WESTERN POWER DISTRIBUTION

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

Company Directive

STANDARD TECHNIQUE: CA2V/4

Relating to Procedures for Making 11kV Cable Straight Joints

Policy Summary

This Standard Technique document contains all the approved 11kV cold applied/pour Straight 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/9.

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: **December 2017**

Approved by

Policy Manager

Date: 12 December 2017

IMPLEMENTATION PLAN

Introduction

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

Main Changes

Document updated to reflect the implementation of the Lovink M series straight joints during Q2 2018.

Impact of Changes

None at this time – Document issued ahead of change-over to M Series Lovink Joints.

Implementation Actions

These changes will be briefed by our training team who will be visiting all locations Q1 2018

Team Managers to ensure all of their 11kV Jointers attend these sessions

Implementation Timetable

This Standard Technique can be issued with immediate effect.

REVISION HISTORY

Document Revision & Review Table		
Date	**Comments**	**Author**
December 2017	The document has been modified to take into account the introduction of the new Lovink M series of straight joint.	Richard Summers
April 2016	Document has been modified to take into account the WPD losses strategy and the harmonization of the 11kV cables within the company. Minor changes in the additional item lists.	Peter White
April 2015	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. This document now contains all the required the Jointing Procedures associated to the cables used within the enlarged company thus allowing Straight joints to be installed on the said cables. Earth tail removed from each JP. Rectification of known typographic errors.	Peter White
September 2014	The document has been updated to take into account six typographic errors that were found in drawings JP2D 7.104.1, 7.104.2, 7.104.3, 7.105.1, 7.105.2 and 7.105.3.	Peter White

ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS

INTRODUCTION

This Standard Technique document contains all the approved 11kV Straight Joints, which shall be implemented in conjunction with the appropriate General Requirements, contained in ST: CA2C/9, including: -

1. General Cleanliness and Accident Prevention.

2. Joint Bay Preparation.

3. General Jointing Procedures – Dead Cables.

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

As from 1st March 2016 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 CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS

JOINTING PROCEDURE 7.101

185mm² EPR TRIPLEX – 185mm² EPR TRIPLEX CABLE 11kV STRAIGHT JOINT

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

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.101

JOINT KIT REFERENCES

CABLE SIZE		JOINT KIT REFERENCES
From	**To**	**Straight Joint**
70 EPR	70 EPR	SJ 1101
	95 EPR	SJ 1102
	185 EPR	SJ 1103
95 EPR	95 EPR	SJ 1104
	185 EPR	SJ 1105
185 EPR	185 EPR	SJ 1106

Note: - The jointing materials for 240mm² EPR Triplex will be as 300mm² EPR Triplex. Any reference to EPR equally applies to XLPE.

JOINTING PROCEDURE 7.101

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE	CABLE DEPENDING MODULE		FOAM TAPE BUILD UP MODULE	CONNECTOR	TUBE SET
	M85	B	D	J	FBTM	MSF-0009-0035/185	SMOE 28003
SJ 1101	1	1		2	1	3	2
SJ 1102	1	1	1	1	1	3	2
SJ 1103	1	1	1	1	1	3	2
SJ 1104	1	1	2			3	2
SJ 1105	1	1	2			3	2
SJ 1106	1	1	2			3	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.101

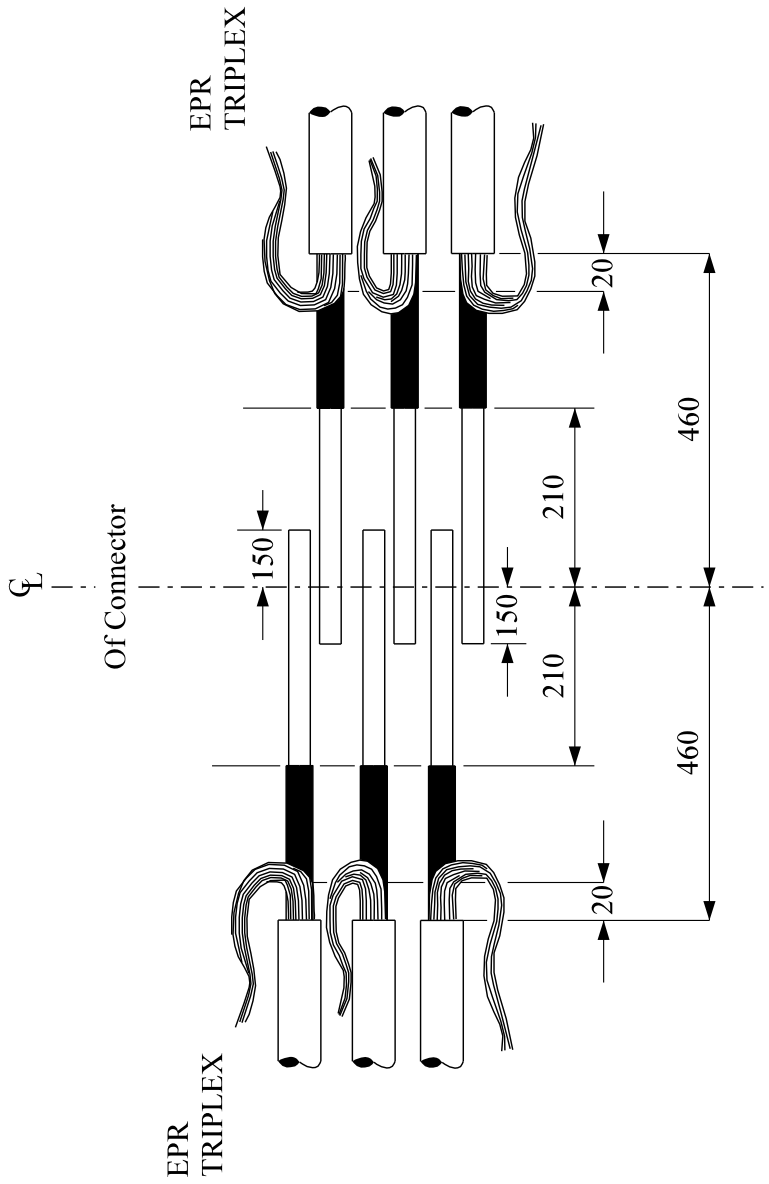
Actions		General Requirements (ST: CA2C/9)

Refer to Drawings **JP2D 7.101.1, 7.101.2** and **7.101.3** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	EPR CABLE - Preparation	
2.	Unravel and straighten individual cores.	--
3.	Identify and mark core phasing clear of joint position.	--
4.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
5.	Clean each oversheath for a distance of 1.5m.	--
6.	Apply a temporary earth continuity bond clear of joint position.	10
7.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
8.	Set and mark cores ensuring one to the top.	--
9.	Remove oversheaths and bedding tapes.	16
10.	Abrade oversheaths.	17
11.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
12.	Straighten copper screen wires and form into a bunch.	--
13.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
14.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28

Actions		**General Requirements (ST: CA2C/9)**
	COMPLETION OF JOINT	
15.	Cut cores and remove phase insulation to allow connector fitting.	31
16.	Apply a stress cone to each core.	35
17.	Fit foam filler pieces and build-up cable oversheaths.	32
18.	Fit inner sleeve foam rings.	34
19.	Connect phase conductors and shear connector bolts.	31/36
20.	Fit phase insulation tubes.	37
21.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
22.	Ensure joint is level and fill with Lovisil.	41
23.	Clean and degrease inner sleeve.	43
24.	Form copper screen wire bunches into one conductor and connect to copper earth bar clamp.	42
25.	Remove temporary earth continuity bond applied in 6 and reseal EPR oversheaths.	51
26.	Wrap and stretch copper stocking across joint and connect to copper screen wires.	44
27.	Fit and support outer sleeve ensuring 15mm clearance.	46
28.	Mix and pour resin.	47

All dimensions in mm



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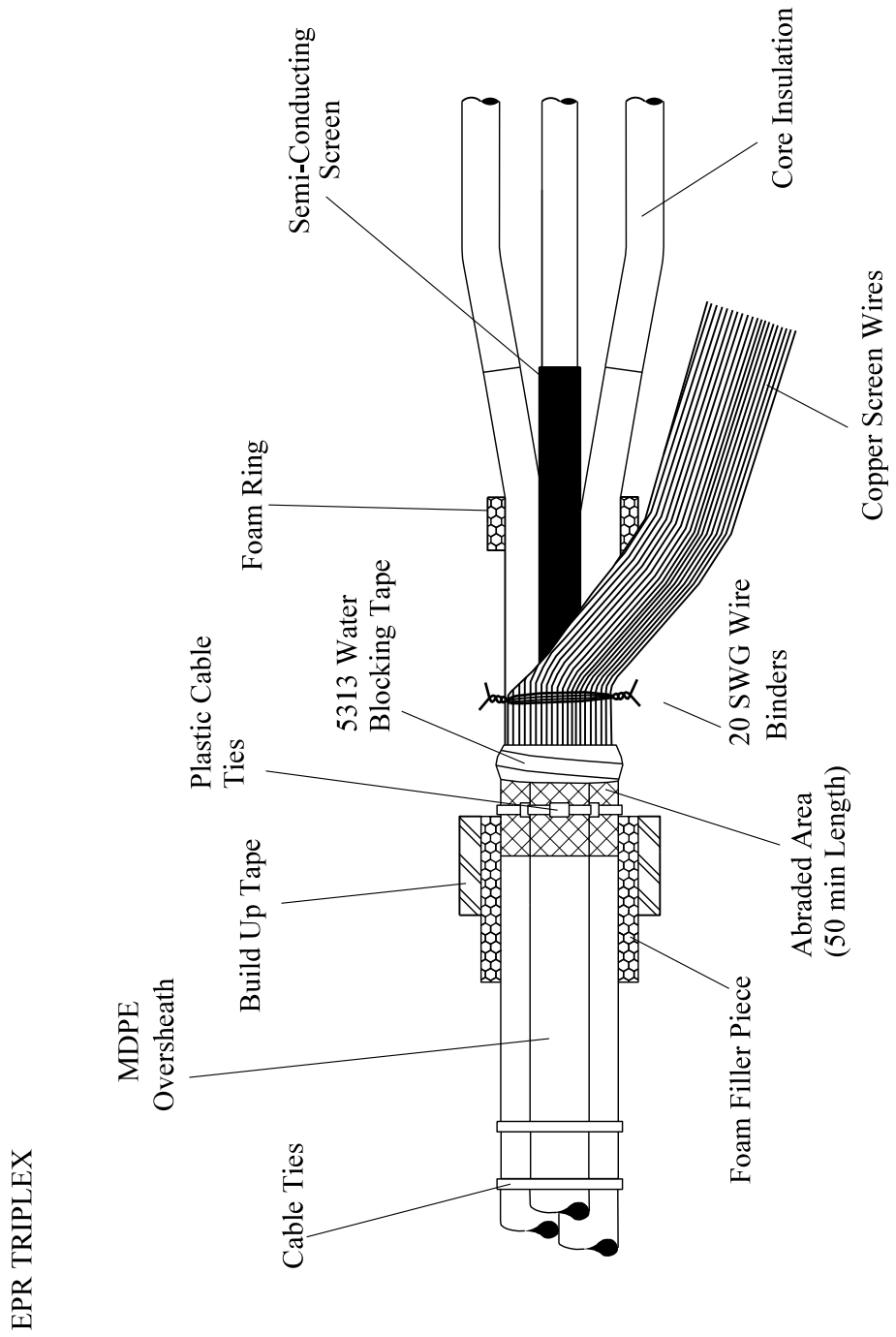
Title: UP TO & INC 185mm^2 EPR TRIPLEX STRAIGHT JOINT STRIPPING DIMENSIONS

Drg. No. JP2D 7.101.1

Rev No

All dimensions in mm



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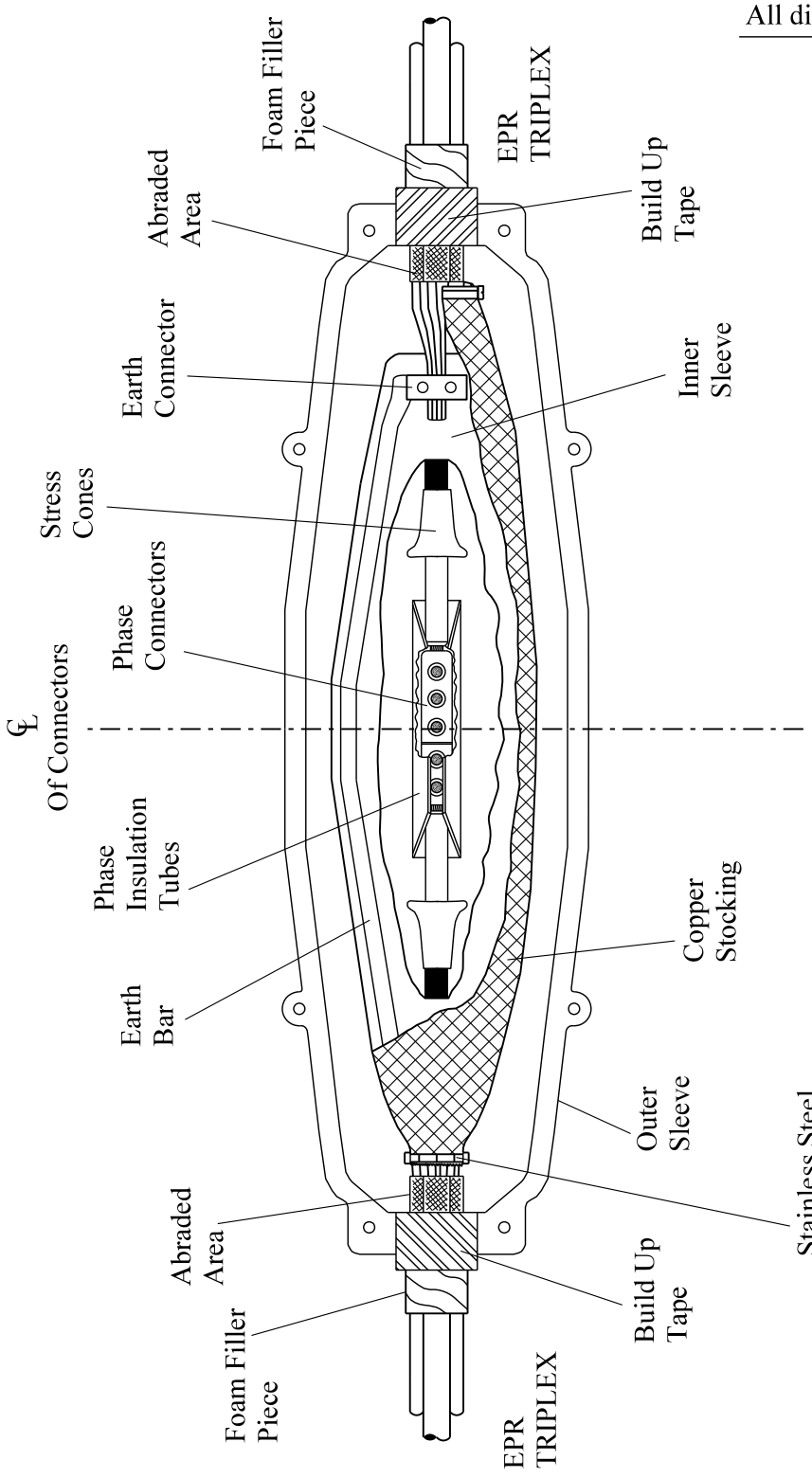
PREPARATION OF EPR TRIPLEX

Drg. No.	Rev No
JP2D 7.101.2	1

All dimensions in mm



Note :- Only One Core Shown For Clarity
5313 Water Blocking Tape Has Been Omitted on EPR Cable For Clarity

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.102

300mm² Al. EPR TRIPLEX – 300mm² Al. EPR TRIPLEX CABLE 11kV STRAIGHT JOINT.

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

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.102

JOINT KIT REFERENCES

CABLE SIZE		JOINT KIT REFERENCES
From	**To**	**Straight Joint**
70 EPR	300 EPR	SJ 1107
95 EPR	300 EPR	SJ 1108
185 EPR	300 EPR	SJ 1109
300 EPR	300 EPR	SJ 1110

Note: - The jointing materials for 240mm² EPR Triplex will be as 300mm² EPR Triplex. Any reference to EPR equally applies to XLPE.

JOINTING PROCEDURE 7.102

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTOR	TUBE SET
	M105	B	C	D	F	J	FBTM	MSFE-0010-035/300	SMOE 28003
SJ 1107	1	1	1		1	1	1	3	2
SJ 1108	1	1	1	1	1		1	3	2
SJ 1109	1	1	1	1	1		1	3	2
SJ 1110	1	1	1		2			3	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
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 (ST:CA2S).

