

Company Directive

STANDARD TECHNIQUE : CAØW/1

Relating to Procedures for Changing Street Lighting Cut-Outs with the Incoming LV Service Cable Live

Policy Summary

This Standard Technique document contains all the approved procedures for changing LV Service Street Lighting Cut-Outs for PVC Plain or Split Concentric and PILC cables. It shall be implemented in conjunction with the appropriate General Requirements in ST: CAØC.

This ST has not been written as a training document. It is not intended to be exhaustive in content and you must refer to your supervisor if you require training or instruction.

You shall work safely and skilfully, utilising the training/instruction you have already received, relating to the contents of this document and its cross-references.

You must make sure that you understand your job instructions and that you have the necessary tools and equipment for the job.

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Approved by:

Policy Manager

Date:

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ST: CAØW/1 PROCEDURES FOR CHANGING LV SERVICE CABLE STREET LIGHTING CUT-OUTS

INTRODUCTION

This Standard Technique document contains all the approved procedures for changing street lighting cut-outs live. It shall be implemented in conjunction with the appropriate General Requirements in ST: CAØC, including:

1. General Cleanliness and Accident Prevention
2. General Jointing Procedures - Dead Cables
3. General Jointing Procedures and Safety Precautions - Live Cables

CONTENTS	Page
General Principles	3
General Notes	4
Tools and Shrouding	5
7.601 Procedure for changing insulated cut-outs with the incoming PVC Plain or Split Concentric and PVCSWA service cables - live.	6
7.602 Procedure for changing insulated cut-outs with incoming PILC service cable - live.	12
7.603 Procedure for the removal of PVC Plain or Split Concentric service cables from insulated cut-outs sited in Street Furniture - live.	19
Note: - Any reference to plain concentric equally applies to hybrid. The phase conductor insulation may be either XLPE or PVC.	

ST: CAØW/1 PROCEDURES FOR CHANGING LV SERVICE CABLE STREET LIGHTING CUT-OUTS

GENERAL PRINCIPLES

Before undertaking any street lighting cut-out change, the work required and the safety considerations shall be evaluated. A risk assessment shall form an integral component of the application of these techniques. Significant risks shall be recorded.

If due to access difficulties, or any other safety consideration it is felt that the work cannot be carried out safely with the incoming service cable live, the work shall be carried out dead, i.e. by cutting the service cable, clear of the column.

The jointing procedures apply only to cut-out changes where the street lighting column is not being replaced.

Insulated cut-outs may be changed in accordance with Jointing Procedure 8.601 and 8.602, providing it is possible to safely withdraw the cut-out through the inspection access, so that the work may be carried out outside the column with a length of at least 150mm of free cable. If these requirements cannot be achieved the service cable shall be cut, clear of the column.

Live changing of cut-outs is limited to the following types of service cable: -

- Plain concentric
- Split concentric
- PVC insulated, twin, steel wire armoured
- PILC, twin, steel tape armoured

Metal clad cut-outs in street lighting columns shall not be changed live in any circumstances.

ST: CAØW/1 PROCEDURES FOR CHANGING LV SERVICE CABLE STREET LIGHTING CUT-OUTS

GENERAL NOTES

1. No cut-out shall be changed live if it is reasonably practicable in the interests of safety to make the service dead. All conductors or associated terminations shall be treated as live, until proved dead.
2. Where a cut-out is used for providing a looped service the procedure shall only apply where the loop service cut-out(s) can be isolated.
3. This work shall be carried out in strict compliance with the current issue of the Distribution Safety Rules with particular reference to sections 8.5 and 8.6.
4. Rule 8.6.1 specifically makes provision for the physical requirement in live cut-out changes where it may be necessary to have more than one conductor bared at a time in order to carry out the operation effectively. The time period when such a condition needs to exist shall be kept to an absolute minimum and all cores not being worked on shall be temporarily shrouded using approved insulation securely taped into position.
5. Rule 8.6.3 states “No person shall work on a live cable unless accompanied by another who shall be in a safe position at the site of the work and have the necessary competence to avoid danger and to render or obtain assistance in an emergency”. It is also important that the second man should ensure non-interference by others and have immediate access to a suitable fire extinguisher.
6. Should the person carrying out the work consider that it would be dangerous to proceed at any stage of the procedure then work shall cease immediately and he shall seek advice from his Supervisor - the work place shall not be left unattended unless safe to do so.
7. Whilst the work is being carried out the person carrying out the work shall make use of protective clothing made available in accordance with Rule 1.10 of the Distribution Safety Rules.
8. LV rubber gloves shall be worn when handling live conductors together with a face visor and your attention drawn to the level of PPE required for this operation which shall be as given in the matrix General Requirement 3.
9. The following tests are to be undertaken in accordance with their relevant Standard Technique:- Polarity ST:OS3E, Phase Rotation ST:MI13K, Voltage ST:HS15J, Earth Loop Impedance ST:MI14D and Required Inspections and Tests of an LV Service ST:NC5A, also General Requirement 6.3.
10. Your attention is drawn to the use of Cleaning/Degreasing Solvents, General Requirement 1.

ST: CAØW/1 PROCEDURES FOR CHANGING LV SERVICE CABLE STREET LIGHTING CUT-OUTS

TOOLS AND SHROUDING

TOOL REQUIREMENTS

Only approved fully insulated tools shall be used.

This does not preclude the use of the standard core knife for trimming conductor insulation or a hack knife for the lead sheath.

SHROUDING REQUIREMENTS

Due to the diversity of situations likely to be experienced, it is not practicable to define precise methods of shrouding exposed metalwork.

The same principles used for shrouding during live low voltage jointing should be followed. Recommended materials are given below.

