td>
<td>6m</td>
</tr>
<tr>
<td>141-14</td>
<td>Lug, compression Cu. 35mm² M12</td>
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<tr>
<td>238-1</td>
<td>Cable guard earth to steel butted wood pole</td>
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## MATERIAL - ADDITIONAL EARTH REMOTE

<table>
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<th>DESCRIPTION</th>
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<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
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</tr>
<tr>
<td>225-3</td>
<td>Earth rod remote HV additional</td>
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## MATERIAL - REMOTE COMMON EARTH

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<th>DESCRIPTION</th>
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</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>20</td>
</tr>
<tr>
<td>86-12</td>
<td>Setscrew fixing M12 x 25 S/S</td>
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</tr>
<tr>
<td>18-5</td>
<td>Connector I.P.C. 25/95mm² main to 6/35mm² tap</td>
<td></td>
</tr>
<tr>
<td>87-3</td>
<td>Connection P.G. Al./Steel - Cu. (PG2)</td>
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</tr>
<tr>
<td>87-10</td>
<td>Connection P.G. Cu. - Cu. (PG4)</td>
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</tr>
<tr>
<td>87-12</td>
<td>Connection P.G. Cu. - Cu. (PG5)</td>
<td>2</td>
</tr>
<tr>
<td>223-3</td>
<td>Earth remote common 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>140-6</td>
<td>Cable, insulated hard drawn Cu. 35mm²</td>
<td>6m</td>
</tr>
<tr>
<td>141-14</td>
<td>Lug, compression Cu. 35mm² M12</td>
<td>3</td>
</tr>
<tr>
<td>238-1</td>
<td>Cable guard earth to steel butted wood pole</td>
<td>1</td>
</tr>
</tbody>
</table>

## OVERHEAD DISTRIBUTION

**EARTHING NAILED & STEEL BUTTED WOOD POLE**

**HV EQUIPMENT, METAL GUARD AND M.E.N. COMMON EARTH TO STEEL BUTTED WOOD POLE - MATERIAL**

1. Bond metal guard / M.E.N to steel butt.
2. For wood pole attachments and foundations refer to Construction Practices.
3. Earthing to run in direction of mains. For clarity, drawing shows earth trenching traverse to mains.
4. Separation from communication equipment:
   - Provide the following minimum separation to communications manholes, pillars, pits etc:
     - Earth rod = 2.0m
     - Bare earth cable = 2.0m
   - Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - Earth rod = 0.3m
     - Bare earth cable = 0.3m
   For separation from other communications assets refer Standards Section
5. Attach warning sign beside remote HV earth lead
6. The L.V. neutral is to be connected to the cable guard earth.
7. A remote earth identification pit to be installed at first remote HV earth electrode position. If additional earthing is required an identification pit is to be installed at last electrode position also. Refer assy 225-3.
**Construction Type**

- **30 ohm Max.**
- **1 ohm**

**HV EQUIPMENT, METAL GUARD AND M.E.N. COMMON EARTH TO STEEL BUTTED WOOD POLE**

**OVERHEAD DISTRIBUTION**

- **EARTHING NAILED & STEEL BUTTED WOOD POLE**

---

**Assy Selection 87-3, 10 or 18-5**

- **To HV equipment**
  - (e.g. Arrester/Tank/Sectionaliser/Darverter)
- **To LV neutral**
  - Assy Selection 87-3, 10 or 18-5

**Construction Details**

- **Assy 86-12**
- **Assy 141-14**
- **Assy 140-6**
- **Assy 238-1**
- **Assy 103-1**