JOINTING PROCEDURE 7.102

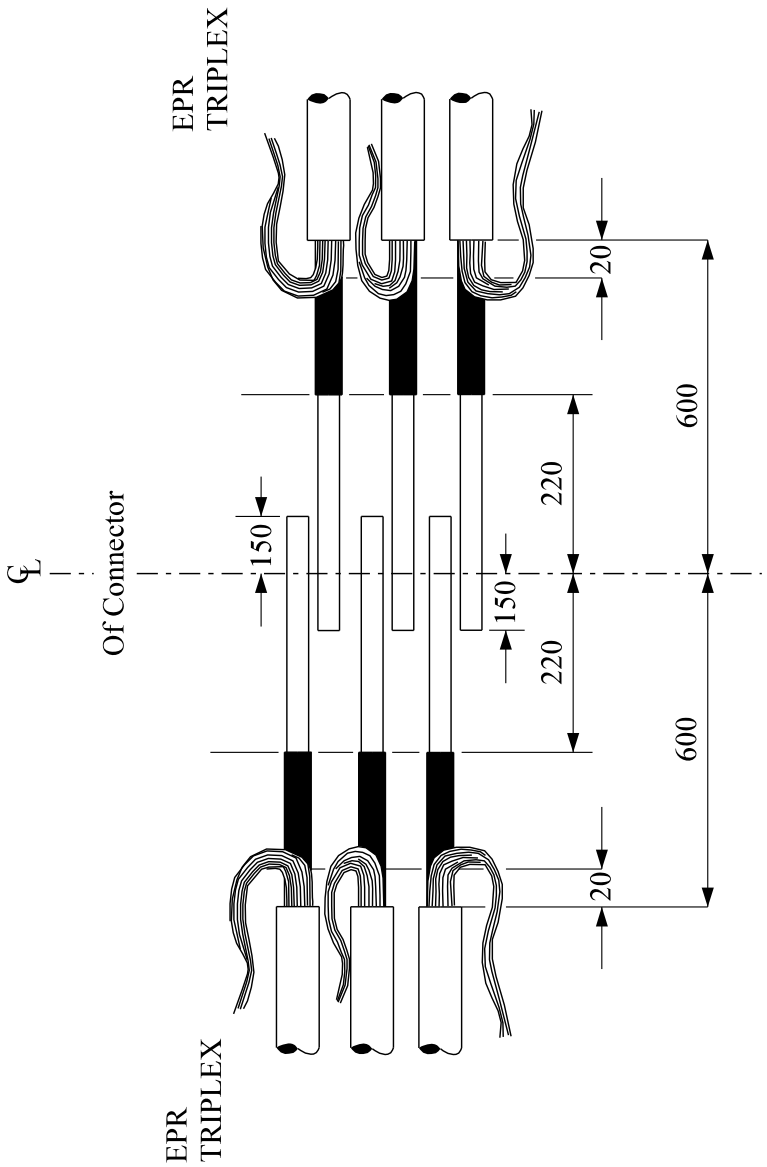
Actions		General Requirements (ST: CA2C/9)

Refer to Drawings **JP2D 7.102.1, 7.102.2** and **7.102.3** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	EPR CABLE - Preparation	
2.	Unravel and straighten individual cores.	--
3.	Identify and mark core phasing clear of joint position.	--
4.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
5.	Clean each oversheath for a distance of 1.5m.	--
6.	Apply a temporary earth continuity bond clear of joint position.	10
7.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
8.	Set and mark cores ensuring one to the top.	--
9.	Remove oversheaths and bedding tapes.	16
10.	Abrade oversheaths.	17
11.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
12.	Straighten copper screen wires and form into a bunch.	--
13.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
14.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28

Actions		**General Requirements (ST: CA2C/9)**
	COMPLETION OF JOINT	
15.	Cut cores and remove phase insulation to allow connector fitting.	31
16.	Apply a stress cone to each core.	35
17.	Fit foam filler pieces and build-up cable oversheaths.	32
18.	Fit inner sleeve foam rings.	34
19.	Connect phase conductors and shear connector bolts.	31/36
20.	Fit phase insulation tubes.	37
21.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
22.	Ensure joint is level and fill with Lovisil.	41
23.	Clean and degrease inner sleeve.	43
24.	Form copper screen wire bunches into one conductor and connect to copper earth bar clamp.	42
25.	Remove temporary earth continuity bond applied in 6 and reseal EPR oversheaths.	51
26.	Wrap and stretch copper stocking across joint and connect to copper screen wires.	44
27.	Fit and support outer sleeve ensuring 15mm clearance.	46
28.	Mix and pour resin.	47

All dimensions in mm



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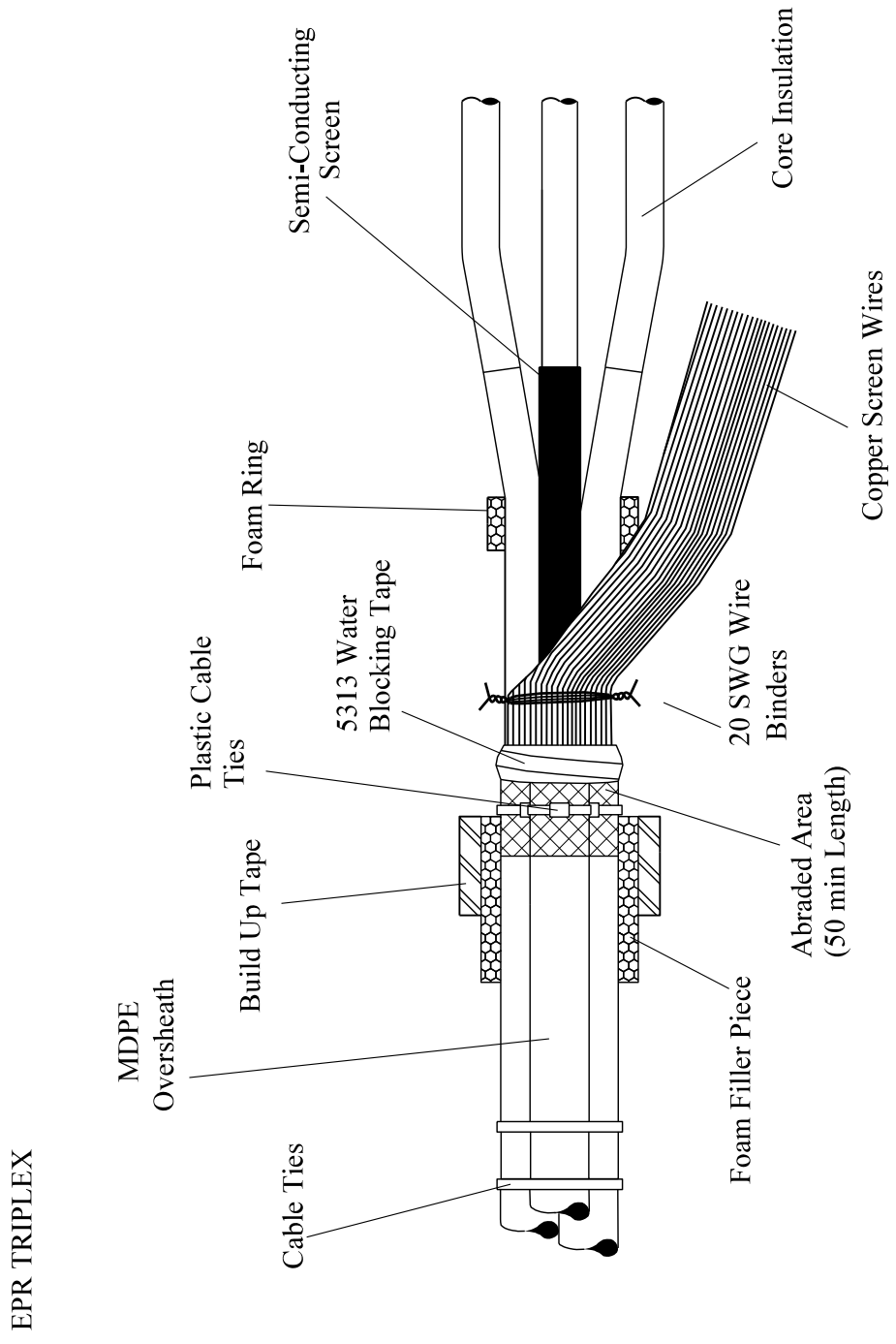
SCALE	N.T.S.		Title: UP TO & INC 300mm^2 EPR TRIPLEX STRAIGHT JOINT STRIPPING DIMENSIONS	Drg. No. JP2D 7.102.1 / Rev No

All dimensions in mm



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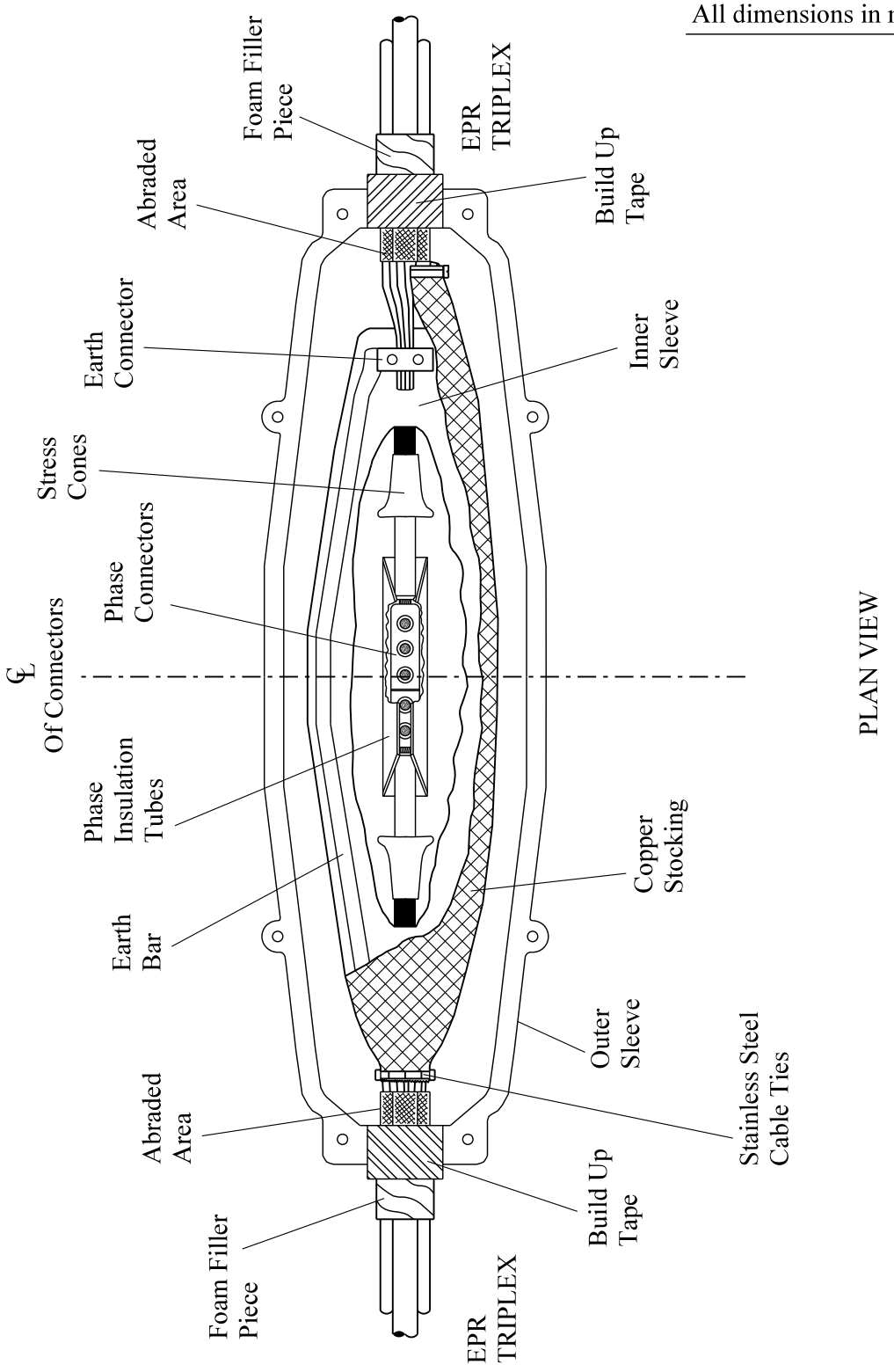
All dimensions in mm



Note :- Only One Core Shown For Clarity
5313 Water Blocking Tape Has Been Omitted on EPR Cable For Clarity

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.103

300mm² Cu. EPR TRIPLEX – 400mm² Cu. EPR TRIPLEX CABLE 11kV STRAIGHT JOINT.

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

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.103

JOINT KIT REFERENCES

CABLE SIZE		JOINT KIT REFERENCES
From	**To**	**Straight Joint**
300 EPR	300 EPR	SJ 1111
400 EPR	300 EPR	SJ 1112

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

JOINTING PROCEDURE 7.103

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTOR	TUBE SET
	M105	B	C	D	F	J	FBTM	BAH-02-211-098	SMOE 28003
SJ 1111	1	1	1	-	2	-	-	3	2
SJ 1112	1	1	1	-	2	-	-	3	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.103

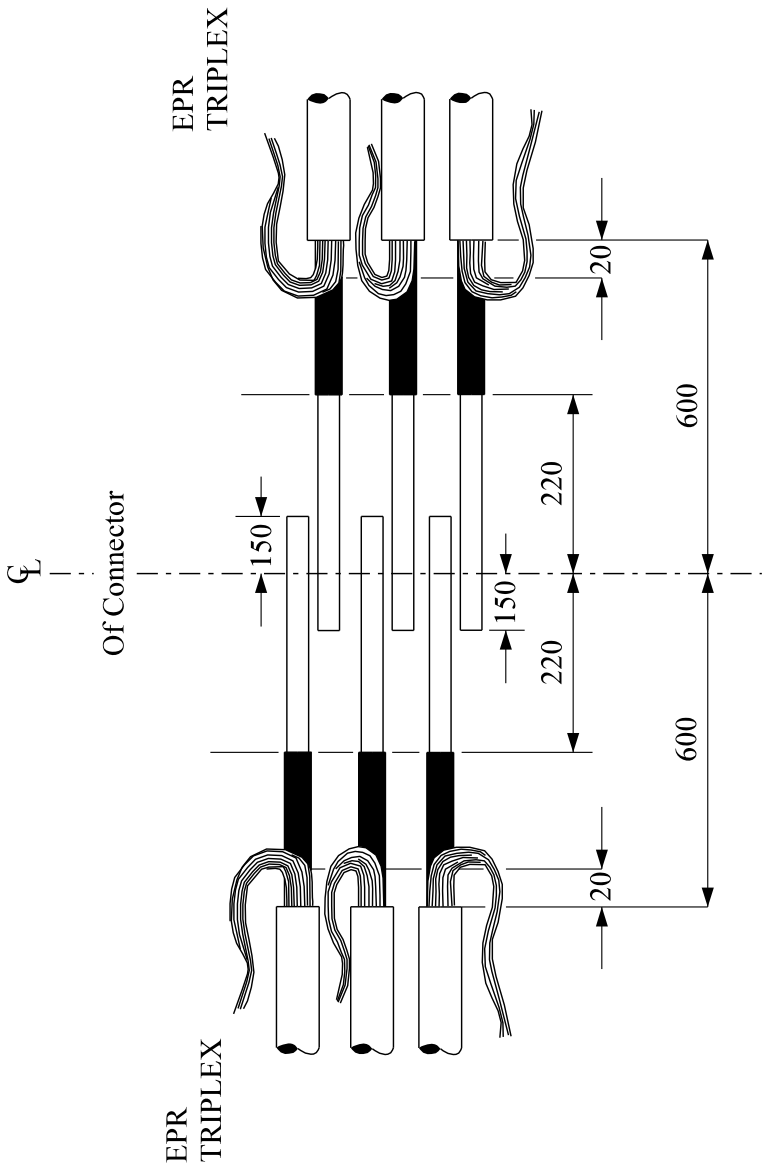
Actions		General Requirements (ST: CA2C/9)

Refer to Drawings **JP2D 7.103.1, 7.103.2 and 7.103.3** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	EPR CABLE - Preparation	
2.	Unravel and straighten individual cores.	--
3.	Identify and mark core phasing clear of joint position.	--
4.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
5.	Clean each oversheath for a distance of 1.5m.	--
6.	Apply a temporary earth continuity bond clear of joint position.	10
7.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
8.	Set and mark cores ensuring one to the top.	--
9.	Remove oversheaths and bedding tapes.	16
10.	Abrade oversheaths.	17
11.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
12.	Straighten copper screen wires and form into a bunch.	--
13.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
14.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28

Actions		**General Requirements (ST: CA2C/9)**
	COMPLETION OF JOINT	
15.	Cut cores and remove phase insulation to allow connector fitting.	31
16.	Apply a stress cone to each core.	35
17.	Fit foam filler pieces and build-up cable oversheaths.	32
18.	Fit inner sleeve foam rings.	34
19.	Connect phase conductors and shear connector bolts.	31/36
20.	Fit phase insulation tubes.	37
21.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
22.	Ensure joint is level and fill with Lovisil.	41
23.	Clean and degrease inner sleeve.	43
24.	Form copper screen wire bunches into one conductor and connect to copper earth bar clamp.	42
25.	Remove temporary earth continuity bond applied in 6 and reseal EPR oversheaths.	51
26.	Wrap and stretch copper stocking across joint and connect to copper screen wires.	44
27.	Fit and support outer sleeve ensuring 15mm clearance.	46
28.	Mix and pour resin.	47