For small areas of shrouding:

- “VM” Tape
- Adhesive Rubber Patches

Edges of Access Hole:

- Co-flex Tubing
- PVC Sheath from Wavecon Cable

For larger areas of shrouding

- Rubber Mats (cut to size and shape)
- Velcro backed plastic shrouding

**ST: CAØW/1 PROCEDURES FOR CHANGING LV SERVICE CABLE STREET
LIGHTING CUT-OUTS**

JOINTING PROCEDURE 7.601

**PROCEDURE FOR CHANGING INSULATED CUT-OUTS WITH
THE INCOMING PVC PLAIN OR SPLIT CONCENTRIC AND
PVCSWA SERVICE CABLE LIVE**

**This procedure is to be read in conjunction with the appropriate
General Requirements ST: CAØC Section 6
of the LV Service Cable Jointing Manual**

JOINTING PROCEDURE 7.601

PROCEDURE FOR CHANGING INSULATED CUT-OUTS WITH THE INCOMING PVC PLAIN OR SPLIT CONCENTRIC AND PVCSWA SERVICE CABLE LIVE

Note: -

1. This Jointing Procedure applies only to insulated cut-outs where the sealing chamber has not been filed with compound.
2. It is a requirement that the cut-out can only be changed outside of the column provided that at least 150mm of free cable is obtainable.

Your attention is drawn for the need to comply with General Principles, General Notes, Tools and Shrouding of this Standard Technique at all times.

JOINTING PROCEDURE 7.601

MATERIALS LIST

Item	Quantity
Replacement cut-out of appropriate type	1

ADDITIONAL ITEMS FOR EACH TERMINATION

Insulation patch
PVC tape
“VM” tape
Seals
Sealing wire

Note: - Individual material item numbers (SHOPS) are to be found in Section 4 of the LV Service Cable Jointing Manual.

JOINTING PROCEDURE 7.601

1. PREPARATORY WORK

- 1.1 All immediately adjacent metal work shall be screened using approved insulating material.
- 1.2. Check the service cable, cut-out and tails have no defects which would render it unsafe to move.
- 1.3. Switch off isolator switches if present.
- 1.4. Looped Services:

Switch off isolator switch if present.
Remove cut-out fuses.
Mark and remove tails (shroud tail ends).
Check polarity and earth loop impedance.
Re-seal cut-outs.
Post caution notice.
- 1.5. Remove fuse carrier from service cut-out, apply phase colour tapes to tails for identification.
- 1.6. Apply 'VM' tape or a proprietary shroud to shroud the exposed live contacts.
- 1.7. Remove phase tail, shroud tail end and fix back at a safe distance.
- 1.8. Remove neutral tail, shroud tail end and fix back at a safe distance, also remove and secure any earth wires as necessary.
- 1.9. Check polarity and earth loop impedance.
- 1.10. If considered safe to do so, pull the cut-out through the access hole so that there is at least 150mm of free service cable outside the column.

JOINTING PROCEDURE 7.601 - Continued

2. REMOVAL OF CABLE CORES

The following procedure may be adopted for an insulated single phase cut-out being changed on a “like for like” basis, provided that no re-trimming of the cable cores is required:-

- 2.1. The complete fuse base assembly may be removed, thus exposing both bare conductors, ensure conductors are restrained by insulating material, remove cut-out leaving the bared ends. **Immediately** place the new (“like for like”) cut-out carefully onto the bared conductors ensuring that the cores are inserted fully into the respective terminal blocks, tighten terminal screws.

Note:- The method in 2.1 excludes insertion of a looped service at this stage.

In all other circumstances such as looped services, the following actions shall be followed:-

- 2.2. Remove phase core from its terminal block.
- 2.3. Apply a piece of adhesive backed rubber insulation shroud to core end, extending 25mm onto the core insulation.
- 2.4. Remove neutral/earth wires from their terminal block.
- 2.5. Apply a piece of 13mm heat shrink tubing as far down as possible and extending 25mm beyond the end of the wires. Using pliers while still hot, crimp the end of the tubing to form a seal.
- 2.6. Tape over any exposed neutral/earth wires with 2 half-lap layers of black PVC tape.
- 2.7. For Split Concentric - repeat actions 2.2 to 2.6 for earth wires.
- 2.8. Repeat actions 2.1 to 2.7 for looped service if applicable.

3. FITTING OF NEW CUT-OUT

- 3.1. Prepare new cut-out (fit PME link if appropriate), offer to cable setting cores to their required positions.
- 3.2. If trimming of the neutral/earth wires is required - remove shroud, cut core to length, remove insulation depth of barrel plus 5mm. Insert conductor into terminal barrel, tighten terminal screws, fit cover or temporary shroud to neutral/earth terminal block.
- 3.3. For Split Concentric - repeat actions 3.3 for earth wires.

JOINTING PROCEDURE 7.601 - Continued

- 3.4. If trimming of the phase core is required - remove shroud, cut core to length, remove insulation depth of barrel plus 5mm. Insert conductor into terminal barrel, tighten terminal screws, fit cover or temporary shroud to phase terminal block.

Alternatively - for fitting single phase insulated cut-outs when it is not practicable to insert the cores separately into their terminal blocks, after setting and trimming the following procedure is permitted :-

- 3.5. Ensure conductors are restrained by insulating material, remove the adhesive backed rubber insulation shroud leaving the bared ends. **Immediately** place the cut-out carefully onto the bared conductors ensuring that the cores are inserted fully into the respective terminal blocks, tighten terminal screws.

Note: - The method in 3.5 excludes insertion of a looped service at this stage.

- 3.6. Check polarity.
- 3.7. Repeat actions 3.1 to 3.4 for looped service if applicable.
- 3.8. Fix new cut-out to back board.
- 3.9. Fit cable covers and all remaining cut-out covers.

