

## **Company Directive**

### **STANDARD TECHNIQUE : CAØN/2**

#### **Relating to Procedures for Making LV Service Cable Stop Ends**

##### **Policy Summary**

This Standard Technique document contains the entire approved LV Service heat shrink and cold applied/pour Stop Ends 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.

**Author:** **Richard Summers**

**Implementation Date:** **July 2014**

**Approved by**



**Policy Manager**

**Date:**

**8 September 2014**

***All references to Western Power Distribution or WPD must be read as National Grid Electricity Distribution or NGED***

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## **IMPLEMENTATION PLAN**

### **Introduction**

This Standard Technique has been updated to correct errors in the numbering of the General Requirements and include the use of solvent wipes.

### **Main Changes**

- General Requirement numbers amended
- SVJ 7.301.1 measurements amended
- SVJ 7.302.1 measurements amended
- Solvent wipes included in the Standard Techniques

### **Impact of Changes**

The core cut length has been increased to 75mm to make fitting the cap easier when the neutral / earths are shrouded.

### **Implementation Actions**

Distribution Managers and Team Managers shall brief their teams on the contents of this policy to the relevant staff.

Word Processing to issue copies to paper manual holders (Midlands and South)

### **Implementation Timetable**

Immediate

<b>Document Revision &amp; Review Table</b>		
<b>Date</b>	<b>Comments</b>	<b>Author</b>
July 2014	<ul style="list-style-type: none"> <li>• Correction of General Requirement Numbers.</li> <li>• SVJ 7.301.1 measurements amended</li> <li>• SVJ 7.302.1 measurements amended</li> <li>• Inclusion of cable solvent wipes</li> </ul>	Richard Summers

# **ST: CAØN/2 PROCEDURES FOR MAKING LV SERVICE CABLE STOP ENDS**

## **INTRODUCTION**

This Standard Technique document contains all the approved service cable stop ends, which shall be implemented in conjunction with the appropriate General Requirements contained 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

**Resin encapsulated joints must not be broken down.**

If the need arises to undertake a service stop end (ie non-standard) not covered within this Standard Technique the Policy Manager, Head Office, is to be consulted.

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**Note: - Any reference to plain concentric equally applies to hybrid.  
The phase conductor insulation may be either XLPE or PVC.**

**ST: CAØN/2 PROCEDURES FOR MAKING SERVICE CABLE  
STOP ENDS**

**JOINTING PROCEDURE 7.301**

**PVC PLAIN CONCENTRIC SERVICE CABLE  
STOP END - SINGLE PHASE**

**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 7.301**

### **MATERIALS LIST**

**CABLE SIZES - 25/35mm<sup>2</sup> Hyb or 16/25mm<sup>2</sup> Cu Plain Conc**

<b>Item</b>	<b>Quantity</b>
Stop End Kit SMOE 81613	1

### **ADDITIONAL ITEMS FOR EACH JOINT**

PVC tape  
Emery cloth  
De-solvit 1000FD  
Workhorse dry wipes  
Cable solvent wipes

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

## JOINTING PROCEDURE 7.301

Actions	General Requirements (ST: CAØC)
Refer to Drawing <b>SVJ 7.301.1</b> whilst undertaking this Jointing Procedure	
1. Set up and mark cable	4
2. Open and cut cable in accordance with General Requirement - Fig 1.	13
3. Prepare neutral/earth wires for jointing - Fig 2	7
4. Apply temporary shrouding	17
5. Cut phase conductor to length - Fig 2	--
6. Thoroughly degrease the phase conductor insulation	29
7. Fit and shrink the small phase conductor cap into place - Fig 3. <b>Allow to cool</b>	21
8. Remove temporary shrouding applied in 4	--
9. Lay the neutral/earth wires over the conductor phase cap and turn back to the oversheath termination - Fig 4	--
<b>NOTE: The neutral/earth wires must be spaced to form an earth screen over the phase conductor and cap</b>	
10. Ensure the wires are evenly spaced, trim off at the oversheath, termination and secure with PVC tape - Fig 4	--
11. Abrade the oversheath - Fig 4	26
12. Thoroughly degrease the complete termination	29
13. Fit and shrink the large cable end cap into place - Fig 5	21
14. Allow the completed stop end to cool before applying any mechanical strain	--

All dimensions in mm

Fig 1

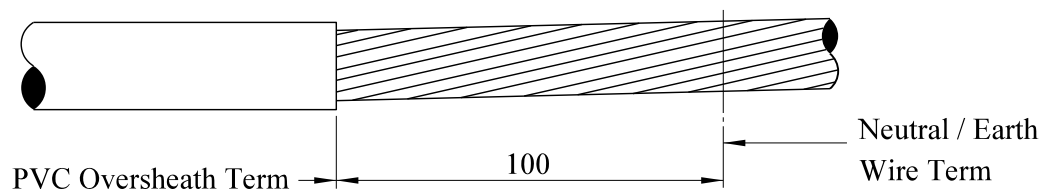


Fig 2

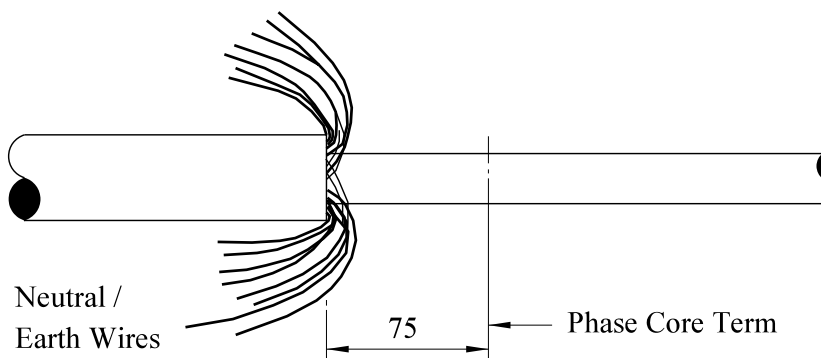


Fig 3

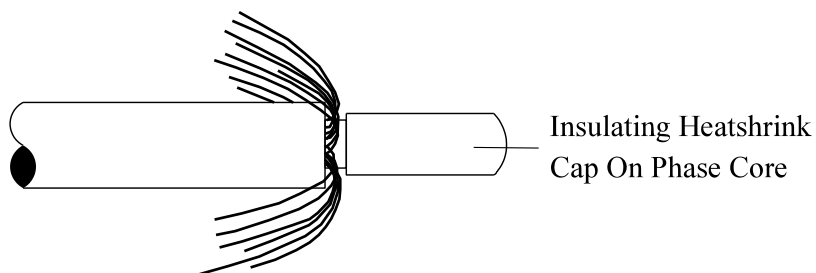


Fig 4

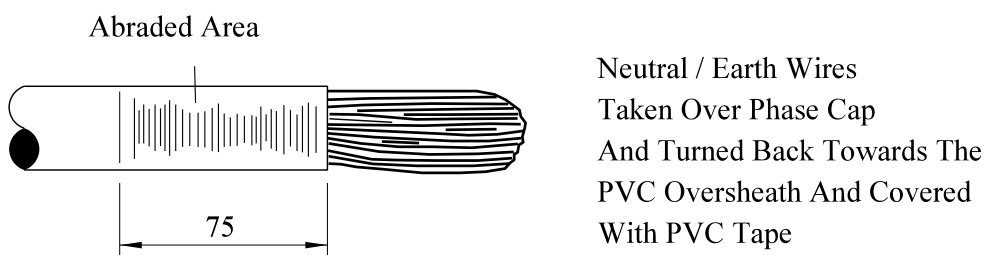


Fig 5



1	RJB			06/14	PHASE CORE TRIM LENGTH ALTERED		
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**ST: CAØN/2 PROCEDURES FOR MAKING SERVICE CABLE  
STOP ENDS**