All dimensions in mm



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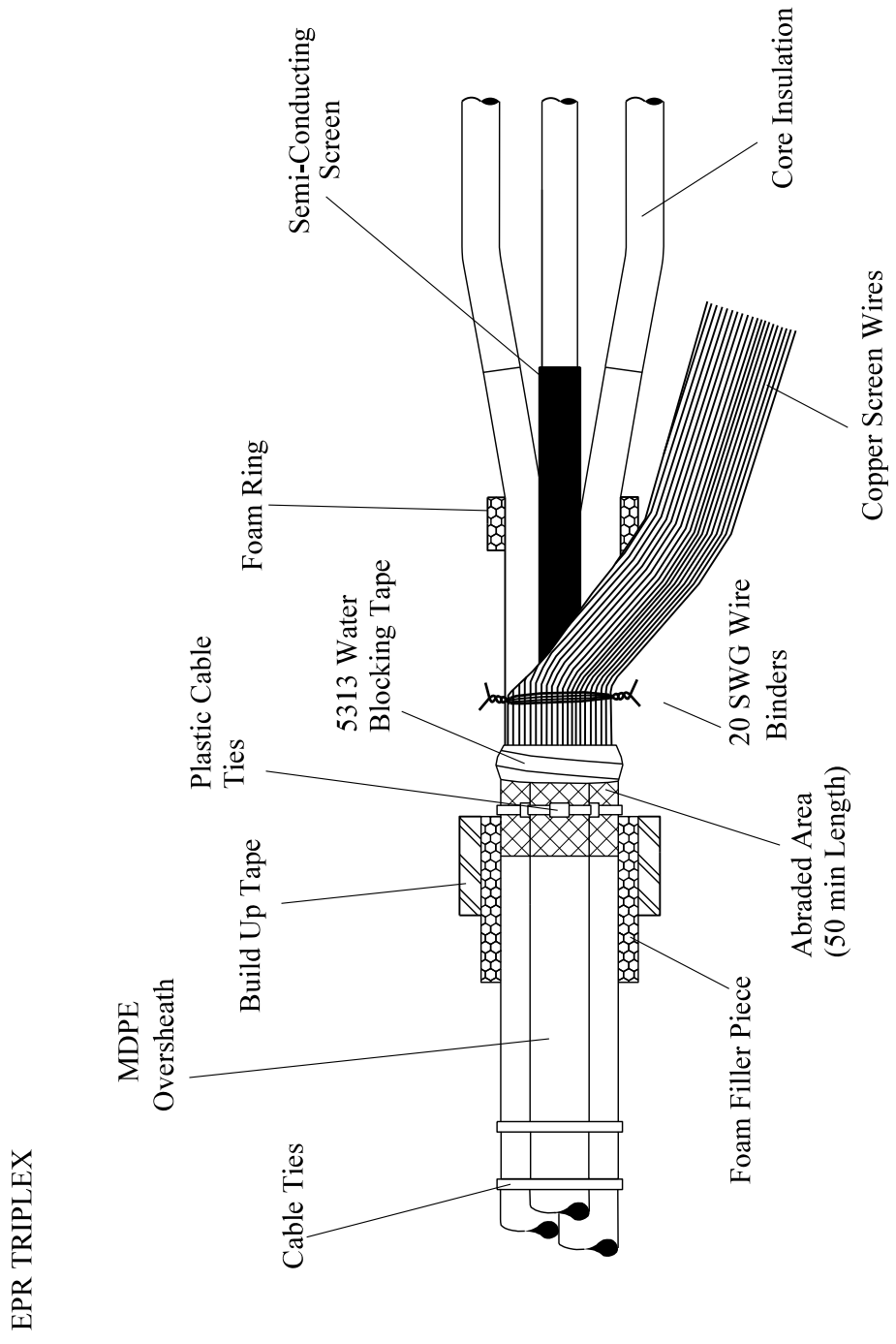
SCALE	N.T.S.		Title: UP TO & INC 400mm^2 EPR TRIPLEX STRAIGHT JOINT STRIPPING DIMENSIONS	Drg. No. JP2D 7.103.1 / Rev No

All dimensions in mm



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PREPARATION OF EPR TRIPLEX

Drg. No.	Rev No
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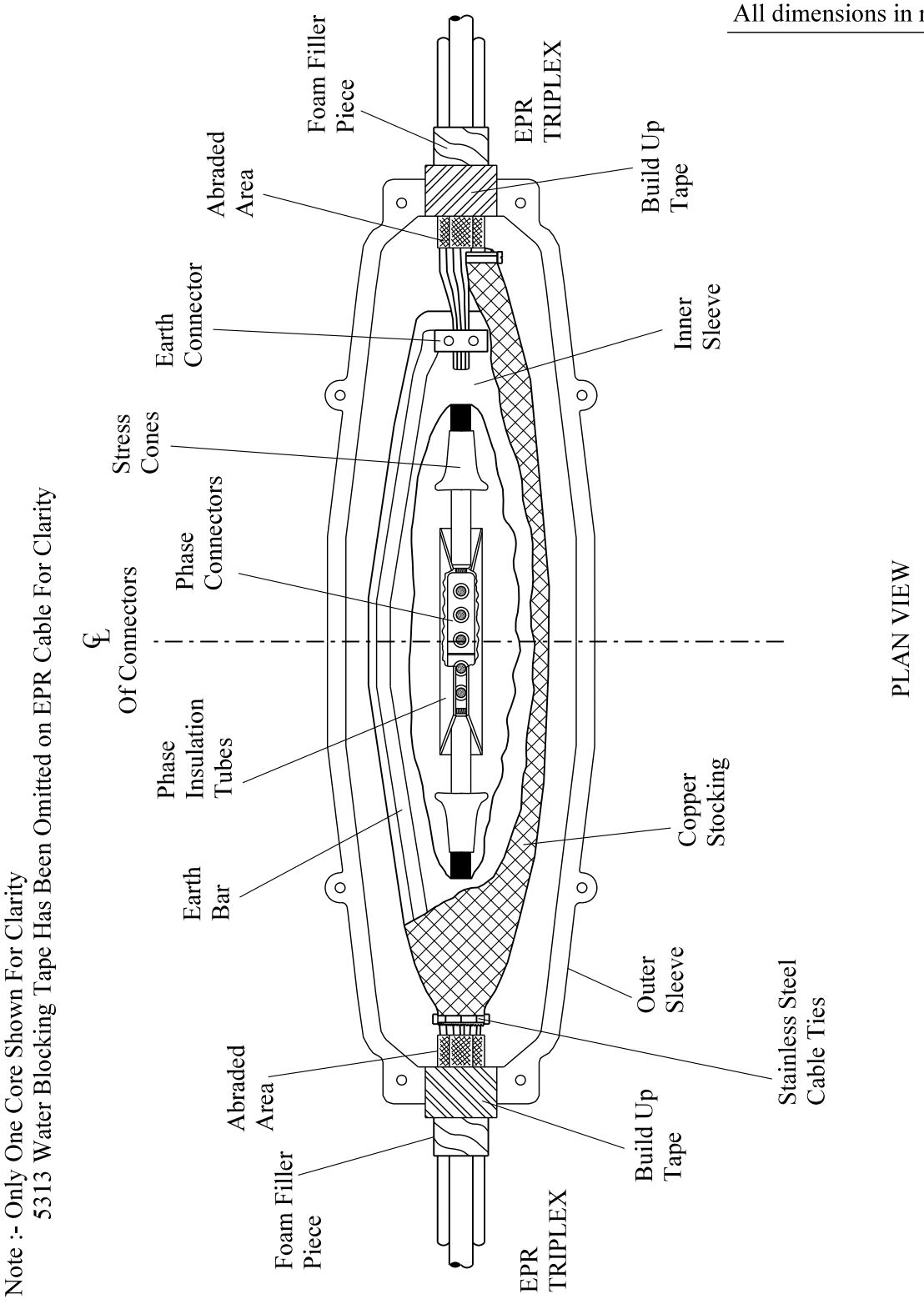
All dimensions in mm



Note :- Only One Core Shown For Clarity
5313 Water Blocking Tape Has Been Omitted on EPR Cable For Clarity

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.104

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

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

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.104

JOINT KIT REFERENCES

CABLE SIZE		JOINT KIT REFERENCES
From	**To**	**Straight Joint**
16/25/35/50 PILC	70 EPR	SJ 1113
	95 EPR	SJ 1114
	185 EPR	SJ 1115
70/95/120/150 PILC	70 EPR	SJ 1116
	95 EPR	SJ 1117
	185 EPR	SJ 1118
185 PILC	70 EPR	SJ 1119
	95 EPR	SJ 1120
	185 EPR	SJ 1121
95 PICAS	70 EPR	SJ 1122
	95 EPR	SJ 1123
	185 EPR	SJ 1124
185 PICAS	70 EPR	SJ 1125
	95 EPR	SJ 1126
	185 EPR	SJ 1127

Note 1: - The jointing materials for 240mm² EPR Triplex will be as 300mm² EPR Triplex.

Note 2: - Any reference to PICAS equally applies to PISAS and any reference to EPR equally applies to XLPE.

JOINTING PROCEDURE 7.104

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE	CABLE DEPENDING MODULE							FOAM TAPE BUILD UP MODULE	CONNECTOR	ARMOUR BONDING MODULE	TUBE SET
	K 85	B	A	B	C	D	J	K	L	FTBM	MSFE-0009-0035/185	ABM STA/SWA	SMOE 28003
			Belted cables					Screened					
SJ 1113	1	1	1				1			1	3	1	1
SJ 1114	1	1	1			1				1	3	1	1
SJ 1115	1	1	1			1				1	3	1	1
SJ 1116	1	1		1			1	1		1	3	1	1
SJ 1117	1	1		1		1		1			3	1	1
SJ 1118	1	1		1		1		1			3	1	1
SJ 1119	1	1			1		1		1	1	3	1	1
SJ 1120	1	1			1	1			1		3	1	1
SJ 1121	1	1			1	1			1		3	1	1
SJ 1122	1	1		1			1	1		1	3		1
SJ 1123	1	1		1		1		1			3		1
SJ 1124	1	1		1		1		1			3		1
SJ 1125	1	1			1		1		1	1	3		1
SJ 1126	1	1			1	1			1		3		1
SJ 1127	1	1			1	1			1		3		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
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 (ST: CA2S).

JOINTING PROCEDURE 7.104

Actions		General Requirements (ST: CA2C/9)

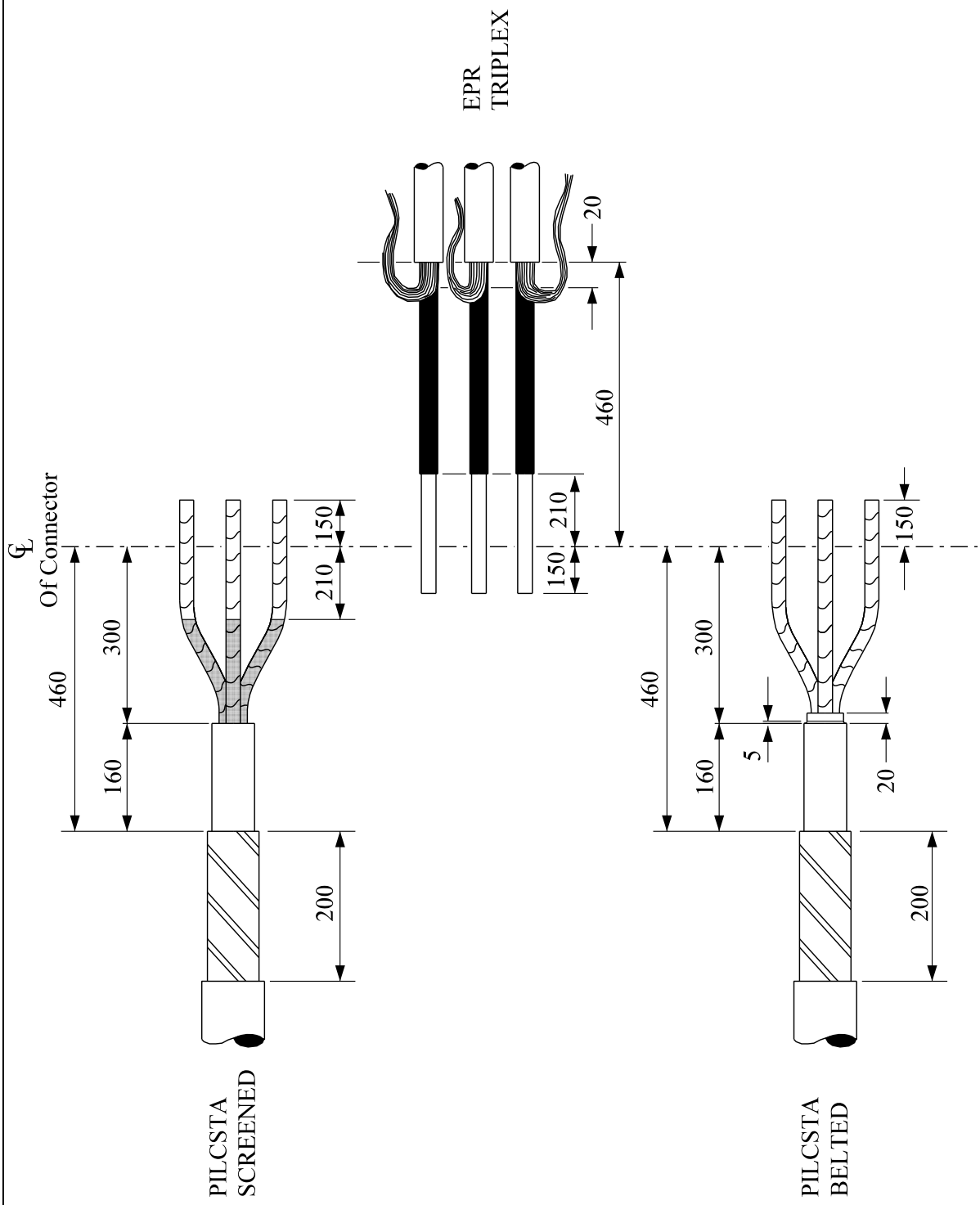
Refer to Drawings **JP2D 7.104.1, 7.104.2, 7.104.3, 7.104.4, 7.104.5 and 7.105.6** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	PILC/PICAS/PISAS CABLE - Preparation	
2.	PILC: - Remove serving, armour and clean lead sheath.	11
	PICAS/PISAS: - Remove PVC oversheath and clean aluminium sheath.	15
3.	PILC: - Abrade metallic sheath from its termination point to serving/oversheath termination point.	--
4.	PILC: - Apply armour bond.	12
	PICAS/PISAS: - Abrade PVC oversheath.	17
5.	Apply a temporary earth continuity bond to metallic sheath.	10
6.	Remove metallic sheath: - PILC (lead)	18
	PICAS/PISAS (aluminium)	19
7.	Terminate board of trade sheath (if present)	20
8.	Carry out moisture test.	8
	BELTED CABLES	
9.	Apply string ties and terminate carbon (if present) and belt papers.	22
10.	Apply a silicon tape seal to belt papers and metallic sheath.	24
11.	Remove core fillers.	--
12.	Using a clean dry wipe remove excess impregnate from cores.	--
	SCREENED CABLES	
13.	Tie off and remove copper woven fabric tape.	23

Actions		General Requirements (ST: CA2C/9)
14.	Apply a silicon tape seal to copper woven fabric tape and metallic sheath.	24
15.	Remove core fillers.	--
16.	Using a clean dry wipe remove excess impregnate from cores.	--
17.	Remove metallic screens, carbon paper and two conductor papers.	27
	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 one to the top.	--
25.	Remove oversheaths and bedding tapes.	16
26.	Abrade oversheaths.	17
27.	Apply a 20swg binder around copper screen wires 20mm from oversheath termination point.	--
28.	Straighten copper screen wires and form into a bunch.	--
29.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	

Actions		General Requirements (ST: CA2C/9)
30.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
31.	Cut cores and remove phase insulation to allow connector fitting.	31
32.	Apply a stress cone to each core.	35
33.	Fit foam filler piece and build up cable oversheaths.	32
34.	Fit inner sleeve foam rings.	34
35.	Connect phase conductors and shear connector bolts.	31/36
36.	Fit phase insulation tubes.	37
37.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
38.	Ensure joint is level and fill with Lovisil.	41
39.	Clean and degrease inner sleeve.	43
40.	Apply metallic sheath bond to PILC/PICAS/PISAS cable.	42
41.	Form copper screen wire bunches into one conductor and connect to copper earth bar clamp.	42
42.	Remove temporary earth continuity bond applied in 5/22 and reseal EPR oversheaths.	51
43.	Wrap and stretch copper stocking across joint and connect to metallic sheath and copper screen wires.	44
44.	Apply water block tape to metallic sheath.	45
45.	Build up PILC/PICAS cable oversheath.	32
46.	Fit and support outer sleeve ensuring 15mm clearance.	46
47.	Mix and pour resin.	47