4. CONNECTION OF TAILS (INCLUDING LOOPED SERVICE)

- 4.1. Apply phase identification and earthing labels.
- 4.2. Check volts, polarity and earth loop impedance.
- 4.3. Connect earth conductor(s) to the earth terminal and connect tails in top of cut-out.
- 4.4. Insert fuses and seal cut-out.
- 4.5. Remove shrouding from adjacent metalwork.
- 4.6. If applicable restore supply to looped cut-out(s), repeating actions 4.1 to 4.4.

**ST: CAØW/1 PROCEDURES FOR CHANGING LV SERVICE CABLE STREET
LIGHTING CUT-OUTS**

JOINTING PROCEDURE 7.602

**PROCEDURE FOR CHANGING INSULATED CUT-OUTS WITH
THE INCOMING PILC SERVICE CABLE LIVE**

**This procedure is to be read in conjunction with the appropriate
General Requirements ST: CAØC Section 6
of the LV Service Cable Jointing Manual**

JOINTING PROCEDURE 7.602

PROCEDURE FOR CHANGING INSULATED CUT-OUTS WITH THE INCOMING PILC SERVICE CABLE LIVE

Note: -

1. It is a requirement that the cut-out can only be changed outside of the column provided that at least 150mm of free cable is obtainable.
2. This Jointing Procedure may be applied to insulated only cut-outs where the sealing chamber has been filled with compound.

Your attention is drawn for the need to comply with General Principles, General Notes, Tools and Shrouding of this Standard Technique at all times.

JOINTING PROCEDURE 7.602

MATERIALS LISTS

Item	Quantity
Single Phase	
Replacement cut-out of appropriate type	1
13mm thin wall heat shrink tubing - lengths as required	-
Heat shrink 2 core breakout	1
16mm ² copper braid for earth connection between cable sheath and neutral block (PME) or earth block (SNE) if required - length as required	-
Roll spring F1	1
Tinned copper mesh EPPA/009-3000	1

ADDITIONAL ITEMS FOR EACH TERMINATION

Insulation patch
Whipping thread
PVC tape
“VM” tape
De-solvit 1000FD
Workhorse dry wipes
Seals
Sealing wire

Note: - Individual material item numbers (SHOPS) are to be found in Section 4 of the LV Service Cable Jointing Manual.

JOINTING PROCEDURE 7.602

1. PREPARATORY WORK

- 1.1 All immediately adjacent metal work shall be screened using approved insulating material.
 - 1.2. Check the service cable, cut-out and tails have no defects which would render it unsafe to move.
 - 1.3. Switch off isolator switches if present.
 - 1.4. Looped Services:

Switch off isolator switch if present.
Remove cut-out fuses.
Mark and remove tails (shroud tail ends).
Check polarity and earth loop impedance.
Re-seal cut-outs.
Post caution notice.
 - 1.5. Remove fuse carrier from service cut-out, apply phase colour tapes to tails for identification.
 - 1.6. Apply 'VM' tape or a proprietary shroud to shroud the exposed live contacts.
 - 1.7. Remove phase tail, shroud tail end and fix back at a safe distance.
 - 1.8. Remove neutral tail, shroud tail end and fix back at a safe distance, also remove and secure any earth wires as necessary.
 - 1.9. Check polarity and earth loop impedance.
 - 1.10. Remove the earth bonding clamp, if fitted, from cable sheath and examine condition of lead sheath for damage or deterioration. Work shall not proceed if condition is considered to present danger.
- Note:** - If an earth wire is soldered to the lead sheath and the connection is satisfactory, providing the cross-section of the earth wire is 16mm² or larger, it may be retained. The earth wire will then be secured and shrouded.
- 1.11. If it is considered safe to do so, pull the cut-out through the access hole so that there is at least 150mm of free service cable outside the column.

JOINTING PROCEDURE 7.602 - Continued

2. REMOVAL OF CABLE CORES

The following procedure may be adopted for an insulated single phase cut-out being changed on a “like for like” basis, provided that:-

- (i) re-trimming of the cable is not required;
- (ii) a new earth connection is not required;
- (iii) the cable termination is heat shrink tubing and breakout.

- 2.1. The complete fuse base assembly may be removed, thus exposing both bare conductors, ensure conductors are restrained by insulating material, remove cut-out leaving the bared ends. **Immediately** place the new (“like for like”) cut-out carefully onto the bared conductors ensuring that the cores are inserted fully into the respective terminal blocks, tighten terminal screws.

Note: - The method in 2.1 excludes insertion of a looped service at this stage.

In all other circumstances such as looped services, the following actions shall be followed:-

- 2.2. Remove phase core from its terminal block.
- 2.3. Apply heat shrink tubing to cover the core right down to the crutch, and extending 25mm above the core end. Using pliers while still hot, crimp the end of the tubing to form a seal.

Apply PVC phase colour tape for core identification.

- 2.4. Repeat actions 2.2 and 2.3 for neutral core.
- 2.5. Repeat actions 2.2 to 2.4 for looped service if applicable.

If sealing chamber is compound filled:-

- 2.6. Remove the front cover of the cable sealing chamber to expose the cable cores and compound. It may be necessary to warm the cover gently with a gas torch.
- 2.7. Ensure any metalwork exposed by operation 1.10 is shrouded, (eg. the cable sheath).
- 2.8. If there is a possibility of the gas torch coming into contact with live terminals, each core (and live fuse contact) should be shrouded using approved insulating material.

JOINTING PROCEDURE 7.602 - Continued

2.9. Remove sufficient compound with either nylon wedge and gas torch to allow the more readily available cable core to be exposed from the compound, this should be the phase conductor.

2.10. Following extraction from the cut-out, insulate the core as follows:-

If cores are contained within compound, apply 13mm heat shrink tubing to cover all the exposed core and extending 25mm above the core end. Using pliers while still hot, crimp to form a seal.

Apply a PVC phase colour tape for core identification.

2.11. Repeat actions 2.8 and 2.9 for the neutral core.

3. REMOVAL OF THE INSULATED CLADDING

3.1. Ease the cable crutch and insulated cores away from the cut-out carcass removing remaining compound with a nylon wedge and gas torch gently warming as necessary.