**JOINTING PROCEDURE 7.302**

**PVC SPLIT CONCENTRIC SERVICE CABLE  
STOP END - SINGLE PHASE**

**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 7.302**

### **MATERIALS LIST**

#### **CABLE SIZES - 16/25mm<sup>2</sup> Cu Plain Conc**

<b>Item</b>	<b>Quantity</b>
Stop End Kit SMOE 81613	1

#### **ADDITIONAL ITEMS FOR EACH JOINT**

PVC tape  
Emery cloth  
De-solvit 1000FD  
Workhorse dry wipes  
Cable solvent wipes

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

## JOINTING PROCEDURE 7.302

Actions	General Requirements (ST: CAØC)
Refer to Drawing <b>SVJ 7.302.1, 7.302.2</b> whilst undertaking this Jointing Procedure	
1. Set up and mark cable	4
2. Open and cut cable in accordance with General Requirement - Fig 1	13
3. Prepare neutral and earth wires for jointing - Fig 2	7
4. Apply temporary shrouding	17
5. Cut phase conductor to length - Fig 2	--
6. Thoroughly degrease the phase conductor insulation	29
7. Fit and shrink the small phase conductor cap into place - Fig 3 <b>Allow to cool</b>	21
8. Remove temporary shrouding applied in 4	--
9. Lay the earth wires over the conductor phase cap and cut level with the cap end - Fig 4	--
10. Ensure the wires are evenly spaced, and cover with three layers of PVC tape - Fig 5.	--
11. Lay the neutral wires over the conductor phase cap and turn back to the oversheath termination - Fig 6.	--
<b>NOTE: The neutral and earth wires must be spaced to form an earth screen over the phase conductor and cap</b>	
12. Ensure the neutral wires are evenly spaced, trim off a the oversheath termination position, and secure with PVC tape - Fig 6	--
13. Abrade the oversheath - Fig 6	26
14. Thoroughly degrease the complete termination	29

## **JOINTING PROCEDURE 7.302 - Continued**

- |     |  |    |
|-----|--|----|
| 15. | Fit and shrink the large cable end cap into place - Fig 7                  | 21 |
| 16. | Allow the completed stop end to cool before applying any mechanical strain | -- |

All dimensions in mm

Fig 1

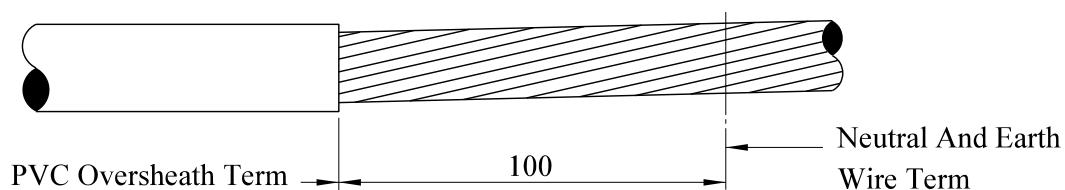


Fig 2

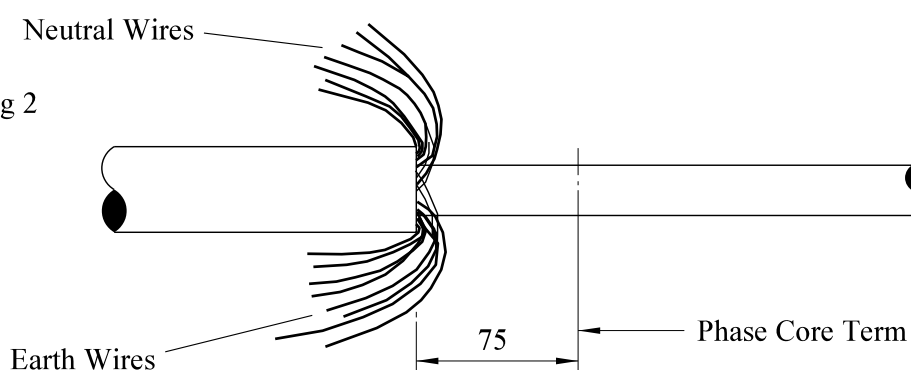


Fig 3

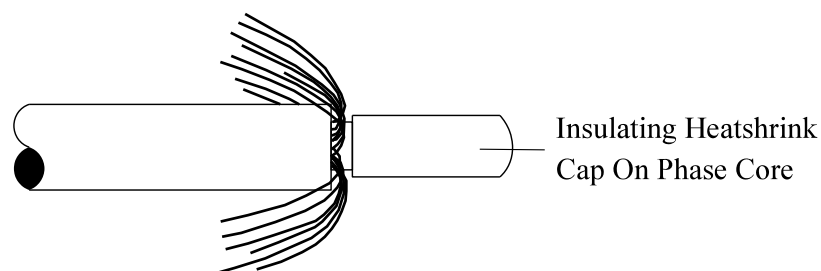
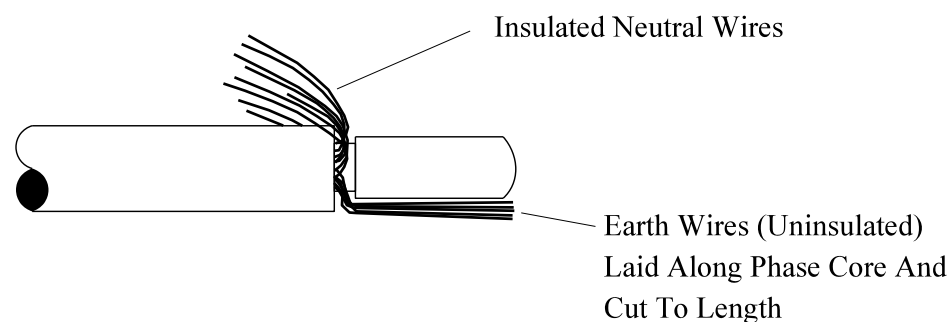



