

Company Directive

STANDARD TECHNIQUE: CA2M/4

Relating to Procedures for Making 11kV Cable Branch Joints

Policy Summary

This Standard Technique document contains all the approved 11kV cold applied/pour Branch Joints for EPR, 3 Core XLPE, 3 Core XLPE SWA, PICAS screened and belted, PISAS and PILC cables. It shall be implemented in conjunction with the appropriate General Requirements in ST: CA2C/8.

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: Peter White

Implementation Date: May 2016

Approved by:

Policy Manager

Date:

17 May 2016

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IMPLEMENTATION PLAN

Introduction

This updated Standard Technique defines all the standard 11kV branch joints which are available for use on the 11kV underground cable used within.

Main Changes

The document has been updated to take into account the WPD losses strategy and some minor changes in the Jointing Procedure kitting lists.

Impact of Changes

None.

Implementation Actions

Team managers to disseminate the information to their respective 11kV Jointers.

Implementation Timetable

This Standard Technique can be implemented with immediate effect.

Document Revision & Review Table		
Date	Comments	Author
May 2016	<p>Document modified to take into account the WPD losses strategy.</p> <p>Minor changes in the kitting lists to remove errors.</p>	Peter White
31/03/2013	<p>The changes that have been made to this document are the inclusion of all the 11kV cables which have over the years been used in the Midlands Areas and not used in the South Wales and South Western areas, thus providing a unified common document applicable to the whole company.</p> <p>This document now contains all the required the Jointing Procedures associated to the cables used within the enlarged company thus allowing Branch joints to be installed on the said cables.</p> <p>Rectification of known typographic errors.</p>	Peter White

ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

INTRODUCTION

This Standard Technique document contains all the approved 11kV Branch Joints, which shall be implemented in conjunction with the appropriate General Requirements, contained in ST: CA2C/8, including: -

1. General Cleanliness and Accident Prevention.
2. Joint Bay Preparation.
3. General Jointing Procedures – Dead Cables.

If the need arises to undertake a branch joint configuration (i.e. non-standard) not covered within the Standard Technique the Policy Manager, Avonbank, is to be consulted.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

Cable sizes shown are the maximum for the individual joint, cable sizes below the maximum and there combinations are accommodated and are provided for in the relevant Jointing Procedure, this is particularly evident for transitional jointing.

Where 240mm² EPR Triplex is to be found, then for material selection and installation data use 300mm² EPR Triplex; but for the electrical purposes i.e. loadings, ratings etc. then the 240mm² EPR Triplex shall be treated as 185mm² EPR Triplex.

Any reference to PICAS equally applies to screened or belted PICAS as well as PISAS. Any reference to EPR triplex equally applies to XLPE triplex.

Resin encapsulated joints must not be broken down.

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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.201

185mm² EPR TRIPLEX - 185mm² EPR TRIPLEX CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 185mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.201

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
70 EPR	70 EPR	BJ 1101
	95 EPR	BJ 1102
	185 EPR	BJ 1103
95 EPR	70 EPR	BJ 1104
	95 EPR	BJ 1105
	185 EPR	BJ 1106
185 EPR	70 EPR	BJ 1107
	95 EPR	BJ 1108
	185 EPR	BJ 1109

Note: - The jointing materials for 240mm² EPR Triplex will be as 300mm² EPR Triplex.

Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.201

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE		FOAM TAPE BUILD UP MODULE	CONNECTORS		TUBE SET
	KB 85	B	D	D	J	FTBM	HVBRM18SPUTC	BCNE-3	SMOE 28003
BJ 1101	1	1	2		3	2	3	2	3
BJ 1102	1	1	2	1	2	1	3	2	3
BJ 1103	1	1	2	1	2	1	3	2	3
BJ 1104	1	1	2	2	1	1	3	2	3
BJ 1105	1	1	2	3			3	2	3
BJ 1106	1	1	2	3			3	2	3
BJ 1107	1	1	2	2	1	1	3	2	3
BJ 1108	1	1	2	3			3	2	3
BJ 1109	1	1	2	3			3	2	3

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
 Scotch 70
 Scotch 13 tape
 Tinned copper wire 16 swg
 Tinned copper wire 20 swg
 De-solvit 1000 FD
 De-solvit 1000
 Workhorse dry wipes
 Emery cloth
 Scotch 5313 Water block tape
 Cable ties
 Sealing putty
 Aluminium oxide cloth 320 grit
 Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.201

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.201.1, 7.201.2 and 7.201.3**, whilst undertaking this Jointing Procedure.

- | | | |
|----|---|-----|
| 1. | Set and mark cables. | 5/6 |
| 2. | Cut main cable at centre of connector (spiking position). | -- |

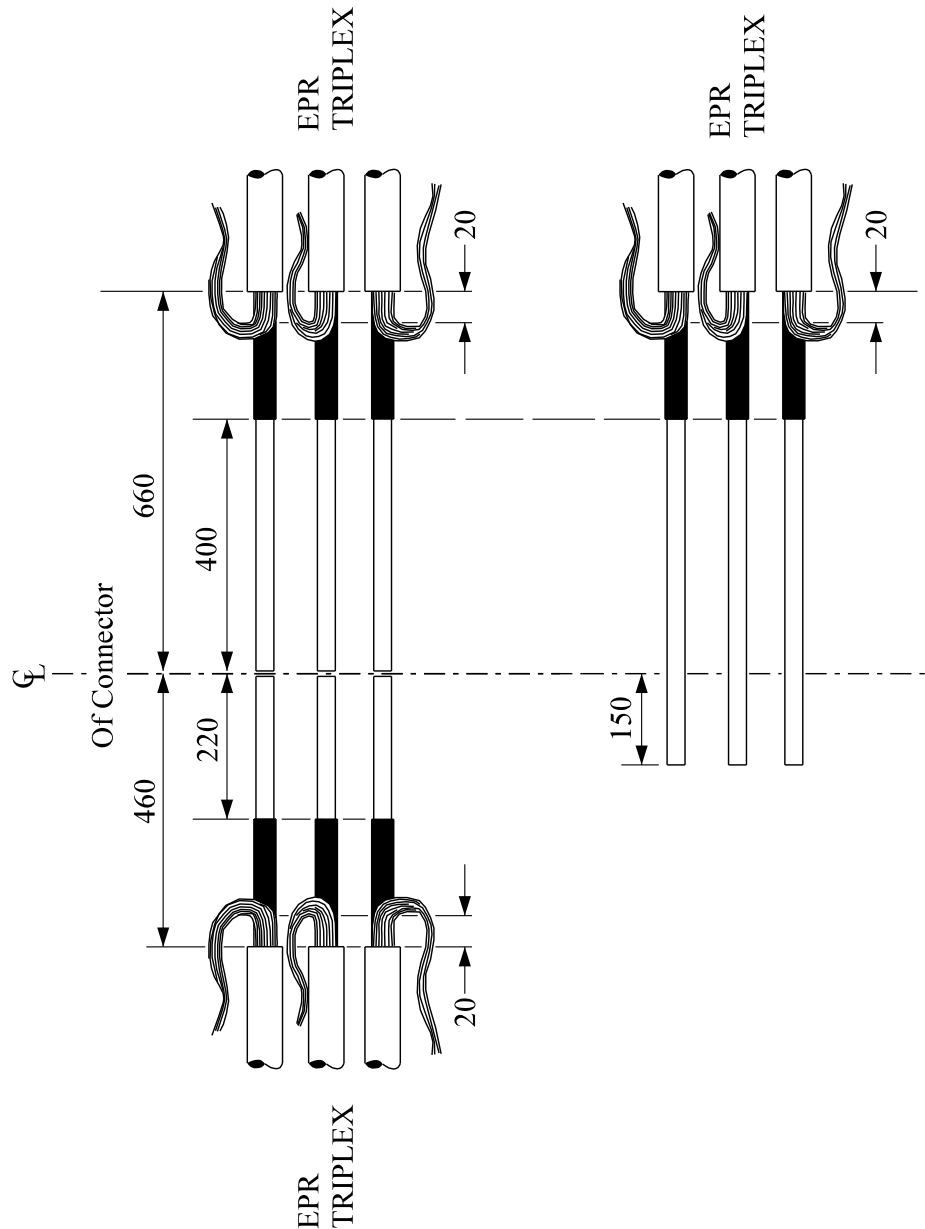
EPR CABLE - Preparation

- | | | |
|-----|--|----|
| 3. | Unravel and straighten individual cores. | -- |
| 4. | Identify and mark core phasing clear of joint position. | -- |
| 5. | Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position. | 25 |
| 6. | Clean each oversheath for a distance of 1.5m. | -- |
| 7. | Apply a temporary earth continuity bond clear of joint position. | 10 |
| 8. | Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core. | -- |
| 9. | Set and mark cores ensuring two to the top. | -- |
| 10. | Remove oversheaths and bedding tapes. | 16 |
| 11. | Abrade oversheaths. | 17 |
| 12. | Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point. | -- |
| 13. | Straighten copper screen wires and form into a bunch. | -- |
| 14. | Remove semi-conducting screens ensuring insulation is free from all conducting material. | 28 |
| 15. | Single end only , remove core insulation to allow connector fitting. | 31 |
| 16. | Fit foam filler pieces and build up cable oversheaths. | 32 |
| 17. | Park copper stocking over cores at single end. | -- |

JOINTING PROCEDURE 7.201 – Continued

Actions	General Requirements (ST: CA2C/8)
18. Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
19. Apply a stress cone to each core.	35
COMPLETION OF JOINT	
20. Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6
21. Park insulation spacers between cores at single end.	37
22. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
23. Fit insulation tubes.	37
24. Fit inner sleeve.	39/40
25. Ensure joint is level and fill with Lovisil.	41
26. Clean and degrease inner sleeve.	43
27. Form copper screen wire bunches into one conductor and connect to earth braid.	42
28. Remove temporary earth continuity bond applied in 7 and reseal EPR oversheaths.	51
29. Slide and stretch copper stocking across joint and connect to copper screen wires.	44
30. Fit and support outer sleeve.	46
31. Mix and pour resin.	47

All dimensions in mm

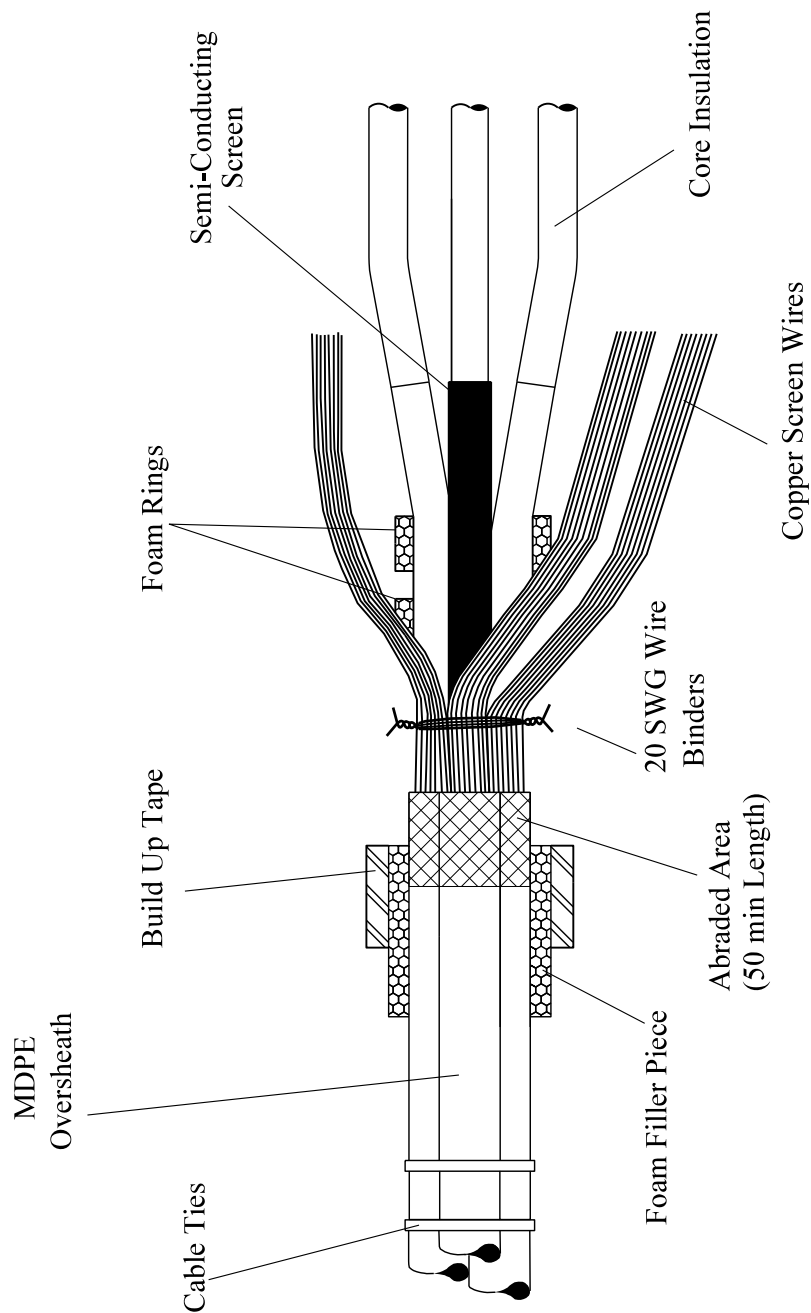



Rev No	Drawn	Chk'd	App'd	Date	Revision
ORIGINAL ISSUE		DATE		WESTERN POWER DISTRIBUTION Design Department. Avonbank,Feeder Road,Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.	
Drawn	RJB	04/13	Title UP TO & INC 185mm ² EPR TRIPLEX BRANCH JOINT STRIPPING DIMENSIONS		
Checked					
Approved					
SCALE N.T.S.			Drg. No. JP2D 7.201.1		Rev No

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All dimensions in mm

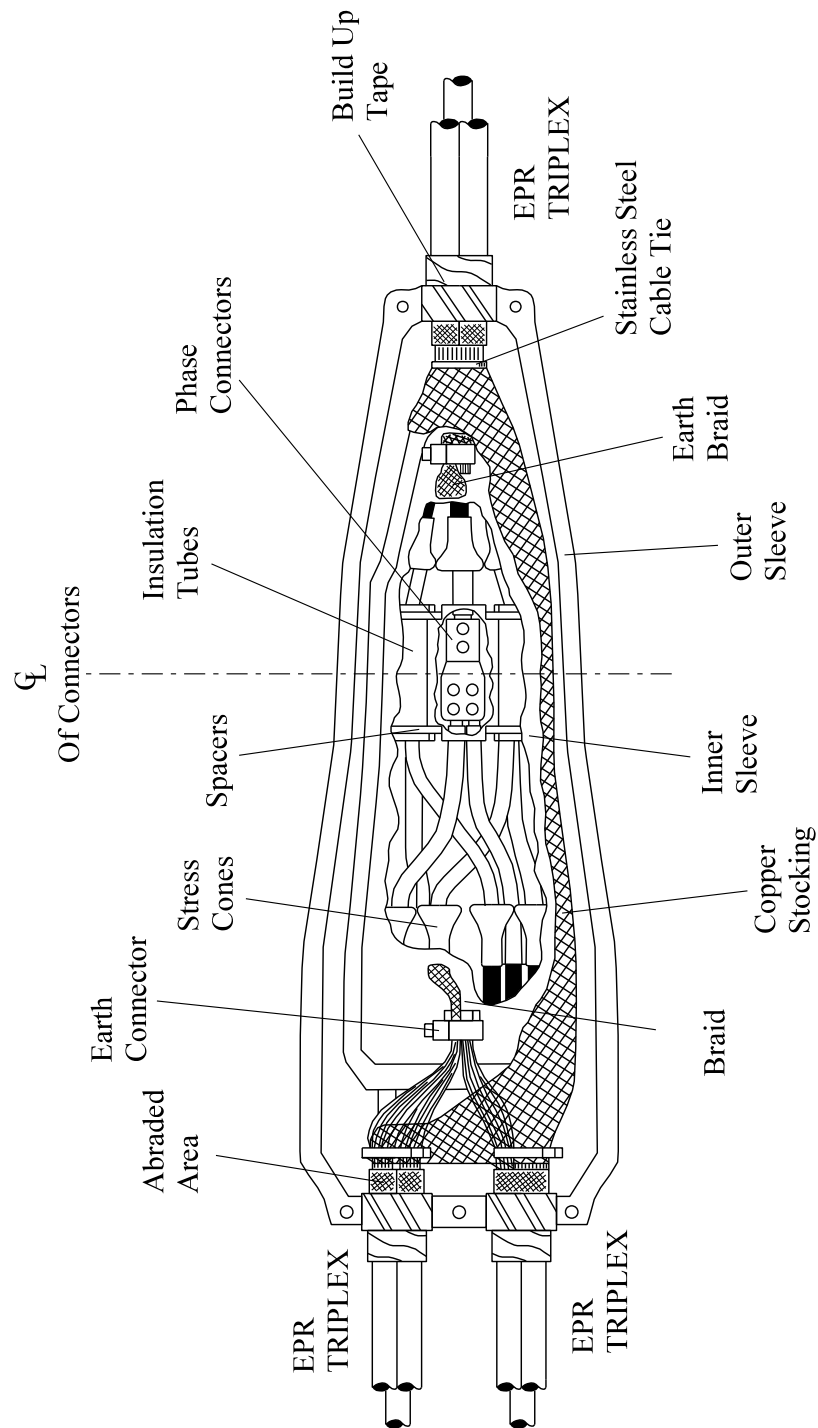
EPR TRIPLEX




Rev No	Drawn	Chk'd	App'd	Date	Revision
ORIGINAL ISSUE		DATE		WESTERN POWER DISTRIBUTION Design Department. Avonbank,Feeder Road,Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.	
Drawn	RJB	04/13		 WESTERN POWER DISTRIBUTION	
Checked					
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SCALE		N.T.S.		Title	
				PREPARATION OF EPR TRIPLEX	
				Drg. No. JP2D 7.201.2	
				Rev No	

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All dimensions in mm



PLAN VIEW

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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.			 WESTERN POWER DISTRIBUTION
Drawn	RJB	04/13				
Checked						
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SCALE	N.T.S.		Title UP TO & INC 185mm ² EPR TRIPLEX BRANCH JOINT GENERAL LAYOUT			Drg. No. JP2D 7.201.3 Rev No

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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.202

300mm² EPR TRIPLEX – 300mm² EPR TRIPLEX CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 300mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.202

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
70 EPR	300 EPR	BJ 1110
95 EPR	300 EPR	BJ 1111
185 EPR	300 EPR	BJ 1112
300 EPR	70 EPR	BJ 1113
	95 EPR	BJ 1114
	185 EPR	BJ 1115
	300 EPR	BJ 1116

Note: - The jointing materials for 240mm² EPR Triplex will be as 300mm² EPR Triplex.

Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.202

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTOR		TUBE SET
	KB 95	B	D	D	F	J	FTBM	HVBRM22SPUTC	BCNE-3	SMOE 28003
BJ 1110	1	2	2		1	2	2	3	2	3
BJ 1111	1	2	2	2	1		1	3	2	3
BJ 1112	1	2	2	2	1		1	3	2	3
BJ 1113	1	2	2		2	1	1	3	2	3
BJ 1114	1	2	2	1	2		1	3	2	3
BJ 1115	1	2	2	1	2		1	3	2	3
BJ 1116	1	2	2		3			3	2	3

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
 Scotch 70
 Scotch 13 tape
 Tinned copper wire 16 swg
 Tinned copper wire 20 swg
 De-solvit 1000 FD
 De-solvit 1000
 Workhorse dry wipes
 Emery cloth
 Scotch 5313 Water block tape
 Cable ties
 Sealing putty
 Aluminium oxide cloth 320 grit
 Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.202

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.202.1, 7.202.2 and 7.202.3**, whilst undertaking this Jointing Procedure.