3.2. Apply further 13mm heat shrink tubing to each core, pushing well down into the crutch.

3.3. Remove the rear portion of the cut-out and discard.

4. FITTING OF NEW CUT-OUT

This section applies only if the cut-out has not been changed on a “like for like” basis in 2.1.

4.1. Prepare new cut-out (fit PME link if appropriate), offer to cable and mark outer serving.

4.2. Remove outer serving, armour and bedding, thoroughly cleaning the lead sheath (if required).

4.3. Abrade and remove lead sheath (if required).

4.4. Terminate belt papers 15mm from lead sheath termination (if required).

4.5. Fit a heat shrinkable breakout into the cable crutch.

4.6. If it is necessary to provide an earth connection, apply in accordance with General Requirement 6.17.3.

4.7. Offer the new cut-out to the cable setting cores to the required positions.

JOINTING PROCEDURE 7.602 - Continued

- 4.8. Cut neutral conductor to length, remove insulation depth of terminal barrel plus 5mm. Insert conductor into terminal barrel, tighten terminal screws, fit cover or temporary shroud to cover neutral and earth terminal block(s).
- 4.9. Cut phase conductor to length, remove insulation depth of terminal barrel plus 5mm. Insert conductor into terminal barrel, tighten terminal screws, fit cover or temporary shroud to live terminal phase block.

Alternatively - for fitting single phase insulated cut-outs when it is not practicable to insert the cores separately into their terminal blocks, after setting and trimming the following procedure is permitted :-

- 4.10. Ensure conductors are restrained by insulating material, remove the adhesive backed rubber insulation shroud leaving the bared ends. **Immediately** place the cut-out carefully onto the bared conductors ensuring that the cores are inserted fully into the respective terminal blocks, tighten terminal screws.

Note: - The method in 4.10 excludes insertion of a looped service at this stage.

- 4.11. Check polarity.
- 4.12. Repeat actions 4.1 to 4.9 for looped service if applicable.
- 4.13. Fix cut-out to back board.
- 4.14. Remove temporary shrouding from earth connection assembly and terminal block, connect earth braid to earth terminal block.
- 4.15. Fit cable cover and all remaining cut-out covers.

5. CONNECTION OF TAILS (INCLUDING LOOPED SERVICE)

- 5.1. Apply phase identification and earthing labels.
- 5.2. Check volts, polarity and earth loop impedance.
- 5.3. Connect earth conductor(s) to earth terminal and connect tails in top of cut-out.
- 5.4. Insert fuses and seal cut-out.
- 5.5. Remove shrouding from adjacent metalwork.
- 5.6. If applicable restore supply to looped cut-out(s), repeating actions 4.1 to 4.4.

**ST: CAØW/1 PROCEDURES FOR CHANGING LV SERVICE CABLE STREET
LIGHTING CUT-OUTS**

JOINTING PROCEDURE 7.603

**REMOVAL OF PVC PLAIN OR SPLIT CONCENTRIC
SERVICE CABLES FROM INSULATED CUT-OUTS SITED IN
STREET FURNITURE**

**This procedure is to be read in conjunction with the appropriate
General Requirements ST: CAØC Section 6
of the LV Service Cable Jointing Manual**

JOINTING PROCEDURE 7.603

REMOVAL OF PVC PLAIN OR SPLIT CONCENTRIC SERVICE CABLES FROM INSULATED CUT-OUTS SITED IN STREET FURNITURE

Note: - This Jointing Procedure applies only to single phase service cables.

Your attention is drawn for the need to comply with General Principles, General Notes, Tools and Shrouding of this Standard Technique at all times.

JOINTING PROCEDURE 7.603

MATERIALS LIST

Item	Quantity
Stop End Kit SMOE 81613	1
Rayvolle Cap	1
Nylon Protection Cap	1
Tinned Copper Mesh EPPA/009 –3000	1

ADDITIONAL ITEMS FOR EACH TERMINATION

Cable ties
PVC tape
Emery cloth
De-solvit 1000FD
Workhorse wipes
Seals
Sealing wire

Note: - Individual item numbers (SHOPS) are to be found in Section 4 of the LV Service Cable Jointing Manual.

JOINTING PROCEDURE 7.603

1. GENERAL

This procedure details a safe working practice for disconnecting and reconnecting a live single phase service cable, and only applies to cables up to 25mm² cross sectional area, made to BS 7870 Part 3.11, or Part 3.21 or Electricity Network Association Technical Specification (ENA TS) 09-7, and which are connected to an all-insulated street light cut-out.

THIS JOINTING PROCEDURE IS ONLY TO BE USED WHEN CUSTOMERS, OTHER THAN STREET FURNITURE, ARE GOING TO BE DISCONNECTED IF THE CUT-OUT CHANGE WERE TO BE UNDERTAKEN DEAD.

2. AUTHORISED PERSONNEL

The work detailed in this engineering instruction/jointing instruction shall only be carried out by suitably Authorised WPD personnel. It may also be used by suitably Authorised Contractors, but only when working on WPD owned service cable and cut-out.

3. RESPONSIBILITY

Before work is carried out on any underground cable it is the responsibility of the person in charge of the work to positively identify the cable at the point of work. It is the responsibility of the person doing the work to carry out all operations in accordance with the Distribution Safety Rules, Engineering Instructions and Operational Instructions.

4. RISK ASSESSMENT

In compiling this Engineering Instruction an assessment has been made of the risks involved in carrying out the various activities. In applying the Engineering Instruction the user must comply with the WPD Risk Assessment Policy (Generic and Specific) which is contained within the Risk Assessment Manual.

5. GENERAL CONDITIONS

If it is reasonably practicable to make the service dead, for example by removing a remote fuse that controls the street furniture only, then this should be done.