Fig 4



1	RJB			06/14	PHASE CORE TRIM LENGTH ALTERED		
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Drawn	RJB	04/12					
Checked				Title PVC SPLIT CONC STOP END - SINGLE PHASE STRIPPING DIMENSIONS / GENERAL LAYOUT		Drg. No. SVJ 7.302.1	
Approved							
SCALE N.T.S.						Rev No 1	

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All dimensions in mm

Fig 5

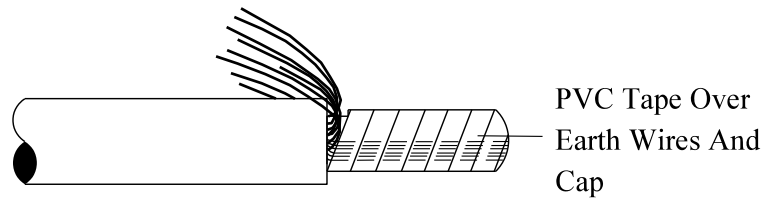


Fig 6

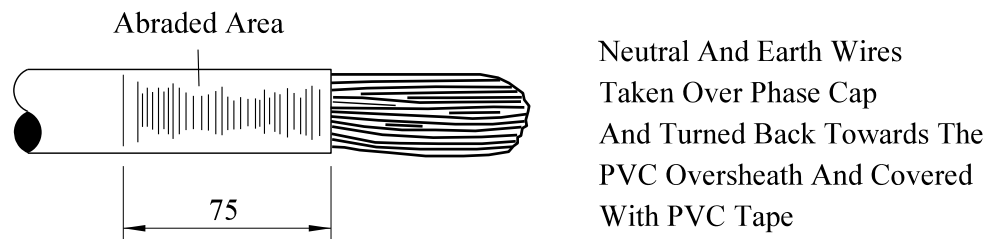
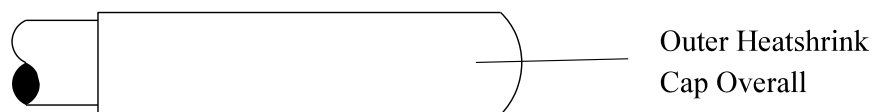



Fig 7



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Drawn	RJB	04/12				
Checked						
Approved						
SCALE	N.T.S.		Title <b>PVC SPLIT CONC</b> <b>STOP END - SINGLE PHASE</b> <b>STRIPPING DIMENSIONS / GENERAL LAYOUT</b>			Drg. No. <b>SVJ 7.302.2</b>
						Rev No

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**ST: CAØN/2 PROCEDURES FOR MAKING SERVICE CABLE  
STOP ENDS**

**JOINTING PROCEDURE 7.303**

**PILC SERVICE CABLE STOP END  
- SINGLE PHASE**

**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 7.303**

### **MATERIALS LIST**

#### **CABLE SIZES - Up to 35mm<sup>2</sup> PILC**

<b>Item</b>	<b>Quantity</b>
Shell 1046	1
Resin	3.2 lts
Armour bond LVSB 18	1

#### **ADDITIONAL ITEMS FOR EACH JOINT**

Insulation patch  
Black cotton tape  
Sealing putty  
Cable ties  
Shell support  
Whipping thread  
PVC tape  
De-solvit 1000FD  
De-solvit 1000  
Workhorse dry wipes  
Cable solvent wipes

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



## JOINTING PROCEDURE 7.303

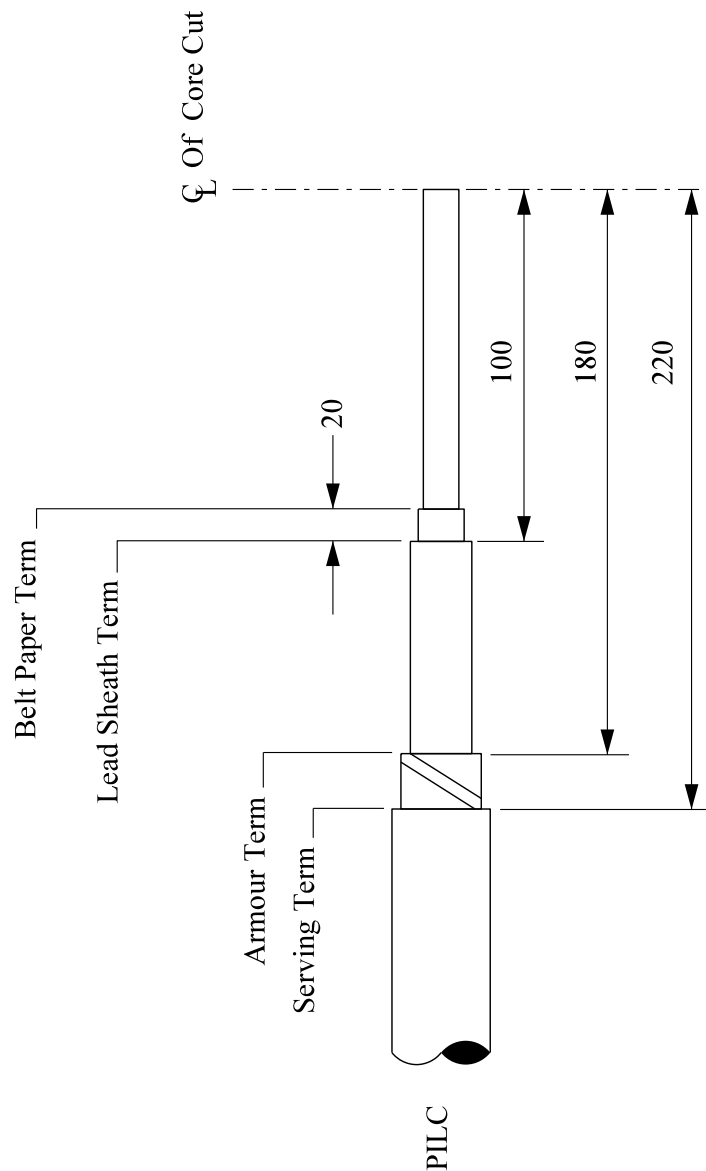
### Actions


### General Requirements (ST: CAØC)

Refer to Drawing **SVJ 7.303.1, 7.303.2** whilst undertaking this Jointing Procedure