- | | | |
|----|---|-----|
| 1. | Set and mark cables. | 5/6 |
| 2. | Cut main cable at centre of connector (spiking position). | -- |

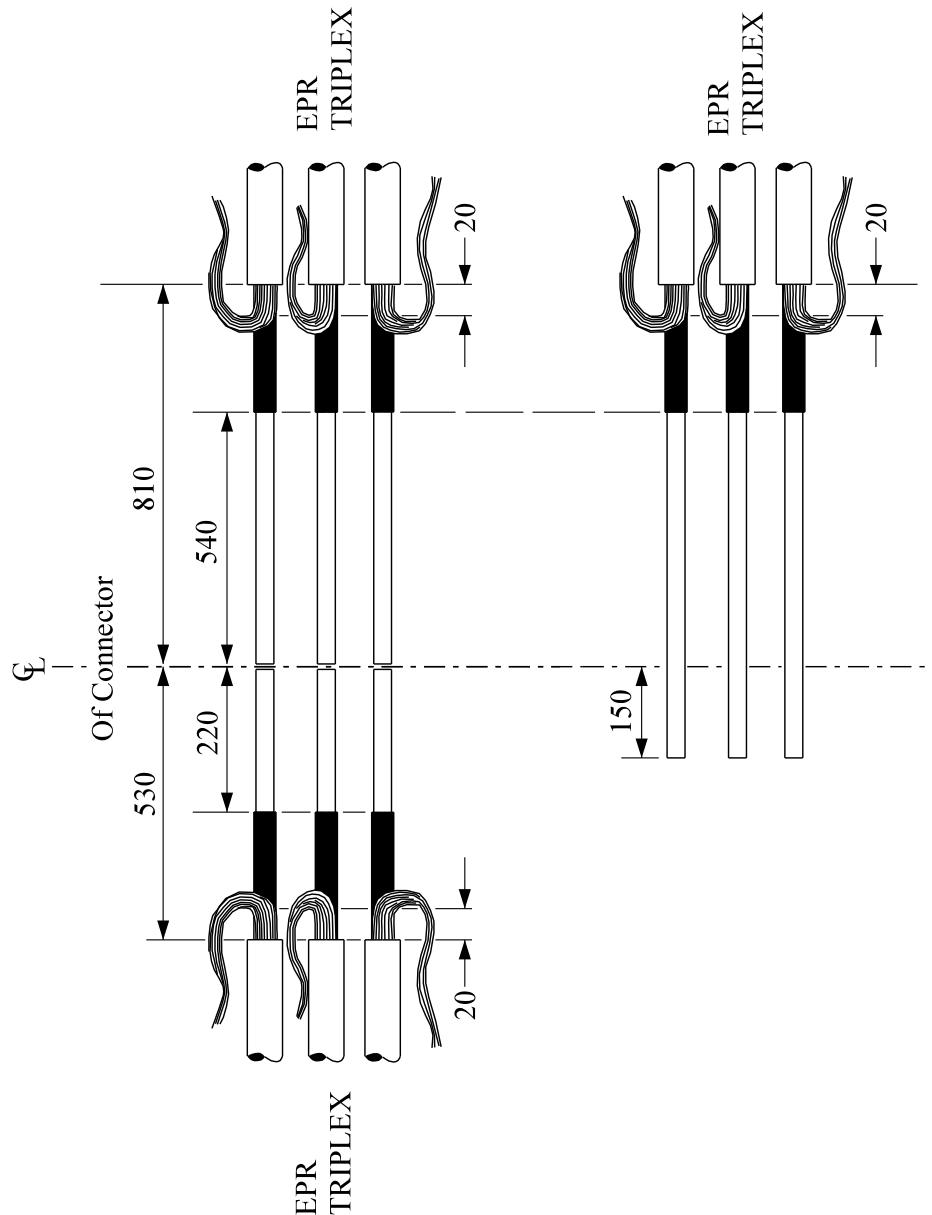
EPR CABLE - Preparation


- | | | |
|-----|--|----|
| 3. | Unravel and straighten individual cores. | -- |
| 4. | Identify and mark core phasing clear of joint position. | -- |
| 5. | Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position. | 25 |
| 6. | Clean each oversheath for a distance of 1.5m. | -- |
| 7. | Apply a temporary earth continuity bond clear of joint position. | 10 |
| 8. | Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core. | -- |
| 9. | Set and mark cores ensuring two to the top. | -- |
| 10. | Remove oversheaths and bedding tapes. | 16 |
| 11. | Abrade oversheaths. | 17 |
| 12. | Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point. | -- |
| 13. | Straighten copper screen wires and form into a bunch. | -- |
| 14. | Remove semi-conducting screens ensuring insulation is free from all conducting material. | 28 |
| 15. | Single end only , remove core insulation to allow connector fitting. | 31 |
| 16. | Fit foam filler pieces and build up cable oversheaths. | 32 |
| 17. | Park copper stocking over cores at single end. | -- |

JOINTING PROCEDURE 7.202 – Continued

Actions	General Requirements (ST: CA2C/8)
18. Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
19. Apply a stress cone to each core.	35
COMPLETION OF JOINT	
20. Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6
21. Park insulation spacers between cores at single end.	37
22. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
23. Fit insulation tubes.	37
24. Fit inner sleeve.	39/40
25. Ensure joint is level and fill with Lovisil.	41
26. Clean and degrease inner sleeve.	43
27. Form copper screen wire bunches into one conductor and connect to earth braid.	42
28. Remove temporary earth continuity bond applied in 7 and reseal EPR oversheaths.	51
29. Slide and stretch copper stocking across joint and connect to copper screen wires.	44
30. Fit and support outer sleeve.	46
31. Mix and pour resin.	47

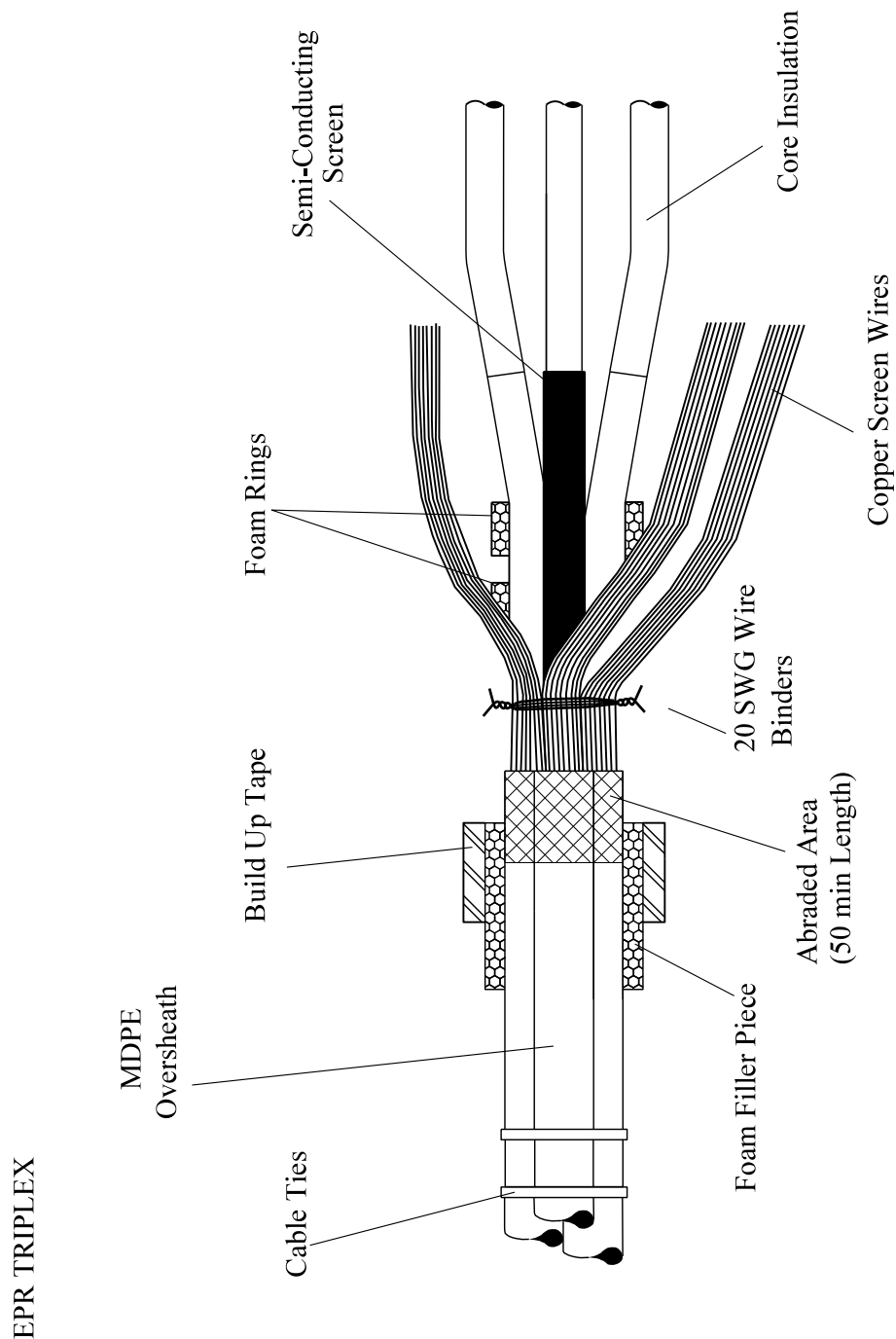
All dimensions in mm




Rev No	Drawn	Chk'd	App'd	Date	Revision	
ORIGINAL	ISSUE	DATE	WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.			 WESTERN POWER DISTRIBUTION
Drawn	RJB	04/13				
Checked						
Approved						
SCALE	N.T.S.		Title UP TO & INC 300mm ² EPR TRIPLEX BRANCH JOINT STRIPPING DIMENSIONS			Drg. No. JP2D 7.202.1 Rev No

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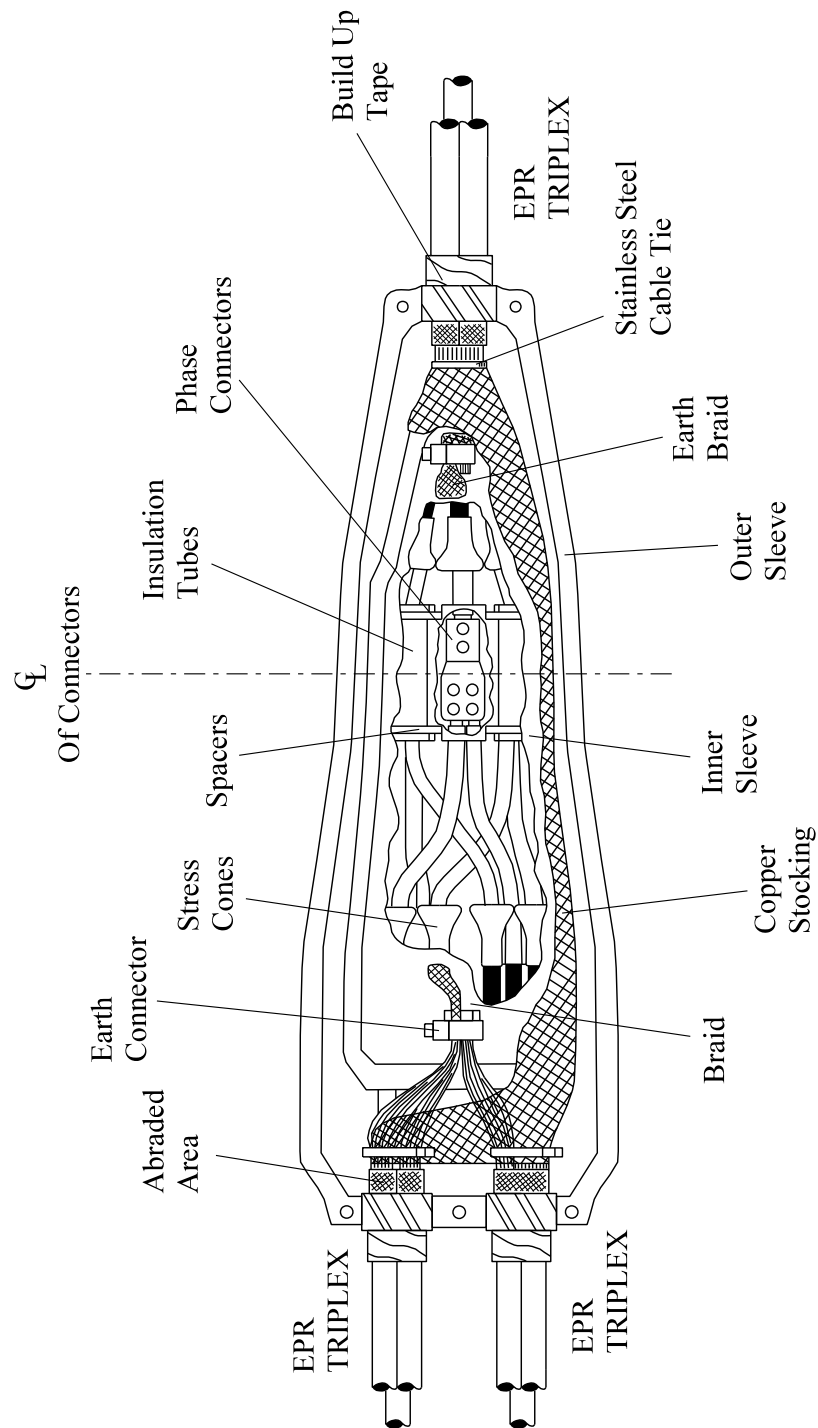
All dimensions in mm



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Drawn	RJB	04/13							
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SCALE		N.T.S.		Title				Drg. No.	Rev No
				PREPARATION OF EPR TRIPLEX				JP2D 7.202.2	

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Drawn	RJB	04/13									
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SCALE		N.T.S.		Title		UP TO & INC 300mm ² EPR TRIPLEX BRANCH JOINT GENERAL LAYOUT		Drg. No. JP2D 7.202.3		Rev No	

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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.203

185mm² EPR TRIPLEX – 185mm² PILC/PICAS CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 185mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.203

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
16/25/35/50 PILC	70 EPR	BJ 1117
	95 EPR	BJ 1118
	185 EPR	BJ 1119
70/95/120/150 PILC	70 EPR	BJ 1120
	95 EPR	BJ 1121
	185 EPR	BJ 1122
185 PILC	70 EPR	BJ 1123
	95 EPR	BJ 1124
	185 EPR	BJ 1125
95 PICAS	70 EPR	BJ 1126
	95 EPR	BJ 1127
	185 EPR	BJ 1128
185 PICAS	70 EPR	BJ 1129
	95 EPR	BJ 1130
	185 EPR	BJ 1131

Note: - The jointing materials for 240mm² EPR Triplex will be as 300mm² EPR Triplex.

Note: - Any reference to PICAS equally applies to PISAS.

Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.203

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE									FOAM TAPE BUILD UP MODULE
	KB 85	B	D	Belted			Screened						FTBM
BJ 1117	1	1	2	2				1					2
BJ 1118	1	1	2	2			1						1
BJ 1119	1	1	2	2			1						1
BJ 1120	1	1	2		2			1		2			1
BJ 1121	1	1	2		2		1			2			
BJ 1122	1	1	2		2		1			2			
BJ 1123	1	1	2			2		1			2		1
BJ 1124	1	1	2			2	1				2		
BJ 1125	1	1	2			2	1				2		
BJ 1126	1	1	2		2			1		2			1
BJ 1127	1	1	2		2		1			2			
BJ 1128	1	1	2		2		1			2			
BJ 1129	1	1	2			2		1				2	1
BJ 1130	1	1	2			2	1					2	
BJ 1131	1	1	2			2	1					2	

KIT REF	CONNECTOR		ARMOUR BONDING MODULE	TUBE SET	TUBE SET
	HVBRM18SPUTC	BCNE-3	ABM STA/SWA	SMOE 28003	WCSM 120/40x350
BJ 1117	3	1	2	1	2
BJ 1118	3	1	2	1	2
BJ 1119	3	1	2	1	2
BJ 1120	3	1	2	1	2
BJ 1121	3	1	2	1	2
BJ 1122	3	1	2	1	2
BJ 1123	3	1	2	1	2
BJ 1124	3	1	2	1	2
BJ 1125	3	1	2	1	2
BJ 1126	3	1		1	2
BJ 1127	3	1		1	2
BJ 1128	3	1		1	2
BJ 1129	3	1		1	2
BJ 1130	3	1		1	2
BJ 1131	3	1		1	2

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
Scotch 70
Scotch 13 tape
Tinned copper wire 16 swg
Tinned copper wire 20 swg
De-solvit 1000 FD
De-solvit 1000
Workhorse dry wipes
Emery cloth
Scotch 5313 Water block tape
Cable ties
Sealing putty
Aluminium oxide cloth 320 grit
Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.203

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.203.1, 7.203.2, 7.203.3, 7.203.4, 7.203.5** and **7.203.6** whilst undertaking this Jointing Procedure.

- | | | |
|----|---|-----|
| 1. | Set and mark cables. | 5/6 |
| 2 | Cut main cable at centre of connector (spiking position). | -- |

PILC/PICAS CABLE - Preparation

- | | | |
|-----|--|----|
| 3. | PILC: - Remove serving, armour and clean lead sheath. | 11 |
| | PICAS: - Remove PVC oversheath and clean aluminium sheath. | 15 |
| 4. | PILC / PICAS: - Abrade metallic sheath from its termination point to serving/oversheath termination point. | -- |
| 5. | PILC: - Apply armour bond. | 12 |
| | PICAS: - Abrade PVC oversheath. | 17 |
| 6. | Park copper stocking over cable at single end. | -- |
| 7. | Apply a temporary earth continuity bond to metallic sheaths. | 10 |
| 8. | Slide two foam rings over metallic sheaths to beyond its termination point. | 34 |
| 9. | Remove metallic sheath: - PILC (lead) | 18 |
| | PICAS (aluminium) | 19 |
| 10. | Terminate board of trade sheath (if present). | 20 |
| 11. | Carry out moisture test. | 8 |

BELTED CABLES

- | | | |
|-----|---|----|
| 12. | Terminate carbon (if present) and belt papers. | 22 |
| 13. | Apply a silicon tape seal to belt papers and metallic sheath. | 24 |
| 14. | Remove core fillers. | -- |
| 15. | Using a clean dry wipe remove excess impregnate from cores. | -- |

JOINTING PROCEDURES 7.203 – Continued

Actions	General Requirements (ST: CA2C/8)
16. Apply metallic sheath bond to PILC/PICAS cable at double end.	42
SCREENED CABLES	
17. Tie off and remove copper woven fabric tape.	23
18. Apply a silicon tape seal to copper woven fabric tape and metallic sheath.	24
19. Remove core fillers.	--
20. Using a clean dry wipe remove excess impregnate from cores.	--
21. Remove metallic screens, carbon paper and two conductor papers.	27
22. Apply a stress cone to each core.	35
23. Single end only , remove core insulation to allow connector fitting.	31
24. Apply metallic sheath bond to PILC/PICAS cable at double end.	42
EPR CABLE - Preparation	
25. Unravel and straighten individual cores.	--
26. Identify and mark core phasing clear of joint position.	--
27. Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
28. Clean each oversheath for a distance of 1.5m.	--
29. Apply a temporary earth continuity bond clear of joint position.	10
30. Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
31. Set and mark cores ensuring two to the top.	--
32. Remove oversheaths and bedding tapes.	16
33. Abrade oversheaths.	17

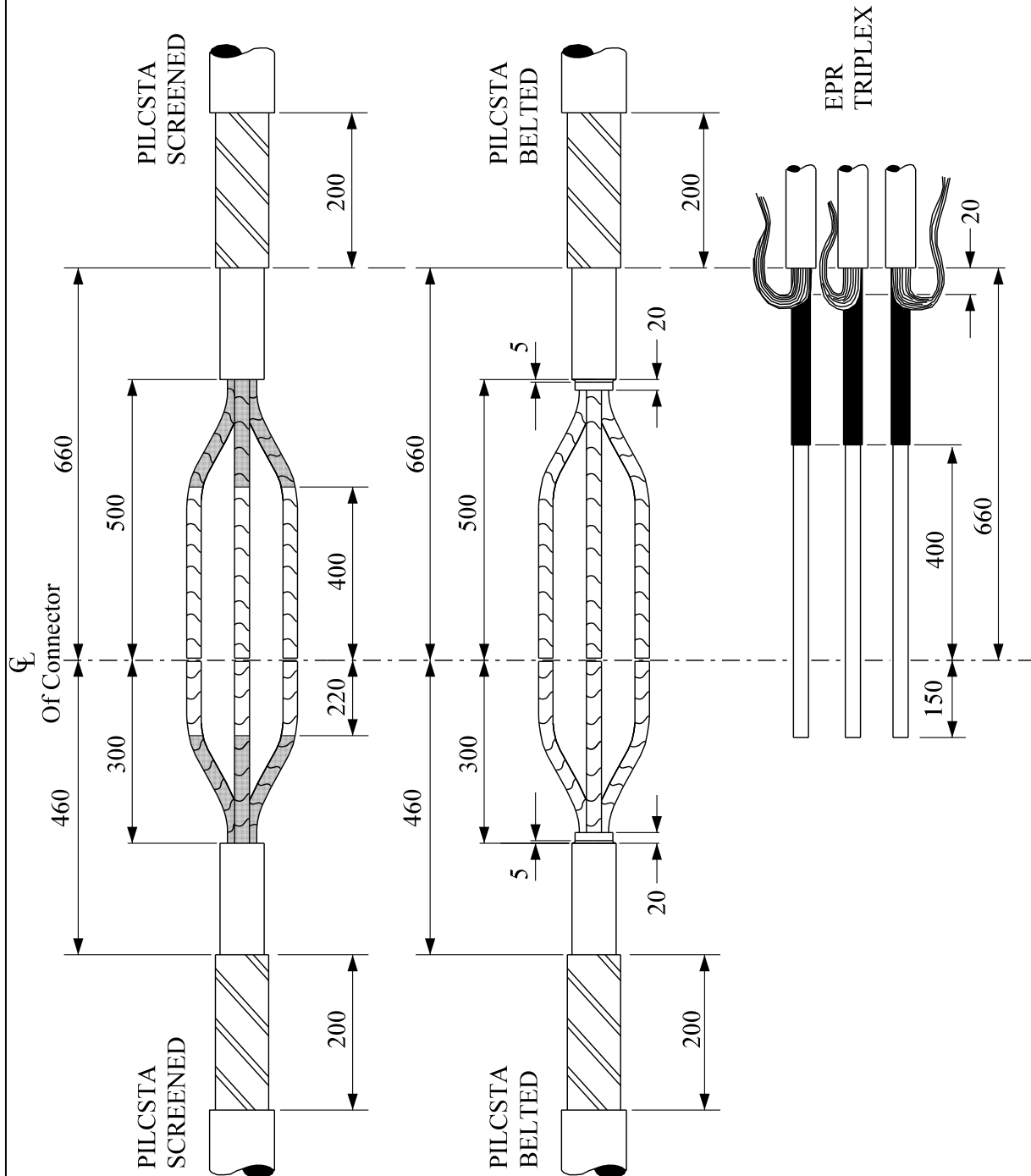
JOINTING PROCEDURES 7.203 – Continued


Actions	General Requirements (ST: CA2C/8)
34. Apply a 20swg binder around copper screen wires 20mm from oversheath termination point.	--
35. Straighten copper screen wires and form into a bunch.	--
36. Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
37. Fit foam filler piece and build up cable oversheaths.	32
38. Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
39. Apply a stress cone to each core.	35
 COMPLETION OF JOINT	
40. Build up PILC/PICAS cable oversheaths.	32
41. Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6
42. Park insulation spacers between cores at single end.	37
43. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
44. Fit insulation tubes.	37
45. Fit inner sleeve.	39/40
46. Ensure joint is level and fill with Lovisil.	41
47. Clean and degrease inner sleeve.	43
48. Apply metallic sheath bond to PILC/PICAS cable at single end.	42
49. Form copper screen wire bunches into one conductor and connect to earth braid.	42

JOINTING PROCEDURES 7.203 – Continued

Actions	General Requirements (ST: CA2C/8)
50 Remove temporary earth continuity bond applied in 7/22 and reseal EPR oversheaths.	51
51. Slide and stretch copper stocking across joint and connect to metallic sheaths and copper screen wires.	44
52. Apply water block tape to metallic sheaths.	45
53. Fit and support outer sleeve.	46
54. Mix and pour resin.	47

