

Serving the Midlands, South West and Wales Gwasanaethu Canolbarth a De Orllewin Lloegr a Chymru

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

NOTE: The current version of this document is stored in the WPD Corporate Information Database. Any other copy in electronic or printed format may be out of date.

Copyright © 2015 Western Power Distribution

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

Date Comments Author • Correction of General Requirement Numbers. • SVI 7 301.1 measurements amended	Document Revision & Review Table		
	Date	Comments	Author
July 2014 SVJ 7.301.1 measurements amended SVJ 7.302.1 measurements amended Inclusion of cable solvent wipes Richard Summer	July 2014	 SVJ 7.301.1 measurements amended SVJ 7.302.1 measurements amended 	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.

CONTENTS		Page
7.301	Plain Concentric Stop End (Single Phase)	5
7.302	Split Concentric Stop End (Single Phase)	9
7.303	PILC Stop End (Single Phase)	15
7.304	Plain Concentric Stop End (Three Phase)	20
7.305	Split Concentric Stop End (Three Phase)	24
7.306	PILC Stop End (Three Phase)	30
7.307	35mm ² CNE Wavecon (Three Phase)	35

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

© Western Power Distribution plc Produced All Rights Reserved 2014

1

MATERIALS LIST

CABLE SIZES - 25/35mm2 Hyb or 16/25mm2 Cu Plain Conc

Item Quantity

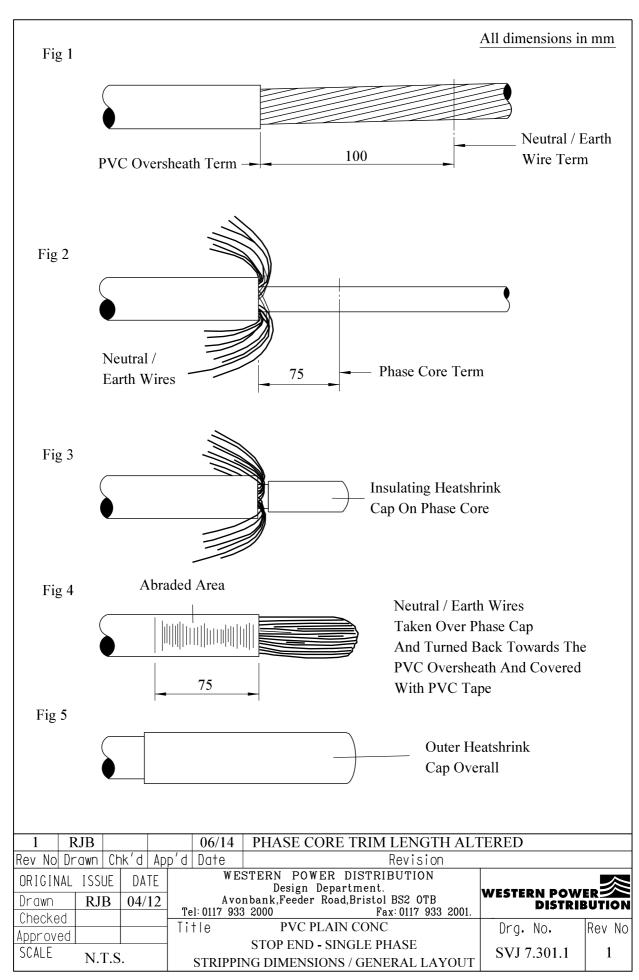
Stop End Kit SMOE 81613

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.

Actions		General Requirements (ST: CAØC)
	Refer to Drawing SVJ 7.301.1 whilst undertaking this Jointing Procedure	
1.	Set up and mark cable	4
2.	Open and cut cable in accordance with General Requiremental Fig 1.	nt 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. Allow to cool	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	nd
NO	OTE: The neutral/earth wires must be spaced to form an e the phase conductor and cap	earth screen over
10.	Ensure the wires are evenly spaced, trim off at the oversheatermination and secure with PVC tape - Fig 4	eth,
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	





Serving the Midlands, South West and Wales Gwasanaethu Canolbarth a De Orllewin Lloegr a Chymru