All dimensions in mm



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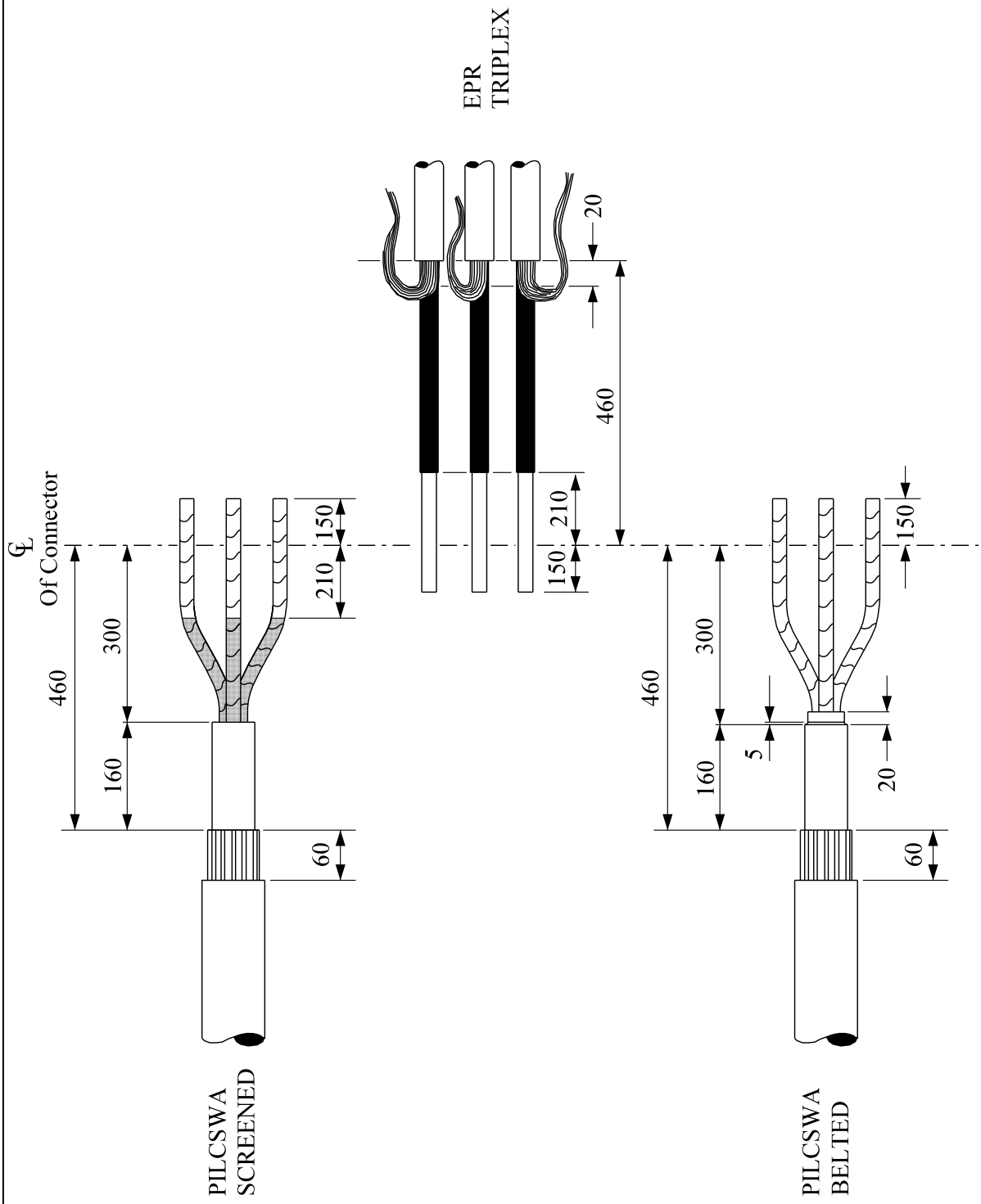
Drg. No.	Rev No
JP2D 7.104.1	2

All dimensions in mm



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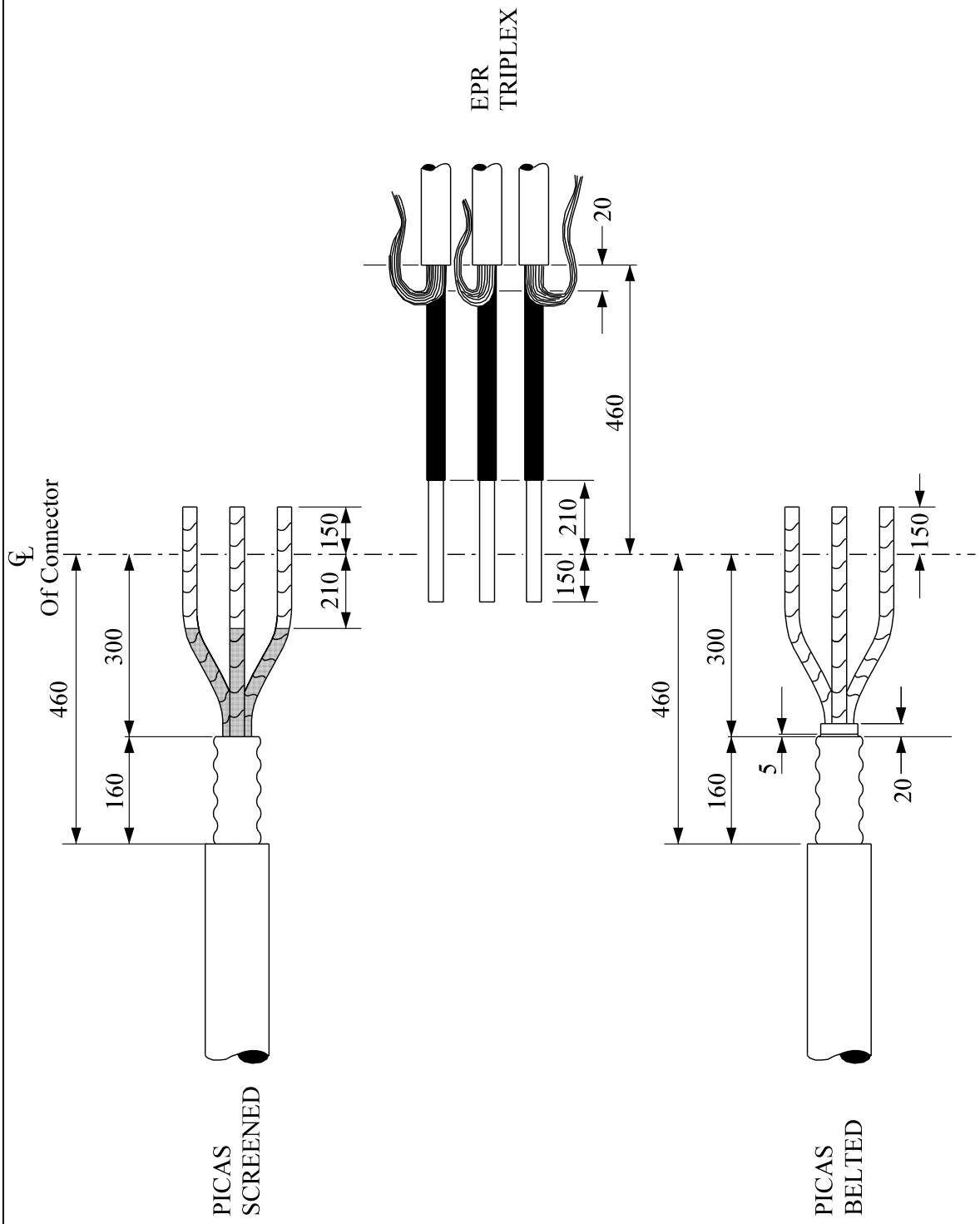

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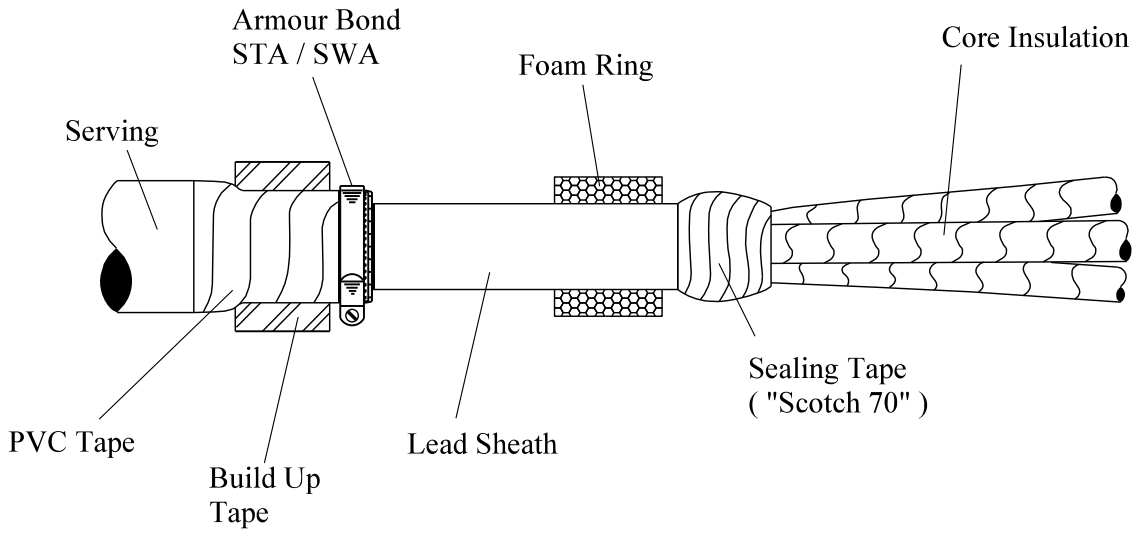
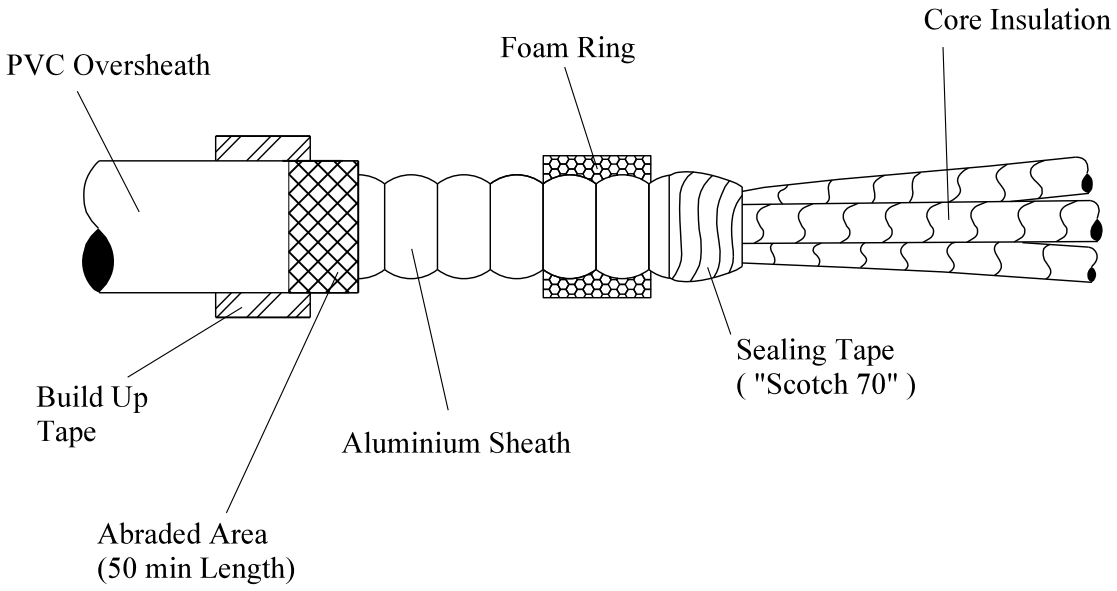
Drg. No.	Rev No
JP2D 7.104.3	2

PILC

All dimensions in mm



PICAS / PISAS



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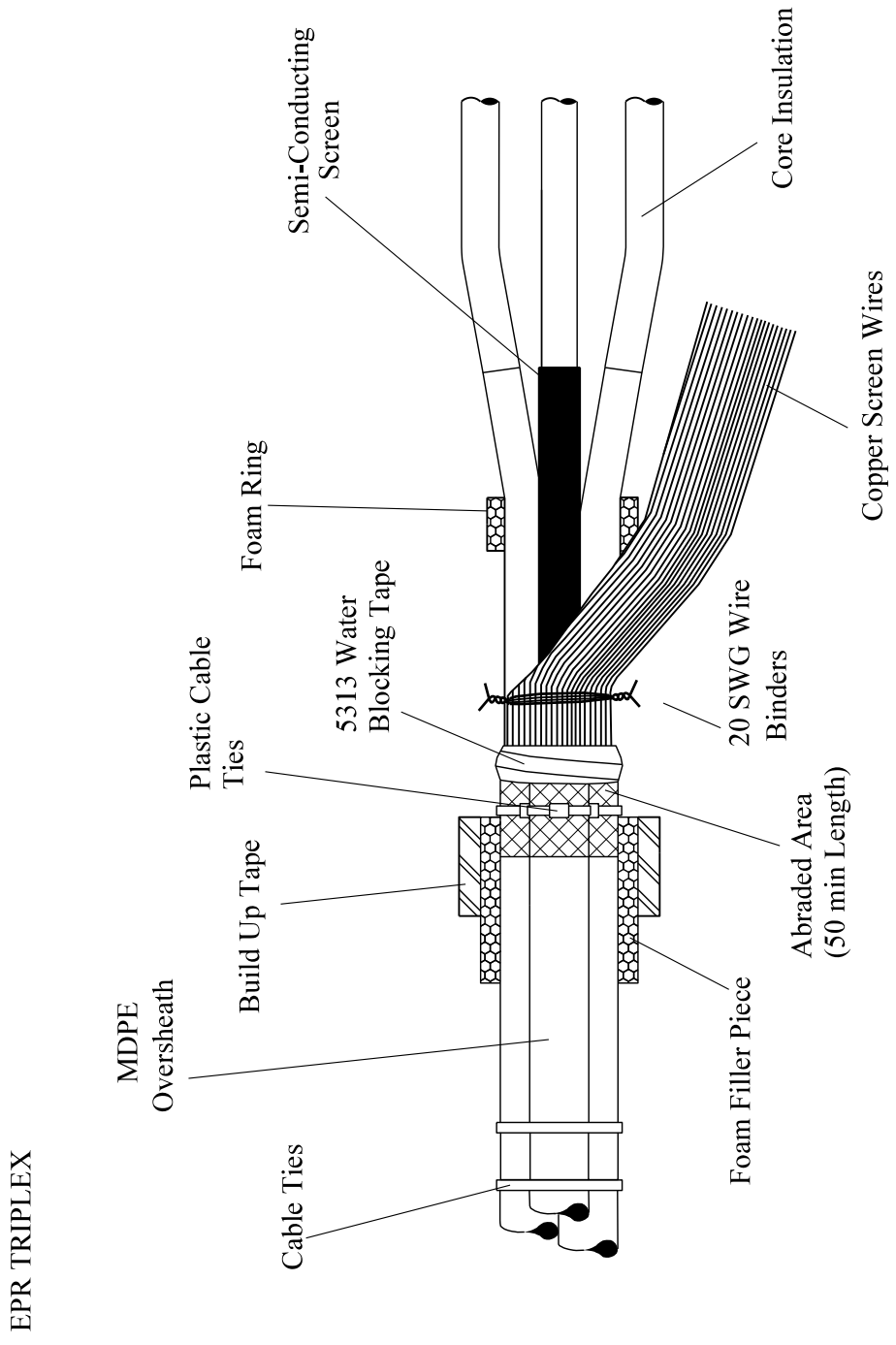
All dimensions in mm



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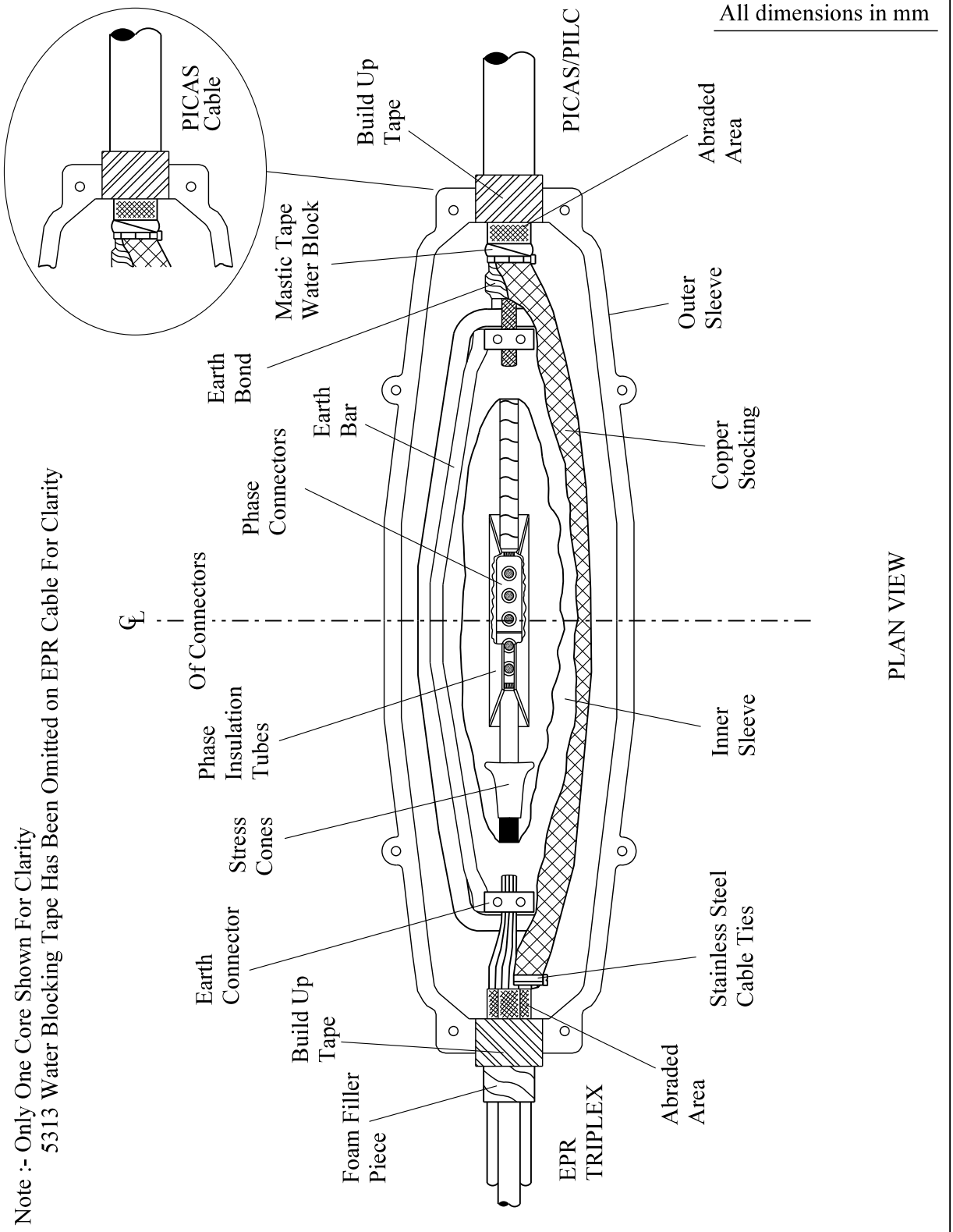

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JOINTING PROCEDURE 7.105

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

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

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.105

JOINT KIT REFERENCES

CABLE SIZE		JOINT KIT REFERENCES
From	**To**	**Straight Joint**
16/25/35/50 PILC	300 EPR	SJ 1127
70/95/120/150 PILC	300 EPR	SJ 1128
185/240/300 PILC	70 EPR	SJ 1129
	95 EPR	SJ 1130
	185 EPR	SJ 1131
	300 EPR	SJ 1132
95 PICAS	300 EPR	SJ 1133
185 PICAS	300 EPR	SJ 1134
300 PICAS	70 EPR	SJ 1135
	95 EPR	SJ 1136
	185 EPR	SJ 1137
	300 EPR	SJ 1138

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

Any reference to PICAS equally applies to PISAS. Any reference to EPR equally applies to XLPE.