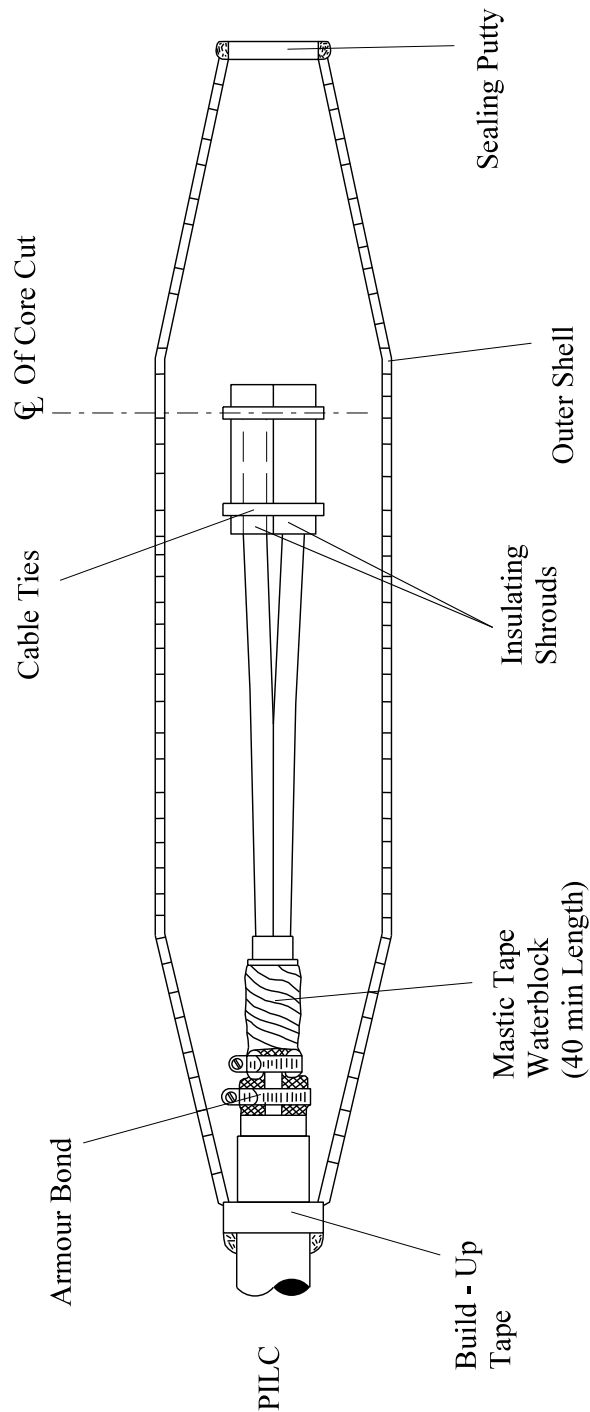
1.	Set up and mark cable	4
2.	Open and cut cable in accordance with General Requirement	12
3.	Apply armour bond	18
4.	Carefully apply cable ties around the core insulation shrouds	--
5.	Build up oversheath	--
6.	Thoroughly degrease the joint	29
7.	Apply mastic water block to lead sheath	27
8.	Prepare and fit shell, ensuring 15mm clearance	30
9.	Mix and pour resin	31

All dimensions in mm




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Approved				Title	
SCALE		N.T.S.		PILC STOP END - SINGLE PHASE STRIPPING DIMENSIONS	
				Drg. No. SVJ 7.303.1	
				Rev No	

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PLAN VIEW

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Drawn	RJB	04/12			
Checked				<div>Title      PILC STOP END - SINGLE PHASE GENERAL LAYOUT</div> <div>Drg. No.      Rev No SVJ 7.303.2</div>	
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SCALE		N.T.S.			

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**ST: CAØN/2 PROCEDURES FOR MAKING SERVICE CABLE  
STOP ENDS**

**JOINTING PROCEDURE 7.304**

**PVC PLAIN CONCENTRIC SERVICE CABLE  
STOP END - THREE PHASE**

**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 7.304**

### **MATERIALS LIST**

#### **CABLE SIZES - 25/35mm<sup>2</sup> Hybrid or 16/25mm<sup>2</sup> Cu Plain Conc**

<b>Item</b>	<b>Quantity</b>
Stop End Kit SMOE 81614	1

### **ADDITIONAL ITEMS FOR EACH JOINT**

PVC tape  
Emery cloth  
De-solvit 1000FD  
Workhorse dry wipes  
Cable solvent wipes

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

## JOINTING PROCEDURE 7.304

Actions	General Requirements (ST: CAØC)
Refer to Drawing <b>SVJ 7.304.1</b> whilst undertaking this Jointing Procedure	
1. Set up and mark cable	4
2. Open and cut cable in accordance with General Requirement - Fig 1	13
3. Prepare the neutral/earth wires for jointing - Fig 2	7
4. Apply temporary shrouding	17
5. Cut the first phase conductor to length - Fig 2	--
6. Thoroughly degrease the phase conductor insulation	--
7. Fit and shrink the small phase conductor cap into place - Fig 3. <b>Allow to cool</b>	21
8. Repeat actions 5 to 7 for remaining phase conductors in turn. <b>Allow to cool</b>	--
9. Remove temporary shrouding applied in 4	--
10. Bind the three cores together with three layers of PVC tape - Fig 3	--
11. Lay the neutral/earth wires over the conductor phase caps and turn back to the oversheath termination - Fig 4	--
<b>NOTE: The neutral/earth wires must be spaced to form a earth screen over the phase conductors and caps</b>	
12. Ensure neutral/earth wires are evenly spaced, trim off at the oversheath termination position and secure with PVC tape - Fig 4	--
13. Abrade the oversheath - Fig 4	26
14. Thoroughly degrease the complete termination	29
15. Fit and shrink the large cable end cap into place - Fig 5	21
16. Allow the completed stop end to cool before applying mechanical strain	