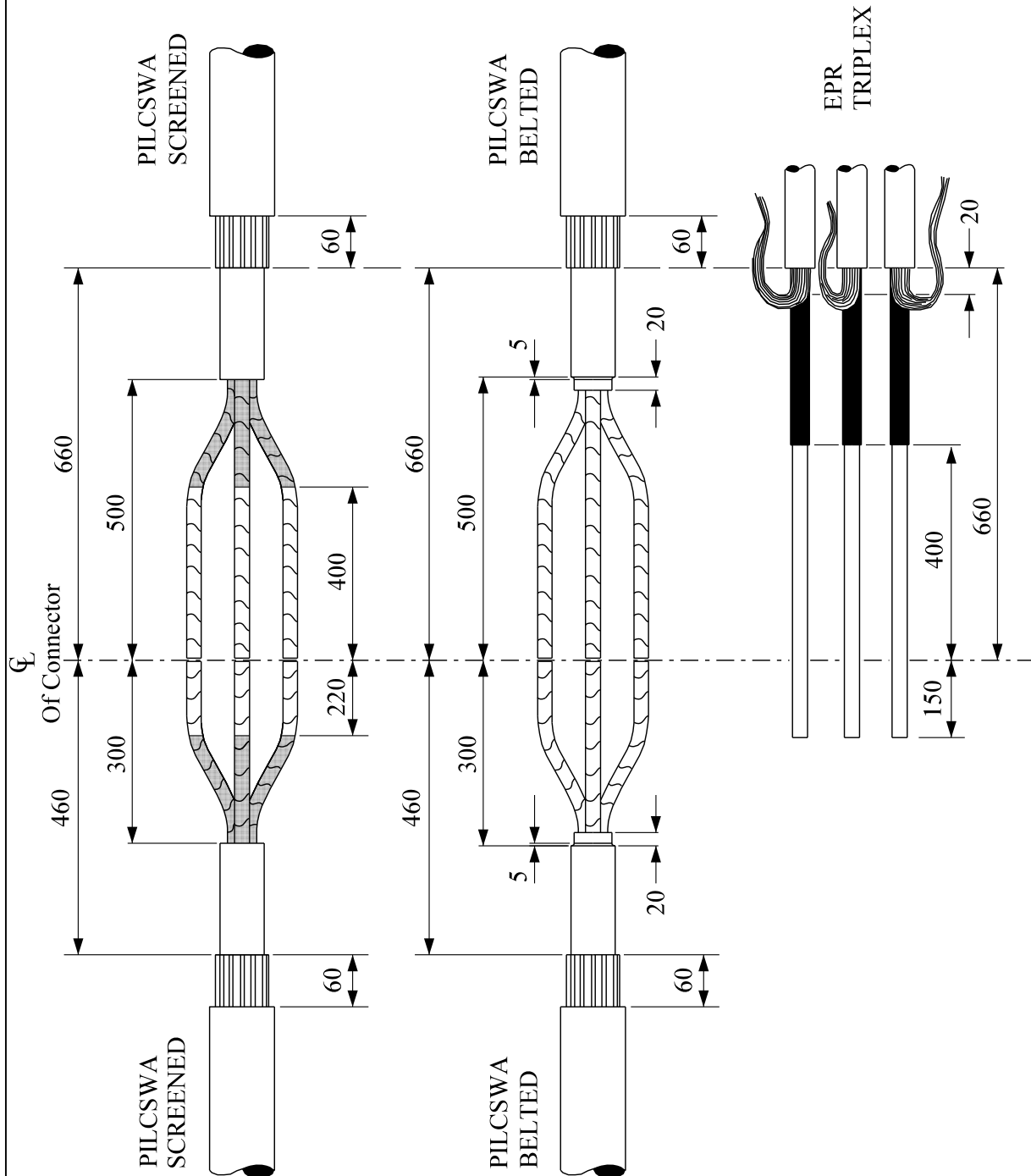
All dimensions in mm




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Drawn	RJB	04/13		WESTERN POWER DISTRIBUTION 	
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Approved				Title UP TO & INC 185mm ² EPR TRIPLEX - PILC/PICAS BRANCH JOINT STRIPPING DIMENSIONS	
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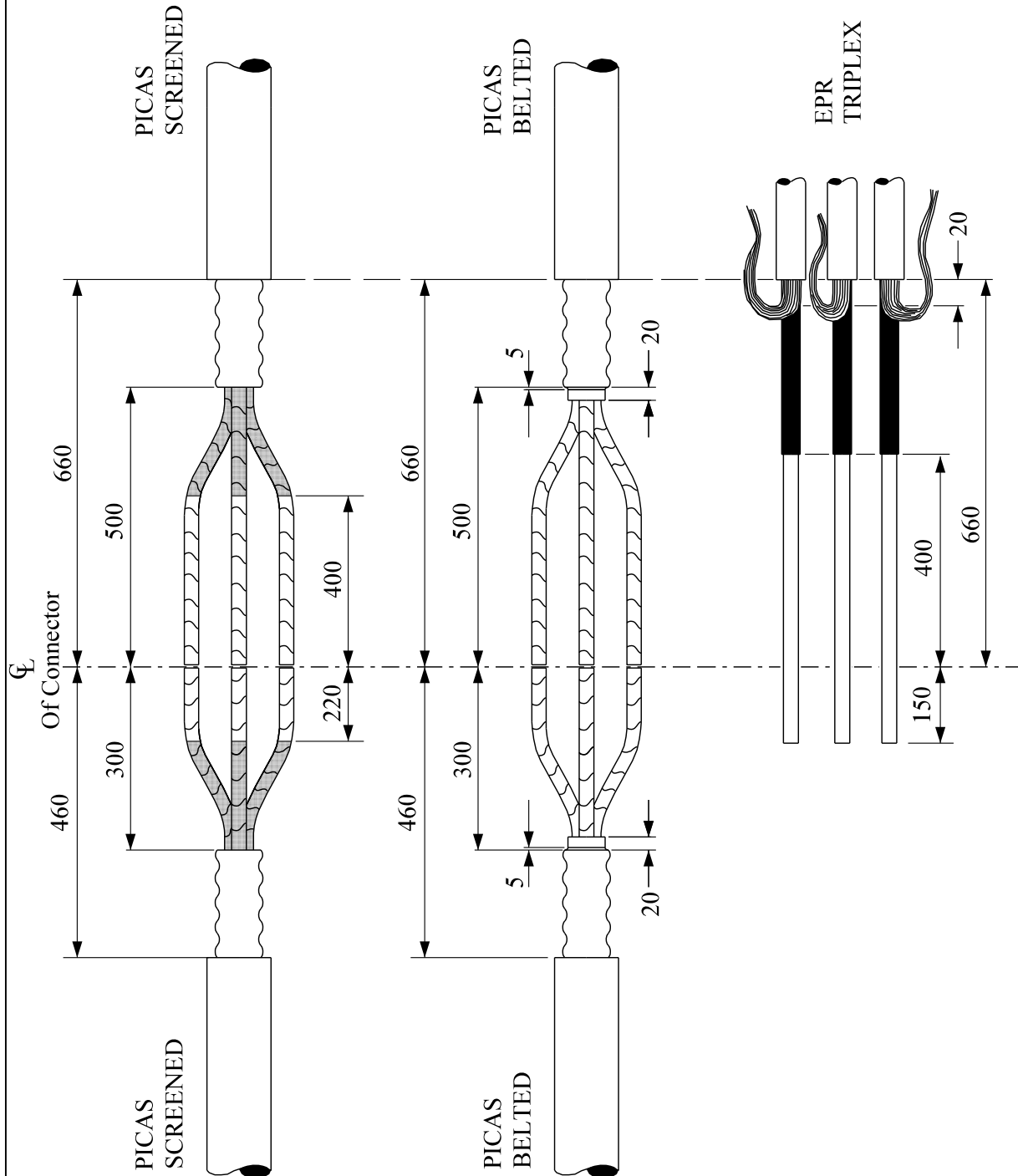
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Drawn	RJB	04/13	Title UP TO & INC 185mm ² EPR TRIPLEX - PILC/PICAS BRANCH JOINT STRIPPING DIMENSIONS			
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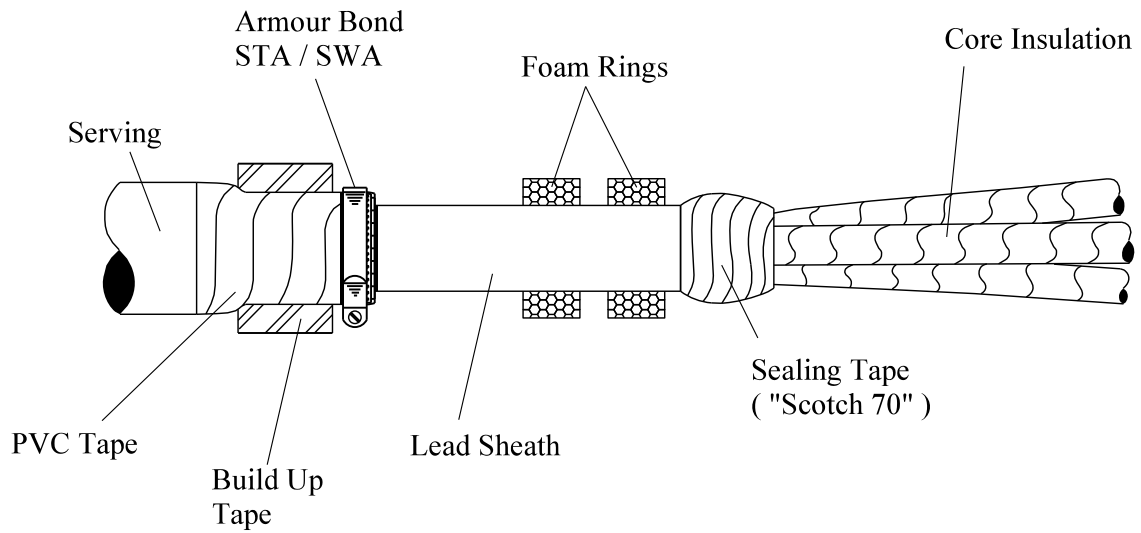


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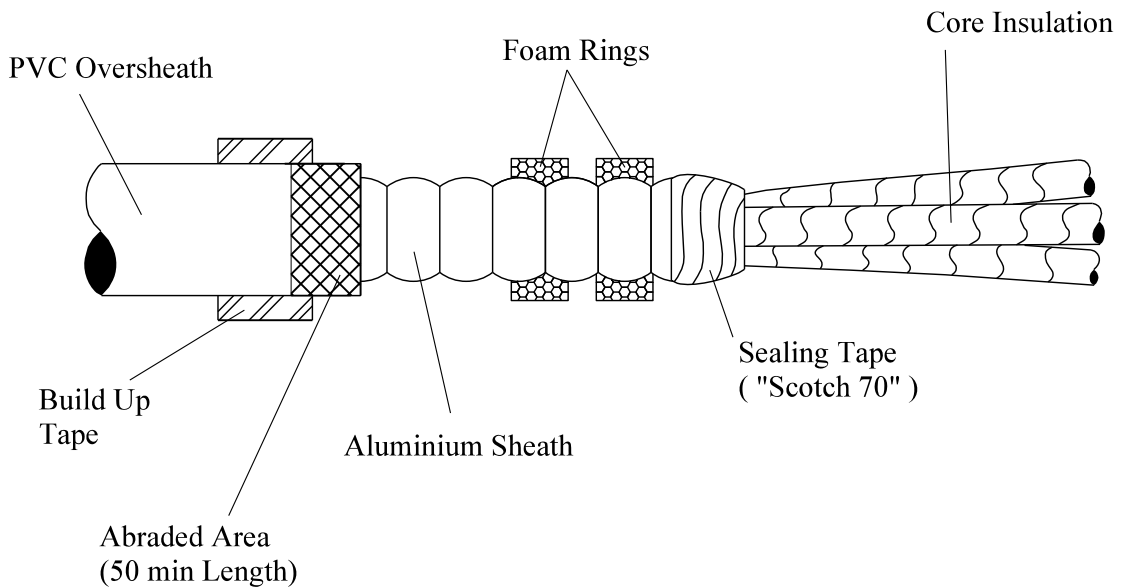
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PILC

All dimensions in mm



PICAS / PISAS

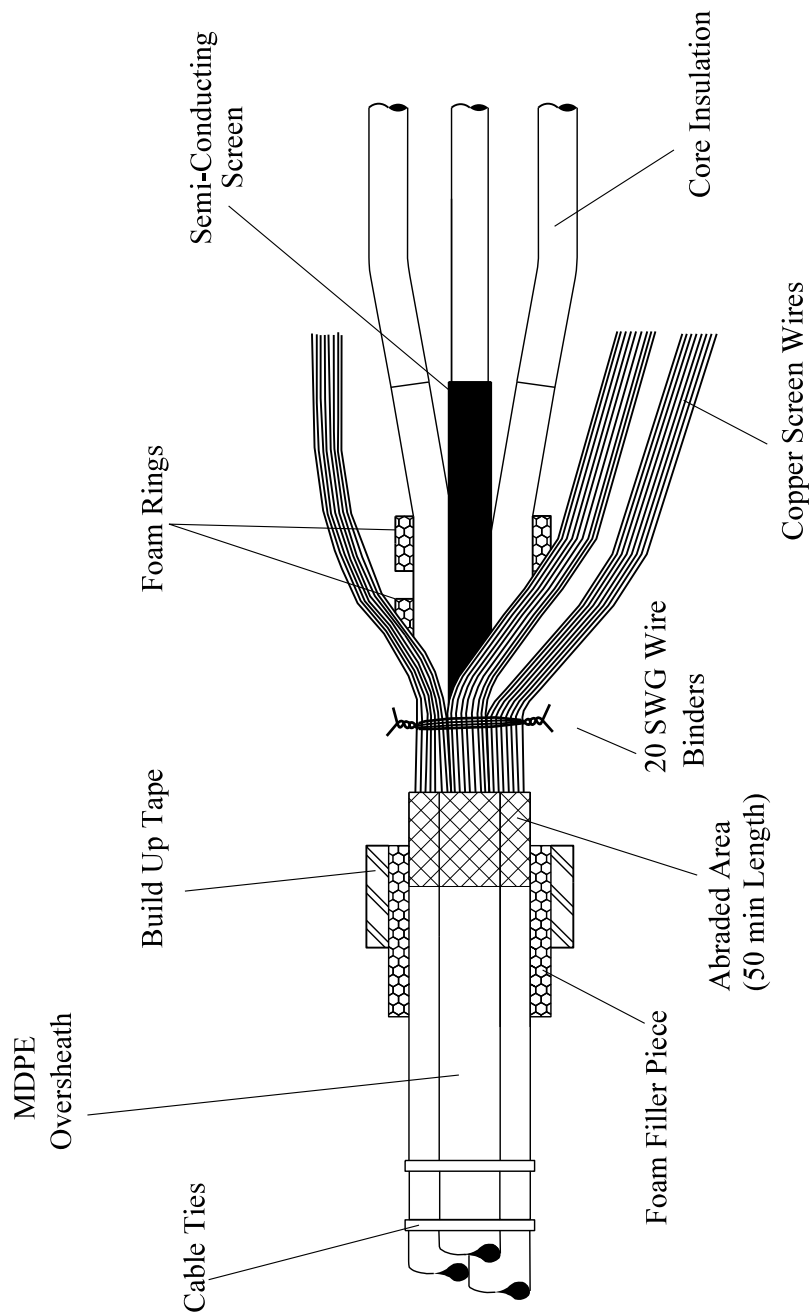



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Drawn	RJB	04/13				
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Approved						
SCALE	N.T.S.		Title PREPARATION OF PILC/PICAS			Drg. No. JP2D 7.203.4
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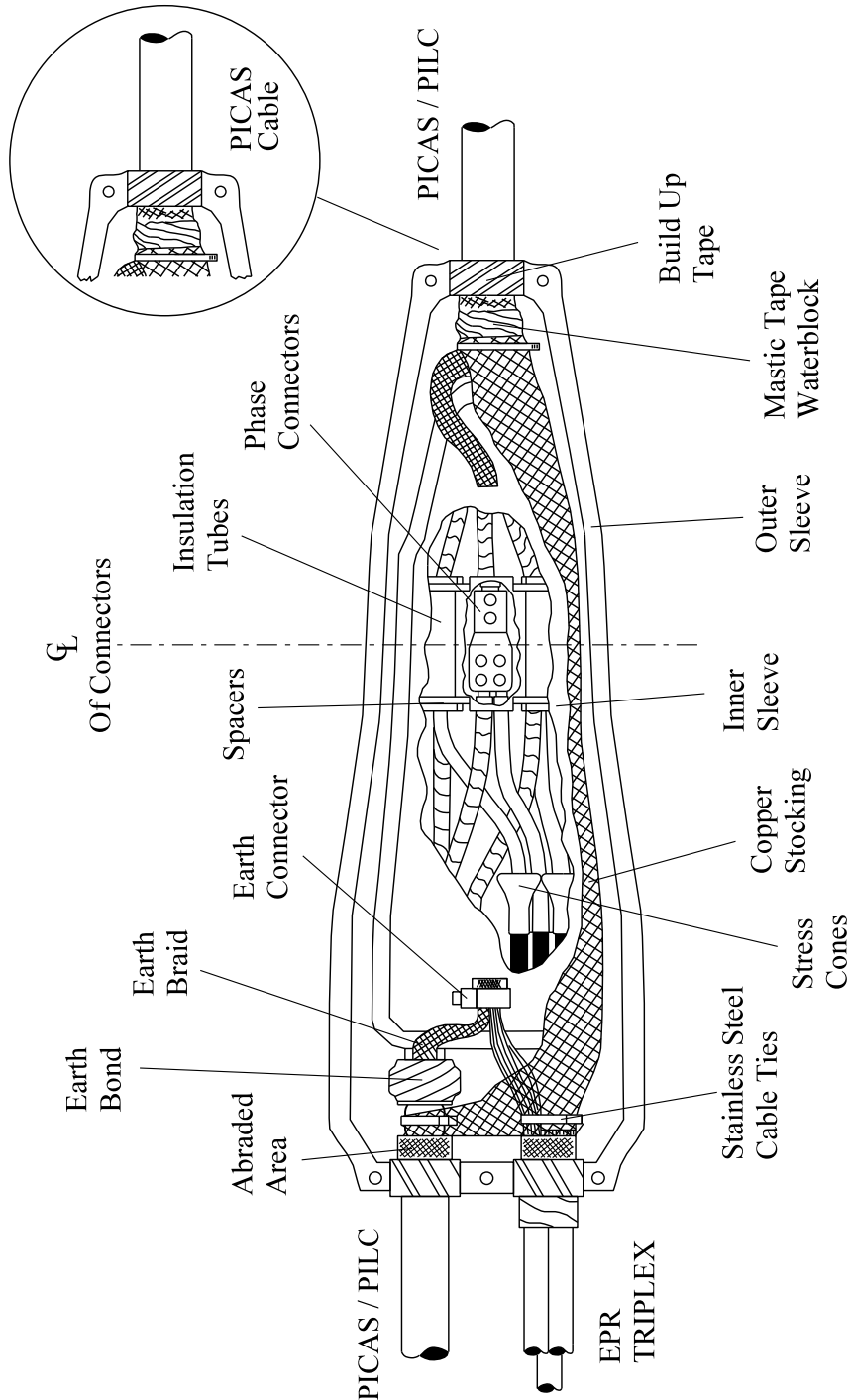
EPR TRIPLEX




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PREPARATION OF EPR TRIPLEX				JP2D 7.203.5	

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All dimensions in mm



PLAN VIEW

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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.204

300mm² EPR TRIPLEX – 300mm² PILC/PICAS CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 300mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual.**

JOINTING PROCEDURE 7.204

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
16/25/35/50 PILC	300 EPR	BJ 1132
70/95/120/150 PILC	300 EPR	BJ 1133
185/240/300 PILC	70 EPR	BJ 1134
	95 EPR	BJ 1135
	185 EPR	BJ 1136
	300 EPR	BJ 1137
95 PICAS	300 EPR	BJ 1138
185 PICAS	300 EPR	BJ 1139
300 PICAS	70 EPR	BJ 1140
	95 EPR	BJ 1141
	185 EPR	BJ1142
	300 EPR	BJ1143

Note: - The jointing materials for 240mm² EPR Triplex will be as 300mm² EPR Triplex.

Note: - Any reference to PICAS equally applies to PISAS.

Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.204

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE										FOAM TAPE BUILD UP MODULE
	KB 95	B	D	Belted							Screened			FTBM
BJ 1132	1	2	2	2					1					2
BJ 1133	1	2	2		2				1		2			1
BJ 1134	1	2	2					2		1			2	1
BJ 1135	1	2	2				1	2					2	1
BJ 1136	1	2	2				1	2					2	1
BJ 1137	1	2	2					2	1				2	1
BJ 1138	1	2	2		2				1		2			1
BJ 1139	1	2	2					2	1				2	
BJ 1140	1	2	2					2		1			2	1
BJ 1141	1	2	2				1	2					2	1
BJ 1142	1	2	2				1	2					2	1
BJ 1143	1	2	2					2	1				2	

KIT REF	CONNECTOR		ARMOUR BONDING MODULE	TUBE SET	TUBE SET
	HVBRM22SPUTC	BCNE-3	ABM STA/SWA	SMOE 28003	WCSM 120/40x350
BJ 1132	3	1	2	1	2
BJ 1133	3	1	2	1	2
BJ 1134	3	1	2	1	2
BJ 1135	3	1	2	1	2
BJ 1136	3	1	2	1	2
BJ 1137	3	1	2	1	2
BJ 1138	3	1		1	2
BJ 1139	3	1		1	2
BJ 1140	3	1		1	2
BJ 1141	3	1		1	2
BJ 1142	3	1		1	2
BJ 1143	3	1		1	2

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
Scotch 70
Scotch 13 tape
Tinned copper wire 16 swg
Tinned copper wire 20 swg
De-solvit 1000 FD
De-solvit 1000
Workhorse dry wipes
Emery cloth
Scotch 5313 Water block tape
Cable ties
Sealing putty
Aluminium oxide cloth 320 grit
Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.204

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.204.1, 7.204.2, 7.204.3, 7.204.4, 7.204.5** and **7.204.6** whilst undertaking this Jointing Procedure.