JOINTING PROCEDURE 7.105

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE Belted						Screened	
	M105	B	C	A	B	D	E	F	J	L	M
SJ 1127	1	1	1	1				1			
SJ 1128	1	1	1		1			1			
SJ 1129	1	1	1				1		1		
SJ 1130	1	1	1			1	1				1
SJ 1131	1	1	1			1	1				1
SJ 1132	1	1	1				1	1			1
SJ 1133	1	1	1		1			1		1	
SJ 1134	1	1	1				1	1		1	
SJ 1135	1	1	1				1		1	1	1
SJ 1136	1	1	1			1	1				1
SJ 1137	1	1	1			1	1				1
SJ 1138	1	1	1				1	1			1

KIT REF	FOAM TAPE BUILD UP MODULE	CONNECTOR	ARMOUR BONDING MODULE	TUBE SET
	FTBM	MSFE-0010-0035/300	ABM STA/SWA	SMOE 28003
SJ 1127	1	3	1	1
SJ 1128	1	3	1	1
SJ 1129	1	3	1	1
SJ 1130	1	3	1	1
SJ 1131	1	3	1	1
SJ 1132		3	1	1
SJ 1133	1	3		1
SJ 1134		3		1
SJ 1135	1	3		1
SJ 1136	1	3		1
SJ 1137	1	3		1
SJ 1138		3		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
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 (ST: CA2S).

JOINTING PROCEDURE 7.105

Actions		General Requirements (ST: CA2C/9)

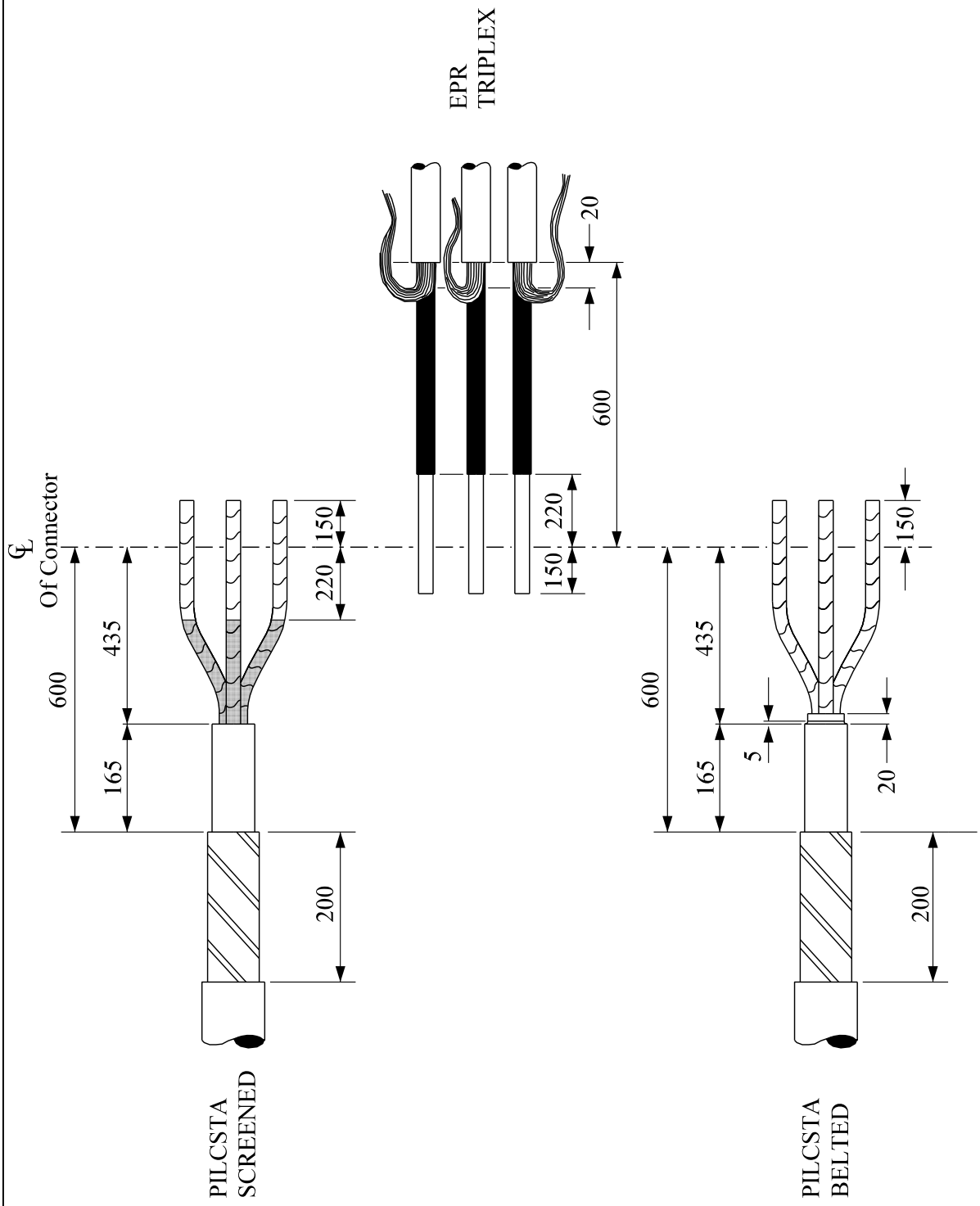
Refer to Drawings **JP2D 7.105.1, 7.105.2, 7.105.3, 7.105.4, 7.105.5 and 7.105.6** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	PILC/PICAS/PISAS CABLE - Preparation	
2.	PILC: - Remove serving, armour and clean lead sheath.	11
	PICAS/PISAS: - Remove PVC oversheath and clean aluminium sheath.	15
3.	PILC: - Abrade metallic sheath from its termination point to serving/oversheath termination point.	--
4.	PILC: - Apply armour bond.	12
	PICAS/PISAS: - Abrade PVC oversheath.	17
5.	Apply a temporary earth continuity bond to metallic sheath.	10
6.	Remove metallic sheath: - PILC (lead)	18
	PICAS/PISAS (aluminium)	19
7.	Terminate board of trade sheath (if present)	20
8.	Carry out moisture test.	8
	BELTED CABLES	
9.	Apply string ties and terminate carbon (if present) and belt papers.	22
10.	Apply a silicon tape seal to belt papers and metallic sheath.	24
11.	Remove core fillers.	--
12.	Using a clean dry wipe remove excess impregnate from cores.	--
	SCREENED CABLES	
13.	Tie off and remove copper woven fabric tape.	23

Actions		General Requirements (ST: CA2C/9)
14.	Apply a silicon tape seal to copper woven fabric tape and metallic sheath.	24
15.	Remove core fillers.	--
16.	Using a clean dry wipe remove excess impregnate from cores.	--
17.	Remove metallic screens, carbon paper and two conductor papers.	27
	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 one to the top.	--
25.	Remove oversheaths and bedding tapes.	16
26.	Abrade oversheaths.	17
27.	Apply a 20swg binder around copper screen wires 20mm from oversheath termination point.	--
28.	Straighten copper screen wires and form into a bunch.	--
29.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	

Actions		General Requirements (ST: CA2C/9)
30.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
31.	Cut cores and remove phase insulation to allow connector fitting.	31
32.	Apply a stress cone to each core.	35
33.	Fit foam filler piece and build up cable oversheaths.	32
34.	Fit inner sleeve foam rings.	34
35.	Connect phase conductors and shear connector bolts.	31/36
36.	Fit phase insulation tubes.	37
37.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
38.	Ensure joint is level and fill with Lovisil.	41
39.	Clean and degrease inner sleeve.	43
40.	Apply metallic sheath bond to PILC/PICAS/PISAS cable.	42
41.	Form copper screen wire bunches into one conductor and connect to copper earth bar clamp.	42
42.	Remove temporary earth continuity bond applied in 5/22 and reseal EPR oversheaths.	51
43.	Wrap and stretch copper stocking across joint and connect to metallic sheath and copper screen wires.	44
44.	Apply water block tape to metallic sheath.	45
45.	Build up PILC/PICAS cable oversheath.	32
46.	Fit and support outer sleeve.	46
47.	Mix and pour resin.	47

All dimensions in mm



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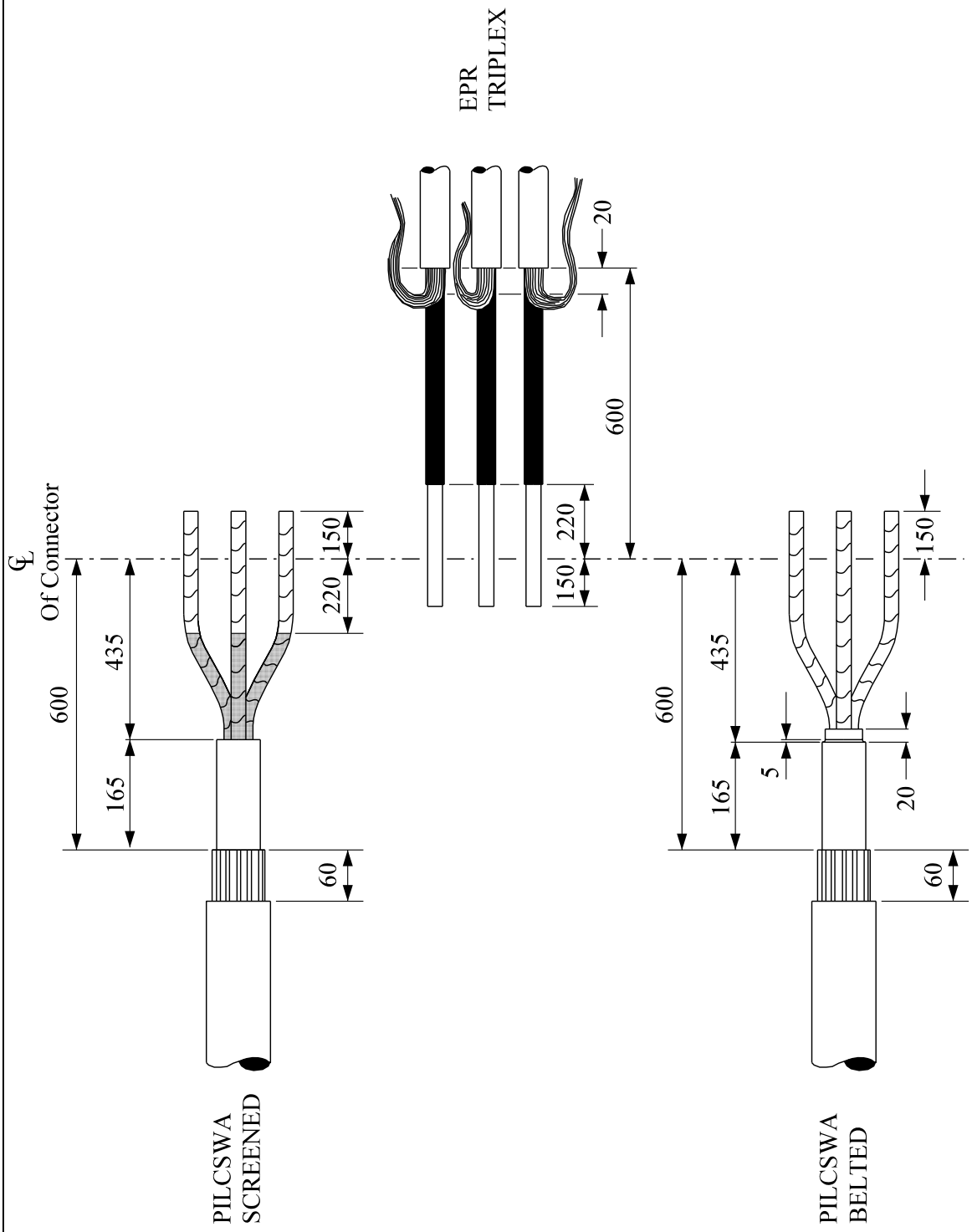
Drg. No. JP2D 7.105.1

Rev No 2

All dimensions in mm



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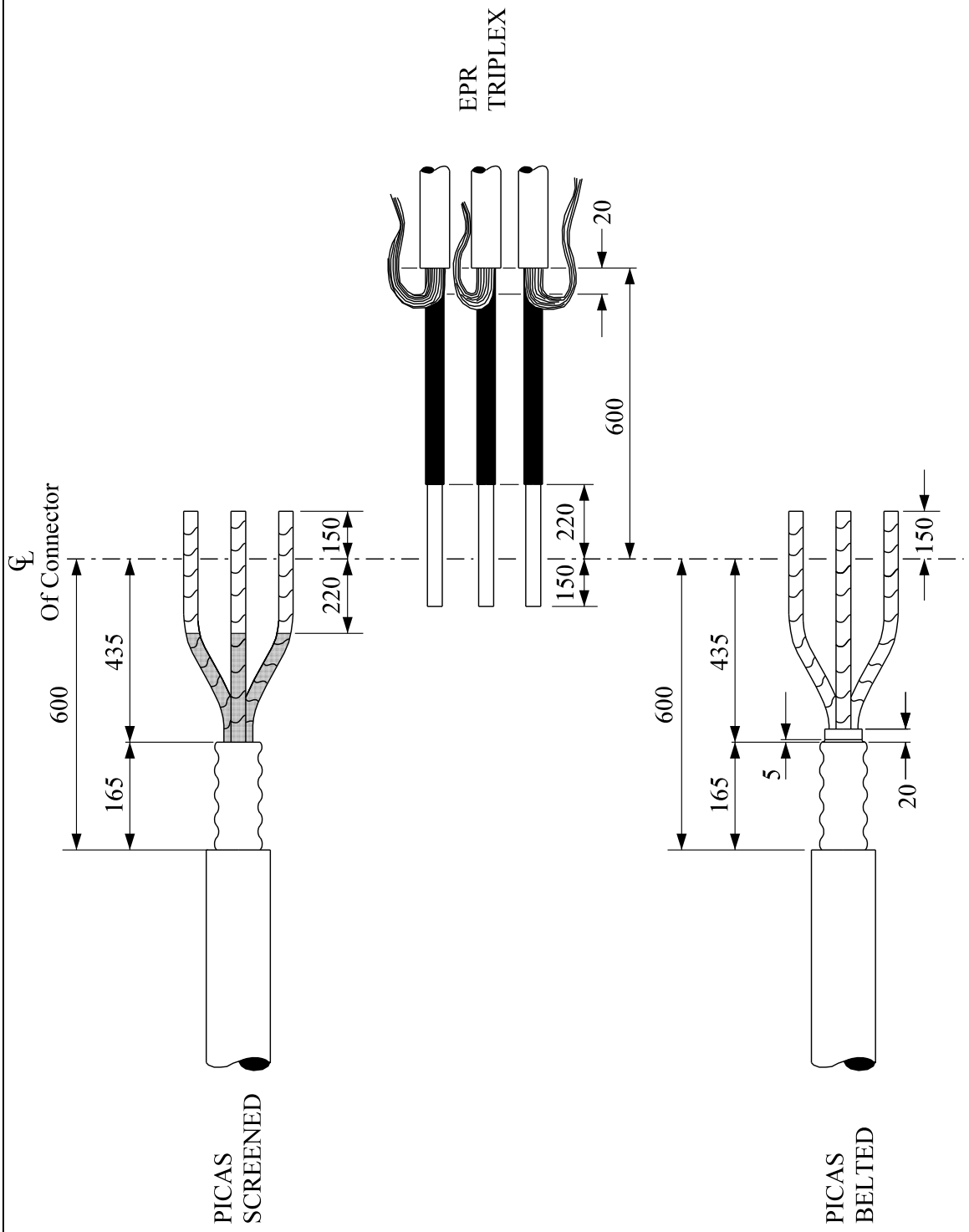
All dimensions in mm