**Additional earthing if required.**
If more than 4 additional earthrods required, contact local Ergon branch.

- **Assy Selection 104-5 or 104-1 and 5.**

**4.0m Min. (Single rod)**

**8.0m Min. (Double rod)**

---

**HV EQUIPMENT, METAL GUARD AND M.E.N. COMMON EARTH TO STEEL BUTTED WOOD POLE**

Ergon Energy Corporation Ltd

ABN 50 087 646 062
To HV equipment (e.g. Arrester/Tank/Sectionaliser/Darverter)
To LV neutral
Assy Selection 87-3, 10 or 18-5
To Control Cubicle (if required)
Assy 86-12
Assy 141-14
Assy 140-6
Assy 238-1
LV / HV Cable Guard
Refer Underground Construction Manual
strip insulation
Pole

HV Earth
300 min
Telstra pit
Detail Top View

Trench sections
Refer EARTHING Dwg. 1238
Refer note 7 sheet 1

Additional earthing if required.
If more than 4 additional earthrods required,
contact local Ergon branch.
Assy Selection 104-5 and 225-3.
Common Earth to Steel Butted Wood Pole

Construction Type
EBHVEMGMEN
EBHVEMGMENX
EAR (Additional)
ERA (Additional rod)

Ergon Energy Corporation Ltd
ABN 50 087 646 062

OVERHEAD DISTRIBUTION
EARTHING NAILED & STEEL BUTTED WOOD POLE
HV EQUIPMENT, METAL GUARD AND M.E.N. REMOTE
COMMON EARTH TO STEEL BUTTED WOOD POLE

HARD COPY
UNCONTROLLED

A  ORIGINAL ISSUE

DATE 21/11/12
PASSED C. Avenell
DRAWN L. Burton

FILE:  5  27 1828 3  Dwg 1828  Sh 3
MATERIAL

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>2</td>
</tr>
<tr>
<td>105-5</td>
<td>Earth Guard LV to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>103-1</td>
<td>Earth HV 35mm² to wood pole</td>
<td>1</td>
</tr>
<tr>
<td>238-5</td>
<td>Bandit strap to steel butted wood pole</td>
<td>1</td>
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</table>

MATERIAL - ADDITIONAL EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>104-1</td>
<td>Earth rod additional</td>
<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
<td>AR</td>
</tr>
</tbody>
</table>

NOTES:

1. Earthing to run in direction of mains.
2. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - HV bare earth cable (site earth) = 0.3m
   For separation from other communications assets refer Standards Section
3. This construction can not be used if Telstra equipment is within 15m of pole
4. Do not bond HV operational earth to steel butted wood pole

OVERHEAD DISTRIBUTION

EARTHING NAILED & STEEL BUTTED WOOD POLE
OPERATION POINT - TO STEEL BUTTED WOOD POLE - CONSTRUCTION

RESISTANCE TO GROUND

DISCONNECTED

30 ohm Max.

HV Earth

Telstra pit
300 min

Detail Top View

Trench sections. Refer EARTHING Dwg. 1238

Construction Type

EBOP
EBOPX
EA (Additional)
EAR (Additional rod)

Additional earthing if required.
If more than 4 additional earthrods required, contact local Ergon branch.
Assy selection 104-5 or
104-1 and 5

4.0m Min. (Single rod)
8.0m Min. (Double rod)

Assy 14-1
Assy 103-1
Assy 105-5 (Saddles at 500 Intervals)
Steel Butted Wood Pole

4.0m Min. (Single rod)
4.0m Min. (Single rod)
8.0m Min. (Double rod)

Bandit strap to steel butted wood pole

Ergon Energy Corporation Ltd
ABN 50 087 646 062

FILE: 5  2718351
NOTES:

1. All metalwork that passes through or into wood shall be greased for the entire length that may come into contact with the wood.
2. For wood pole attachments and foundations refer to Construction Practices.
3. A 25mm gap is required between bottom of pole top bracket and top of earth wire.
   Strip end of cable insulation approx. 10mm and place two saddles as shown in detail 'A'.
4. Gapped Bands not required on stayed poles.
5. Gapped bands are to be installed on all new intermediate SWER poles.
6. Earth leads and metal work above ground to be separated by at least 50mm.
7. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - HV bare earth cable (site earth) = 1.0m
   For separation from other communications assets refer Standards Section
8. This construction can not be used if Telstra equipment is within 15m of pole.