- | | | |
|----|---|-----|
| 1. | Set and mark cables. | 5/6 |
| 2 | Cut main cable at centre of connector (spiking position). | -- |

PILC/PICAS CABLE - Preparation

- | | | |
|-----|--|----|
| 3. | PILC: - Remove serving, armour and clean lead sheath. | 11 |
| | PICAS: - Remove PVC oversheath and clean aluminium sheath. | 15 |
| 4. | PILC / PICAS: - Abrade metallic sheath from its termination point to serving/oversheath termination point. | -- |
| 5. | PILC: - Apply armour bond. | 12 |
| | PICAS: - Abrade PVC oversheath. | 17 |
| 6. | Park copper stocking over cable at single end. | -- |
| 7. | Apply a temporary earth continuity bond to metallic sheaths. | 10 |
| 8. | Slide two foam rings over metallic sheaths to beyond its termination point. | 34 |
| 9. | Remove metallic sheath: - PILC (lead) | 18 |
| | PICAS (aluminium) | 19 |
| 10. | Terminate board of trade sheath (if present). | 20 |
| 11. | Carry out moisture test. | 8 |

BELTED CABLES

- | | | |
|-----|---|----|
| 12. | Terminate carbon (if present) and belt papers. | 22 |
| 13. | Apply a silicon tape seal to belt papers and metallic sheath. | 24 |
| 14. | Remove core fillers. | -- |
| 15. | Using a clean dry wipe remove excess impregnate from cores. | -- |

JOINTING PROCEDURES 7.204 – Continued

Actions	General Requirements (ST: CA2C/8)
---------	--------------------------------------

SCREENED CABLES

16.	Tie off and remove copper woven fabric tape.	23
17.	Apply a silicon tape seal to copper woven fabric tape and metallic sheath.	24
18.	Remove core fillers.	--
19.	Using a clean dry wipe remove excess impregnate from cores.	--
20.	Remove metallic screens, carbon paper and two conductor papers.	27
21.	Apply a stress cone to each core.	35
22.	Single end only , remove core insulation to allow connector fitting.	31
23.	Apply metallic sheath bond to PILC/PICAS cable at double end.	42

EPR CABLE - Preparation

24.	Unravel and straighten individual cores.	--
25.	Identify and mark core phasing clear of joint position.	--
26.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
27.	Clean each oversheath for a distance of 1.5m.	--
28.	Apply a temporary earth continuity bond clear of joint position.	10
29.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
30.	Set and mark cores ensuring two to the top.	--
31.	Remove oversheaths and bedding tapes.	16
32.	Abrade oversheaths.	17

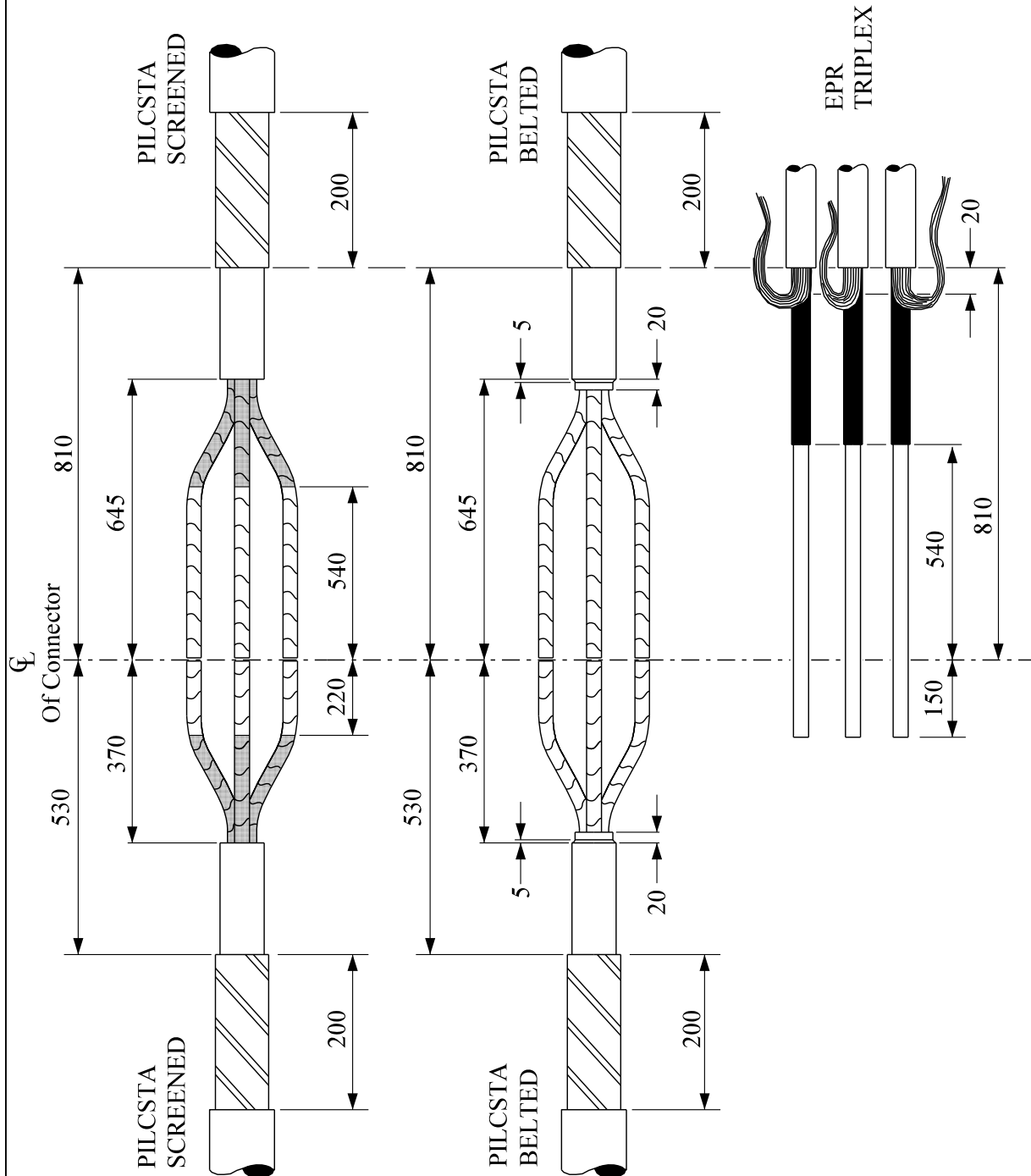
JOINTING PROCEDURES 7.204 – Continued


Actions	General Requirements (ST: CA2C/8)
33. Apply a 20swg binder around copper screen wires 20mm from oversheath termination point.	--
34. Straighten copper screen wires and form into a bunch.	--
35. Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
36. Fit foam filler piece and build up cable oversheaths.	32
37. Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
38. Apply a stress cone to each core.	35
 COMPLETION OF JOINT	
39. Build up PILC/PICAS cable oversheaths.	32
40. Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6
41. Park insulation spacers between cores at single end.	37
42. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
43. Fit insulation tubes.	37
44. Fit inner sleeve.	39/40
45. Ensure joint is level and fill with Lovisil.	41
46. Clean and degrease inner sleeve.	43
47. Apply metallic sheath bond to PILC/PICAS cable at single end.	42
48. Form copper screen wire bunches into one conductor and connect to earth braid.	42

JOINTING PROCEDURES 7.204 – Continued

Actions	General Requirements (ST: CA2C/8)
50 Remove temporary earth continuity bond applied in 7/22 and reseal EPR oversheaths.	51
51. Slide and stretch copper stocking across joint and connect to metallic sheaths and copper screen wires.	44
52. Apply water block tape to metallic sheaths.	45
53. Fit and support outer sleeve.	46
54. Mix and pour resin.	47

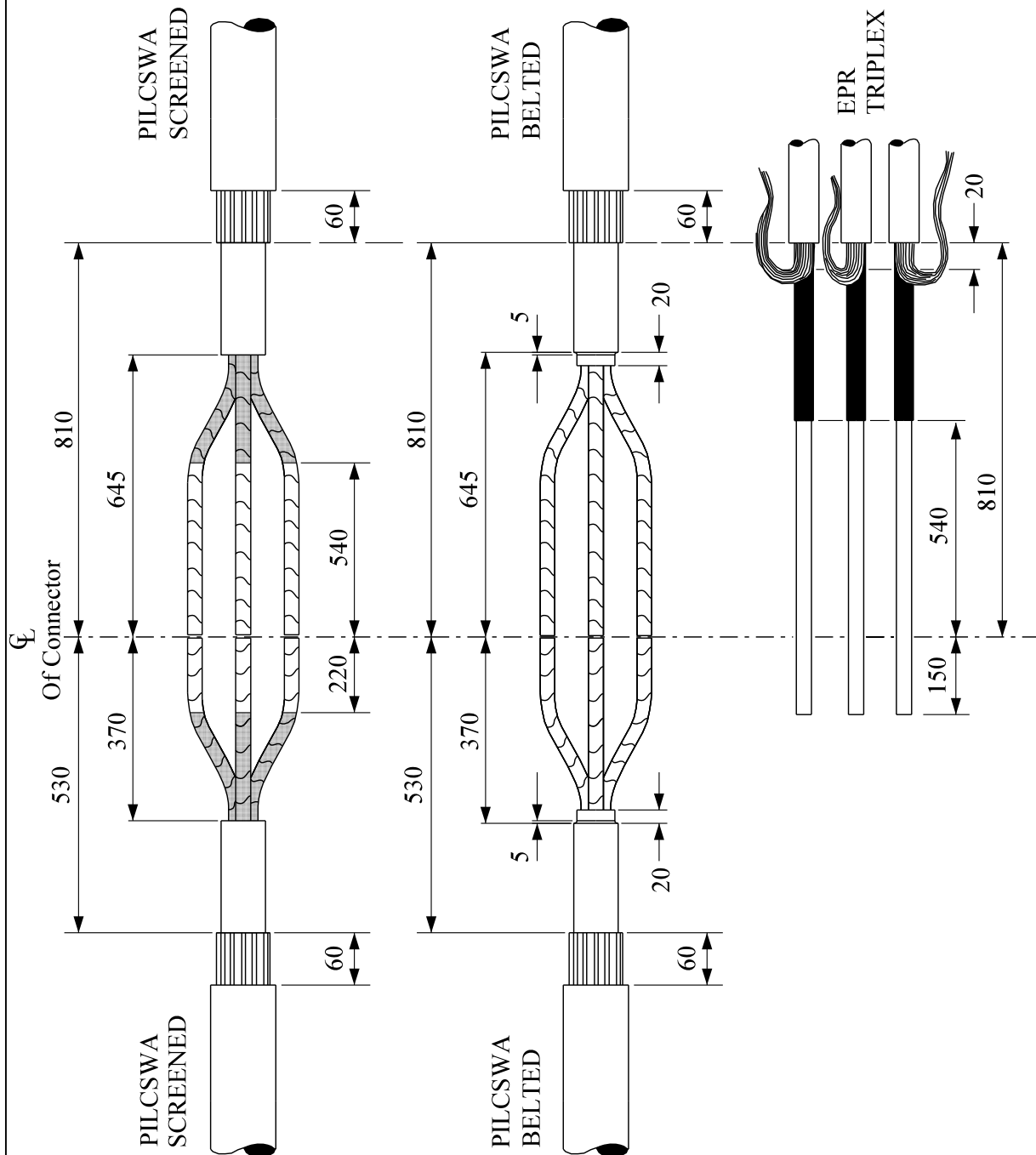
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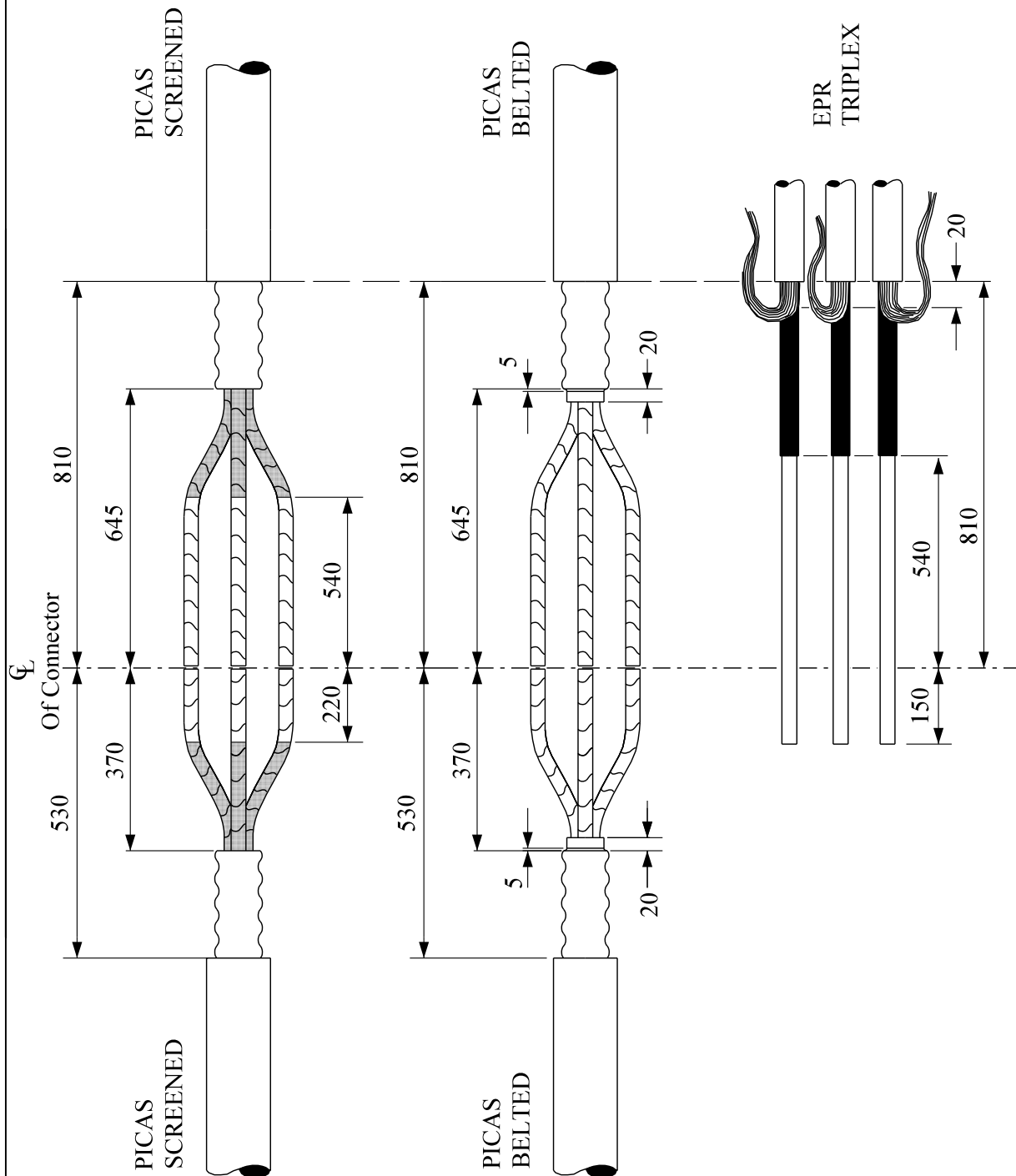
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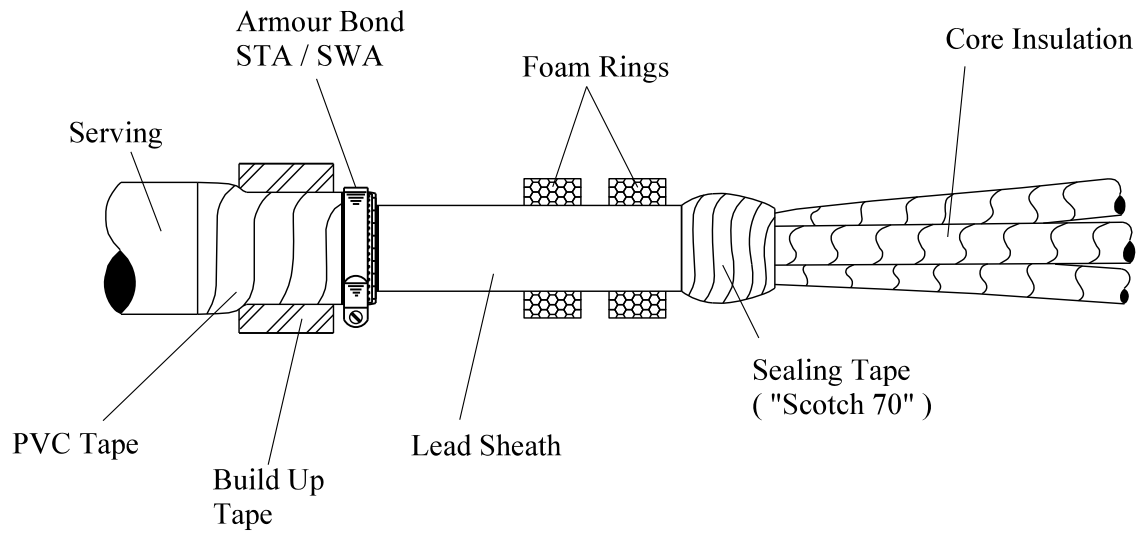


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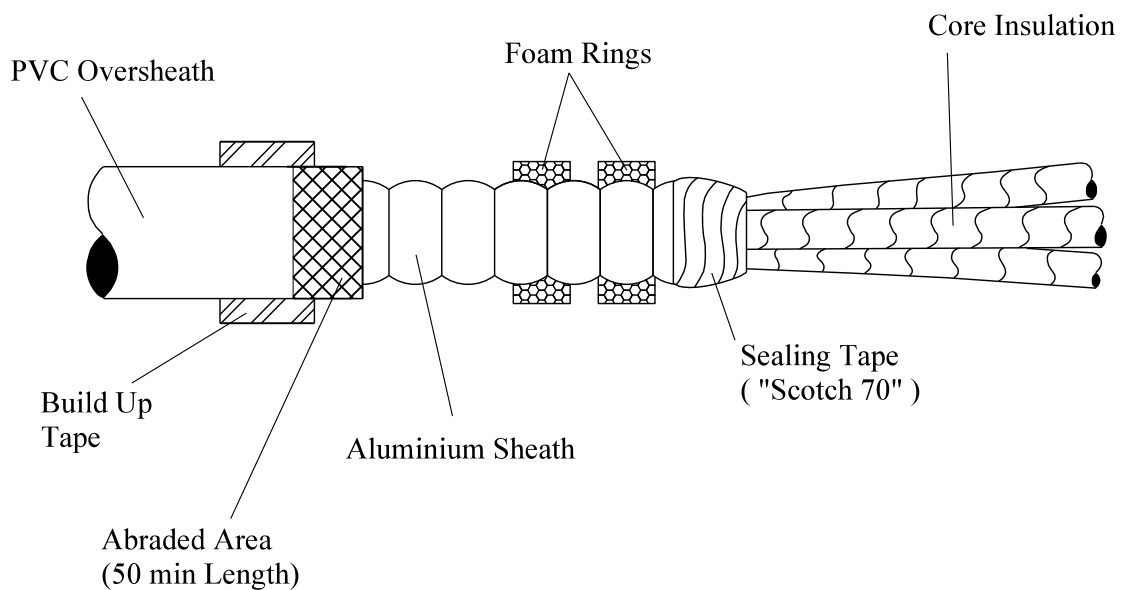
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PILC

All dimensions in mm



PICAS / PISAS

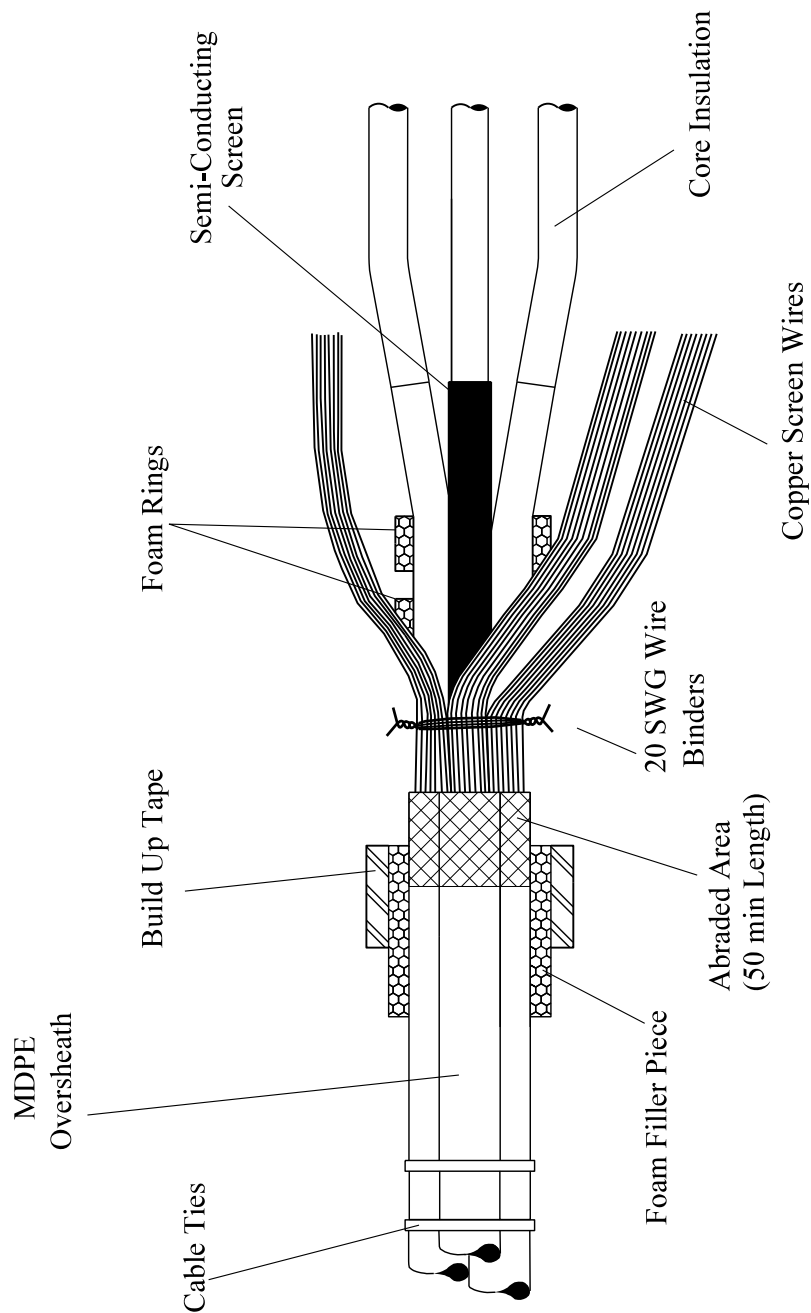



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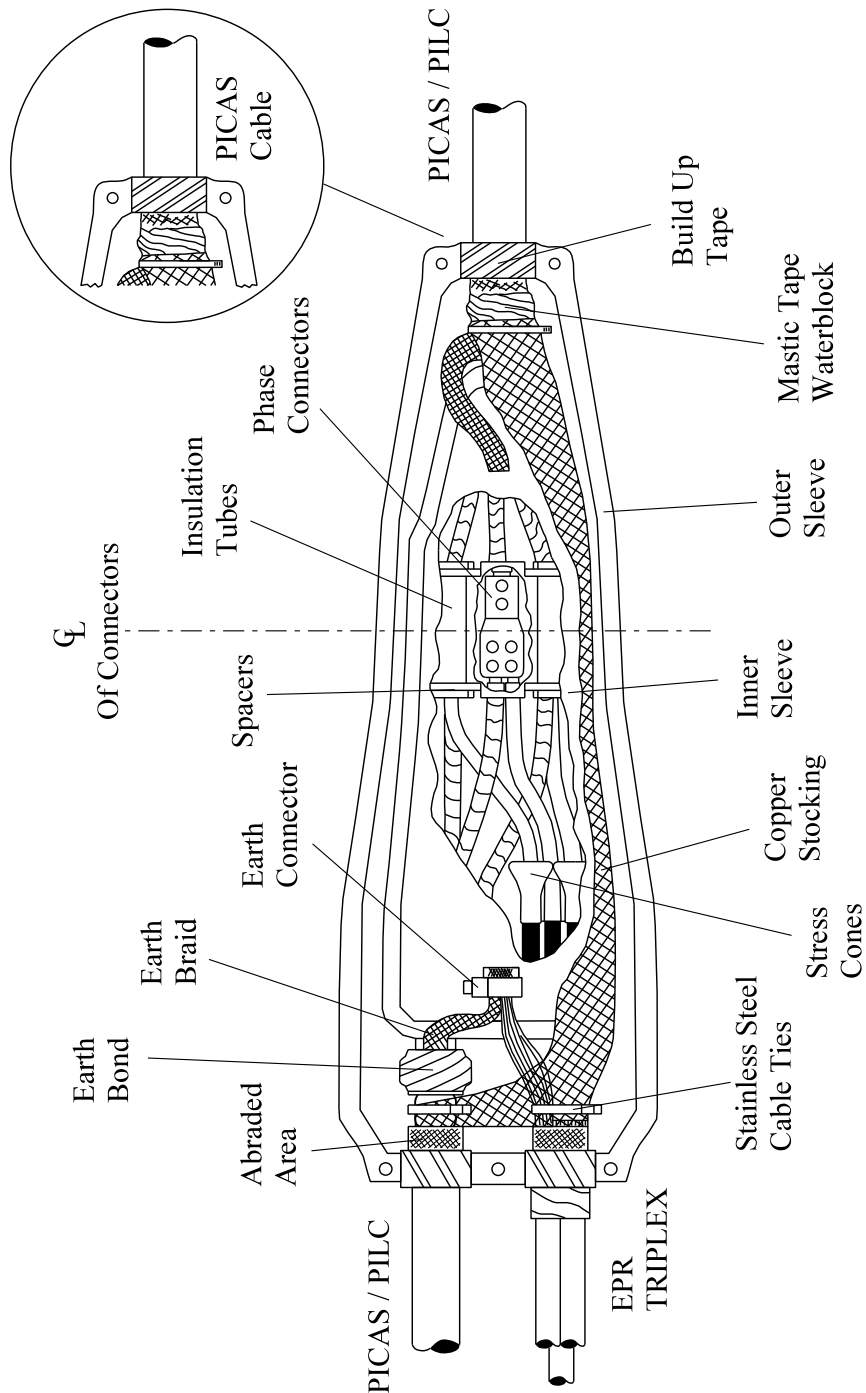
EPR TRIPLEX



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PLAN VIEW

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Drawn	RJB	04/13	Title UP TO & INC 300mm ² EPR TRIPLEX - PILC/PICAS BRANCH JOINT GENERAL LAYOUT		
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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.205

185mm² 3 CORE XLPE - 185mm² EPR TRIPLEX CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 185mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.205

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
95 3 Core XLPE	70 EPR	BJ 1144
	95 EPR	BJ 1145
	185 EPR	BJ 1146
185 3 Core XLPE	70 EPR	BJ 1147
	95 EPR	BJ 1148
	185 EPR	BJ 1149

Note: - Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.205

JOINT KIT MATERIALS

KIT REF	BASE MODULE	Extended shell	RESIN MODULE			CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTOR		TUBE SET
	KB 85	KB 85X	B	D	G	D	J	N	FTBM	HVBRM18SPUTC	BCNE-3	SMOE 28003
BJ 1144	1	1	1	2	3		1	2	1	3	2	1
BJ 1145	1	1	1	2	3	1		2		3	2	1
BJ 1146	1	1	1	2	3	1		2		3	2	1
BJ 1147	1	1	1	2	3		1	2	1	3	2	1
BJ 1148	1	1	1	2	3	1		2		3	2	1
BJ 1149	1	1	1	2	3	1		2		3	2	1

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
 Scotch 70
 Scotch 13 tape
 Tinned copper wire 16 swg
 Tinned copper wire 20 swg
 De-solvit 1000 FD
 De-solvit 1000
 Workhorse dry wipes
 Emery cloth
 Scotch 5313 Water block tape
 Cable ties
 Sealing putty
 Aluminium oxide cloth 320 grit
 Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.205

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.205.1, 7.205.2, 7.205.3 and 7.205.4**, whilst undertaking this Jointing Procedure.