Should the person carrying out the work consider that it would be dangerous to proceed at any stage of the procedure then he must stop the work and seek advice from his Team Manager. The work place must not be left unattended unless safe to do so.

The work must be carried out in strict compliance with the current issue of the Distribution Safety Rules.

JOINTING PROCEDURE 7.603 - Continued

In the case of a column damaged by a vehicle, then unless the service is still in good condition throughout, (fault current could have burnt insulation) and the cut-out is still accessible then the service should be cut at a safe distance away using live techniques. A permanent approved stop end (pot end) should then be made on the live cable. If a safe distance cannot be achieved because of site conditions or if the tee joint is too close, or if there are other considerations like traffic hazards or the presence of petrol, then the main should be made dead. Note that a “5th core” system may come live from a separate source.

However, even after proving dead at the point of work then live working procedures must be employed.

6. CONDITIONS TO BE OBSERVED FOR THE REMOVAL OF LIVE SERVICE CABLE FROM STREET FURNITURE

Live working is only permitted where the following additional conditions are fulfilled:-

- 6.1. The cut-out must be accessible from ground level.
- 6.2. Suitable barriers and screens shall be erected to control the area of work.
- 6.3. Live working procedures and approved insulated tools must be used.
- 6.4. During inclement weather an adequate shelter shall be erected.
- 6.5. A rubber mat shall be placed on the ground, rubber gloves and a full face visor shall be worn. Overalls with full length sleeves shall be worn. No part of the body shall be exposed. A helmet shall be worn when there is any risk of head injury.
- 6.6. Check the service cable, cut-out and tails have NO defects which would render them unsafe to move, for example there must be no signs of burning or other damage below the fuse carrier.
- 6.7. There must be no debris, such as grass or soil etc., around the cut-out.
- 6.8. There must be at least 250mm spare length of service cable to allow the cut-out to be totally withdrawn from the street furniture.
- 6.9. All metalwork in the immediate vicinity shall be shrouded. In particular the street furniture shall be shrouded with an approved insulating shroud, which shall be inspected immediately before use and used only if in good condition.
- 6.10. Where the above conditions are not fulfilled the service cable shall be made dead either by making the main dead by withdrawing fuses or by cutting the service cable outside the street furniture.

JOINTING PROCEDURE 7.603 - Continued

7. PREPARATORY WORK

- 7.1. Using a torch and a mirror carefully view inside the street furniture to see where the service cable exits from the street furniture into the ground, plus use the mirror to see if there is likely to be any other obstruction preventing the removal of the service cable from the inside of the street furniture.
- 7.2. Once it has been established on which side the cable exits the street furniture, and that there are no possible obstructions inside the street furniture to prevent the removal of the service cable, then carefully dig down the side of the street furniture to expose the service cable and the slot in the street furniture into which the cable enters/exits the street furniture. The size of the excavation along side the street furniture should be sufficient to allow removal of the service but should also be so constructed so not to collapse the street furniture.

8. DETAILED PROCEDURE

- 8.1. Inspect the cut-out and cable closely, including the point of entry to the street furniture. Only proceed with this live cable removal engineering instruction if still satisfied that the existing cut-out and cable show no signs of damage or insulation failure.
- 8.2. Remove the cut-out fuse carrier.
- 8.3. Disconnect all tails and shroud tail ends from the outgoing terminals of the cut-out and secure them away from the immediate vicinity of the cut-out.
- 8.4. Check polarity and earth loop impedance.
- 8.5. Check the approved shrouding, place around the street furniture so that the access door to the street furniture is accessible and the shrouding is protecting the front and top metal lips of the access door; tape in place if necessary.
- 8.6. Check to see if there is at least 250mm of service cable between the bottom of the cut-out and the bottom of the access door - Fig 1. If it is considered safe to do so, unscrew the retaining screw/s.
- 8.7. Once the cut-out and attached service cable has been removed from the back board pull and ease them through the access door, the service cable shall then be secured against retraction by taping to the shrouded column with adhesive PVC tape.
- 8.8. Remove the crutch cover and install a temporary phase terminal shroud on the phase terminal block of the cut-out using two layers of 3M No. 88 PVC tape unless a flash-guard is fitted and the flashguard is secure.

JOINTING PROCEDURE 7.603 - Continued

- 8.9. Apply and secure some PVC cable oversheath around the phase conductor insulation - Fig 2.
- 8.10. Remove the CNE wires from the cut-out and tape up using two layers with a 50% overlap of 3M No 88 tape - Fig 3.

Note: -If there is a split concentric cable in the cut-out, remove the earth wires first and shroud using two layers with a 50% overlap of 3M No 88 tape.
- 8.11. Remove the temporary phase shroud and loosen the phase terminal screws. Remove the phase conductor from the terminal block.
- 8.12. Carefully lift the cut-out off the service cables. Once the cut-out has been lifted off the service cable, exposing the live phase conductor the appropriate hard nylon temporary core protection cap shall be slipped over the phase conductor. Once in place the temporary core protection cap is to be taped on to the phase conductor using two layers of black PVC tape - Fig 4.
- 8.13. Remove the 3M No 88 tape from the CNE wires and lay the wires up along side the temporary core protection cap - Fig 5.
- 8.14. Using tinned copper mesh apply a 50% lapped layer starting 15mm on the PVC oversheath and work towards the cable end ensuring a complete enclosure. Secure both ends using the 3M No 88 tape, thereby effectively earth screening the stop end - Fig 6.
- 8.15. If the street furniture is not going to be replaced immediately then offer the heat shrink outer mastic lined cap to the cable, mark the base of the cap onto the PVC oversheath, abrade and degrease the area to covered. Fit the heat shrink pot end tubing over both the hard nylon temporary core protection cap and copper mesh and shrink down as per General Requirement 27 - Fig 7.
- 8.16. If the street furniture is to be replaced immediately, then offer the Rayvolve cap to the cable, mark the base of the cap onto the PVC oversheath, abrade and degrease the area to be covered. Fit the temporary Rayvolve cap by sliding over the end. Once the cap cannot be slid any further take a cable tie and securely fasten around the Rayvolve cap. The cable tie is to be applied to the end of the Rayvolve cap that is furthest away from the end of the cable.
- 8.17. Carefully remove the service cable from the street furniture, by feeding the service cable out through the access hole, ensuring there is no kinking of the cable where it is held by the ground.
- 8.18. Carefully coil the service cable away from the street furniture, thereby avoiding possible damage when the street furniture is removed.