Fig 1

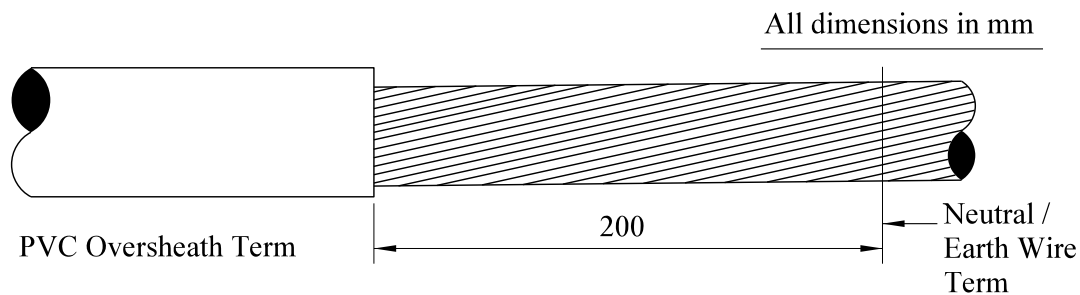


Fig 2

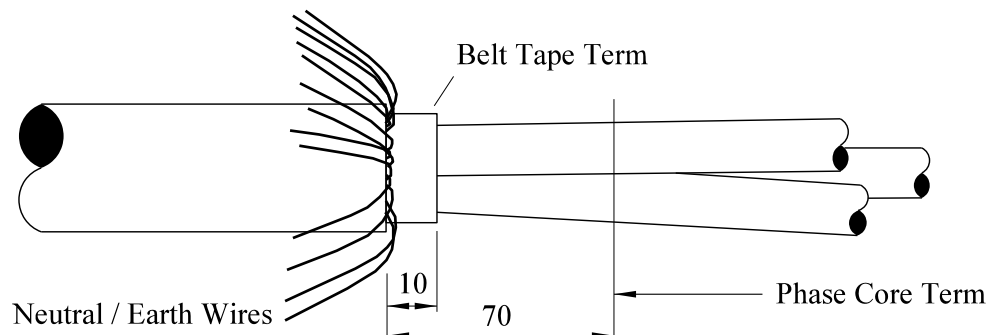


Fig 3

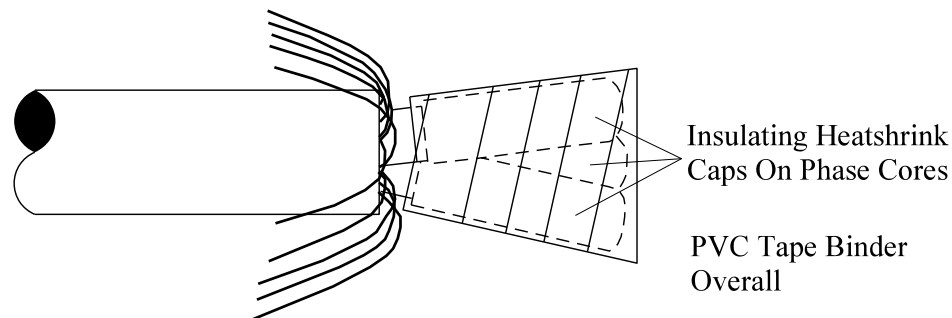


Fig 4

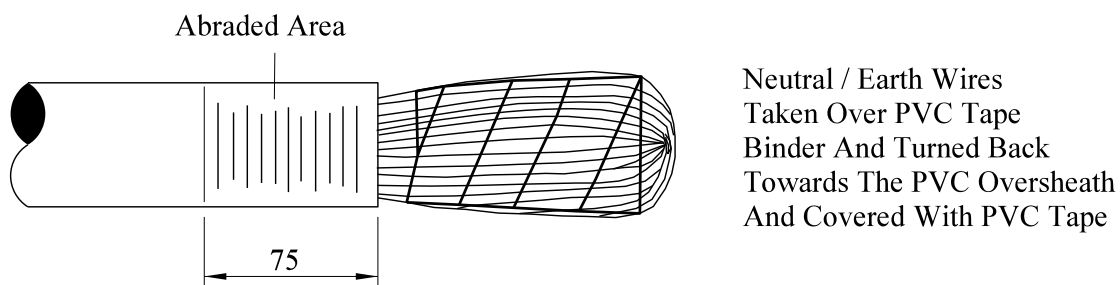


Fig 5



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Drawn	RJB	04/12	Title PVC PLAIN CONC STOP END - THREE PHASE STRIPPING DIMENSIONS / GENERAL ARRANGEMENT		
Checked					
Approved			Title PVC PLAIN CONC STOP END - THREE PHASE STRIPPING DIMENSIONS / GENERAL ARRANGEMENT		
SCALE	N.T.S.		<div style="display: flex; justify-content: space-between;"> <span>Drng. No. SVJ 7.304.1</span> <span>Rev No</span> </div>		

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**ST: CAØN/2 PROCEDURES FOR MAKING SERVICE CABLE  
STOP ENDS**

**JOINTING PROCEDURE 7.305**

**PVC SPLIT CONCENTRIC SERVICE CABLE  
STOP END - THREE PHASE**

**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 7.305**

### **MATERIALS LIST**

#### **CABLE SIZES - 25/35mm<sup>2</sup> Hybrid or 16/25mm<sup>2</sup> Cu Split Conc**

<b>Item</b>	<b>Quantity</b>
-------------	-----------------

Stop End Kit SMOE 81614 Raychem	1
---------------------------------	---

### **ADDITIONAL ITEMS FOR EACH JOINT**

PVC tape  
Emery cloth  
De-solvit 1000FD  
Workhorse dry wipes  
Cable solvent wipes

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

## JOINTING PROCEDURE 7.305

Actions	General Requirements (ST: CAØC)
Refer to Drawing <b>SVJ 7.305.1, 7.305.2</b> whilst undertaking this Jointing Procedure	
1. Set up and mark cable	4
2. Open and cut cable in accordance with General Requirement - Fig 1	13
3. Prepare neutral and earth wires for jointing - Fig 2	7
4. Apply temporary shrouding	17
5. Cut the first phase conductor to length - Fig 2	--
6. Thoroughly degrease the phase conductor insulation	29
7. Fit and shrink the small phase conductor cap into place - Fig 3 <b>Allow to cool</b>	21
8. Repeat actions 5 to 7 for remaining phase conductors in turn. <b>Allow to cool</b>	--
9. Remove temporary shrouding applied in 4	--
10. Bind the three cores together with three layers of PVC tape - Fig 3	--
11. Lay the earth wires over the conductor phase caps and cut level with the cap end - Fig 4	--
12. Ensure the earth wires are evenly spaced and cover with three layers of PVC tape - Fig 5	--
13. Lay the neutral wires over the conductor phase cap and turn back to the oversheath termination - Fig 6	--
<b>NOTE: The neutral and earth wires must be spaced to form an earth screen over the phase conductor and cap</b>	
14. Ensure the neutral wires are evenly spaced, trim off at the oversheath termination position and secure with PVC tape - Fig 6	--
15. Abrade the oversheath - Fig 6	26

### **JOINTING PROCEDURE 7.305 - Continued**

- |     |  |    |
|-----|--|----|
| 16. | Thoroughly degrease the complete termination                           | 29 |
| 17. | Fit and shrink the large cable and cap into places - Fig 7             | 21 |
| 18. | Allow the completed stop end to cool before applying mechanical strain | -- |