- | | | |
|--|--|-------|
| 1. | Set and mark cables. | 5/6 |
| 2. | Cut main cable at centre of connector (spiking position). | -- |
| 3 CORE XLPE CABLE - Preparation | | |
| 3. | Clean each oversheath for a distance of 1.5m. | -- |
| 4. | Apply a temporary earth continuity bond clear of joint position. | 10 |
| 5. | Park a mastic lined heat shrink tube next to temporary earth continuity bond . | -- |
| 6. | Remove oversheath. | 15/16 |
| 7. | Apply 20 swg binding wire 70mm from oversheath termination point to collective copper wire screen. | 21 |
| 8. | Straighten copper screen wires and form into a bunch. | -- |
| 9. | Remove the semi-conducting bedding layer. | 21 |
| 10. | Apply 13 tape to screen wires and semi-conductor screens. | 21 |
| 11. | Abrade oversheath. | 17 |
| 12. | Set and mark cores ensuring two to the top. | -- |
| 13. | Remove semi-conducting screens ensuring insulation is free from all conducting material. | 28 |
| 14. | Single end only , remove core insulation to allow connector fitting. | 31 |
| 15. | Fit foam filler pieces and build up cable oversheaths. | 32 |
| 16. | Park copper stocking over cable at single end. | -- |
| 17. | Slide two foam rings over cores to beyond semi-conducting screen termination point. | 34 |
| 18. | Apply a stress cone to each core. | 35 |

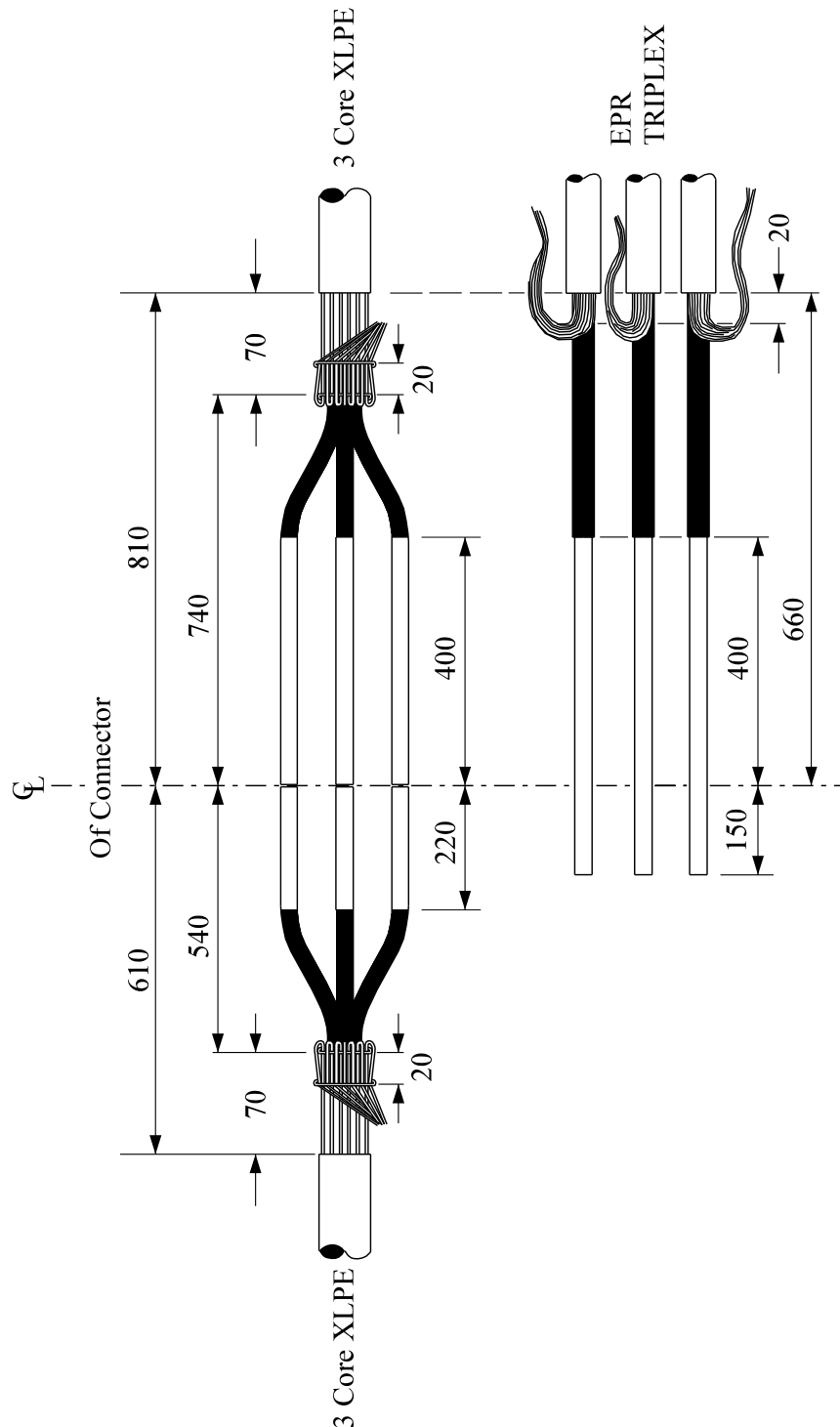
JOINTING PROCEDURES 7.205 – Continued

Actions	General Requirements (ST: CA2C/8)
EPR CABLE - Preparation	
19. Unravel and straighten individual cores.	--
20. Identify and mark core phasing clear of joint position.	--
21. Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
22. Clean each oversheath for a distance of 1.5m.	--
23. Apply a temporary earth continuity bond clear of joint position.	10
24. Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
25. Set and mark cores ensuring two to the top.	--
26. Remove oversheaths and bedding tapes.	16
27. Abrade oversheaths.	17
28. Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
29. Straighten copper screen wires and form into a bunch.	--
30. Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
31. Fit foam filler pieces and build up cable oversheaths.	32
32. Park copper stocking over cores at single end.	--
33. Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
34. Apply a stress cone to each core.	35
COMPLETION OF JOINT	
35. Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6

JOINTING PROCEDURE 7.205 – Continued

Actions	General Requirements (ST: CA2C/8)
36. Park insulation spacers between cores at single end.	37
37. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
38. Fit insulation tubes.	37
39. Fit inner sleeve.	39/40
40. Ensure joint is level and fill with Lovisil.	41
41. Clean and degrease inner sleeve.	43
42. Form copper screen wire bunches into one conductor and connect to earth braid.	42
43. Remove temporary earth continuity bond applied in 7 and reseal EPR oversheaths.	51
44. Slide and stretch copper stocking across joint and connect to copper screen wires.	44
45. Fit and support outer sleeve.	46
46. Mix and pour resin.	47

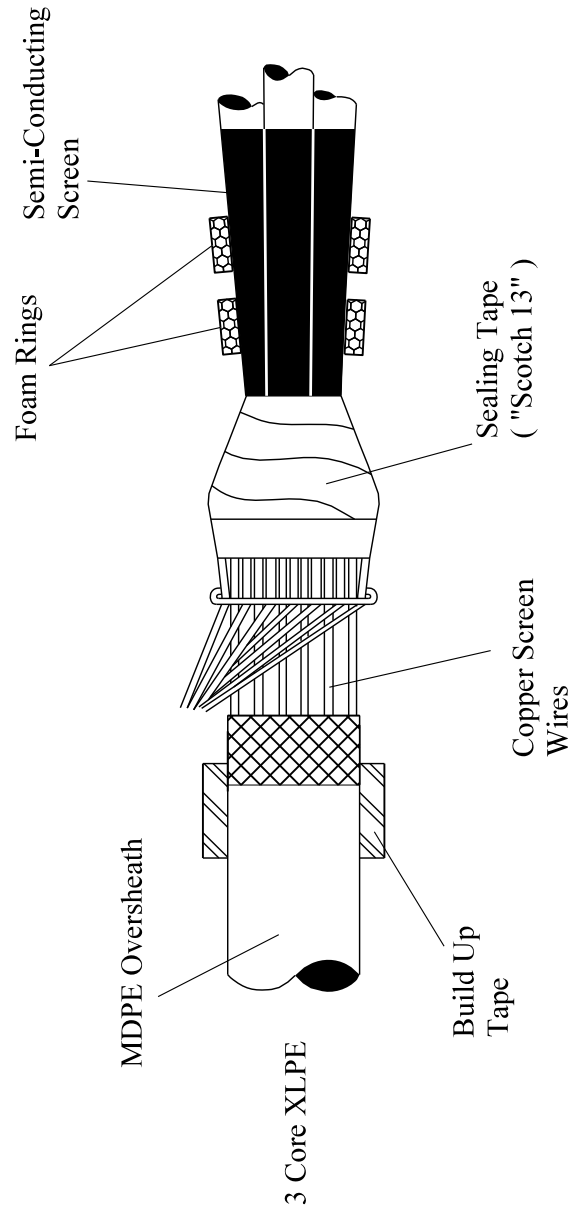
All dimensions in mm




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Drawn	RJB	05/13			
Checked					
Approved					
SCALE		N.T.S.		Title UP TO & INC 185mm ² EPR TRIPLEX - 3 CORE XLPE BRANCH JOINT STRIPPING DIMENSIONS	
				Drg. No. JP2D 7.205.1 Rev No	

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All dimensions in mm

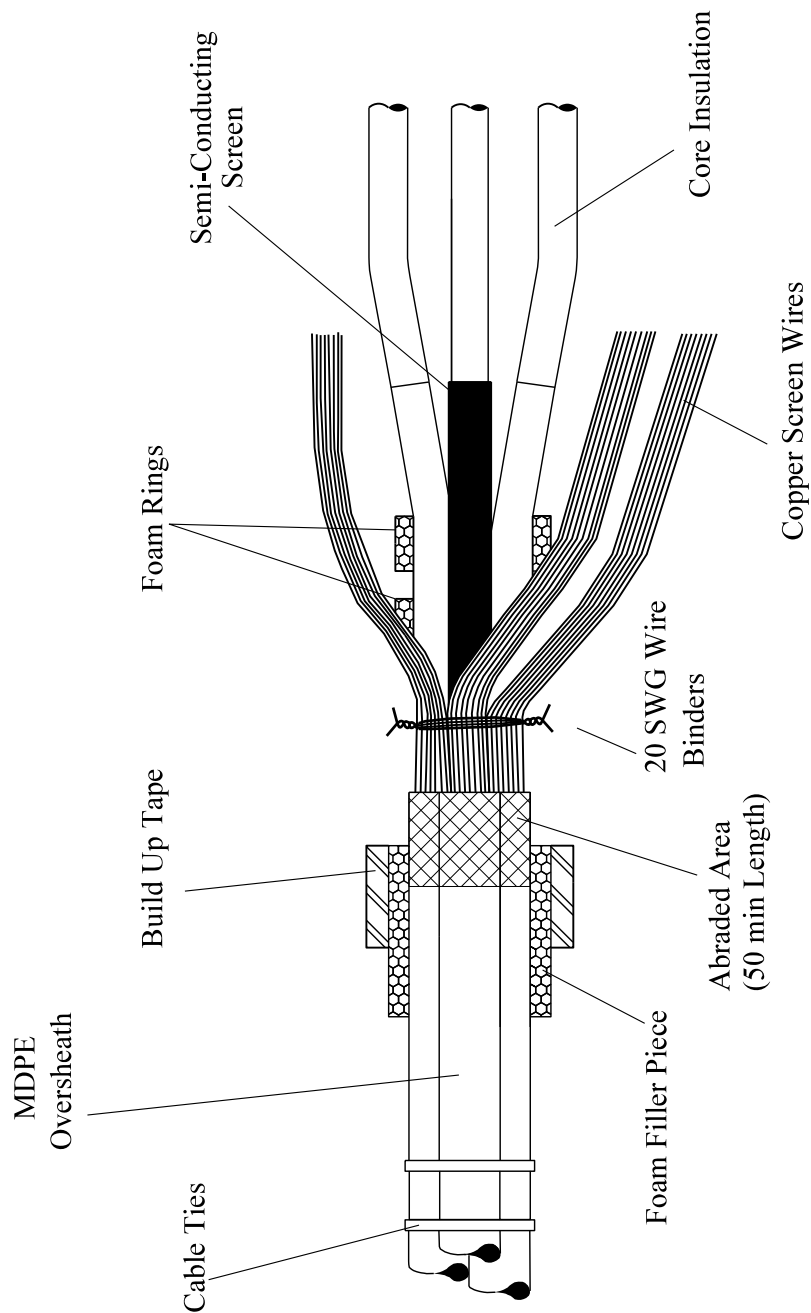


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Drawn	RJB	04/13			
Checked					
Approved					
SCALE		N.T.S.		Title	
				PREPARATION TO 3 CORE XLPE	
				Drg. No. JP2D 7.205.2	
				Rev No	

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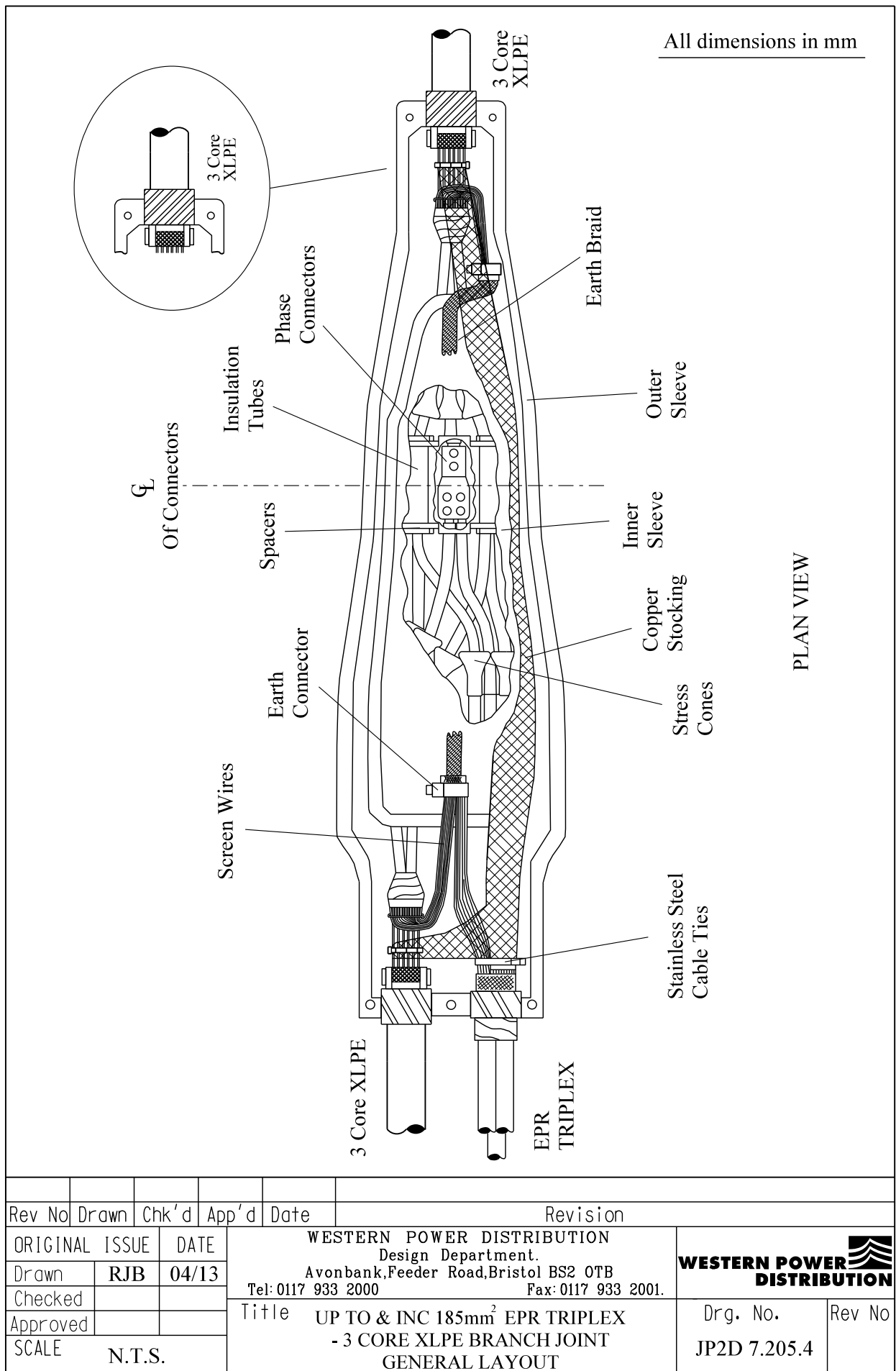
All dimensions in mm

EPR TRIPLEX



Rev No	Drawn	Chk'd	App'd	Date	Revision
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Drawn	RJB	04/13	Title PREPARATION OF EPR CABLE		
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Approved			Drg. No. JP2D 7.205.3		Rev No
SCALE		N.T.S.			

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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.206

300mm² 3 CORE XLPE – 300mm² EPR TRIPLEX CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 300mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.206

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
95 3 Core XLPE	300 EPR	BJ 1150
185 3 Core XLPE	300 EPR	BJ 1151
300 3 Core XLPE	70 EPR	BJ 1152
	95 EPR	BJ 1153
	185 EPR	BJ 1154
	300 EPR	BJ 1155

Note: - Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.206

JOINT KIT MATERIALS

KIT REF	BASE Module	Extended shell	RESIN MODULE			CABLE DEPENDING MODULE					FOAM TAPE BUILD UP MODULE	CONNECTOR		TUBE SET	TUBE SET
	KB 95	KB 95X	B	D	G	D	F	J	N	O	FTBM	HVBRM22SPUTC	BCNE-3	SMOE 28003	WCSM 120/40 x 350
BJ 1150	1	1	2	2	3		1		2		1	3	2	1	2
BJ 1151	1	1	2	2	3		1		2		1	3	2	1	2
BJ 1152	1	1	2	2	3			1		2	1	3	2	1	2
BJ 1153	1	1	2	2	3	1				2	1	3	2	1	2
BJ 1154	1	1	2	2	3	1				2	1	3	2	1	2
BJ 1155	1	1	2	2	3		1			2		3	2	1	2

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
 Scotch 70
 Scotch 13 tape
 Tinned copper wire 16 swg
 Tinned copper wire 20 swg
 De-solvit 1000 FD
 De-solvit 1000
 Workhorse dry wipes
 Emery cloth
 Scotch 5313 Water block tape
 Cable ties
 Sealing putty
 Aluminium oxide cloth 320 grit
 Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.206

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.206.1, 7.206.2, 7.206.3** and **7.206.4**, whilst undertaking this Jointing Procedure.