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
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<tbody>
<tr>
<td>14-1</td>
<td>Saddle Cu. 10mm to suit 35mm² cable to wood pole</td>
<td>15</td>
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<tr>
<td>55-5</td>
<td>12.7/19.1kV Lightning protection gapped bands to wood pole</td>
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</tr>
<tr>
<td>233-1</td>
<td>Earth to Rebutted wood pole</td>
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### MATERIAL - ADDITIONAL EARTH

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<th>QTY</th>
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</thead>
<tbody>
<tr>
<td>104-1</td>
<td>Earth rod additional</td>
<td>AR</td>
</tr>
<tr>
<td>104-5</td>
<td>Earth rod additional depth</td>
<td>AR</td>
</tr>
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### NOTES:
1. Earthing to run in direction of mains.
2. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - HV earth rod = 15.0m
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - HV bare earth cable (site earth) = 0.3m
3. Do not bond earth lead to steel butt
4. Additional earthing if required.
   If more than 4 additional earthrods required, contact local Ergon branch. Assy selection 104-1 or 104-1 and 5

---

---
**EARTH RESISTANCE VALUES FOR EARTH RODS**

**H.V. CONNECTED MAX. RESISTANCE**
H.V. Earth wires must not be broken
(Minimum of 3 electrodes)

<table>
<thead>
<tr>
<th>DISTRIBUTION S/STN</th>
<th>kVA</th>
<th>11kV</th>
<th>12.7kV</th>
<th>19.1kV</th>
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<tbody>
<tr>
<td>10</td>
<td>13Ω</td>
<td>15Ω</td>
<td>22Ω</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>6Ω</td>
<td>7Ω</td>
<td>10Ω</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3.3Ω</td>
<td>3.5Ω</td>
<td>5Ω</td>
<td></td>
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<tr>
<td>100</td>
<td>2Ω</td>
<td>2.3Ω</td>
<td>3.4Ω</td>
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</table>

**H.V. Earth wires must not be broken**

**DISTRIBUTION S/STN**

<table>
<thead>
<tr>
<th>kVA</th>
<th>11kV</th>
<th>12.7kV</th>
<th>19.1kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>14Ω</td>
<td>16Ω</td>
<td>25Ω</td>
</tr>
<tr>
<td>25</td>
<td>6Ω</td>
<td>7.5Ω</td>
<td>11Ω</td>
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<td>50</td>
<td>3.5Ω</td>
<td>4Ω</td>
<td>6Ω</td>
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<tr>
<td>100</td>
<td>2Ω</td>
<td>2.3Ω</td>
<td>3.4Ω</td>
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**ISOLATING S/STN**

<table>
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<th>kVA</th>
<th>11kV</th>
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<th>19.1kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>2Ω</td>
<td>2.3Ω</td>
<td>3.4Ω</td>
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<tr>
<td>200</td>
<td>1Ω</td>
<td>1.2Ω</td>
<td>1.9Ω</td>
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**CONSTRUCTION TYPE**

**OVERHEAD DISTRIBUTION**
EARTHING NAILED & STEEL BUTTED WOOD POLE
NAIL TO EXISTING WOOD POLE WITH SWER
TRANSFORMER / ISOLATOR EARTH ARRANGEMENT
NOTES
1. Do not bond earth leads to pole nail.
2. LV earth to be insulated from pole nail with HV heat shrink.
3. HV heat shrink to have 100mm coverage from any metal work of pole nail and attachment bolts.
NOTES:-

1. Separation from communication equipment:
   * Provide the following minimum separation to communications manholes, pillars, pits etc:
     - Bonded Pole Nail = 2.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - Bonded Pole Nail = 0.3m
2. The L.V. neutral is to be connected to the cable guard earth.
3. Bond HV equipment earth (e.g. arrester, tank), metal cable guard and MEN to pole nail