All dimensions in mm

Fig 1

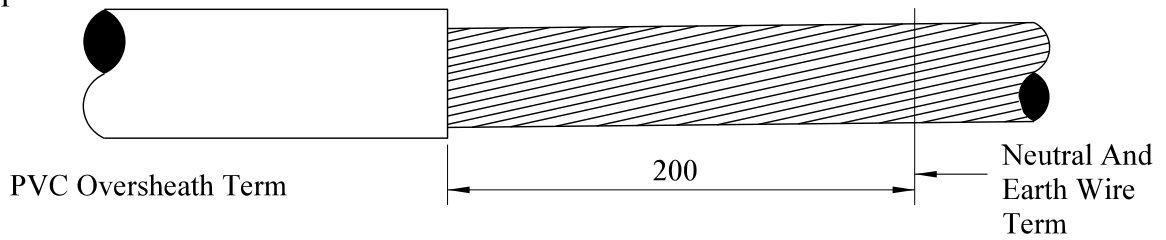


Fig 2

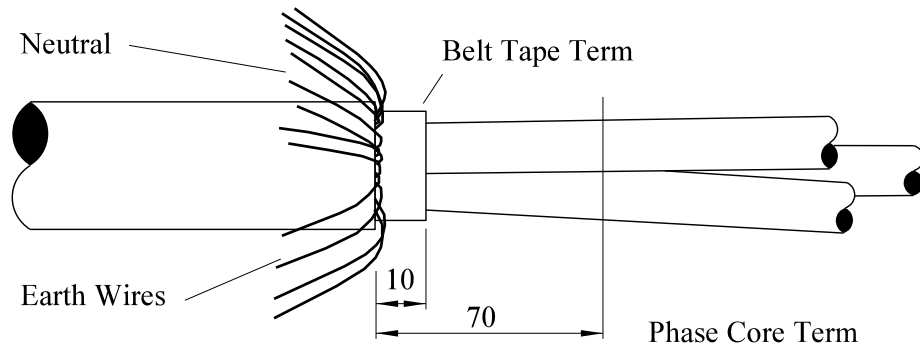


Fig 3

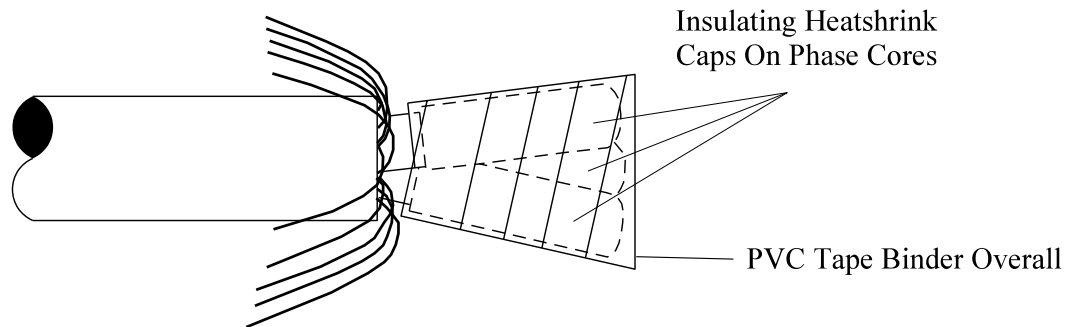
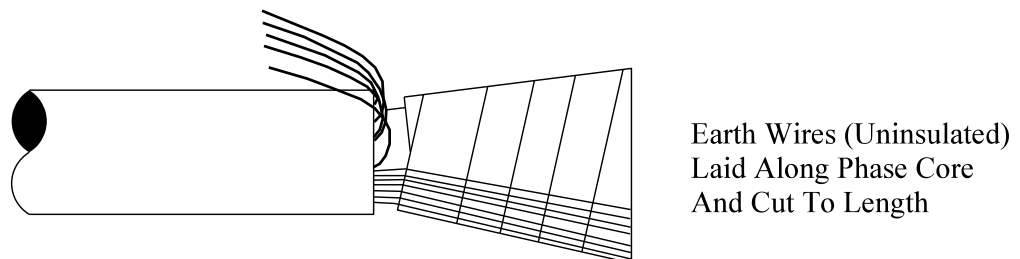


Fig 4



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Drawn	RJB	04/12						
Checked								
Approved								
SCALE	N.T.S.		Title <b>PVC SPLIT CONC</b> <b>STOP END - THREE PHASE</b> <b>STRIPPING DIMENSIONS / GENERAL LAYOUT</b>			Drg. No. <b>SVJ 7.305.1</b>	Rev No	

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All dimensions in mm

Fig 5

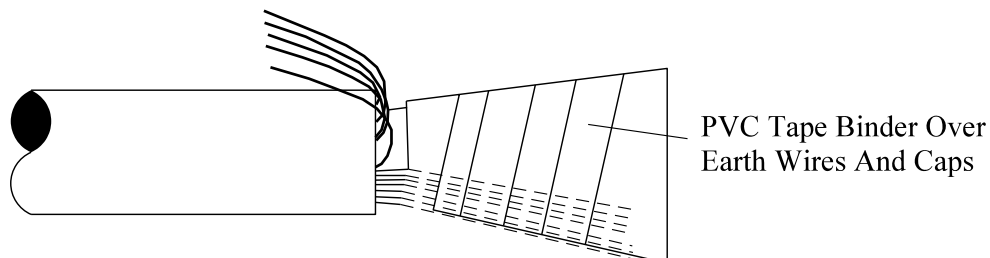


Fig 6

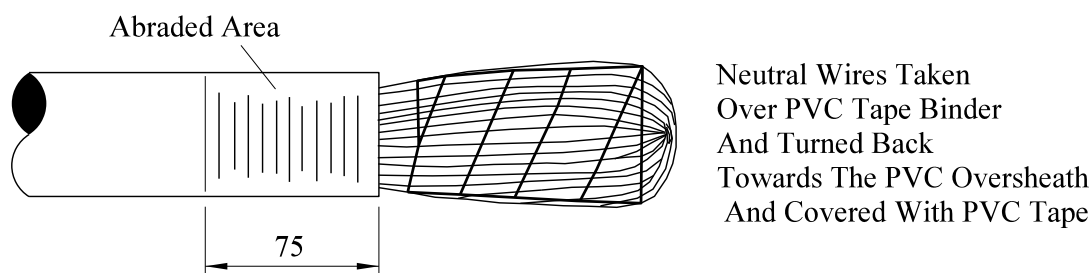



Fig 7



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Approved					
SCALE		N.T.S.		Title	
				PVC SPLIT CONC	
				STOP END - THREE PHASE STRIPPING	
				DIMENSIONS / GENERAL LAYOUT	
				Drg. No.	
				SVJ 7.305.2	
				Rev No	

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**ST: CAØN/2 PROCEDURES FOR MAKING SERVICE CABLE  
STOP ENDS**

**JOINTING PROCEDURE 7.306**

**PILC SERVICE CABLE STOP END  
- THREE PHASE**

**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 7.306**

### **MATERIALS LIST**

#### **CABLE SIZES - Up to 35mm<sup>2</sup> PILC**

<b>Item</b>	<b>Quantity</b>
Shell 1046	1
Resin	3.2 litres
Armour bond LVSB 18	1

#### **ADDITIONAL ITEMS FOR EACH JOINT**

Insulation patch  
Black cotton tape  
Sealing putty  
Cable ties  
Shell support  
Whipping thread  
PVC tape  
De-solvit 1000FD  
De-solvit 1000  
Workhorse dry wipes  
Cable solvent wipes