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

 $\hbox{@}$ Western Power Distribution plc Produced All Rights Reserved 2014

1

MATERIALS LIST

CABLE SIZES - 16/25mm2 Cu Plain Conc

Item Quantity

Stop End Kit SMOE 81613

ADDITIONAL ITEMS FOR EACH JOINT

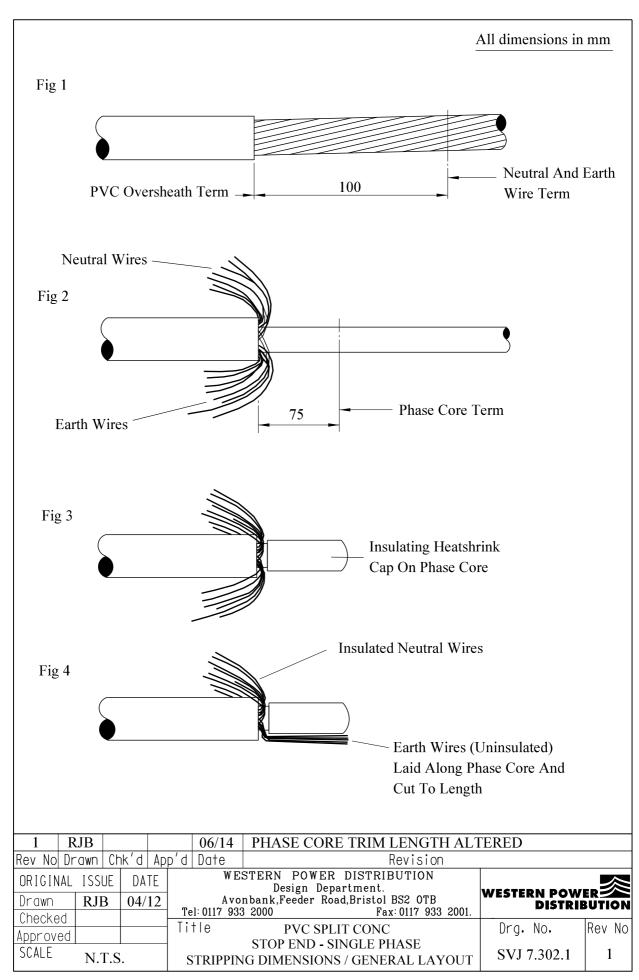
PVC tape Emery cloth De-solvit 1000FD Workhorse dry wipes Cable solvent wipes

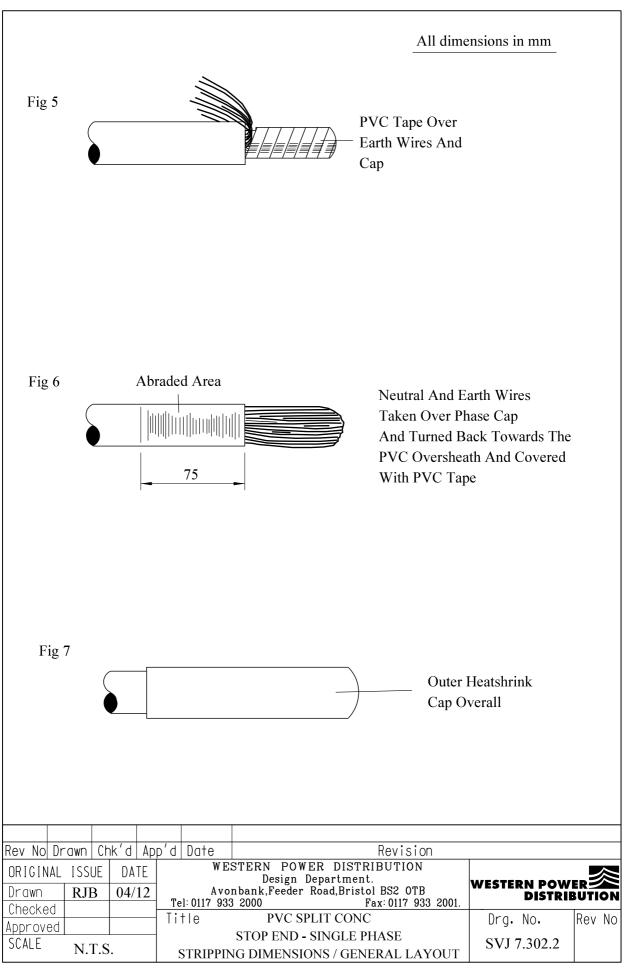
Note: - Individual material item numbers (SHOPS) are to be found in Section 4 of the LV Service Cable Jointing Manual.