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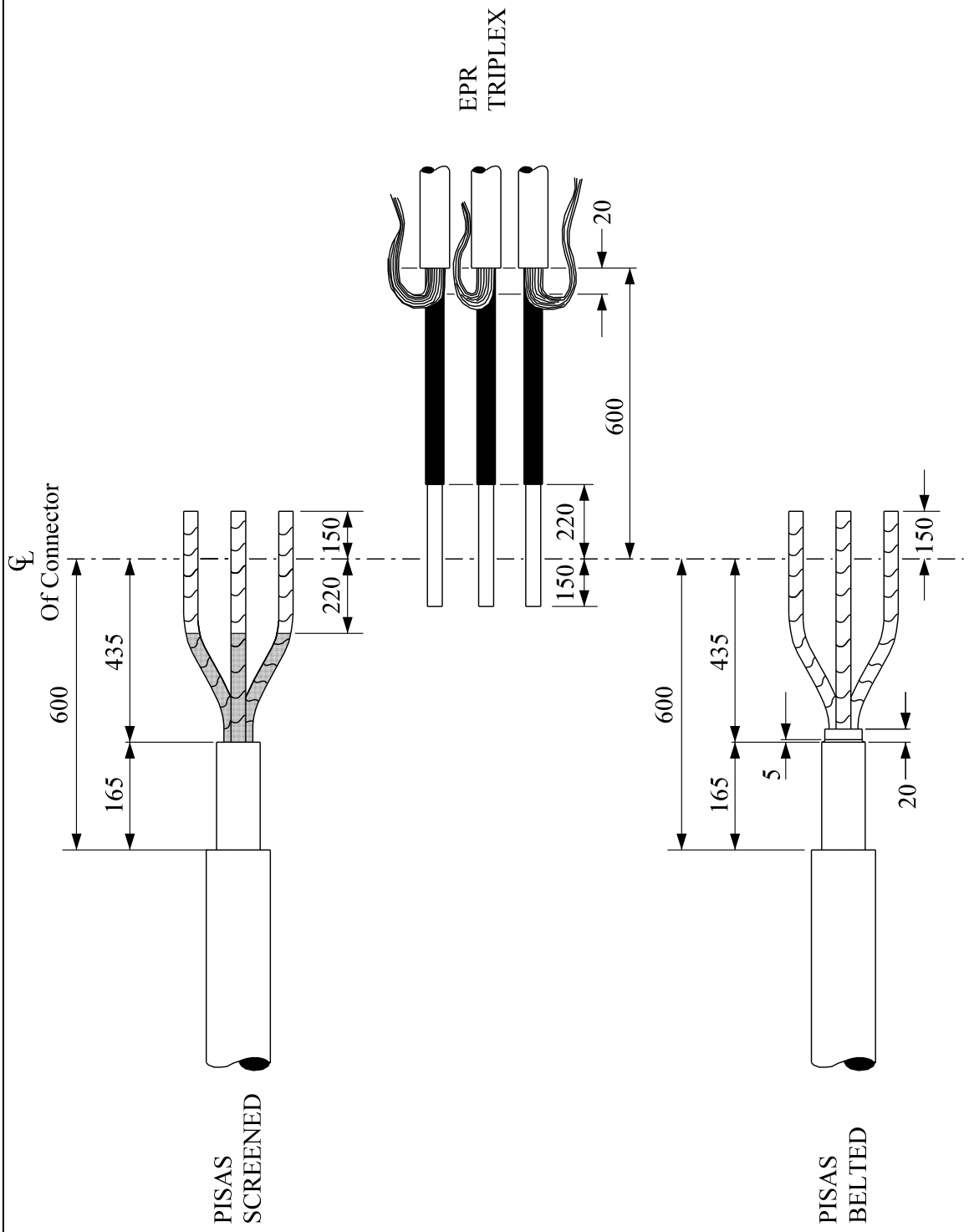
Drg. No. JP2D 7.105.3

Rev No 2

All dimensions in mm



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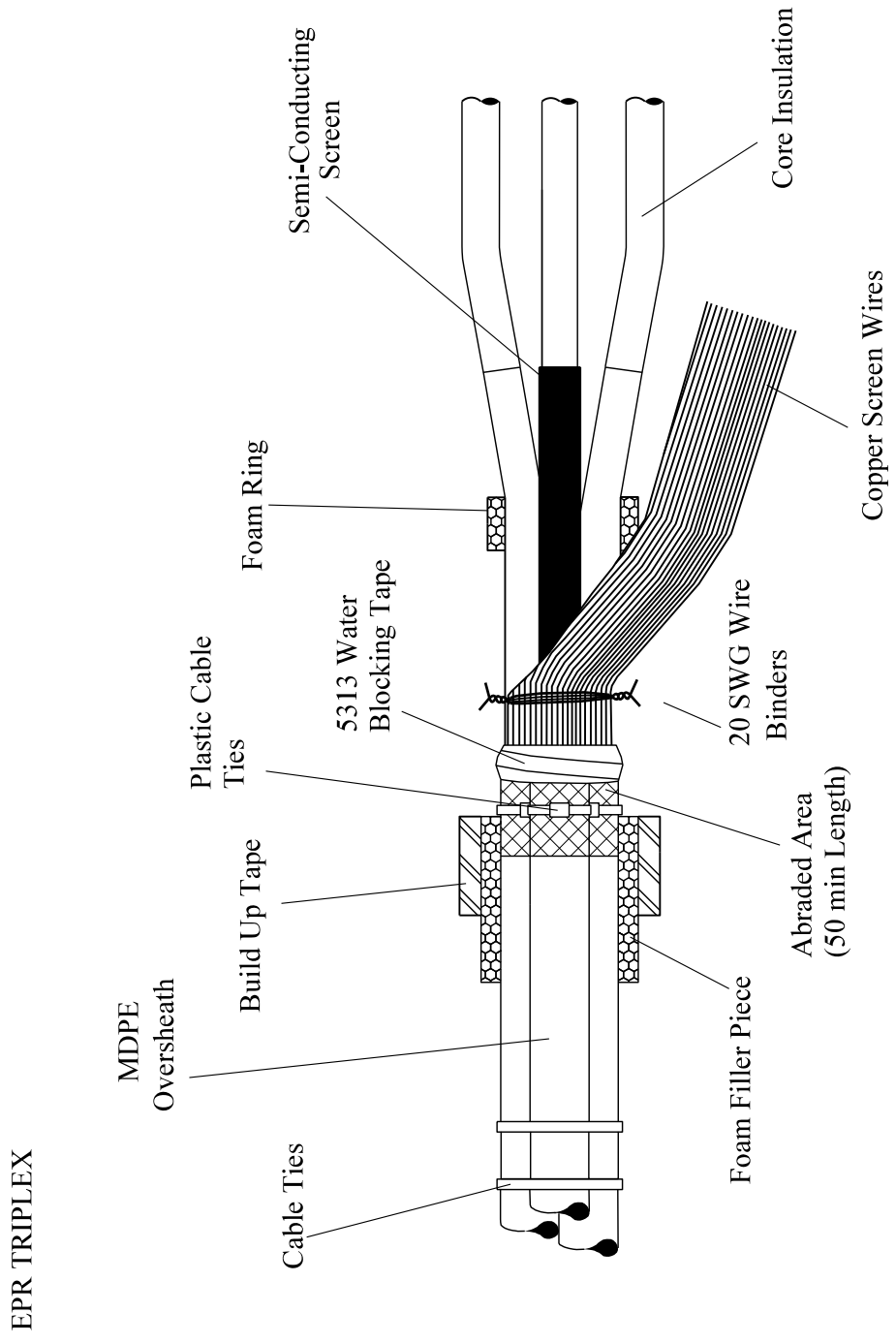
All dimensions in mm



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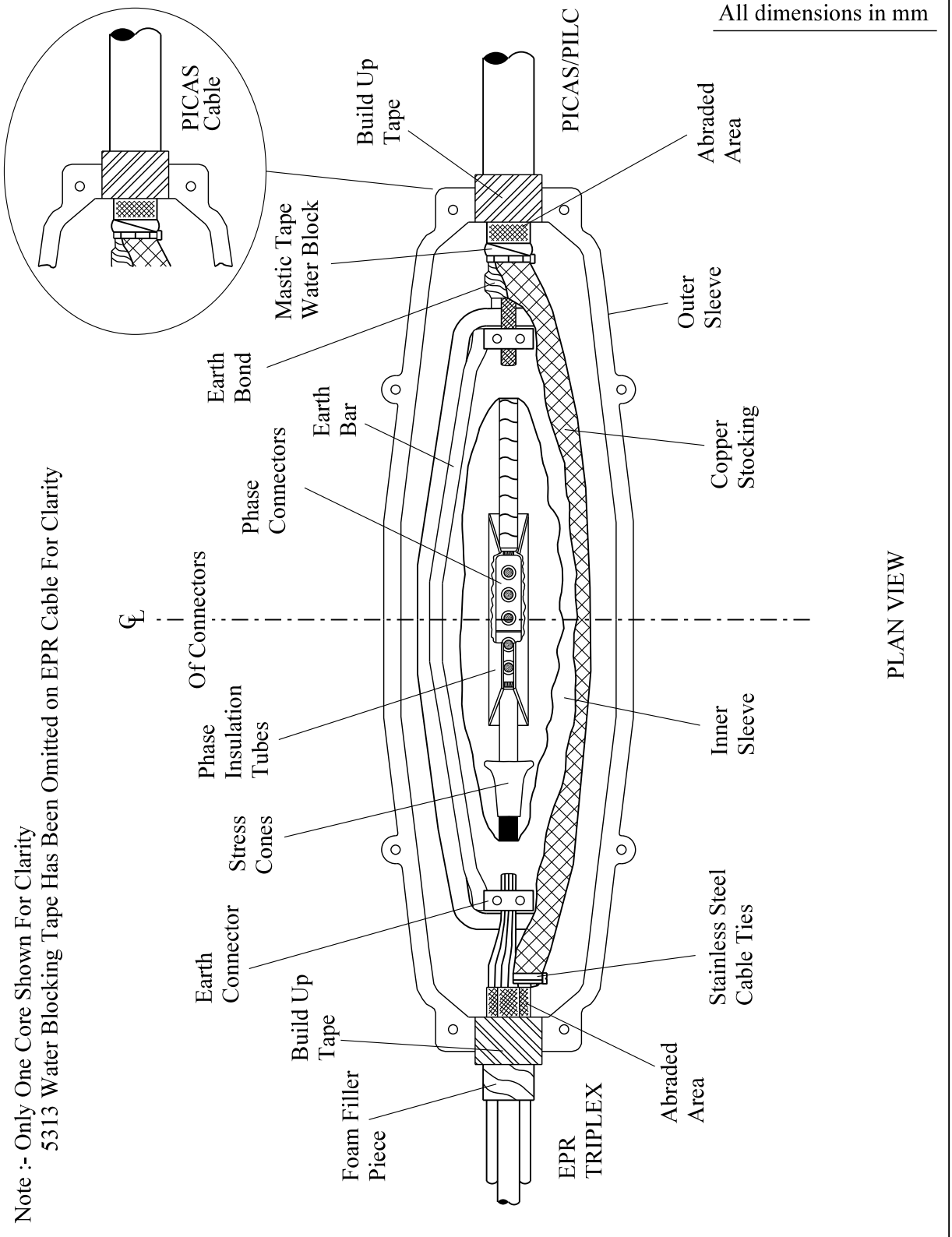
PREPARATION OF EPR TRIPLEX

Drg. No.	Rev No
JP2D 7.105.5	1

All dimensions in mm



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Title: UP TO & INC 300mm² EPR TRIPLEX - PILC/PICAS STRAIGHT JOINT GENERAL LAYOUT

Drg. No. JP2D 7.105.6

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.106

300mm² Cu EPR TRIPLEX – 400mm² Cu PICAS CABLE 11kV STRAIGHT JOINT.

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.106

JOINT KIT MATERIALS

CABLE SIZES: - **300mm² Copper EPR Triplex – 400mm² PICAS**

Item	Quantity
Base Module BM M105	1
Resin Module RM-B	2
Resin Module RM-C	1
Cable Depending Module CDM M105-F	1
Cable Depending Module CDM M105-H	1
Foam Tape Build up Module FTBM	1
Connector BAH 02-211-0098	3
Tube Set SMOE 28003	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.106

Actions		General Requirements (ST: CA2C/9)

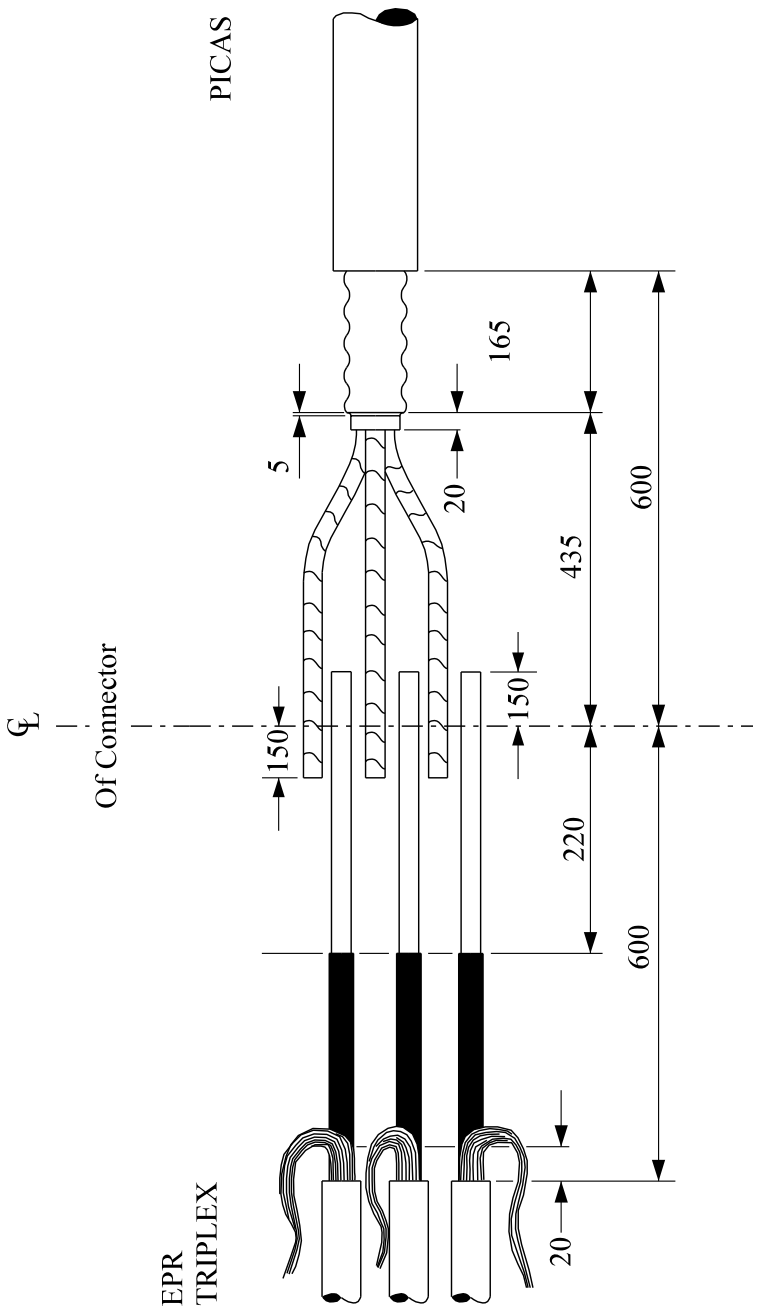
Refer to Drawings **JP2D 7.106.1, 7.106.2, 7.106.3** and **7.106.4** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	PILC/PICAS/PISAS CABLE - Preparation	
2.	PILC: - Remove serving, armour and clean lead sheath.	11
	PICAS/PISAS: - Remove PVC oversheath and clean aluminium sheath.	15
3.	PILC: - Abrade metallic sheath from its termination point to serving/oversheath termination point.	--
4.	PILC: - Apply armour bond.	12
	PICAS/PISAS: - Abrade PVC oversheath.	17
5.	Apply a temporary earth continuity bond to metallic sheath.	10
6.	Remove metallic sheath: - PILC (lead)	18
	PICAS/PISAS (aluminium)	19
7.	Terminate board of trade sheath (if present)	20
8.	Carry out moisture test.	8
	BELTED CABLES	
9.	Apply string ties and terminate carbon (if present) and belt papers.	22
10.	Apply a silicon tape seal to belt papers and metallic sheath.	24
11.	Remove core fillers.	--
12.	Using a clean dry wipe remove excess impregnate from cores.	--
	SCREENED CABLES	
13.	Tie off and remove copper woven fabric tape.	23

Actions		General Requirements (ST: CA2C/9)
14.	Apply a silicon tape seal to copper woven fabric tape and metallic sheath.	24
15.	Remove core fillers.	--
16.	Using a clean dry wipe remove excess impregnate from cores.	--
17.	Remove metallic screens, carbon paper and two conductor papers.	27
	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 one to the top.	--
25.	Remove oversheaths and bedding tapes.	16
26.	Abrade oversheaths.	17
27.	Apply a 20swg binder around copper screen wires 20mm from oversheath termination point.	--
28.	Straighten copper screen wires and form into a bunch.	--
29.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	

	Actions	**General Requirements (ST: CA2C/9)**
30.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
31.	Cut cores and remove phase insulation to allow connector fitting.	31
32.	Apply a stress cone to each core.	35
33.	Fit foam filler piece and build up cable oversheaths.	32
34.	Fit inner sleeve foam rings.	34
35.	Connect phase conductors and shear connector bolts.	31/36
36.	Fit insulation tubes.	37
37.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
38.	Ensure joint is level and fill with Lovisil.	41
39.	Clean and degrease inner sleeve.	43
40.	Apply metallic sheath bond to PICAS cable.	42
41.	Form copper screen wire bunches into one conductor and connect to copper earth bar clamp.	42
42.	Remove temporary earth continuity bond applied in 5/22 and reseal EPR oversheaths.	51
43.	Wrap and stretch copper stocking across joint and connect to metallic sheath and copper screen wires.	42
44.	Apply water block tape to metallic sheath.	45
45.	Build up PICAS cable oversheath.	32
46.	Fit and support outer sleeve.	46
47.	Mix and pour resin.	47