---

MATERIAL - EARTH

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
<td>241-4</td>
<td>Metal cable guard earthed to pole nail</td>
<td>1</td>
</tr>
</tbody>
</table>

---

Construction Type

EN/HVEMENMG
NOTES:-
1. Do NOT bond HV equipment earth (eg. arrestor tank) to pole nail.
2. Bond metal guard / MEN to pole nail
3. The HV earthing rod of other apparatus mounted on the same pole shall be located at least 4.0m clear of bonded pole nail and covered cable insulated to the first rod to avoid transfer potential.
4. Separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes payphones or miscellaneous earths:
     - HV earth rod = 15.0m, Cable guard = 0.3m
     - HV bare earth cable (site earth) = 15.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - HV bare earth cable (site earth) = 0.3m
   For separation from other communications assets refer Standards Section
5. Bonded pole nail to be separated from insulated HV Earth downlead by 50mm if not installed in HFT conduit.
NOTES:-

1. Separation from communication equipment:
   - Provide the following minimum separation to communications manholes, pillars, pits etc:
     - Bonded Pole Nail = 2.0m
   - Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - Bonded Pole Nail = 0.3m

2. Bond HV equipment earth (eg. arrestor, tank), to pole nail

---

<table>
<thead>
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<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>234-1</td>
<td>Earth to pole nail</td>
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</table>

Construction Type

EN/HVE

EARTHING NAILED & STEEL BUTTED WOOD POLE
NAIL TO EXISTING WOOD POLE WITH HV EQUIPMENT COMMON EARTH

OVERHEAD DISTRIBUTION

ERGON ENERGY

Ergon Energy Corporation Ltd
ABN 50 087 646 062

DATE 29/1/14
APPROVED C. Noel
PASSED C. Avenell
DRAWN L. Burton
FILE: 5 27 1911.1
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### NOTES:

1. For wood pole attachments and foundations refer to Construction Practices.
2. If metal cable guard is installed ensure guard is bonded to ABS handle.
3. ABS with insulated operating rod separation from communication equipment:
   * Provide the following minimum separation to communications pillars/cabinets, cable pits/manholes, payphones or miscellaneous earths:
     - Separately earthed:
       - ABS earth rod = 1.0m
       - Bare earth cable = 1.0m
       - Metal cable guard = 1.0m
       - Pole nail = 1.0m
     - Common earthed (CMEN):
       - ABS earth rod = 2.0m
       - Bare earth cable = 2.0m
       - Metal cable guard = 2.0m
       - Pole nail = 2.0m
   * Provide the following minimum separation to communications cable plastic sheathed / jacketed or in plastic conduit:
     - ABS bare earth (site earth) = 0.3m
   * for separation from other communications assets refer standards section
4. HV equipment separate earths (e.g. arrestor / tank) and pole nail to be separated by 50mm if not installed in HFT conduit
5. Bond ABS to pole nail.

### MATERIAL

<table>
<thead>
<tr>
<th>ASSY</th>
<th>DESCRIPTION</th>
<th>QTY</th>
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<tbody>
<tr>
<td>234-5</td>
<td>ABS handle to new pole nail</td>
<td>1</td>
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</tbody>
</table>

### Diagram:

- **Construction Type**
- **EN/ABS**
- **Assy 234-5**
- **1.0m min (Separate earth)**
- **2.0m min (Common earth)**
- **Nailed Wood Pole**
- **Telstra pit of equipment**

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**Ergon Energy Corporation Ltd**
ABN 50 087 646 062

**OVERHEAD DISTRIBUTION**
EARTHING NAILED & STEEL BUTTED WOOD POLE
AIR BREAK SWITCH NEW POLE NAIL EARTHING ARRANGEMENT

**DATE** 14.06.12

**APPROVED** C. Noel

**PASSED** C. Avenell

**DRAWN** T. Borg