Actions		General Requirement (ST: CAØC)	
	Refer to Drawing SVJ 7.302.1, 7.302.2 whilst undertaking Jointing Procedure	this	
1.	Set up and mark cable	4	
2.	Open and cut cable in accordance with General Requiremental Fig 1	nt 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. Allow to cool	g 3 21	
8.	Remove temporary shrouding applied in 4		
9.	Lay the earth wires over the conductor phase cap and cut lewith the cap end - Fig 4	vel	
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.	ı 	
NO	OTE: The neutral and earth wires must be spaced to form over the phase conductor and cap	an earth screen	
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	







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

© Western Power Distribution plc Produced All Rights Reserved 2014

MATERIALS LIST

CABLE SIZES - Up to 35mm² PILC

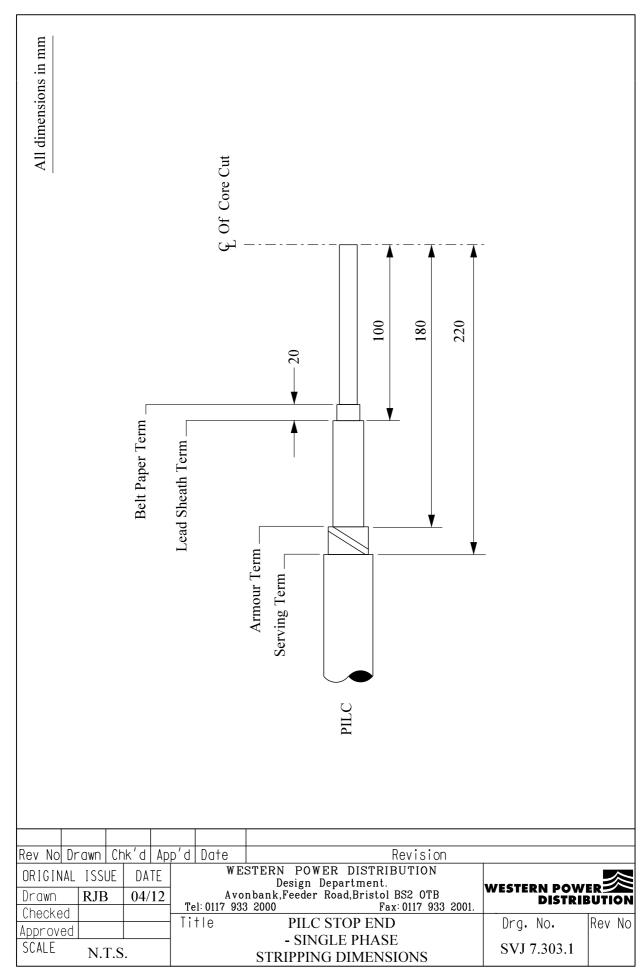
Item	Quantity
Shell 1046	1
Resin	3.2 lts
Armour bond LVSB 18	1

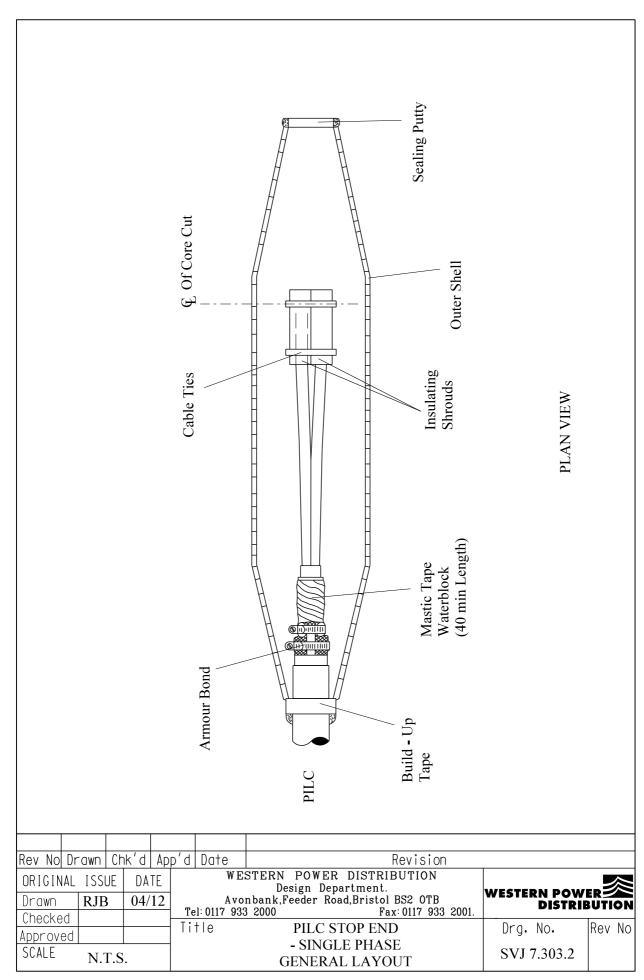
ADDITIONAL ITEMS FOR EACH JOINT

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.