JOINTING PROCEDURE 7.603 - Continued

9. CONDITIONS FOR LIVE WORKING FOR A RECONNECTION

Live working is only permitted where the following additional conditions are fulfilled:-

- 9.1. The cut-out must be accessible from ground level.
- 9.2. Suitable barriers and screens shall be erected to control the area of work.
- 9.3. Live working procedures and approved insulated tools must be used.
- 9.4. During inclement weather an adequate shelter shall be erected.
- 9.5. A rubber mat shall be placed on the ground, rubber gloves and a full face visor shall be worn. Overalls with full length sleeves shall be worn. No part of the body shall be exposed. A helmet shall be worn when there is any risk of head injury.
- 9.6. The service cable shall have been terminated in accordance with either a permanent pot end or as described in paragraph 8.10 to 8.15.
- 9.7. There must be at least 250mm of service cable able to be totally withdrawn from the column, thereby enabling the fitting of the cut-out.
- 9.8. There must be no cables connected to the outgoing terminals of the cut-out.
- 9.9. All metalwork in the immediate vicinity shall be shrouded. In particular the street furniture, which shall be shrouded with the approved shrouding, which shall be inspected immediately before use and used only if in good condition.
- 9.10. Where the above conditions cannot be achieved the service cable shall be made dead either by making the main dead by withdrawing fuses or by cutting the service cable outside the street light column.

10. CONNECTING THE LIVE SERVICE CABLE INTO THE CUT-OUT

Once the old street furniture has been replaced by new street furniture and the recently removed service cable has been replaced into the internal cavity of the street furniture.

- 10.1. Shroud the column with the approved shrouding. Secure the cable against retraction by taping to the shrouded column with adhesive PVC tape. Withdraw the service cable from the column through the access door.
- 10.2. Temporarily insulate the phase terminal block of the cut-out using two layers of 3M No 88 tape, unless a flashguard is fitted and the flashguard is secure.

JOINTING PROCEDURE 7.603 - Continued

- 10.3. Position a rubber grommet over the service cable.
- 10.4. If the service cable has a permanent pot end then, gently warm the outer cap and using the knife blade flat to the cable, slice the cap working towards the cable end and remove - Fig 8. Remove the securing tapes and tinned copper mesh.
- 10.5. If the service cable has the Rayvolve cap, then remove the cable tie and slide the Rayvolve cap off.
- 10.6. Cut the PVC oversheath for a distance of 130mm, take the CNE strands to one side and twist together into a compact group - Fig 9.

Note: -Do not cut the phase conductor at this stage.

- 10.7. Shroud the neutral/earth block with two layers of 3M No 88 tape.
- 10.8. Cut the phase conductor at the marked position and remove 10mm of insulation. Laying the cut-out to one side insert the phase conductor and connect to the cut-out, replace the flash-guard - Fig 11.
- 10.9. Fix the cut-out into position in the street furniture and then remove the approved shrouding from the street furniture.
- 10.10. Confirm correct polarity and earth loop impedance of the service and fit the fuse carrier.

11. LOOP SERVICES

If the cut-out is to contain a loop service, this is best fitted before the live service cable under dead conditions. If this is not possible and the loop service cable is to be connected to a live cut-out then ensure there is no load on the loop service by removing the fuse from the loop cut-out and continue as follows:-

- 11.1. Bend the phase and neutral conductors to their approximate final positions with the loop service cable located in the right hand access port of the cut-out. Check that the rubber grommet is fitted around the loop service cable. Fit if necessary.
- 11.2. Temporarily insulate the phase terminal block of the cut-out using two layers of 3m No 88 tape, unless a flashguard is fitted and the flashguard is secure.
- 11.3. Install the loop service cable CNE wires in the right hand terminal of the neutral terminal block.
- 11.4. Remove the temporary neutral phase shroud and shroud the phase block with two layers of 3m No 88 tape.
- 11.5. Remove the temporary end cap from the phase conductor and strip off the end 10mm of insulation.

JOINTING PROCEDURE 7.603 - Continued

- 11.6. Install the phase conductor of the loop service in the right hand terminal of the phase terminal block.
- 11.7. Remove the temporary phase terminal shroud. Position the rubber grommet on the cable in the right hand access port. Fit and secure the crutch cover.
- 11.8. Fix the cut-out into position in the streetlight furniture and remove the approved shrouding.
- 11.9. Confirm correct polarity and earth loop impedance of the service and fit the fuse carrier.