- | | | |
|--|--|-------|
| 1. | Set and mark cables. | 5/6 |
| 2. | Cut main cable at centre of connector (spiking position). | -- |
| 3 CORE XLPE CABLE - Preparation | | |
| 3. | Clean each oversheath for a distance of 1.5m. | -- |
| 4. | Apply a temporary earth continuity bond clear of joint position. | 10 |
| 5. | Park a mastic lined heat shrink tube next to temporary earth continuity bond . | -- |
| 6. | Remove oversheath. | 15/16 |
| 7. | Apply 20 swg binding wire 70mm from oversheath termination point to collective copper wire screen. | 21 |
| 8. | Straighten copper screen wires and form into a bunch. | -- |
| 9. | Remove the semi-conducting bedding layer. | -- |
| 10. | Apply 13 tape to screen wires and semi-conductor screens. | 21 |
| 11. | Flame abrade MDPE oversheath. | 17 |
| 12. | Set and mark cores ensuring two to the top. | -- |
| 13. | Remove semi-conducting screens ensuring insulation is free from all conducting material. | 28 |
| 14. | Single end only , remove core insulation to allow connector fitting. | 31 |
| 15. | Fit foam filler pieces and build up cable oversheaths. | 32 |
| 16. | Park copper stocking over cable at single end. | -- |
| 17. | Slide two foam rings over cores to beyond semi-conducting screen termination point. | 34 |
| 18. | Apply a stress cone to each core. | 35 |

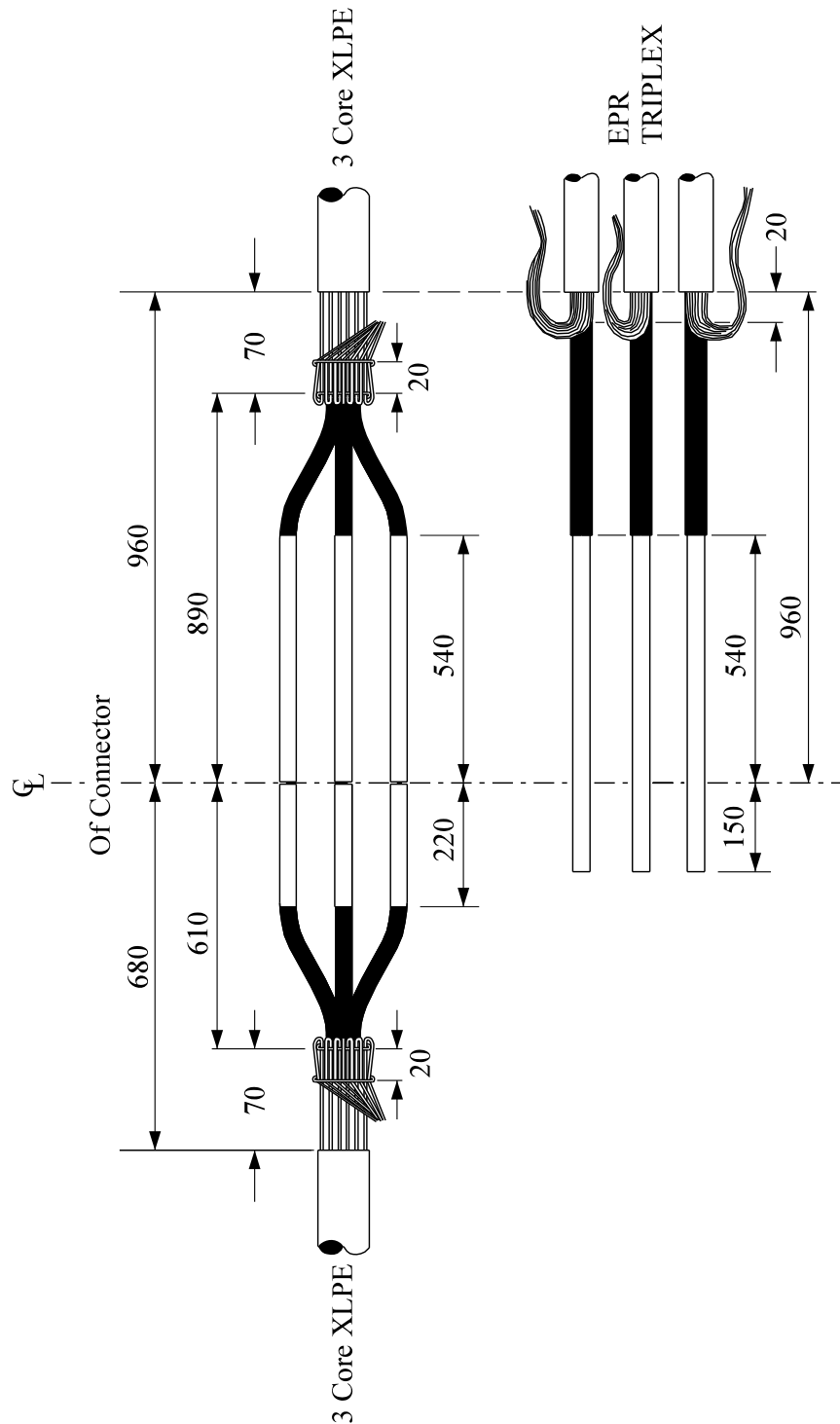
JOINTING PROCEDURES 7.206 – Continued


Actions	General Requirements (ST: CA2C/8)
EPR CABLE - Preparation	
19. Unravel and straighten individual cores.	--
20. Identify and mark core phasing clear of joint position.	--
21. Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
22. Clean each oversheath for a distance of 1.5m.	--
23. Apply a temporary earth continuity bond clear of joint position.	10
24. Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
25. Set and mark cores ensuring two to the top.	--
26. Remove oversheaths and bedding tapes.	16
27. Abrade oversheaths.	17
28. Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
29. Straighten copper screen wires and form into a bunch.	--
30. Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
31. Fit foam filler pieces and build up cable oversheaths.	32
32. Park copper stocking over cores at single end.	--
33. Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
34. Apply a stress cone to each core.	35
COMPLETION OF JOINT	
35. Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6

JOINTING PROCEDURE 7.206 – Continued

Actions	General Requirements (ST: CA2C/8)
36. Park insulation spacers between cores at single end.	37
37. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
38. Fit insulation tubes.	37
39. Fit inner sleeve.	39/40
40. Ensure joint is level and fill with Lovisil.	41
41. Clean and degrease inner sleeve.	43
42. Form copper screen wire bunches into one conductor and connect to earth braid.	42
43. Remove temporary earth continuity bond applied in 7 and reseal EPR oversheaths.	51
44. Slide and stretch copper stocking across joint and connect to copper screen wires.	44
45. Fit and support outer sleeve.	46
46. Mix and pour resin.	47

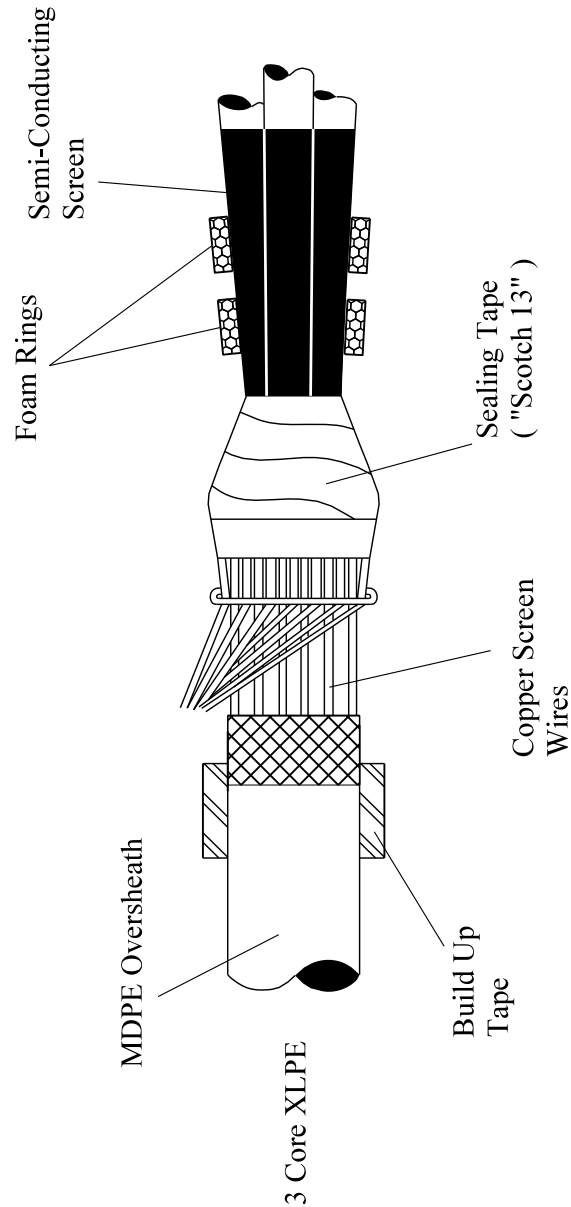
All dimensions in mm



Rev No	Drawn	Chk'd	App'd	Date	Revision	
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Drawn	RJB	05/13				
Checked						
Approved						
SCALE			Title UP TO & INC 300mm ² EPR TRIPLEX - 3 CORE XLPE BRANCH JOINT STRIPPING DIMENSIONS			Drg. No. JP2D 7.206.1
N.T.S.						Rev No

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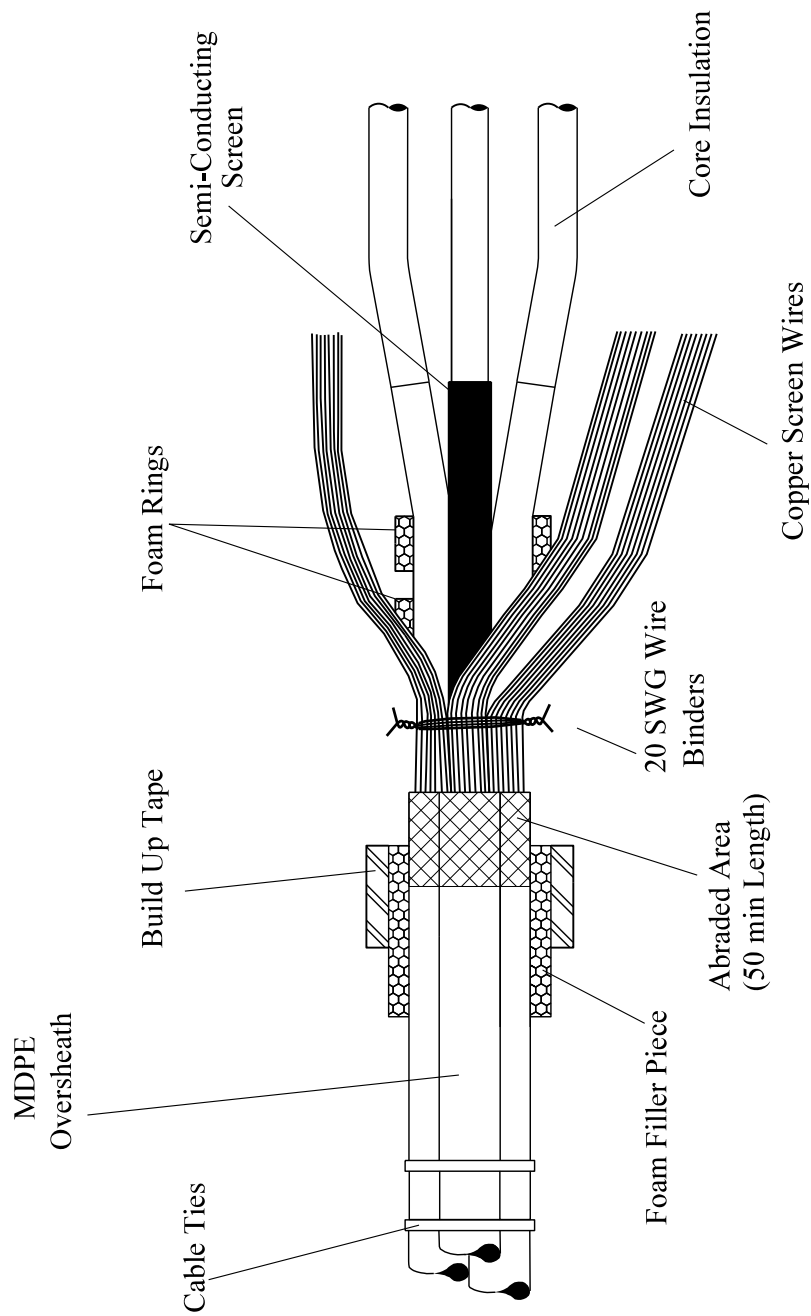



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Drawn	RJB	04/13			
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SCALE		N.T.S.		Title	
				PREPARATION OF 3 CORE XLPE	
				Drg. No. JP2D 7.206.2	
				Rev No	

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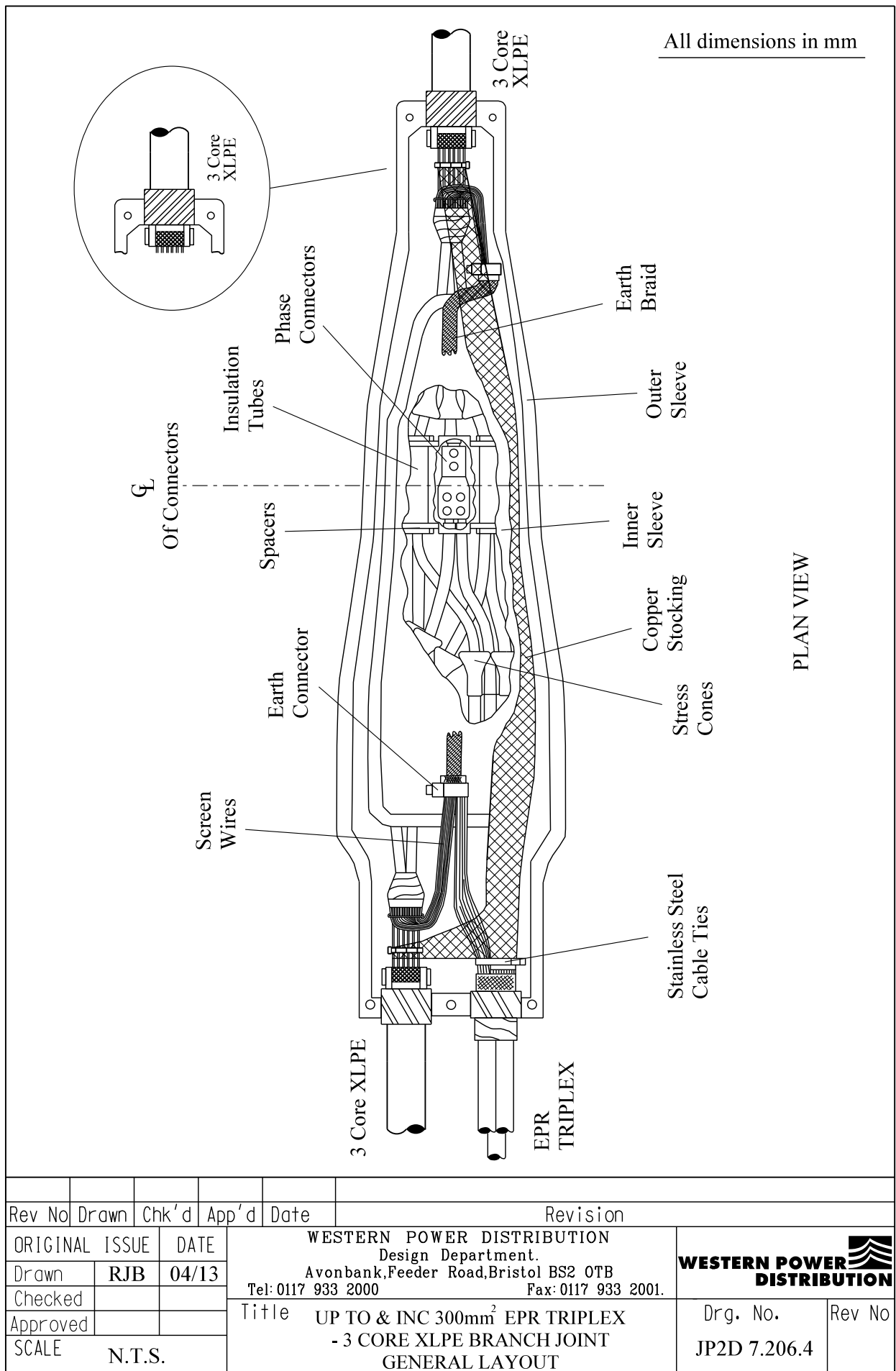
All dimensions in mm

EPR TRIPLEX



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Approved					
SCALE N.T.S.		PREPARATION OF EPR CABLE		Drg. No. JP2D 7.206.3	Rev No

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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.207

300/400mm² 3 CORE XLPE – 300mm² EPR TRIPLEX CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 400mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.207

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
300 Cu 3 Core XLPE	300 EPR	BJ 1156
	400 EPR	BJ 1157
400 Cu 3 Core XLPE	300 EPR	BJ 1158
	400 EPR	BJ 1159

Note: - Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.207

JOINT KIT MATERIALS

KIT REF	BASE MODULE		RESIN MODULE			CABLE DEPENDENT MODULE		CONNECTOR		TUBE SET	TUBE SET
	KB 95	KB 95X	B	D	G	F	O	HVBRM22SPUTC	BCNE-3	SMOE 28003	WCSM 120/40 x 350
BJ 1156	1	1	2	2	3	1	2	3	2	1	2
BJ 1157	1	1	2	2	3	1	2	3	2	1	2
BJ 1158	1	1	2	2	3	1	2	3	2	1	2
BJ 1159	1	1	2	2	3	1	2	3	2	1	2

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
 Scotch 70
 Scotch 13 tape
 Tinned copper wire 16 swg
 Tinned copper wire 20 swg
 De-solvit 1000 FD
 De-solvit 1000
 Workhorse dry wipes
 Emery cloth
 Scotch 5313 Water block tape
 Cable ties
 Sealing putty
 Aluminium oxide cloth 320 grit
 Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.207

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.207.1, 7.207.2, 7.207.3 and 7.207.4** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
2.	Cut main cable at centre of connector (spiking position).	--
3 CORE XLPE CABLE - Preparation		
3.	Clean each oversheath for a distance of 1.5m.	--
4.	Apply a temporary earth continuity bond clear of joint position.	10
5.	Park a mastic lined heat shrink tube next to temporary earth continuity bond .	--
6.	Remove oversheath.	15/16
7.	Apply 20 swg binding wire 70mm from oversheath termination point to collective copper wire screen.	21
8.	Straighten copper screen wires and form into a bunch.	--
9.	Remove the semi-conducting bedding layer.	--
10.	Apply 13 tape to screen wires and semi-conductor screens.	21
11.	Flame abrade MDPE oversheath.	17
12.	Set and mark cores ensuring two to the top.	--
13.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
14.	Single end only , remove core insulation to allow connector fitting.	31
15.	Fit foam filler pieces and build up cable oversheaths.	32
16.	Park copper stocking over cable at single end.	--
17.	Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
18.	Apply a stress cone to each core.	35

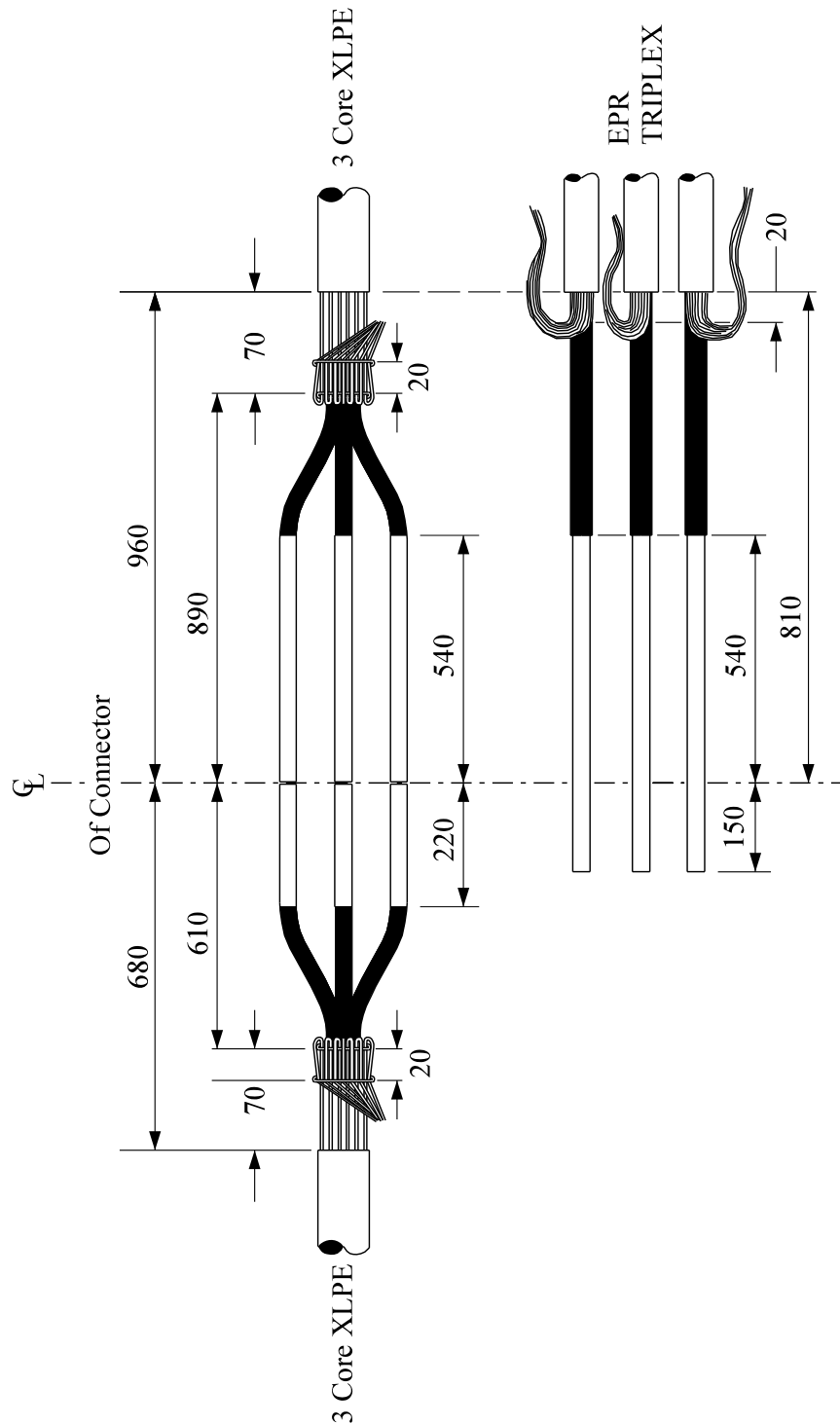
JOINTING PROCEDURES 7.207 – Continued


Actions	General Requirements (ST: CA2C/8)
EPR CABLE - Preparation	
19. Unravel and straighten individual cores.	--
20. Identify and mark core phasing clear of joint position.	--
21. Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
22. Clean each oversheath for a distance of 1.5m.	--
23. Apply a temporary earth continuity bond clear of joint position.	10
24. Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
25. Set and mark cores ensuring two to the top.	--
26. Remove oversheaths and bedding tapes.	16
27. Abrade oversheaths.	17
28. Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
29. Straighten copper screen wires and form into a bunch.	--
30. Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
31. Fit foam filler pieces and build up cable oversheaths.	32
32. Park copper stocking over cores at single end.	--
33. Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
34. Apply a stress cone to each core.	35
COMPLETION OF JOINT	
35. Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6

JOINTING PROCEDURE 7.207 – Continued

Actions	General Requirements (ST: CA2C/8)
36. Park insulation spacers between cores at single end.	37
37. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
38. Fit insulation tubes.	37
39. Fit inner sleeve.	39/40
40. Ensure joint is level and fill with Lovisil.	41
41. Clean and degrease inner sleeve.	43
42. Form copper screen wire bunches into one conductor and connect to earth braid.	42
43. Remove temporary earth continuity bond applied in 7 and reseal EPR oversheaths.	51
44. Slide and stretch copper stocking across joint and connect to copper screen wires.	44
45. Fit and support outer sleeve.	46
46. Mix and pour resin.	47

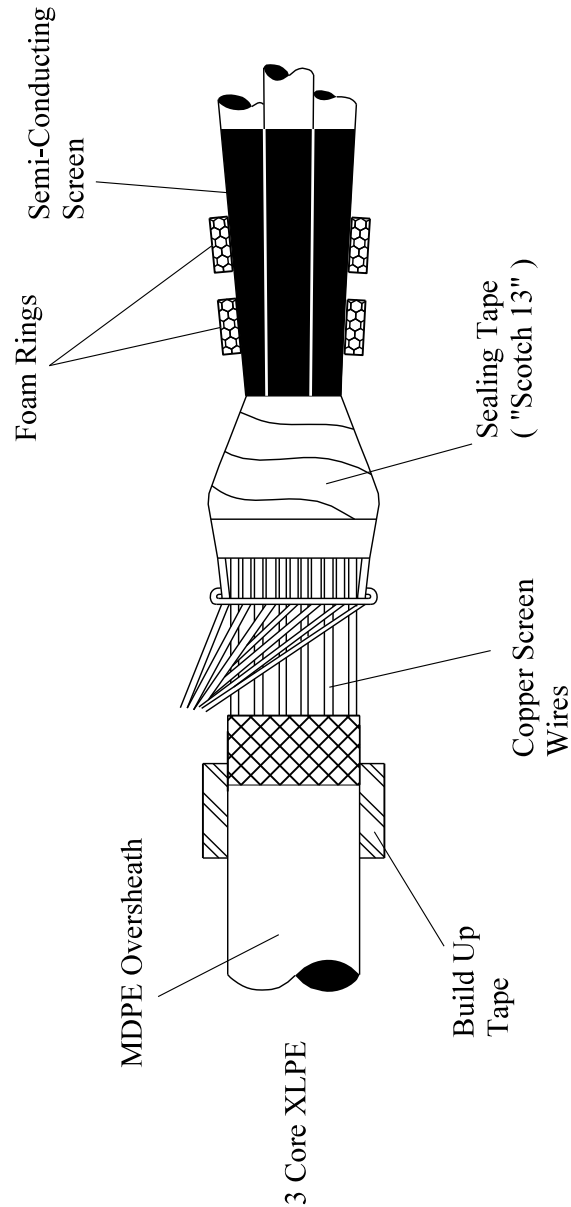
All dimensions in mm




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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	05/13			
Checked			Title UP TO & INC 400mm ² EPR TRIPLEX - 3 CORE XLPE BRANCH JOINT STRIPPING DIMENSIONS		
Approved			Drg. No. JP2D 7.207.1 Rev No		
SCALE			N.T.S.		