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

## JOINTING PROCEDURE 7.306

### Actions

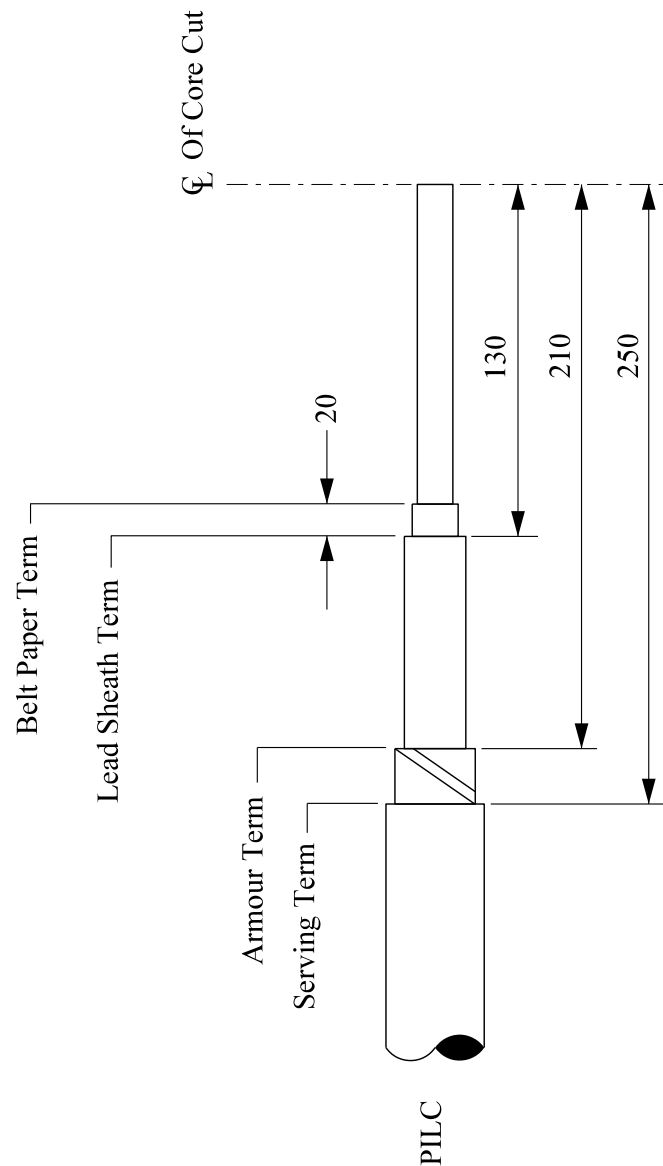
### General Requirements (ST: CAØC)


Refer to Drawing **SVJ 7.306.1, 7.306.2**, whilst undertaking this Jointing Procedure

1.	Set up and mark cable	4
2.	Open and cut cable in accordance with General Requirement	12
3.	Apply armour bond	18
4.	Carefully apply cable ties around the core insulation shrouds	--
5.	Build up oversheath	--
6.	Thoroughly degrease the joint	29
7.	Apply mastic water block to lead sheath	27
8.	Prepare and fit shell, ensuring 15mm clearance	30
9.	Mix and pour resin	31

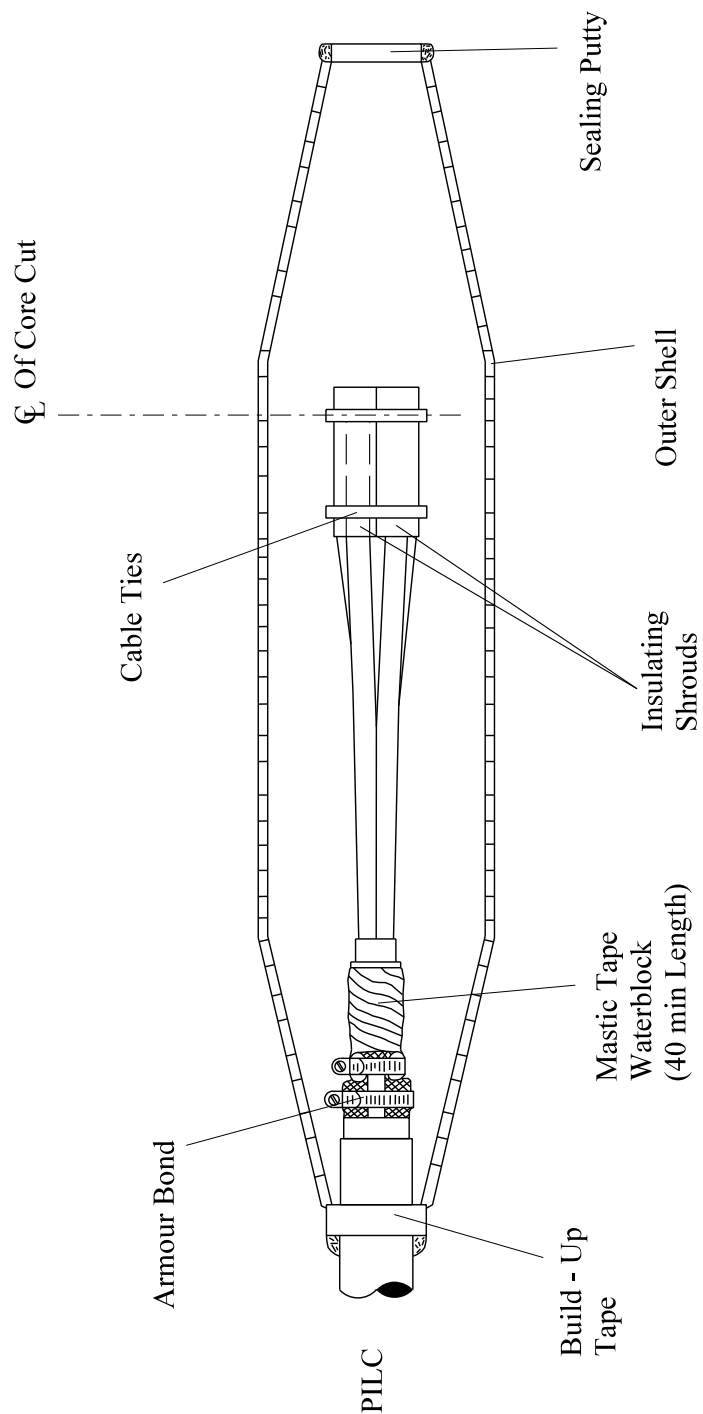


All dimensions in mm




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ORIGINAL ISSUE		DATE		WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.	
Drawn	RJB	04/12		 <b>WESTERN POWER DISTRIBUTION</b>	
Checked					
Approved					
SCALE		N.T.S.		Title PILC STOP END - THREE PHASE STRIPPING DIMENSIONS	
				Drg. No. SVJ 7.306.1	
				Rev No	

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PLAN VIEW

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Approved					
SCALE		N.T.S.		Title PILC STOP END - THREE PHASE GENERAL LAYOUT	
				Drg. No. SVJ 7.306.2	
				Rev No	

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**ST: CAØN/2 PROCEDURES FOR MAKING SERVICE CABLE  
STOP ENDS**

**JOINTING PROCEDURE 7.307**

**35mm<sup>2</sup> CNE WAVECON SERVICE CABLE  
STOP END - THREE PHASE**

**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 7.307**

### **MATERIALS LIST**

#### **CABLE SIZES – 35mm<sup>2</sup> Wavecon**

<b>Item</b>	<b>Quantity</b>
Stop End Kit SMOE 81614	1

#### **ADDITIONAL ITEMS FOR EACH JOINT**

PVC tape  
Emery cloth  
De-solvit 1000FD  
Workhorse dry wipes  
Cable solvent wipes