All dimensions in mm

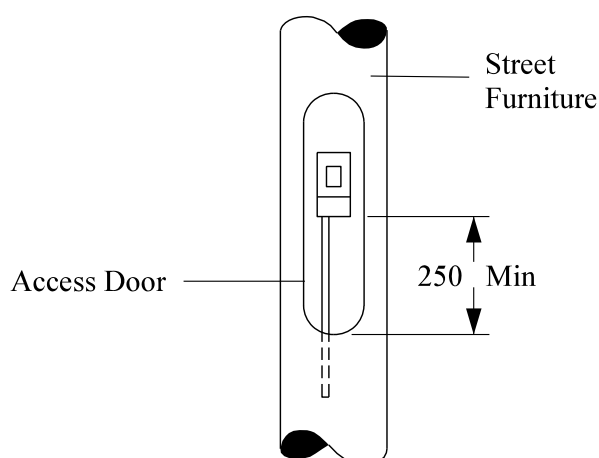


Fig 1

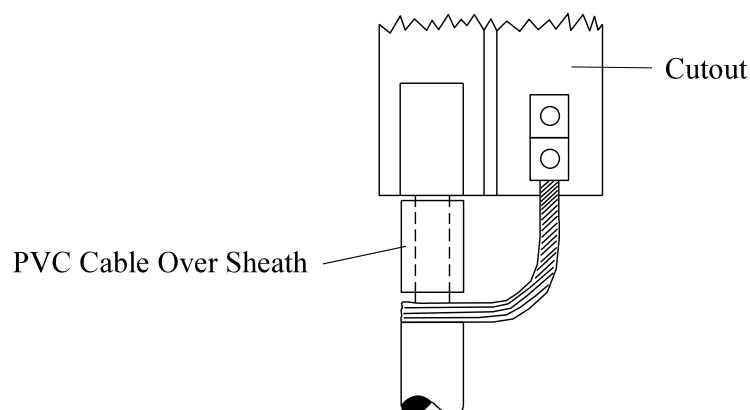



Fig 2

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Drawn	RJB	04/12			
Checked					
Approved					
SCALE		N.T.S.		Title	
				REMOVAL OF PVC SERVICE CABLE FROM STREET LIGHTING FURNITURE	
				Drg. No. SVJ 7.603.1	
				Rev No	

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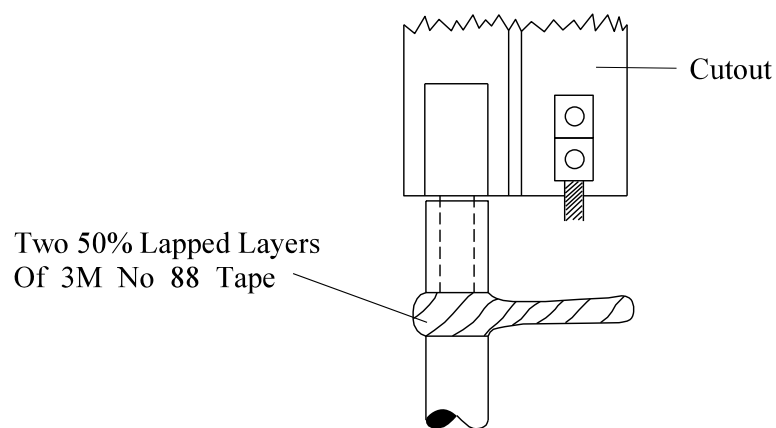


Fig 3

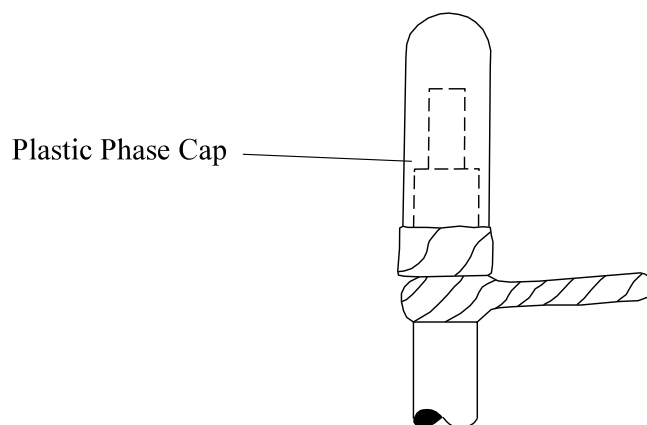



Fig 4

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All dimensions in mm

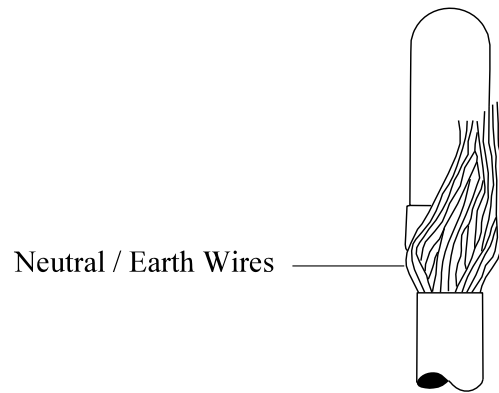


Fig 5

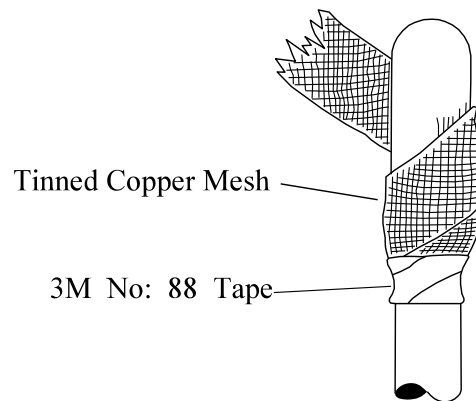



Fig 6

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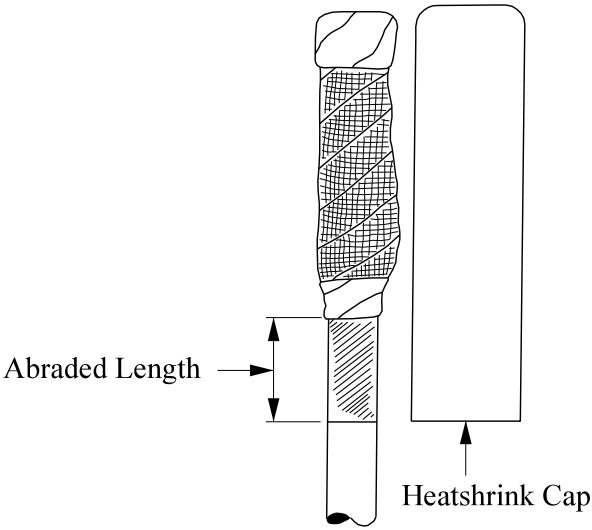


