

COMMISSIONING LV UNDERGROUND CABLE INSTALLATIONS SWP

1. PURPOSE AND SCOPE

The purpose of this Standard Work Practice (SWP) is to standardise and prescribe the method for the commissioning of low voltage underground cable installations.

2. STAFFING RESOURCES

Technical Service Person (Electrical Fitter Mechanic or Cable Joiner) and a Competent Assistant.

Safety Observer where required.

Required Training and Certificates

Staff must be current in all Statutory Training relevant for the task.

All workers must have Completed Field Induction or have recognition of prior Ergon Energy Field Experience.

Contractors must have completed Ergon Energy's Generic Contractor Worker Induction.

Additional Training

Training Course Description for Authorisations or Certificates.
Confined Space Awareness, if required
Safe Work in Confined Spaces, if required
Perform Cable Pit/Trench/Excavation Rescue, if required
Joint and Terminate Underground LV Cables
Low Voltage Switching & Access

3. DOCUMENTATION

EQL SWMS - Safe Work Method Statements

HazChat - On-Site Hazard Assessment

Health and Safety Policy - 692225

Procedures for Safe Access to High Voltage Electrical Apparatus (SAHV) - 2904212

Electrical Safety Rules 2022 - 6503074

LV Cable Commissioning Test Report - 2945423

Operate the Network Enterprise Process - 2909674

Manage Low Voltage Switching for De-energised Access on the Network - 2882932

Electricity Safety Code of Practice

Work Health and Safety Regulations

Underground Construction Manual

Electrical Safety Regulation

4. KEY TOOLS AND EQUIPMENT

Insulating gloves applicable to task, work gloves, safety headwear where gravitational hazards exist, safety eyewear and footwear, high visibility clothing, protective clothing, hearing protection, and sun protection.

Pole top rescue kit LV Rescue Kit (where required).

Confined space monitoring and rescue equipment (where required).

Roadway warning signs.

Barricading.

Work site communication equipment (e.g. 2-way radio, etc).

Test equipment shall comply with Code of Practice for Electrical Work Section 6 and be fitted with fused leads (where applicable).

DC insulation resistance tester.

Dry chemical fire extinguisher.

Class 00 Low Voltage Gloves.

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5. TASK STEPS

5.1. Carry out an on-site hazard assessment

Prior to performing this activity any hazards associated with prerequisite tasks at the worksite shall be identified and assessed with appropriate control measures implemented and documented in accordance with the HazChat - On-Site Hazard Assessment.

If any hazards cannot be managed or reduced to an acceptable level, do not proceed with the task and seek assistance from your Supervisor.

5.2. Preliminary steps

As per constructed drawing supplied to work crew with construction folder.

Ensure test equipment is suitable for task. Confirm all test equipment is within current test date, calibrated and operational.

Select all required test equipment for performing earthing resistance, continuity and insulation resistance, voltage, phase rotation and polarity tests.

Assign adequate staffing resources with required competencies to safely complete task.

Ensure all persons required to use test equipment are competent in its operation.

Assign adequate staffing resources with required competencies to safely complete tests.

Reinforce requirement to wear all required PPE including applicable class of gloves. Ensure class 00 gloves, and insulated mats are used while working on or near exposed live parts.

Live work on LV including testing is only to be performed where a documented safe system of work is implemented.

Persons performing electrical testing must ensure electrical equipment is tested to confirm electrical work performed is electrically safe and all persons not necessary for testing are electrically safe.

Use roadway warning signs/ barricading to control vehicle and pedestrian traffic around work zone and relevant exclusion zones around live parts.

Ground conditions and potential slip/fall hazards in travel path considered in the HazChat - On-Site Hazard Assessment.

Identify locations defined as confined spaces and ensure compliance with confined space entry requirements.

Ensure ready on-site access to dry chemical fire extinguisher where a gas torch is used.

5.3. Confirm isolation prior to test

Check phase rotation where required.

Confirm LV fuse carriers open & fuse cartridges removed (where applicable).

Confirm LV cables to be tested are isolated from all sources of supply and tagged, and locked where provision is made, in accordance with LV isolation requirements. Ensure all members of working party sign on and understand requirements of LV Isolation Section of the HazChat - On-Site Hazard Assessment.

Ensure class 00 gloves, and insulated mats are used while working on or near exposed live parts. Ensure insulated tools are used while working on or near exposed live parts.

Comply with EQL SWMS - Safe Work Method Statements when working aloft.

Ensure ground-based persons are clear of no go zone while work is performed aloft.

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5.4. Prove mechanical and electrical integrity of LV cable installations

Confirm by sample (at intervals no greater than 6 pillars apart) that cable terminations at pillars and poles are tight and phase colours correct.

Disconnect all Multiple Earth Neutral connections of cable section under test.

Remove street light fuses and disconnect associated neutrals at street light poles.

Remove any other loads that may be connected to the cable section.

Carry out the following test and enter results into LV Cable Commissioning Test Report - 2945423

Perform **continuity test** between each phase and neutral conductor combinations with a bridge connected between applicable conductors at cable end and confirm similar resistance values between tests (i.e. A-B, B-C, A-C, \emptyset -N) – a maximum variation of 10% between readings. Ensure all Tee off sections off the feeder also have a continuity test performed.

Perform the **Insulation Resistance** test by applying 1.0kV between phase to phase and phase to neutral (e.g. A-B+C+N+E, B-A+C+N+E, C-A+B+N+E, N-A+B+C+E) for LV cables until a steady value is achieved (minimum allowable resistance on new cables is 100M Ω , minimum allowable resistance prior to energisation of aged cables is 1M Ω) and record readings.

For cables metallic sheaths, disconnect all earth leads/MEN links and test the **Sheath Integrity** by applying 1.0kV between the Metallic Sheathing (Msh) and Earth. Record values as measured. Measured value of 10M Ω or greater is acceptable.

Conduct earth resistance tests at MEN points and record results.

Energise Cable and Confirm Polarity.

Remove DNOB from LV cable isolation points.

Replace fuse cartridges and close.

At the last pillar of each circuit and at sample locations (at intervals no greater than 6 pillars apart):

- Check polarity and record (Phase to phase, phase to neutral, phase to independent earth).
- Check phase rotation.
- Phase out to other supply across existing LV open point (where applicable).

Reconnect all Multiple Earth Neutral connections of cable section under test.

Conduct polarity tests at street lights and reconnect streetlight neutrals.

Confirm all neutral and MEN conductors are reinstated after polarity tests.

5.5. Final checks

Ensure all final tests have been carried out and completed works have been built to the design plan / construction standards.

Check that the cabinet / padmount are locked, or the pillar lid is replaced and securely bolted down, where work has been carried in these areas.

Caution: Where multiple cables have been installed and not all cables are being commissioned then confirm that the correct cables have been energised and any un-terminated cables are still de-energised.

Make the site electrically and mechanically safe and tidy the area before leaving.

Update all records relevant to the work undertaken.