Actio	ons	General Requirements (ST: CAØC)
	Refer to Drawing SVJ 7.303.1, 7.303.2 whilst undertaking Jointing Procedure	this
1.	Set up and mark cable	4
2.	Open and cut cable in accordance with General Requirement	nt 12
3.	Apply armour bond	18
4.	Carefully apply cable ties around the core insulation shrouds	s
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







Serving the Midlands, South West and Wales Gwasanaethu Canolbarth a De Orllewin Lloegr a Chymru

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

 $\ensuremath{\mathbb{C}}$ Western Power Distribution plc Produced All Rights Reserved 2014

ST: CAØN/2 July 2014

- 20 of 40 -

MATERIALS LIST

CABLE SIZES - 25/35mm2 Hybrid or 16/25mm2 Cu Plain Conc

1

Item Quantity

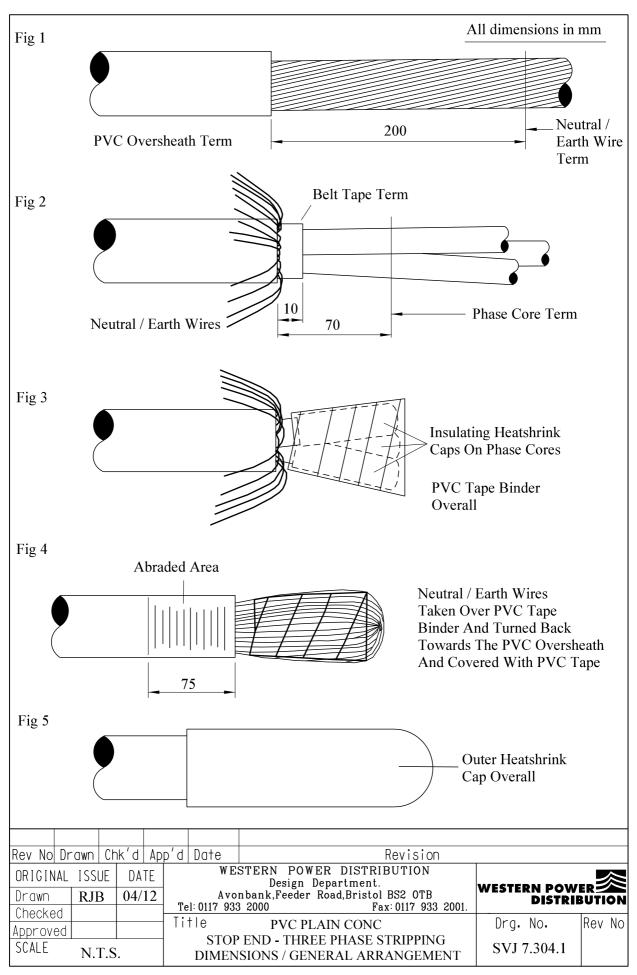
Stop End Kit SMOE 81614

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.

Acti	ions Gen	neral Requirements (ST: CAØC)
	Refer to Drawing SVJ 7.304.1 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. Allow to cool	21
8.	Repeat actions 5 to 7 for remaining phase conductors in turn. Allow to cool	
9.	Remove temporary shrouding applied in 4	
10.	Bind the three cores together with three layers of PVC tape - Fi	g 3
11.	Lay the neutral/earth wires over the conductor phase caps and turn back to the oversheath termination - Fig 4	
	NOTE: The neutral/earth wires must be spaced to form a ear over the phase conductors and caps	rth screen
12.	Ensure neutral/earth wires are evenly spaced, trim off at the over termination position and secure with PVC tape - Fig 4	ersheath
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 mechanic strain	cal





Serving the Midlands, South West and Wales Gwasanaethu Canolbarth a De Orllewin Lloegr a Chymru

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

 $\ensuremath{\mathbb{C}}$ Western Power Distribution plc Produced All Rights Reserved 2014