Fig 7

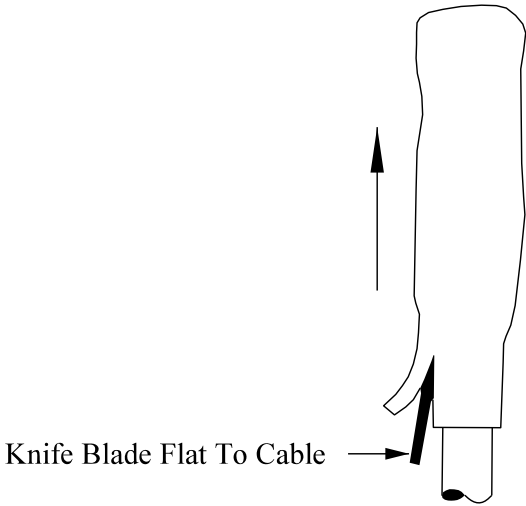


Fig 8

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All dimensions in mm

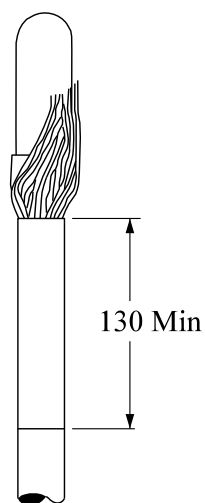


Fig 9

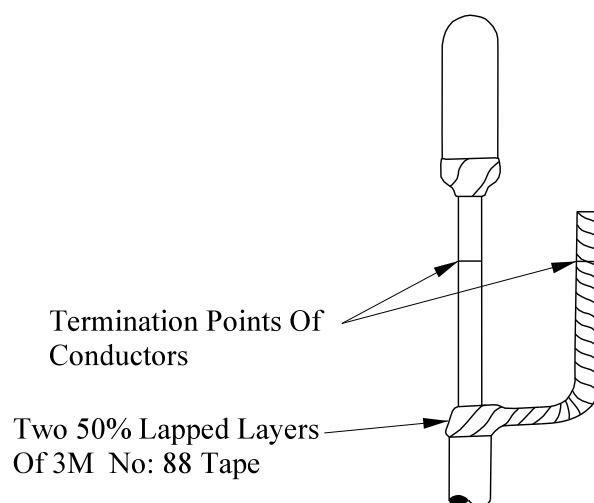



Fig 10

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All dimensions in mm

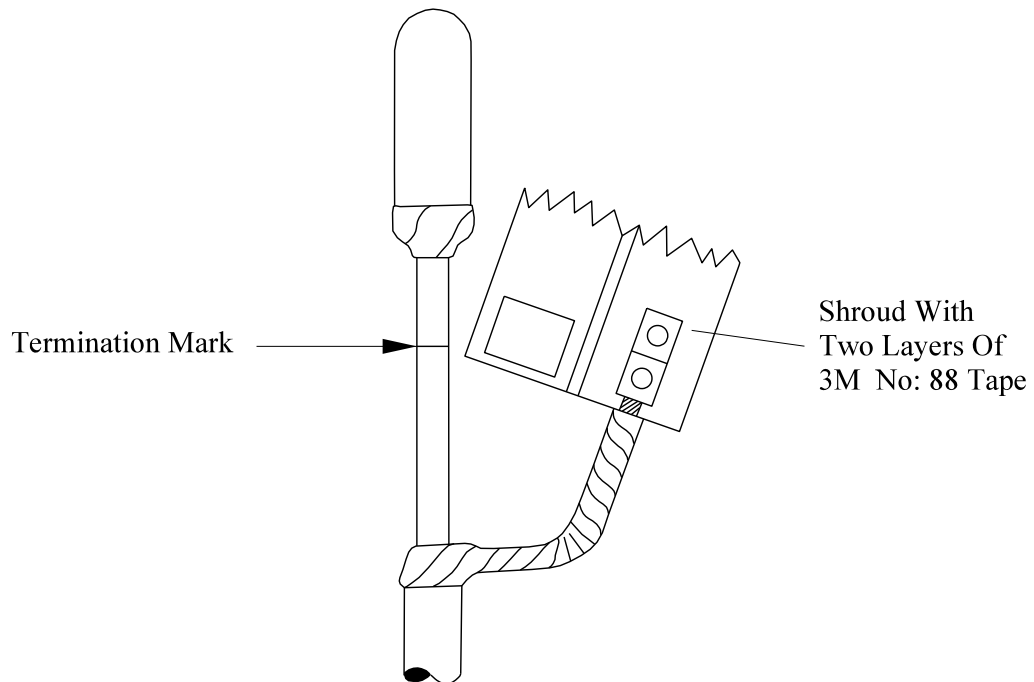



Fig 11

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APPENDIX A

SUPERSEDED DOCUMENTATION

This Standard Technique supersedes ST: CAØW dated April 2006 which should now be withdrawn.

APPENDIX B

ASSOCIATED DOCUMENTATION

ST:CAØA, ST:CAØB, ST:CAØC, ST:CAØM, ST:CAØN, ST:CAØS, ST:CAØT, ST:CAØU, ST:CAØV, ST:CAØZ.

APPENDIX C

IMPACT ON COMPANY POLICY

None, as this document has just been updated to incorporate all the latest SHOPS numbers and other subtle minor changes.

APPENDIX D

IMPLEMENTATION OF POLICY

This Standard Technique shall be communicated to all relevant WPD engineers and site staff at the next Team Briefing by the Team Manager.

APPENDIX E

KEY WORDS

PL Live Cut-Out Changing, Street Furniture.

APPENDIX F

DOCUMENT LAST REVIEWED

May 2012