All dimensions in mm



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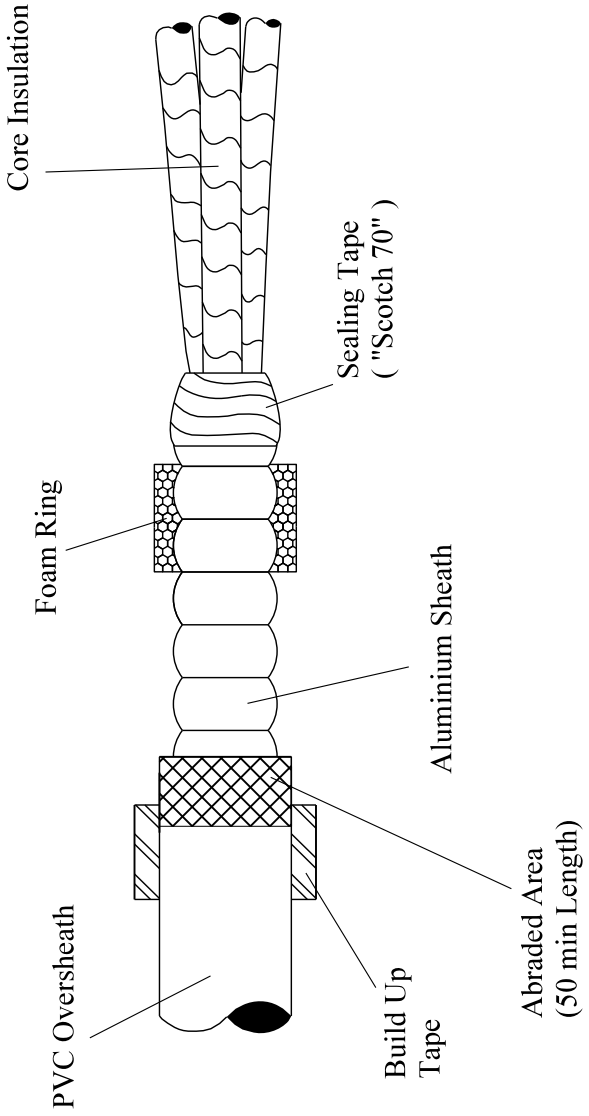
Title: 300mm^2 CU EPR TRIPLEX - 400mm^2 PICAS STRAIGHT JOINT STRIPPING DIMENSIONS

Drg. No. JP2D 7.106.1

Rev No 1

All dimensions in mm



PICAS

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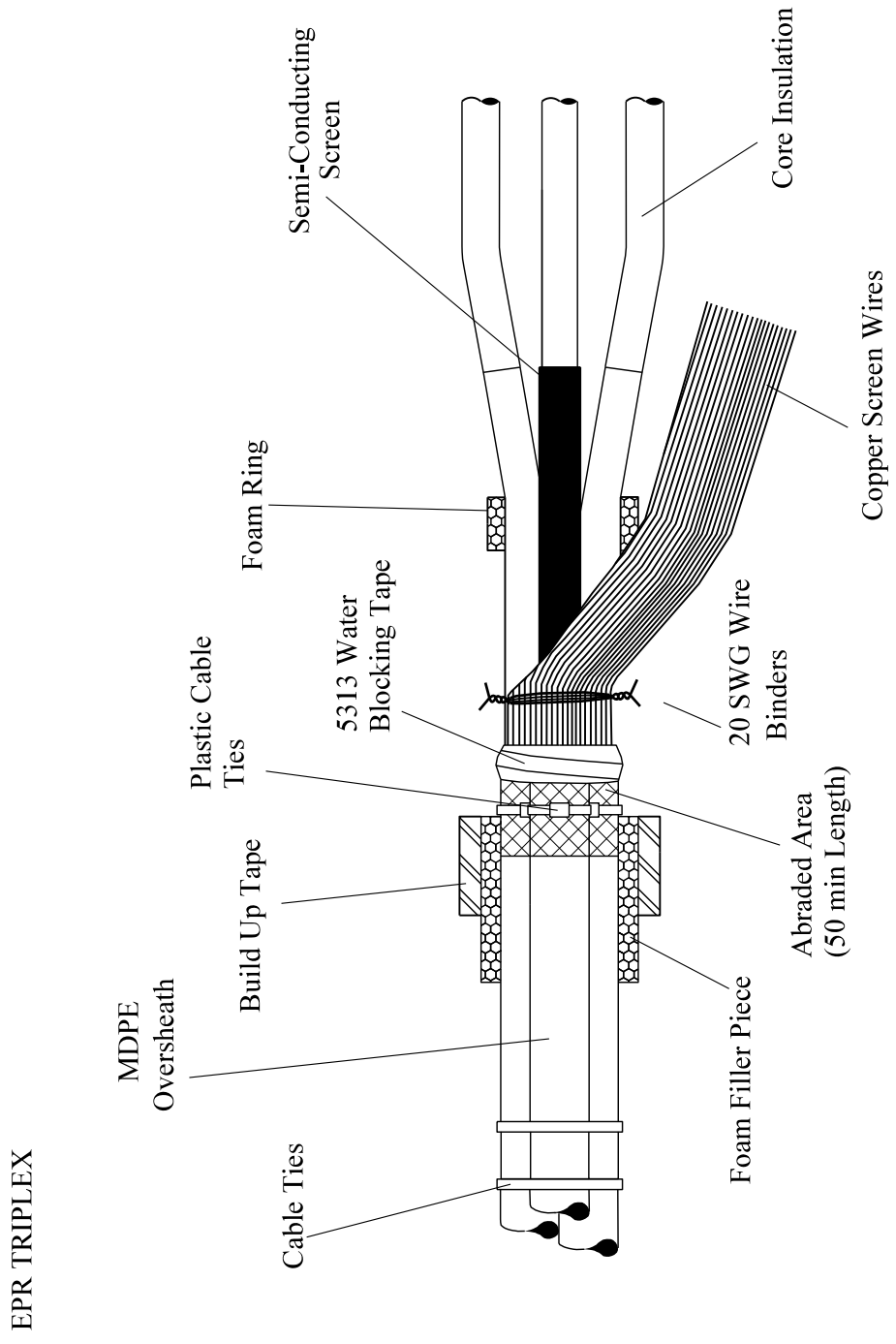

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PREPARATION OF EPR TRIPLEX

Drg. No.	Rev No
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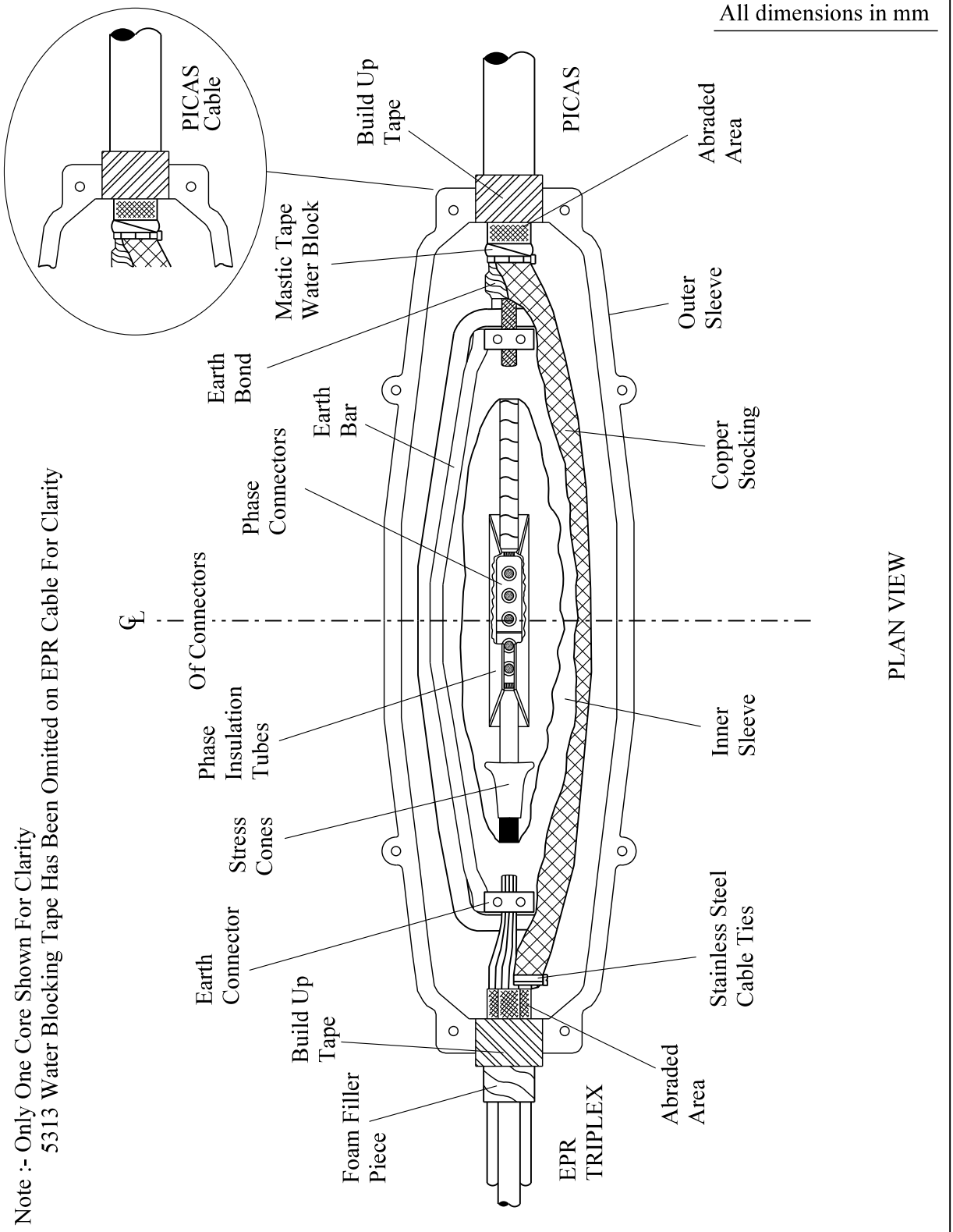
All dimensions in mm



Note :- Only One Core Shown For Clarity
5313 Water Blocking Tape Has Been Omitted on EPR Cable For Clarity

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.107

300mm² Al. EPR TRIPLEX – 185mm² Cu. PILCSWA 'H' 33kV CABLE 11kV STRAIGHT JOINT

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.107

JOINT KIT MATERIALS

CABLE SIZES: - 300mm² EPR Triplex – 185mm² PILCSWA ('H' 33kV)

Item	Quantity
Base Module BM M105	1
Resin Module RM-B	1
Resin Module RM-C	1
Cable Depending Module CDM M105-F	1
Cable Depending Module CDM M105-G	1
Foam Tape Build up Module FTBM	1
Armour Bonding Module ABM STA/SWA	1
Connector MSFE-0010-0035/300	3
Tube Set SMOE 28003	1

ADDITIONAL ITEMS FOR EACH JOINT

PVC tape
Tinned copper wire 20 swg
Tinned copper wire 16 swg
De-Solvit 1000 FD
De-Solvit 1000
Workhorse dry wipes
Emery cloth
Aluminium oxide cloth 320 grit
Aluminium oxide cloth 400 grit
Cable ties
Sealing putty

Note: - Individual material item numbers (E 5) are to be found in Section 4 of the 11kV Jointing Manual (ST: CA2S).

JOINTING PROCEDURE 7.107

Actions		General Requirements (ST: CA2C/9)

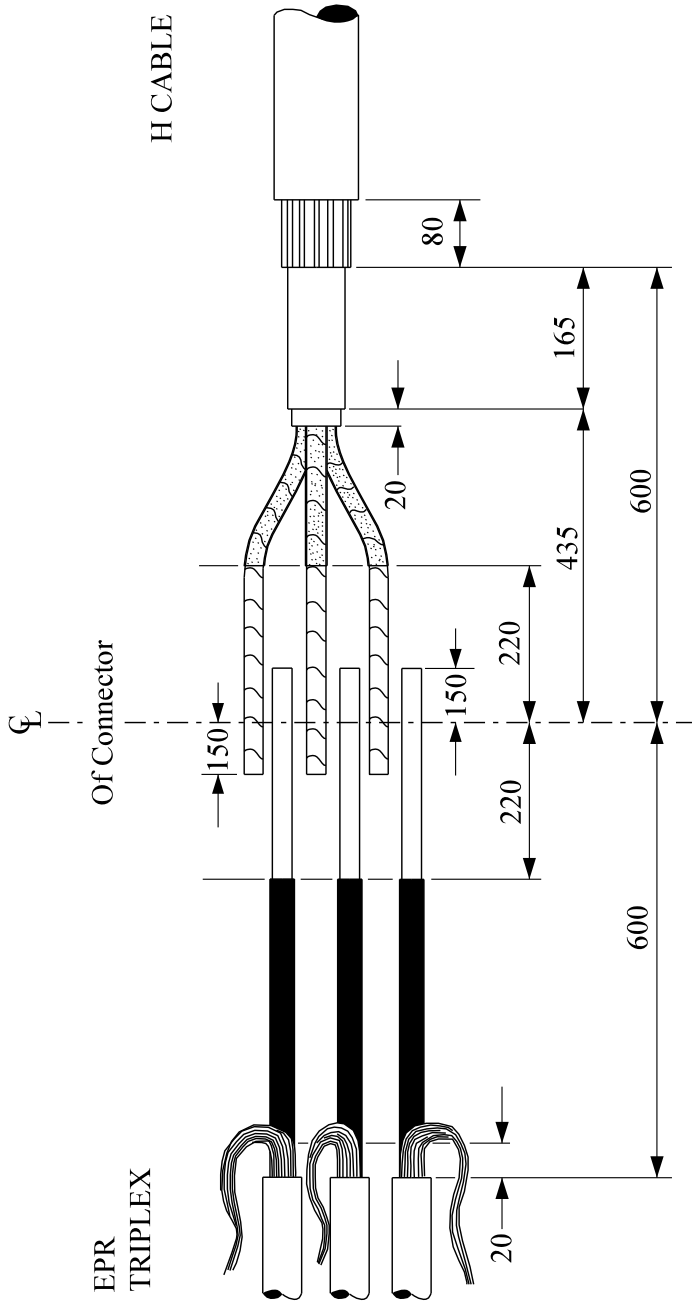
Refer to Drawings **JP2D 7.107.1, 7.107.2, 7.107.3** and **7.107.4** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	'H' PILCSWA CABLE - Preparation	
2.	Remove serving, armour and clean lead sheath.	11
3.	Abrade metallic sheath from its termination point to serving termination point.	--
4.	Apply armour bond to SWA or STA if present.	12
5.	Abrade PVC oversheath if present.	17
6.	Apply a temporary earth continuity bond to metallic sheath.	10
7.	Remove metallic sheath.	18
8.	Carry out moisture test.	8
9.	Tie off and remove copper woven fabric tape.	23
10.	Apply a silicon tape seal to copper woven fabric tape and metallic sheath.	24
11.	Remove core fillers.	--
12.	Using a clean dry wipe remove excess impregnate from cores.	--
13.	Remove metallic screens, carbon paper and two conductor papers.	27
	EPR CABLE - Preparation	
14.	Unravel and straighten individual cores.	--
15.	Identify and mark core phasing clear of joint position.	--

Actions		**General Requirements (ST: CA2C/9)**
16.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
17.	Clean each oversheath for a distance of 1.5m.	--
18.	Apply a temporary earth continuity bond clear of joint position.	10
19.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
20.	Set and mark cores ensuring one to the top.	--
21.	Remove oversheaths and bedding tapes.	16
22.	Abrade oversheaths	17
23.	Apply a 20swg binder around copper screen wires 20mm from oversheath termination point.	--
24.	Straighten copper screen wires and form into a bunch	--
25.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
26.	Remove semi-conducting screens ensuring insulation is free from all conducting material	28
	COMPLETION OF JOINT	
27.	Cut cores and remove phase insulation to allow connector fitting.	31
28.	Apply a stress cone to each core.	35
29.	Fit foam filler piece and build up cable oversheaths.	32
30.	Fit inner sleeve foam rings.	34
31.	Connect phase conductors and shear connector bolts.	31/36

Actions		**General Requirements (ST: CA2C/9)**
32.	Fit insulation tubes.	37
33.	Apply foam build up tape to PILC metallic sheath.	32
34.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
35.	Clean and degrease inner sleeve.	43
36.	Apply metallic sheath bond to PILC cable.	42
37.	Form copper screen wire bunches into one conductor and connect to earth braid.	42
38.	Remove temporary earth continuity bond applied in 6/18 and reseal EPR oversheaths.	51
39.	Wrap and stretch copper stocking across joint and connect to metallic sheath and copper screen wires.	44
40.	Apply water block tape to metallic sheath.	45
41.	Build up PILC cable oversheath.	32
42.	Fit and support outer sleeve.	46
43.	Mix and pour resin.	47