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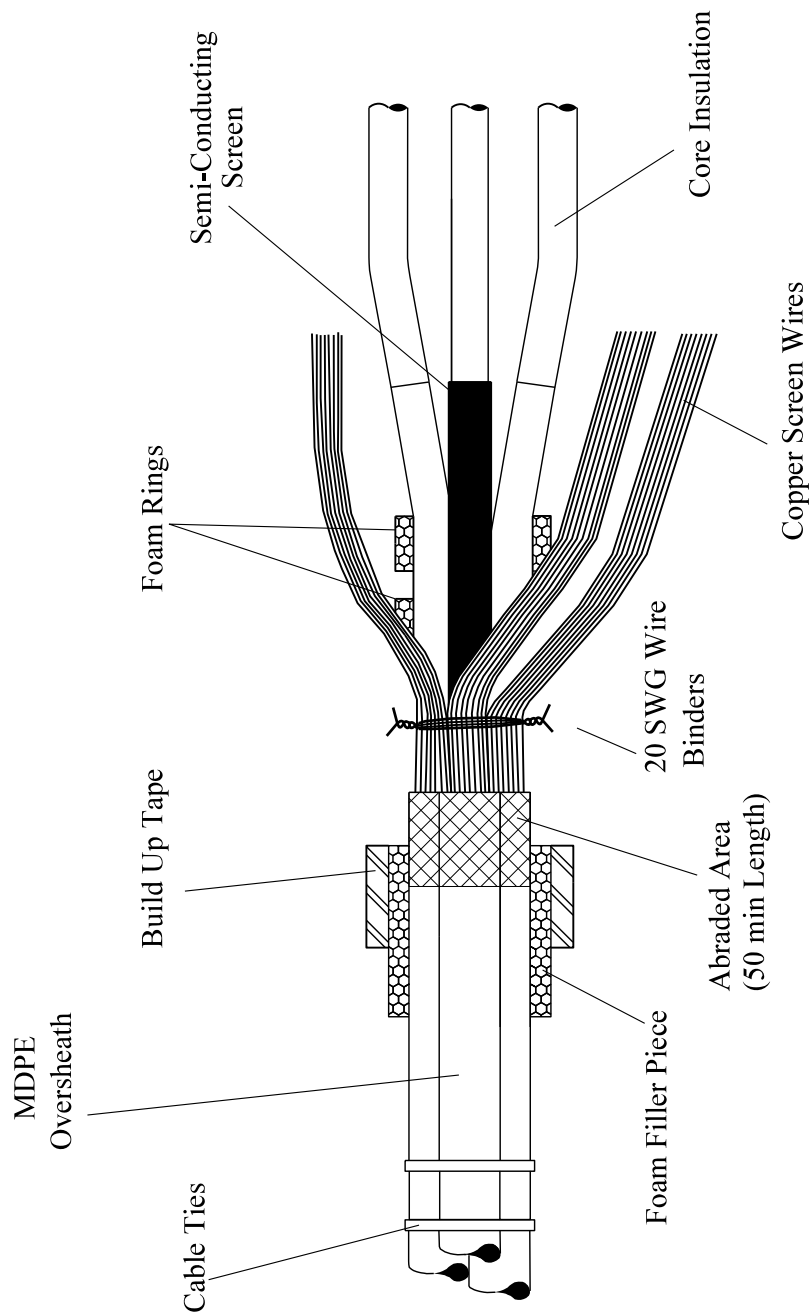


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Drawn	RJB	04/13					
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Approved							
SCALE		N.T.S.		Title		Drg. No.	Rev No
				PREPARATION OF 3 CORE XLPE		JP2D 7.207.2	

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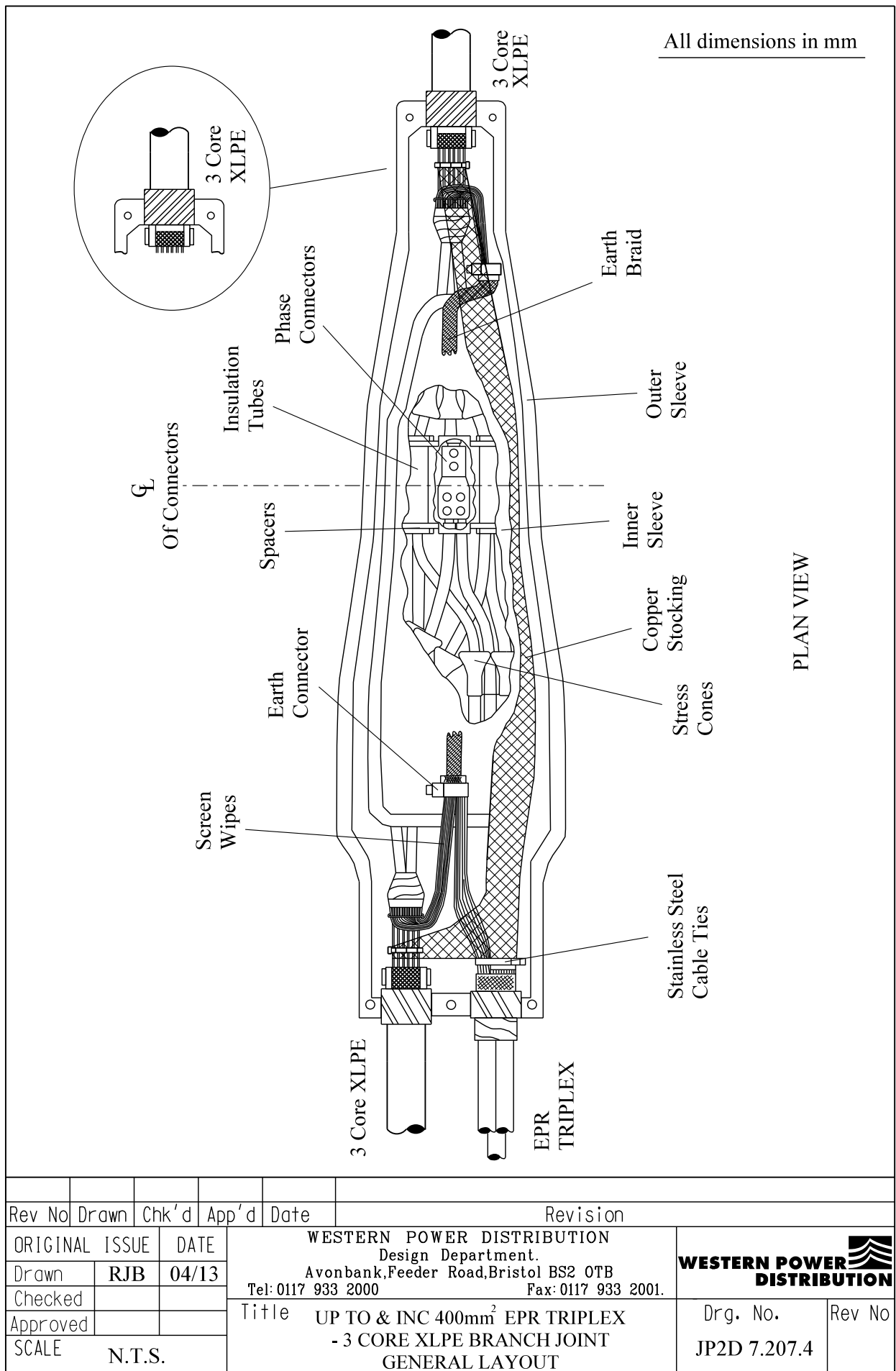
All dimensions in mm

EPR TRIPLEX



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Drawn	RJB	04/13	Title		
Checked					
Approved			PREPARATION OF EPR CABLE		
SCALE	N.T.S.				
			WESTERN POWER DISTRIBUTION		
			Drg. No. JP2D 7.207.3		Rev No

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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.208

185mm² 3 CORE SWA XLPE - 185mm² EPR TRIPLEX CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 185mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.208

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
95 3 core SWA XLPE	70 EPR	BJ 1160
	95 EPR	BJ 1161
	185 EPR	BJ 1162
185 3 core SWA XLPE	70 EPR	BJ 1163
	95 EPR	BJ 1164
	185 EPR	BJ 1165

Note: - Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.208

JOINT KIT MATERIALS

KIT REF	BASE MODULE		RESIN MODULE			CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTOR		TUBE SET	TUBE SET
	KB 85	KB 85X	B	D	G	D	J	P	FTBM	HVBRM18SPUTC	BCNE-3	SMOE 28003	WCSM 120/40 x 350
BJ 1160	1	1	1	2	3		1	2	1	3	2	1	2
BJ 1161	1	1	1	2	3	1		2		3	2	1	2
BJ 1162	1	1	1	2	3	1		2		3	2	1	2
BJ 1163	1	1	1	2	3		1	2	1	3	2	1	2
BJ 1164	1	1	1	2	3	1		2		3	2	1	2
BJ 1165	1	1	1	2	3	1		2		3	2	1	2

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
 Scotch 70
 Scotch 13 tape
 Tinned copper wire 16 swg
 Tinned copper wire 20 swg
 De-solvit 1000 FD
 De-solvit 1000
 Workhorse dry wipes
 Emery cloth
 Scotch 5313 Water block tape
 Cable ties
 Sealing putty
 Aluminium oxide cloth 320 grit
 Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.208

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.208.1, 7.208.2, 7.208.3 and 7.208.4** whilst undertaking this Jointing Procedure.

- | | | |
|--|--|-------|
| 1. | Set and mark cables. | 5/6 |
| 2. | Cut main cable at centre of connector (spiking position). | -- |
| 3 CORE XLPE SWA CABLE - Preparation | | |
| 3. | Clean each oversheath for a distance of 1.5m. | -- |
| 4. | Remove oversheath. | 15/16 |
| 5. | Apply 20 swg binding wire 70mm from oversheath termination point to steel wire armour. | 13 |
| 6. | Fit support ring and bond SWA. | 14 |
| 7. | Remove bedding layer and core fillers. | -- |
| 8. | Terminate and remove the copper tape from semi-conducting screens. | 29 |
| 9. | Fit braids to semi-conductor screens. | 29 |
| 10. | Flame abrade MDPE oversheath. | 17 |
| 11. | Set and mark cores ensuring two to the top. | -- |
| 12. | Remove semi-conducting screens ensuring insulation is free from all conducting material. | 28 |
| 13. | Single end only , remove core insulation to allow connector fitting. | 31 |
| 14. | Fit foam filler pieces and build up cable oversheaths. | 32 |
| 15. | Park copper stocking over cable at single end. | -- |
| 16. | Slide two foam rings over cores to beyond semi-conducting screen termination point. | 34 |
| 17. | Apply a stress cone to each core. | 35 |

JOINTING PROCEDURES 7.208 – Continued

Actions	General Requirements (ST: CA2C/8)
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EPR CABLE - Preparation

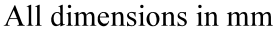
18.	Unravel and straighten individual cores.	--
19.	Identify and mark core phasing clear of joint position.	--
20.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
21.	Clean each oversheath for a distance of 1.5m.	--
22.	Apply a temporary earth continuity bond clear of joint position.	10
23.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
24.	Set and mark cores ensuring two to the top.	--
25.	Remove oversheaths and bedding tapes.	16
26.	Abrade oversheaths.	17
27.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
28.	Straighten copper screen wires and form into a bunch.	--
29.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
30.	Fit foam filler pieces and build up cable oversheaths.	32
31.	Park copper stocking over cores at single end.	--
32.	Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
33.	Apply a stress cone to each core.	35

COMPLETION OF JOINT

34.	Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6
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JOINTING PROCEDURE 7.208 – Continued

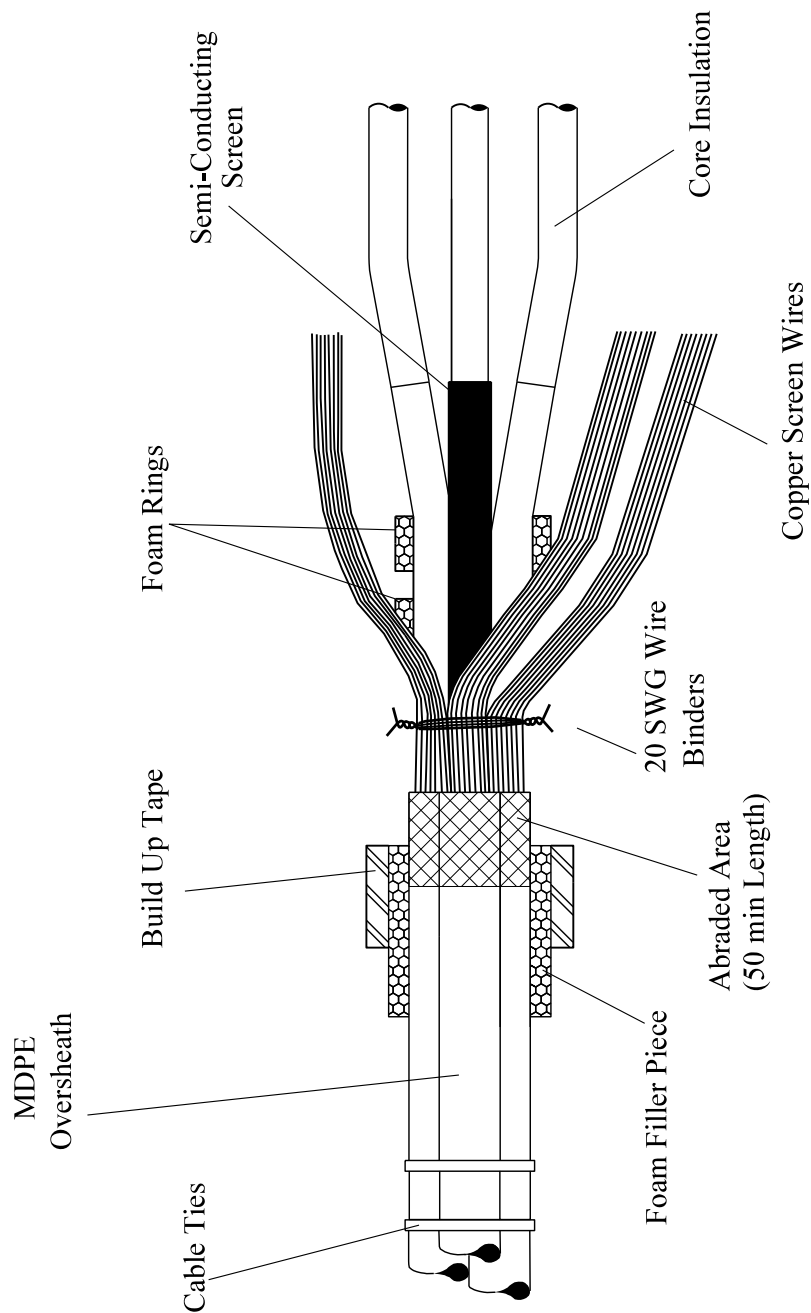
Actions	General Requirements (ST: CA2C/8)
35. Park insulation spacers between cores at single end.	37
36. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
37. Fit insulation tubes.	37
38. Fit inner sleeve.	39/40
39. Ensure joint is level and fill with Lovisil.	41
40. Clean and degrease inner sleeve.	43
41. Form copper screen wire bunches into one conductor and connect to earth braid.	42
42. Remove temporary earth continuity bond applied in 7 and reseal EPR oversheaths.	51
43. Slide and stretch copper stocking across joint and connect to copper screen wires.	44
44. Fit and support outer sleeve.	46
45. Mix and pour resin.	47




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All dimensions in mm

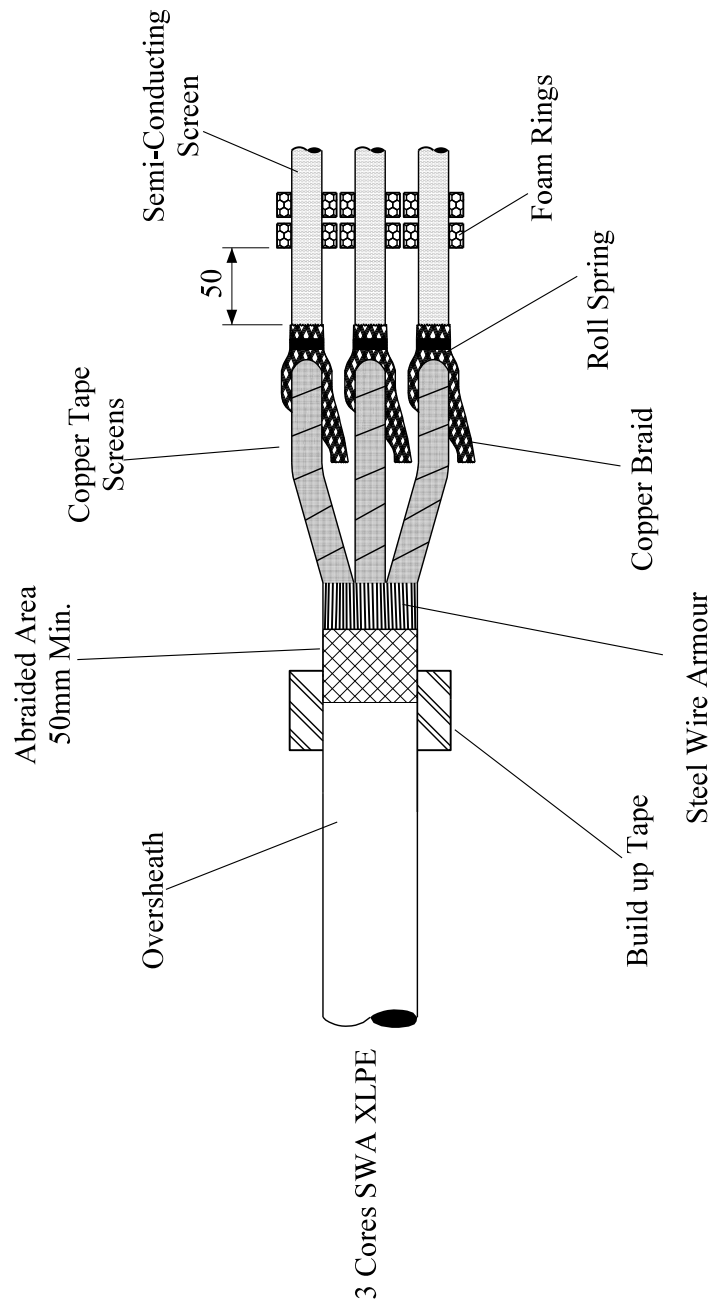
EPR TRIPLEX



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Approved					
SCALE		N.T.S.		Title	
				PREPARATION OF EPR TRIPLEX	
				Drg. No. JP2D 7.208.2	
				Rev No	

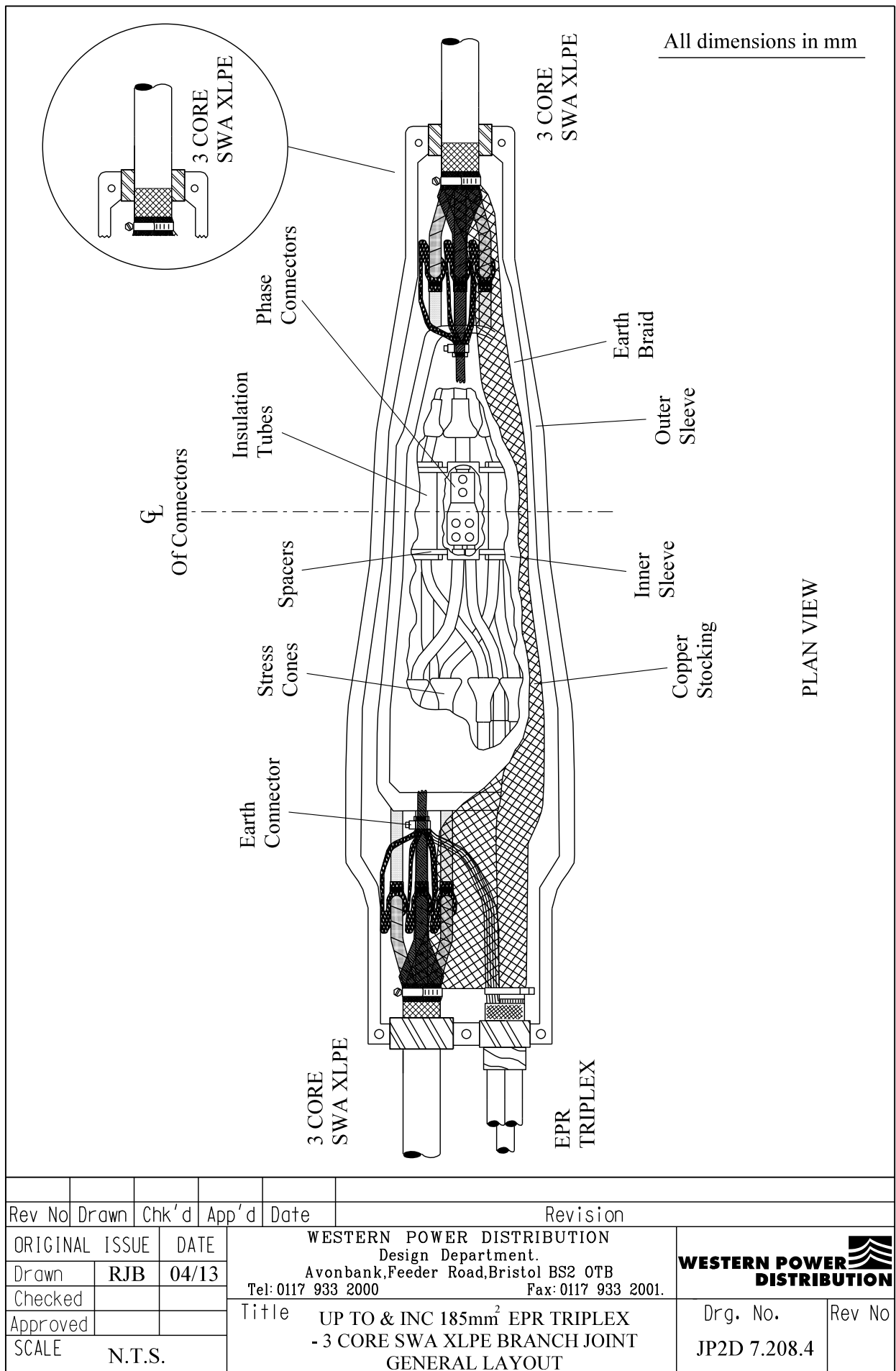
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Drawn	RJB	04/13		Title PREPARATION OF 3 CORE SWA XLPE	
Checked					
Approved				Drg. No. JP2D 7.208.3	
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ST: CA2M/4 PROCEDURES FOR MAKING 11kV CABLE BRANCH JOINTS

JOINTING PROCEDURE 7.209

300mm² 3 CORE SWA XLPE– 300mm² EPR TRIPLEX CABLE 11kV BRANCH JOINT

(This Jointing Procedure covers cable sizes up to and including 300mm²)

**This procedure is to be read in conjunction with the appropriate
General Requirement ST: CA2C/8 Section 6
of the 11kV Jointing Manual**

JOINTING PROCEDURE 7.209

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
Main	Branch	Branch Joint
95 3 Core XLPE SWA	300 EPR	BJ 1166
185 3 Core XLPE SWA	300 EPR	BJ 1167
300 3 Core XLPE SWA	70 EPR	BJ 1168
	95 EPR	BJ 1169
	185 EPR	BJ 1170
	300 EPR	BJ 1171

Note: - Any reference to EPR triplex equally applies to XLPE triplex.