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

## JOINTING PROCEDURE 7.307

### Actions

### General Requirements (ST: CAØC)

Refer to Drawing **SVJ 7.307.1** whilst undertaking this Jointing Procedure

1.	Set up and mark cable	4
2.	Open and cut cable in accordance with General Requirement - Fig 1	13
3.	Prepare the neutral/earth wires for jointing - Fig 2	7
4.	Apply temporary shrouding	17
5.	Cut the first phase conductor to length - Fig 2	--
6.	Thoroughly degrease the phase conductor insulation	--
7.	Fit and shrink the small phase conductor cap into place - Fig 3. <b>Allow to cool</b>	21
8.	Repeat actions 5 to 7 for remaining phase conductors in turn. <b>Allow to cool</b>	--
9.	Remove temporary shrouding applied in 4	--
10.	Bind the three cores together with three layers of PVC tape - Fig 3	--
11.	Lay the neutral/earth wires over the conductor phase caps, turn back to the oversheath termination - Fig 4	--
<b>NOTE: The neutral/earth wires must be spaced to form a earth screen over the phase conductors and caps</b>		
12.	Ensure neutral/earth wires are evenly spaced, trim off at the oversheath termination position and secure with PVC tape - Fig 4	--
13.	Abrade the oversheath - Fig 4	26

### **JOINTING PROCEDURE 7.307 - Continued**

- |     |  |    |
|-----|--|----|
| 14. | Thoroughly degrease the complete termination                           | 29 |
| 15. | Fit and shrink the large cable end cap into place - Fig 5              | 21 |
| 16. | Allow the completed stop end to cool before applying mechanical strain | -- |

Fig 1

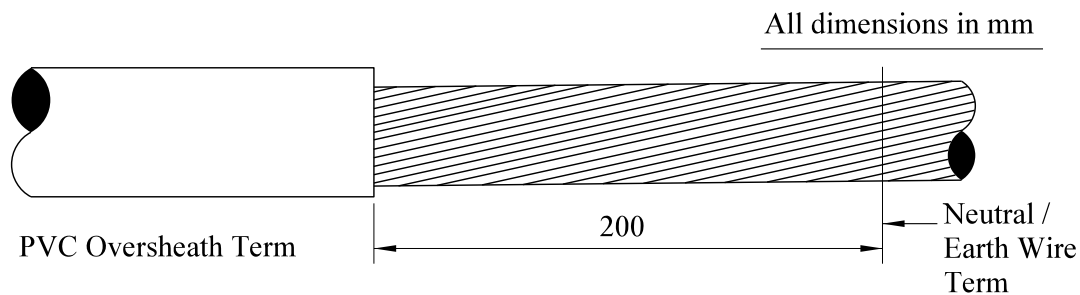


Fig 2

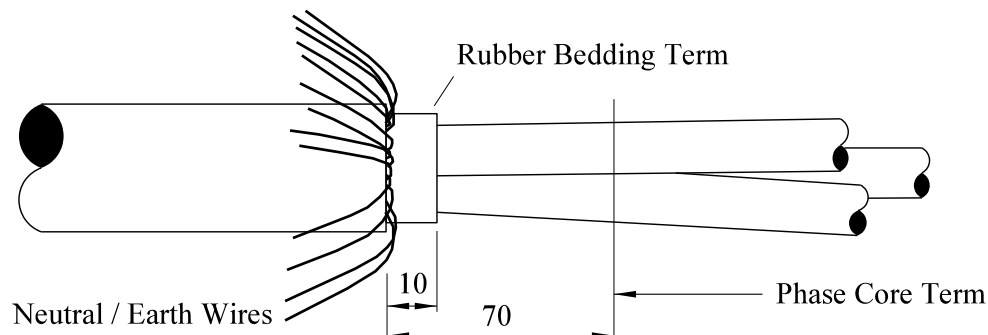


Fig 3

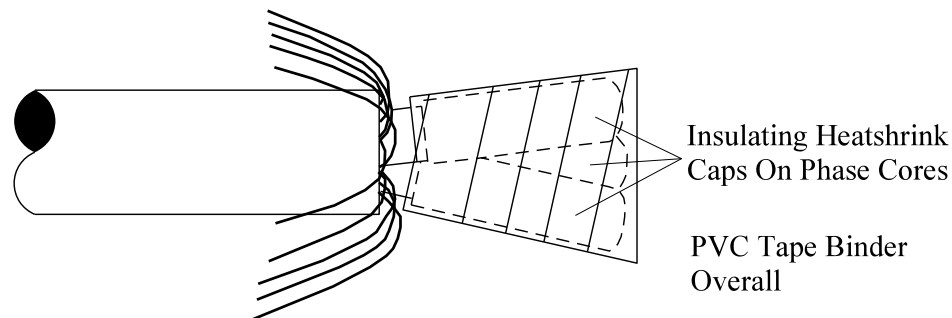


Fig 4

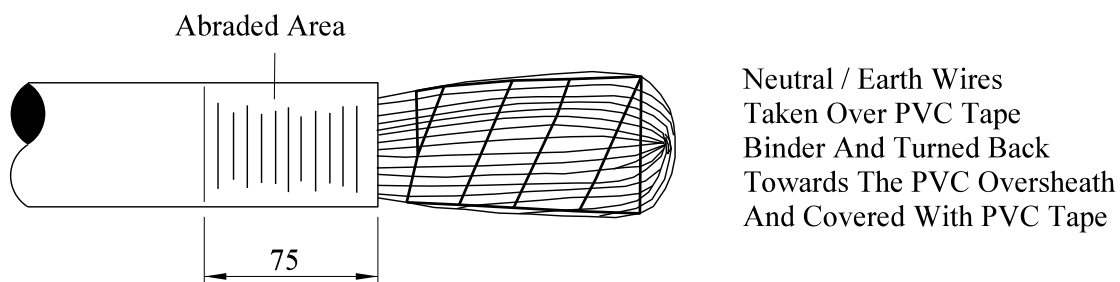


Fig 5



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Checked					
Approved			Title 35mm <sup>2</sup> CNE WAVECON STOP END - THREE PHASE STRIPPING DIMENSIONS / GENERAL ARRANGEMENT		
SCALE	N.T.S.		<div style="display: flex; justify-content: space-between;"> <span>Drng. No. SVJ 7.307.1</span> <span>Rev No</span> </div>		

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## **APPENDIX A**

### **SUPERSEDED DOCUMENTATION**

This Standard Technique supersedes ST:CAØN/1 dated May 2012 which should now be withdrawn.

## **APPENDIX B**

### **ASSOCIATED DOCUMENTATION**

ST:CAØA, ST:CAØB, ST:CAØC, ST:CAØM, ST:CAØS, ST:CAØT, ST:CAØU, ST:CAØV, ST:CAØW, 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**

Stop Ends, Service Cable Stop Ends.