ST: CAØN/2 July 2014

MATERIALS LIST

CABLE SIZES - 25/35mm2 Hybrid or 16/25mm2 Cu Split Conc

Item Quantity

Stop End Kit SMOE 81614 Raychem 1

ADDITIONAL ITEMS FOR EACH JOINT

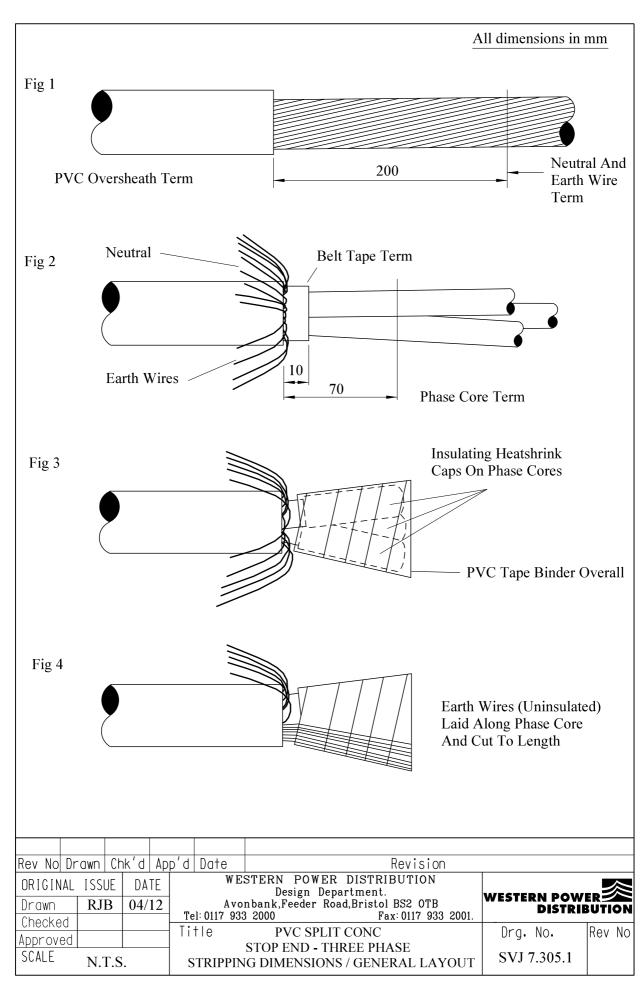
PVC tape Emery cloth De-solvit 1000FD Workhorse dry wipes Cable solvent wipes

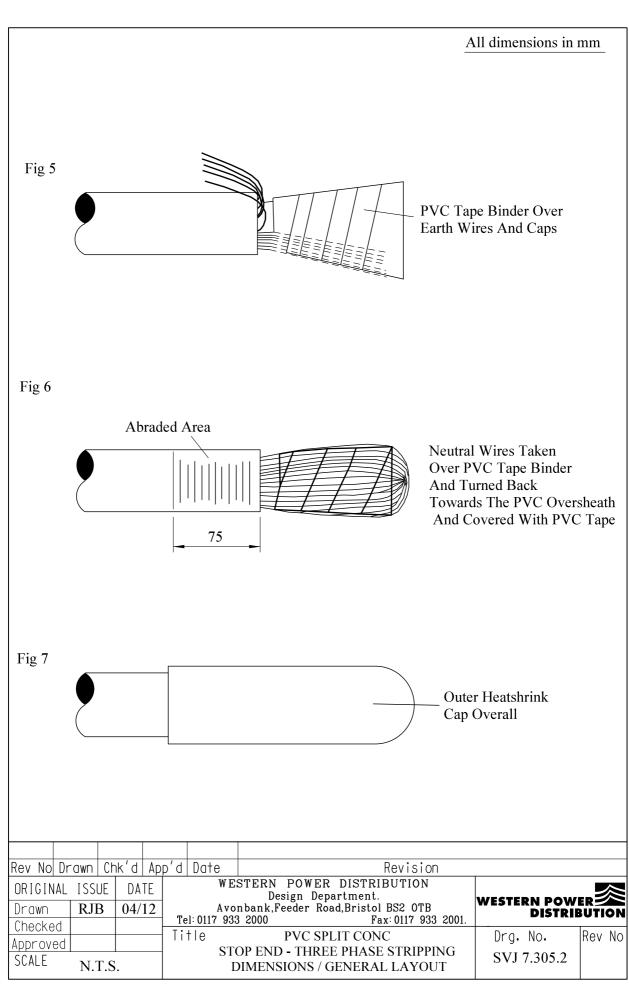
Note: - Individual material item numbers (SHOPS) are to be found in Section 4 of the LV Service Cable Jointing Manual.