JOINTING PROCEDURE 7.209

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE			CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTOR		TUBE SET	TUBE SET
	KB 95X	B	D	G	D	F	J	FTBM	HVBRM22SPUTC	BCNE-3	SMOE 28003	WCSM 120/40 x 350
BJ 1166	1	2	2	3	2	1		1	3	2	1	2
BJ 1167	1	2	2	3	2	1		1	3	2	1	2
BJ 1168	1	2	2	3		2	1	1	3	2	1	2
BJ 1169	1	2	2	3	1	2		1	3	2	1	2
BJ 1170	1	2	2	3	1	2		1	3	2	1	2
BJ 1171	1	2	2	3		3			3	2	1	2

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
 Scotch 70
 Scotch 13 tape
 Tinned copper wire 16 swg
 Tinned copper wire 20 swg
 De-solvit 1000 FD
 De-solvit 1000
 Workhorse dry wipes
 Emery cloth
 Scotch 5313 Water block tape
 Cable ties
 Sealing putty
 Aluminium oxide cloth 320 grit
 Aluminium oxide cloth 400 grit

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in existing 95mm² circuits.

JOINTING PROCEDURE 7.209

Actions

General Requirements (ST: CA2C/8)

Refer to Drawings **JP2D 7.209.1, 7.209.2, 7.209.3 and 7.209.4** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
2.	Cut main cable at centre of connector (spiking position).	--
3 CORE XLPE SWA CABLE - Preparation		
3.	Clean each oversheath for a distance of 1.5m.	--
4.	Remove oversheath.	15/16
5.	Apply 20 swg binding wire 70mm from oversheath termination point to steel wire armour.	13
6.	Fit support ring and bond SWA.	14
7.	Remove bedding layer and core fillers.	--
8.	Terminate and remove the copper tape from semi-conducting screens.	29
9.	Fit braids to semi-conductor screens.	29
10.	Abrade oversheath.	17
11.	Set and mark cores ensuring two to the top.	--
12.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
13.	Single end only , remove core insulation to allow connector fitting.	31
14.	Fit foam filler pieces and build up cable oversheaths.	32
15.	Park copper stocking over cable at single end.	--
16.	Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
17.	Apply a stress cone to each core.	35

JOINTING PROCEDURES 7.209 – Continued

Actions	General Requirements (ST: CA2C/8)
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EPR CABLE - Preparation

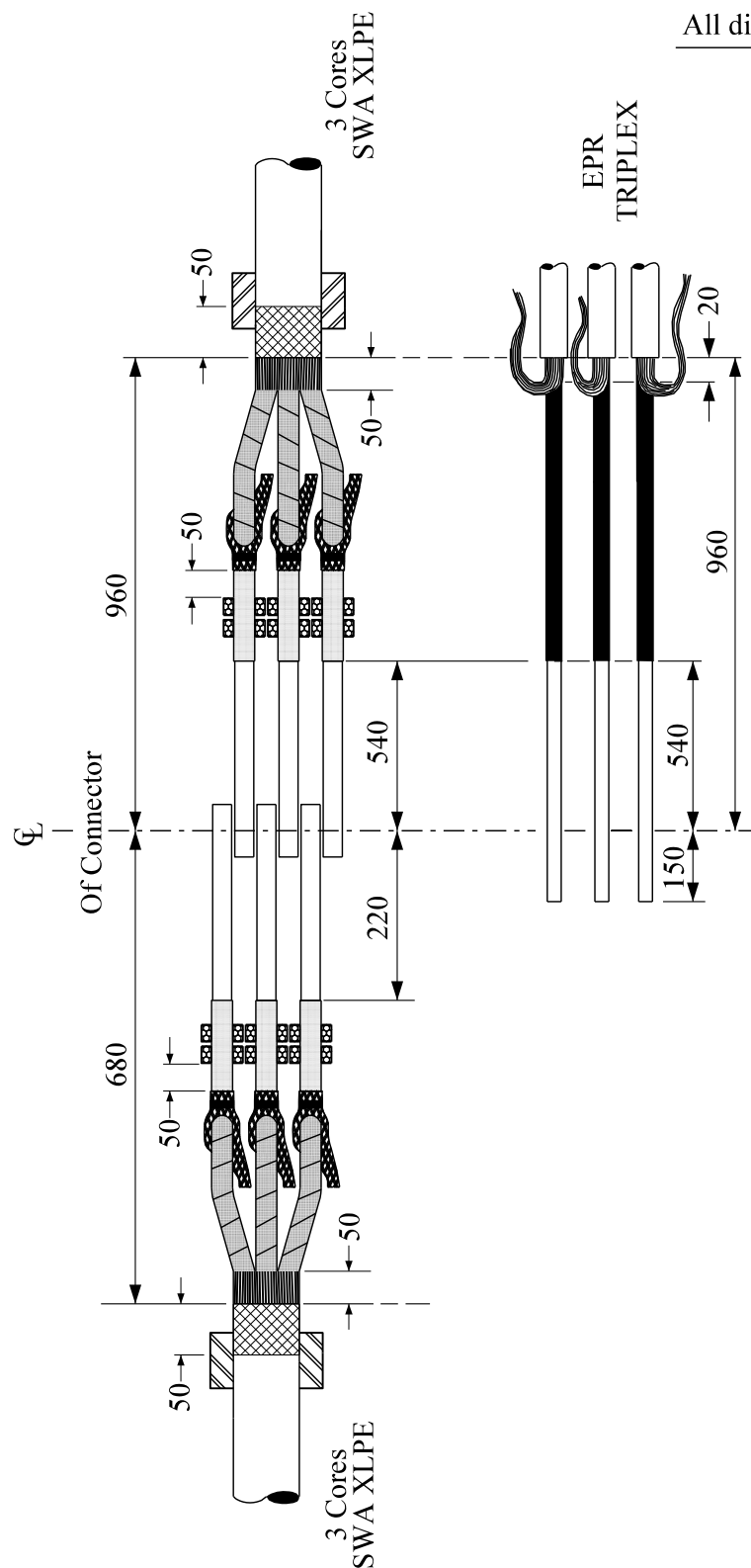
18.	Unravel and straighten individual cores.	--
19.	Identify and mark core phasing clear of joint position.	--
20.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
21.	Clean each oversheath for a distance of 1.5m.	--
22.	Apply a temporary earth continuity bond clear of joint position.	10
23.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
24.	Set and mark cores ensuring two to the top.	--
25.	Remove oversheaths and bedding tapes.	16
26.	Abrade oversheaths.	17
27.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
28.	Straighten copper screen wires and form into a bunch.	--
29.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
30.	Fit foam filler pieces and build up cable oversheaths.	32
31.	Park copper stocking over cores at single end.	--
32.	Slide two foam rings over cores to beyond semi-conducting screen termination point.	34
33.	Apply a stress cone to each core.	35

COMPLETION OF JOINT

34.	Fit cable spacer jigs at double end ensuring cables are positioned central to single end and maintain this position until completion.	6
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JOINTING PROCEDURE 7.209 – Continued

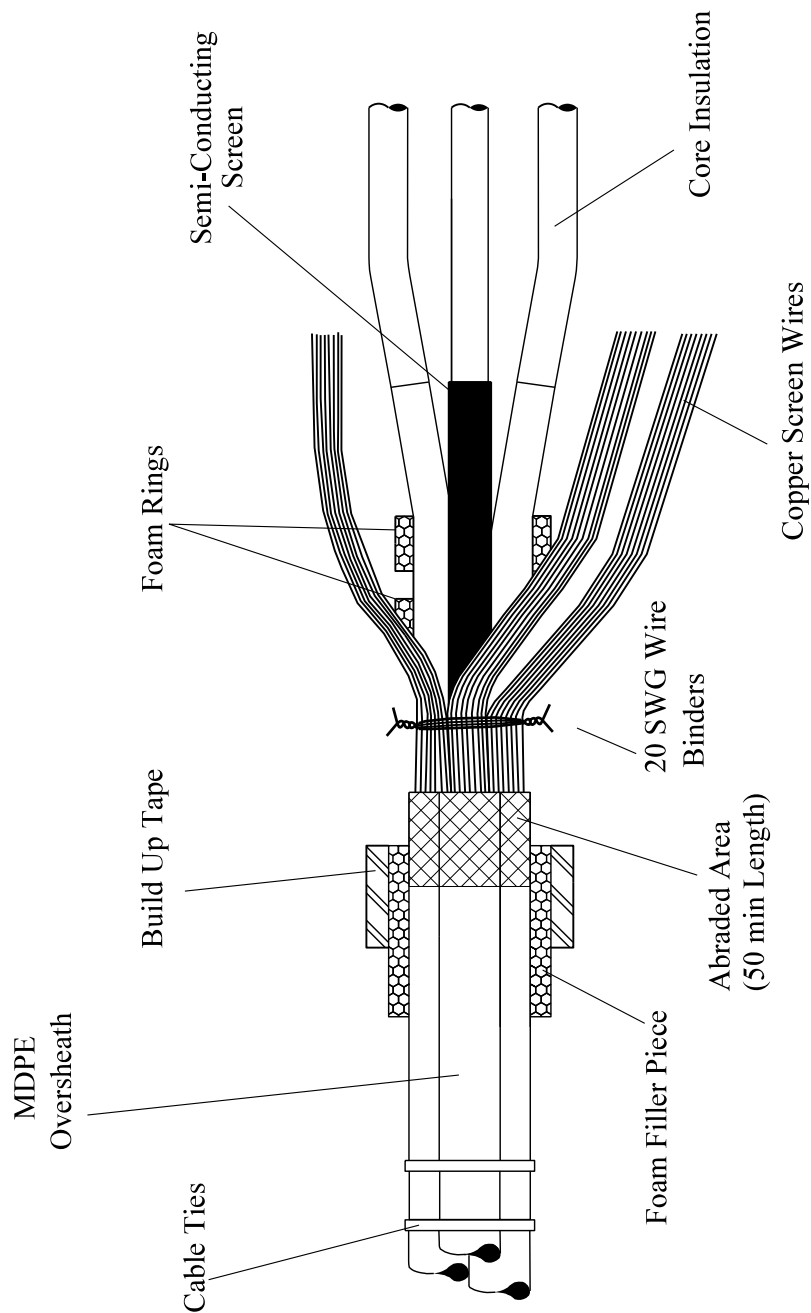
Actions	General Requirements (ST: CA2C/8)
35. Park insulation spacers between cores at single end.	37
36. Connect phase conductors ensuring correct connector set up to insulation spacer.	31/36
37. Fit insulation tubes.	37
38. Fit inner sleeve.	39/40
39. Ensure joint is level and fill with Lovisil.	41
40. Clean and degrease inner sleeve.	43
41. Form copper screen wire bunches into one conductor and connect to earth braid.	42
42. Remove temporary earth continuity bond applied in 7 and reseal EPR oversheaths.	51
43. Slide and stretch copper stocking across joint and connect to copper screen wires.	44
44. Fit and support outer sleeve.	46
45. Mix and pour resin.	47




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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	04/13			
Checked					
Approved				Title UP TO & INC 300mm ² EPR TRIPLEX - 3 CORE SWA XLPE BRANCH JOINT STRIPPING DIMENSIONS	Drg. No. JP2D 7.209.1
SCALE N.T.S.				Rev No	

All dimensions in mm

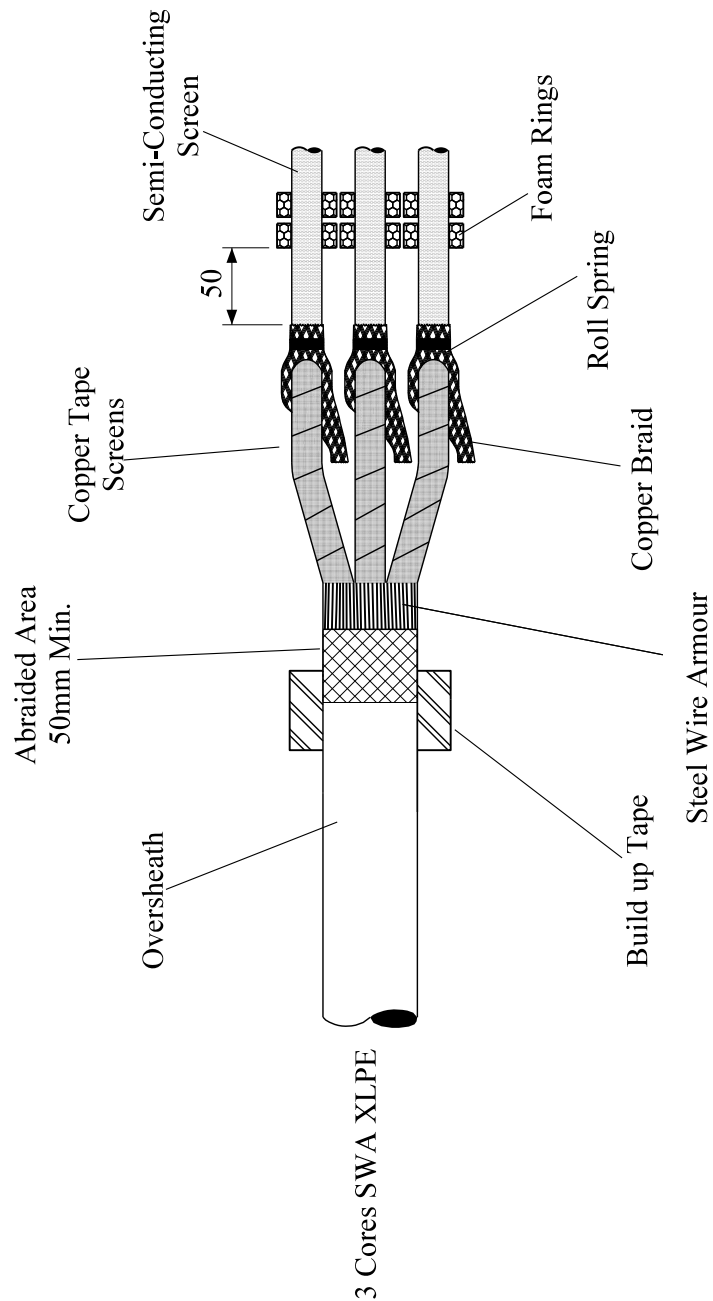
EPR TRIPLEX



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SCALE		N.T.S.		Title		Drg. No.	Rev No
				PREPARATION OF EPR TRIPLEX		JP2D 7.209.2	

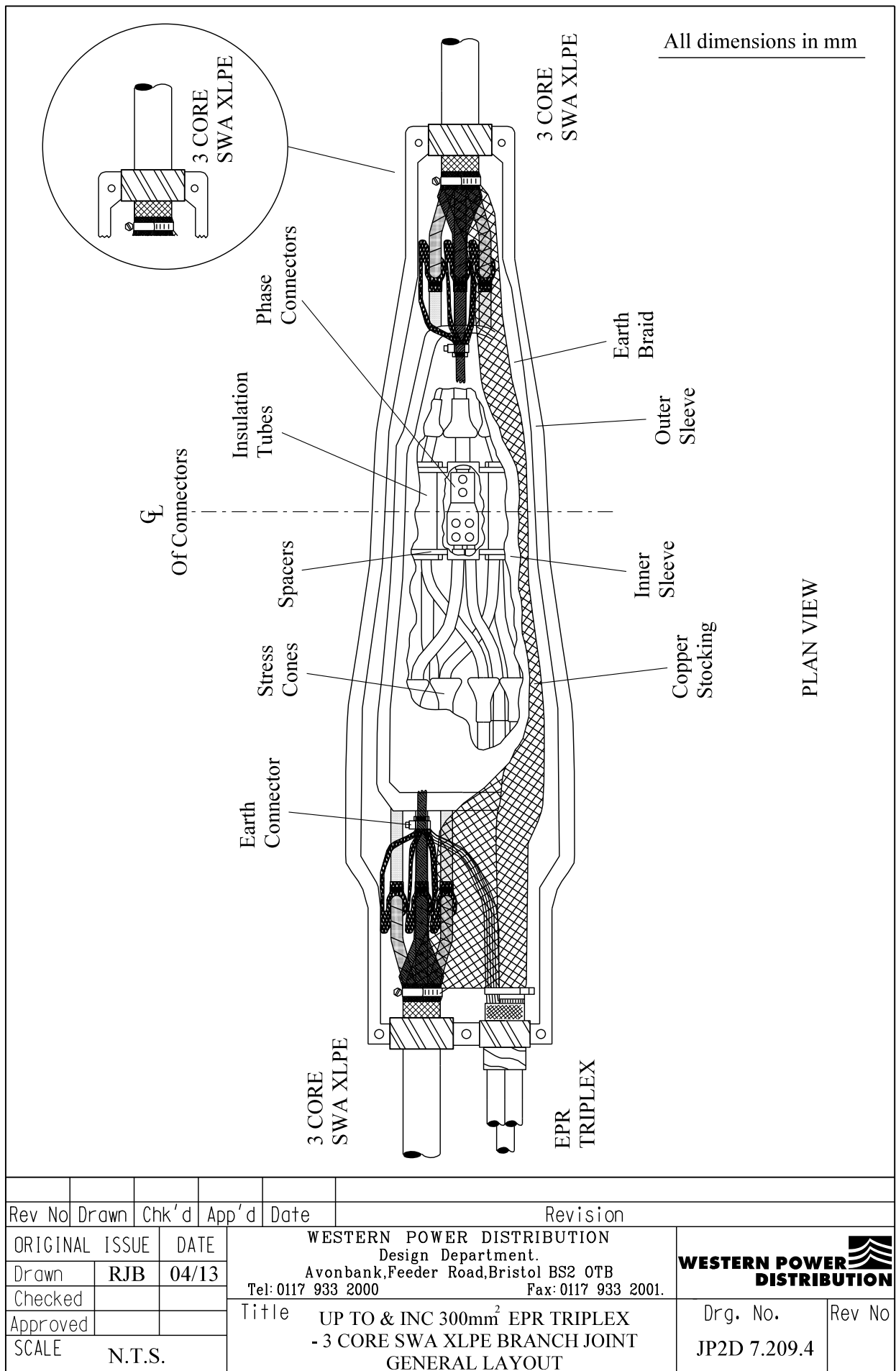
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All dimensions in mm



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Drawn	RJB	04/13			
Checked				Title <div>PREPARATION OF 3 CORE SWA XLPE</div>	
Approved					
SCALE		N.T.S.		Drg. No. JP2D 7.209.3	
				Rev No	

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APPENDIX A

SUPERSEDED DOCUMENTATION

This document replaces ST: CA2M/3 dated April 2013 which should now be withdrawn.

APPENDIX B

ASSOCIATED DOCUMENTATION

ST:CA2A, ST:CA2C, ST:CA2N, ST:CA2O, ST:CA2S, ST:CA2T, ST:CA2U, ST:CA2V.

APPENDIX C

IMPACT ON COMPANY POLICY

None, in South Wales and South West as this document has just been updated to incorporate losses strategy.

APPENDIX D

IMPLEMENTATION OF POLICY

For WPD staff Team Managers shall ensure that all relevant 11kV Jointing staff are aware of the changes to 11kV Jointing Manual of which this Standard Technique forms a major part. It can be implemented into all area of WPD with immediate effect. Managers shall ensure that all staff involved in the design, installation, maintenance and operation of the 11kV system are familiar with, and follow, the requirements of this document.

Independent Connection Providers (ICPs) shall follow the requirements of ST: CA2M/3 or of this document (ST: CA2M/4) for a period of up to 3 months from the issue of this document. After this date, all jointing works shall comply with ST: CA2M/4.

Where any difficulty is encountered in the application of this Standard Technique the author shall be notified who will determine whether a variation is appropriate.

APPENDIX E

KEY WORDS

11kV branch joints, 11kV transitional branch joints.