Actio	ons (General Requirements (ST: CAØC)	
	Refer to Drawing SVJ 7.305.1 , 7.305.2 whilst undertaking the Jointing Procedure	nis	
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 Allow to cool	3 21	
8.	Repeat actions 5 to 7 for remaining phase conductors in turn. Allow to cool		
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 lever with the cap end - Fig 4	/el	
12.	Ensure the earth wires are evenly spaced and cover with three layers of PVC tape - Fig 5	e	
13.	Lay the neutral wires over the conductor phase cap and turn back to the oversheath termination - Fig 6		
NO	OTE: The neutral and earth wires must be spaced to form a over the phase conductor and cap	nn earth screen	
14.	Ensure the neutral wires are evenly spaced, trim off at the oversheath termination position and secure with PVC tape - I	 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	







Serving the Midlands, South West and Wales Gwasanaethu Canolbarth a De Orllewin Lloegr a Chymru

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

 $\hbox{@}$ Western Power Distribution plc Produced All Rights Reserved 2014

MATERIALS LIST

CABLE SIZES - Up to 35mm² PILC

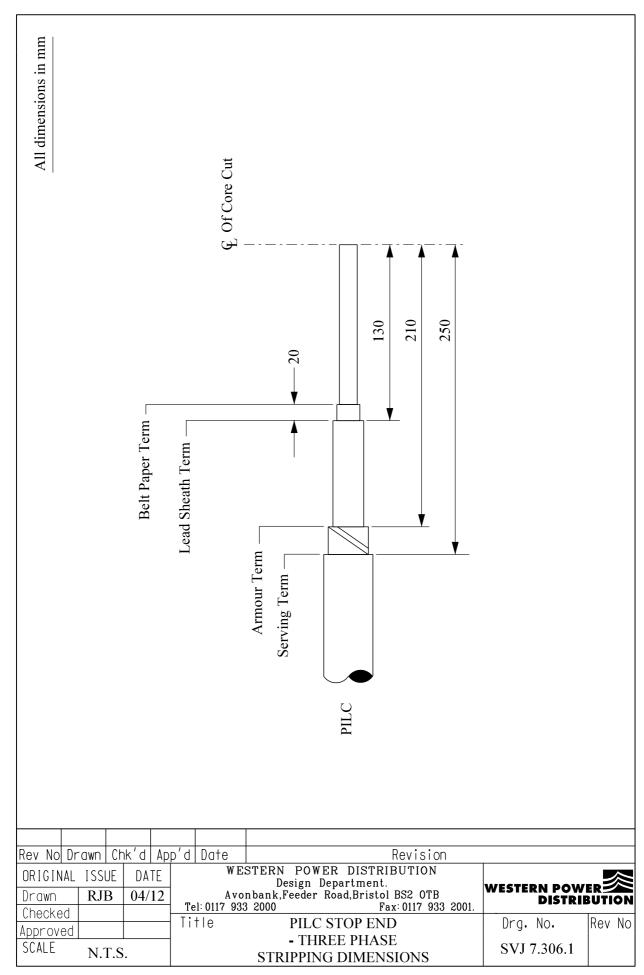
Item	Quantity
Shell 1046	1
Resin	3.2 litres
Armour bond LVSB 18	1

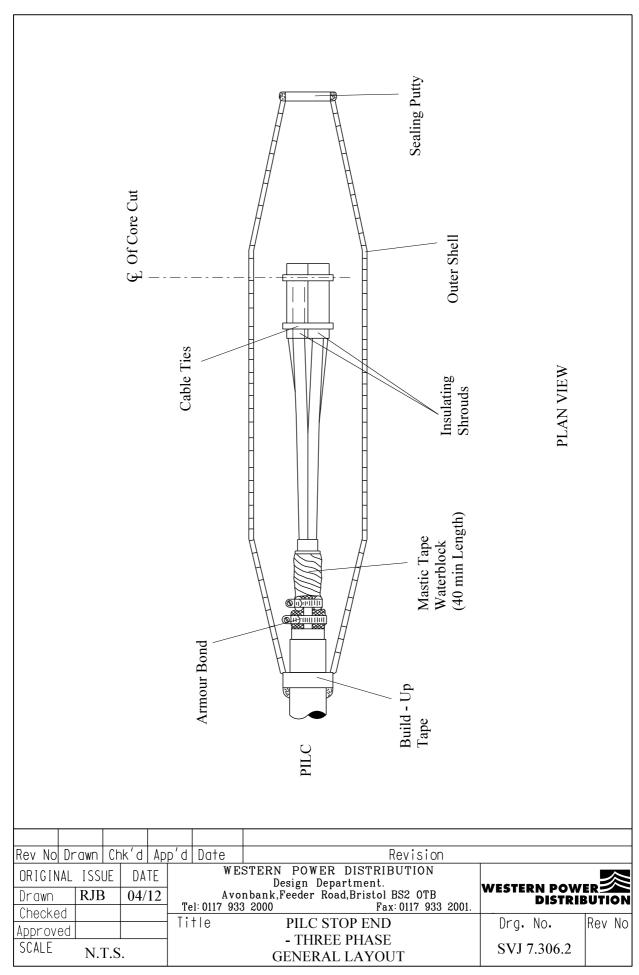
ADDITIONAL ITEMS FOR EACH JOINT

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.

Actions **General Requirements** (ST: CAØC) Refer to Drawing SVJ 7.306.1, 7.306.2, whilst undertaking this Jointing Procedure 4 1. Set up and mark cable 2. Open and cut cable in accordance with General Requirement 12 3. 18 Apply armour bond 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. 30 Prepare and fit shell, ensuring 15mm clearance 9. 31 Mix and pour resin







Serving the Midlands, South West and Wales Gwasanaethu Canolbarth a De Orllewin Lloegr a Chymru

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

JOINTING PROCEDURE 7.307

35mm² 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

© Western Power Distribution plc Produced All Rights Reserved 2014

MATERIALS LIST

CABLE SIZES – 35mm² Wavecon

Item Quantity

Stop End Kit SMOE 81614

ADDITIONAL ITEMS FOR EACH JOINT

1

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.

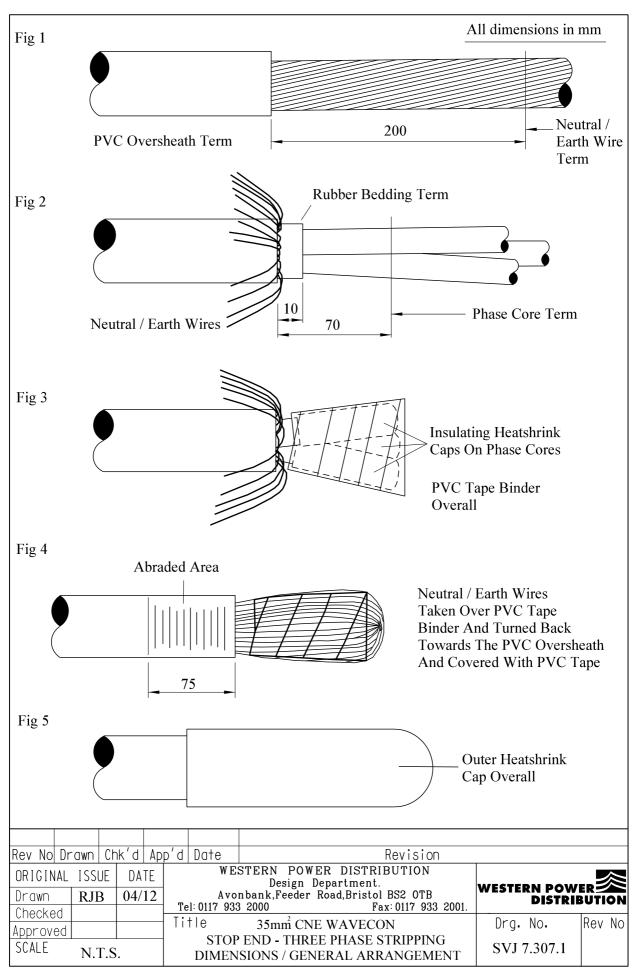
Actions General Requirements (ST: CAØC)

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. Allow to cool	21
8.	Repeat actions 5 to 7 for remaining phase conductors in turn. Allow to cool	
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	
	NOTE: The neutral/earth wires must be spaced to form a earth screen over the phase conductors and caps	
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	



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.