All dimensions in mm



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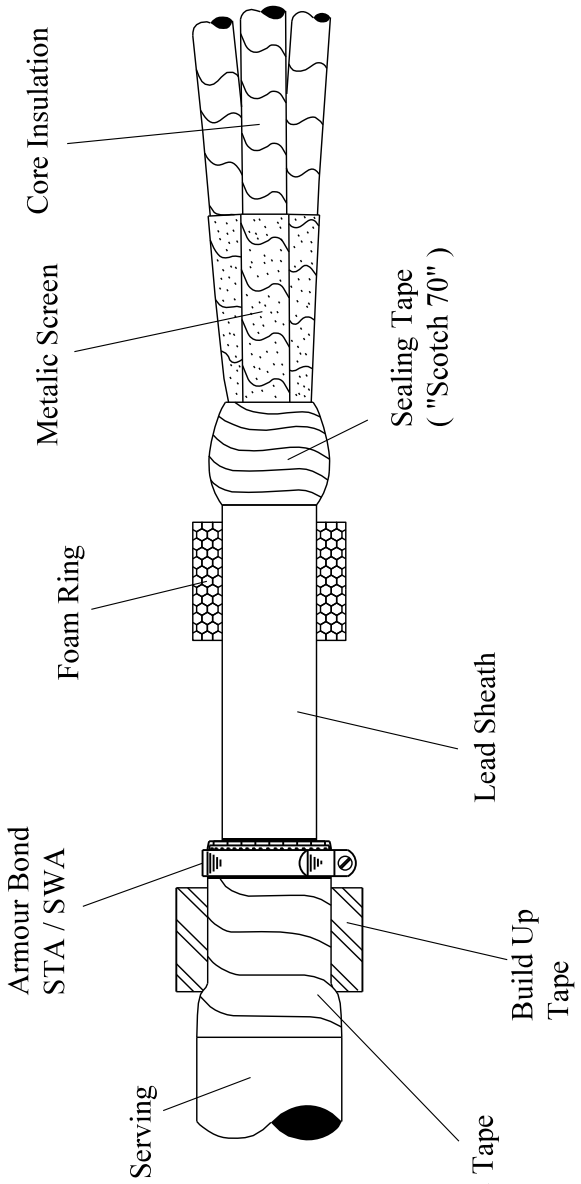

H CABLE

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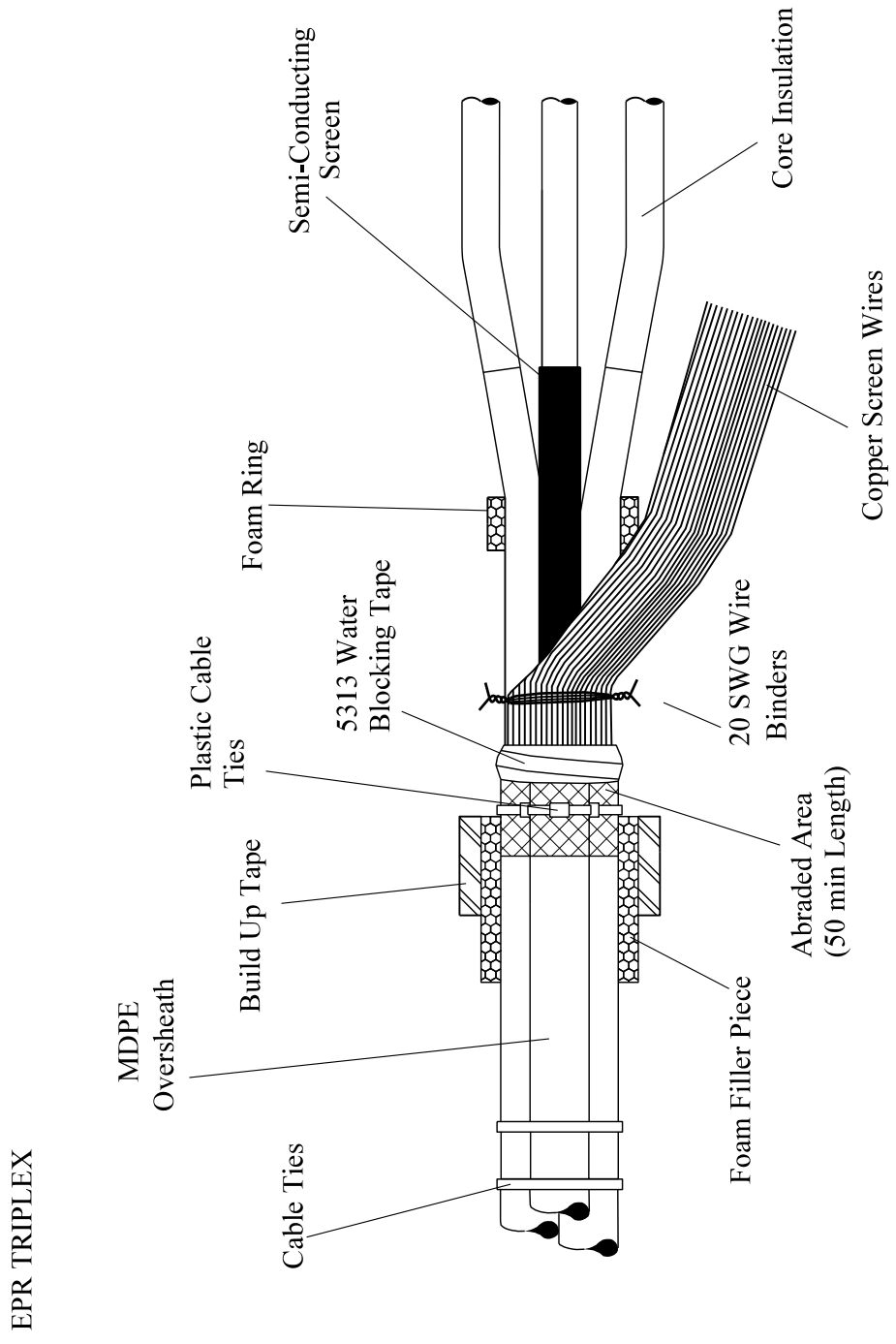

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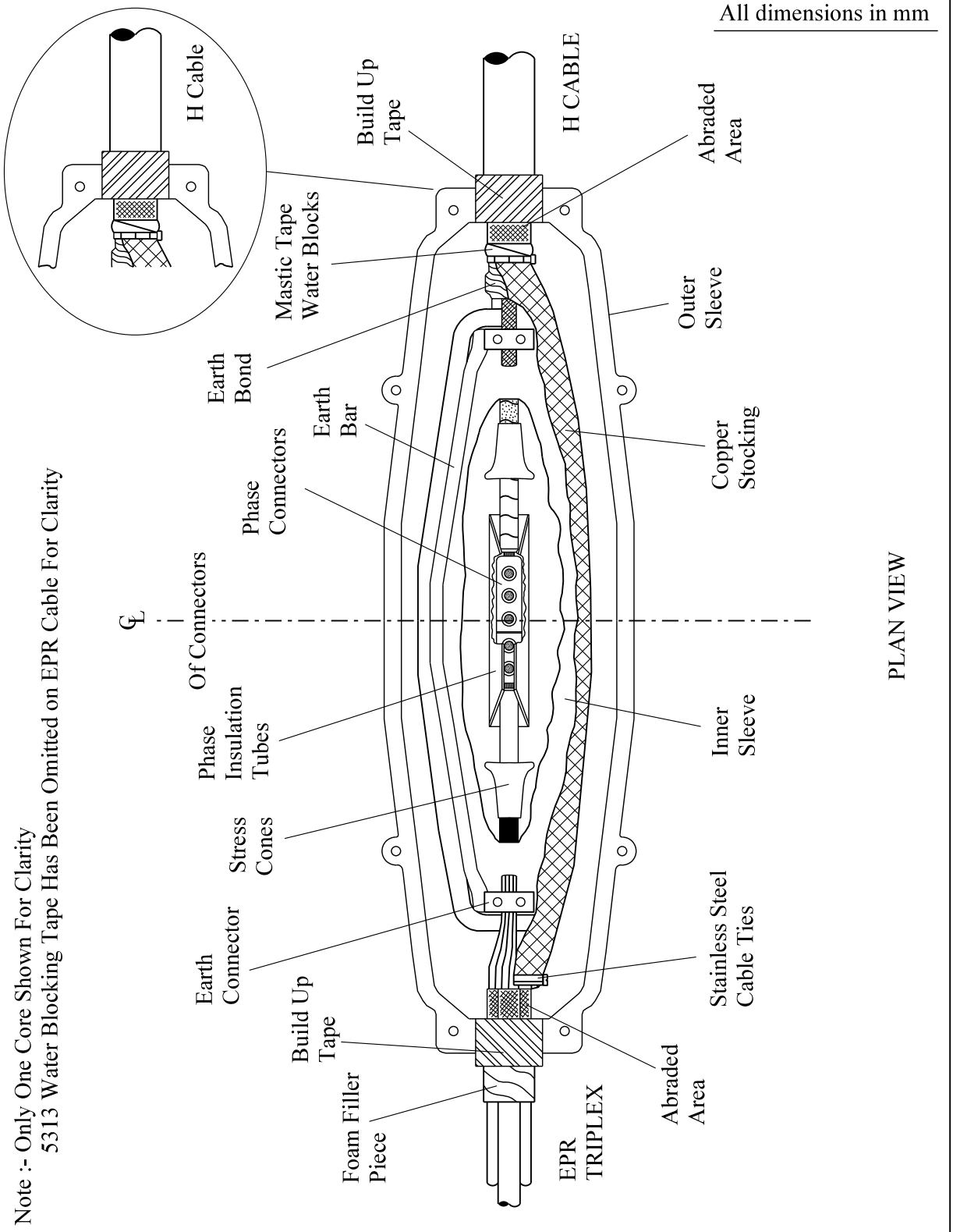

Note :- Only One Core Shown For Clarity
5313 Water Blocking Tape Has Been Omitted on EPR Cable For Clarity

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.108

185mm² 3 CORE XLPE - 185mm² EPR TRIPLEX CABLE 11kV STRAIGHT 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/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.108

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
From	**To**	**Straight Joint**
95 3 CORE XLPE	70 EPR	SJ 1139
	95 EPR	SJ 1140
	185 EPR	SJ 1141
185 3 CORE XLPE	70 EPR	SJ 1142
	95 EPR	SJ 1143
	185 EPR	SJ 1144

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

JOINTING PROCEDURE 7.108

JOINT KIT MATERIALS

KIT REF	Extended shell	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTOR	TUBE SET
	M85X	M85	B	G	D	J	N	FTBM	MSFE-0009-0035/185	SMOE 28003
SJ 1139	1	1	1	1		1	1	1	3	1
SJ 1140	1	1	1	1	1		1		3	1
SJ 1141	1	1	1	1	1		1		3	1
SJ 1142	1	1	1	1		1	1	1	3	1
SJ 1143	1	1	1	1	1		1		3	1
SJ 1144	1	1	1	1	1		1		3	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.108

Actions		General Requirements (ST: CA2C/9)

Refer to Drawings **JP2D 7.108.1, 7.108.2, 7.108.3** and **7.108.4** whilst undertaking this Jointing Procedure.

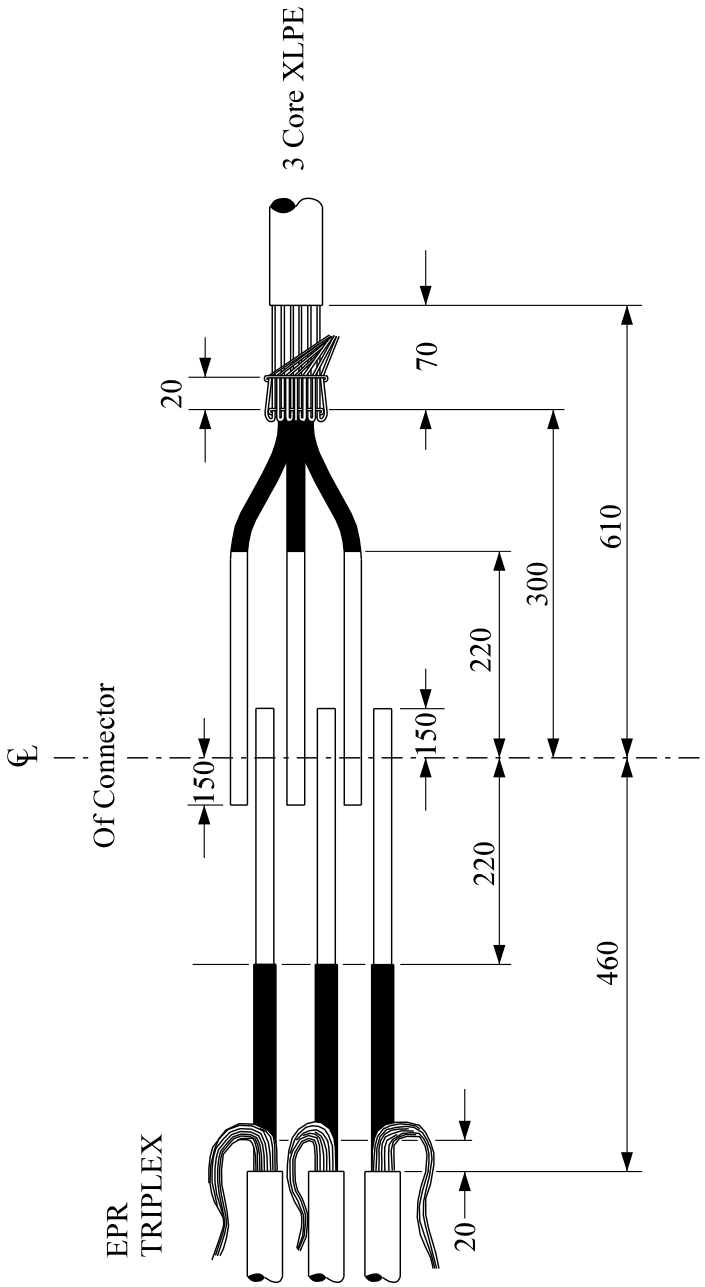
1.	Set and mark cables.	5/6
	3 CORE XLPE CABLE - Preparation	
2.	Clean each oversheath for a distance of 1.5m.	--
3.	Apply a temporary earth continuity bond clear of joint position.	10
4.	Park a mastic lined heat shrink tube next to temporary earth continuity bond .	--
5.	Remove oversheath.	15/16
6.	Apply 20 swg binding wire 70mm from oversheath termination point to collective copper wire screen.	21
7.	Straighten copper screen wires and form into a bunch.	--
9.	Remove the semi-conducting bedding layer.	--
10.	Apply Scotch 13 tape to screen wires and semi-conductor screens.	21
11.	Abrade oversheath.	17
12.	Set and mark cores ensuring one is at the top.	--
13.	Apply black mastic water blocking tape at the termination point of the oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the oversheath.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
14.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28

	Actions	**General Requirements (ST: CA2C/9)**
	EPR CABLE - Preparation	
15.	Unravel and straighten individual cores.	--
16.	Identify and mark core phasing clear of joint position.	--
17.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
18.	Clean each oversheath for a distance of 1.5m.	--
19.	Apply a temporary earth continuity bond clear of joint position.	10
20.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
21.	Set and mark cores ensuring one to the top.	--
22.	Remove oversheaths and bedding tapes.	16
23.	Abrade oversheaths.	17
24.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
25.	Straighten copper screen wires and form into a bunch.	--
26.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
27.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
28.	Cut cores and remove core insulation to allow connector fitting.	31
29.	Apply a stress cone to each core.	35
30.	Fit foam filler piece and build up cable oversheaths.	32

JOINTING PROCEDURES 7.108 – Continued

Actions		General Requirements (ST: CA2C/9)
31.	Fit inner sleeve foam rings.	34
32.	Connect phase conductors and shear bolts.	31/36
33.	Fit insulation tubes.	37
34.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
35.	Ensure joint is level and fill with Lovisil.	41
36.	Clean and degrease inner sleeve.	43
37.	Form copper screen wire bunches into one conductor and connect to earth braid.	42
38.	Remove temporary earth continuity bond applied in 3/21 and reseal EPR oversheaths.	51
39.	Wrap and stretch copper stocking across joint and connect to copper screen wires.	44
40.	Build up cable oversheaths. .	32
41.	Fit and support outer sleeve.	46
42.	Mix and pour resin.	47

All dimensions in mm



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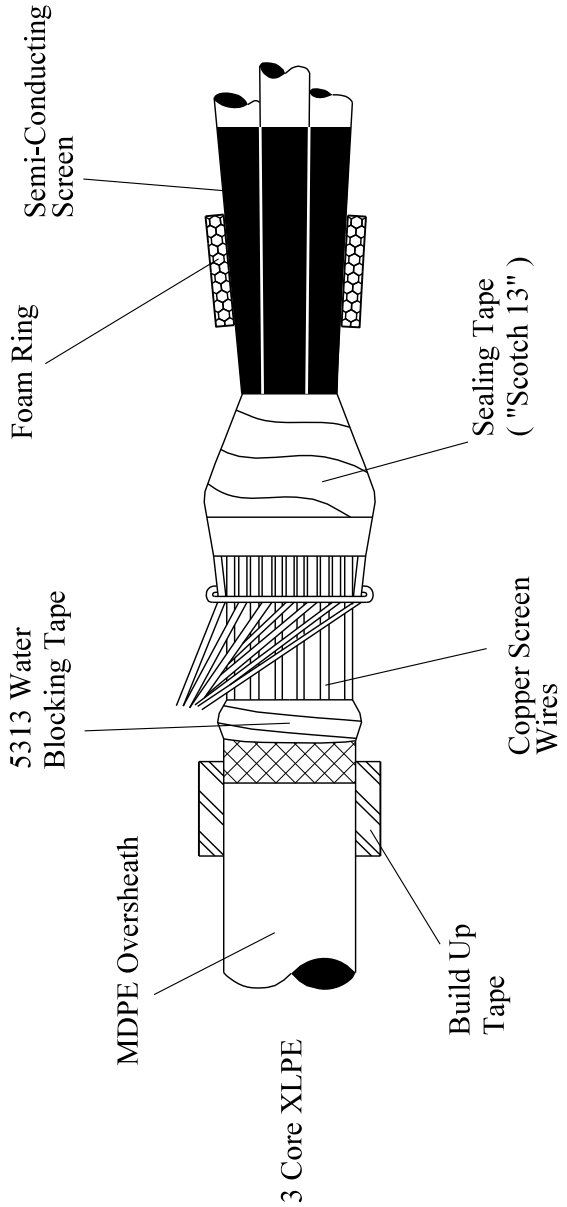
All dimensions in mm



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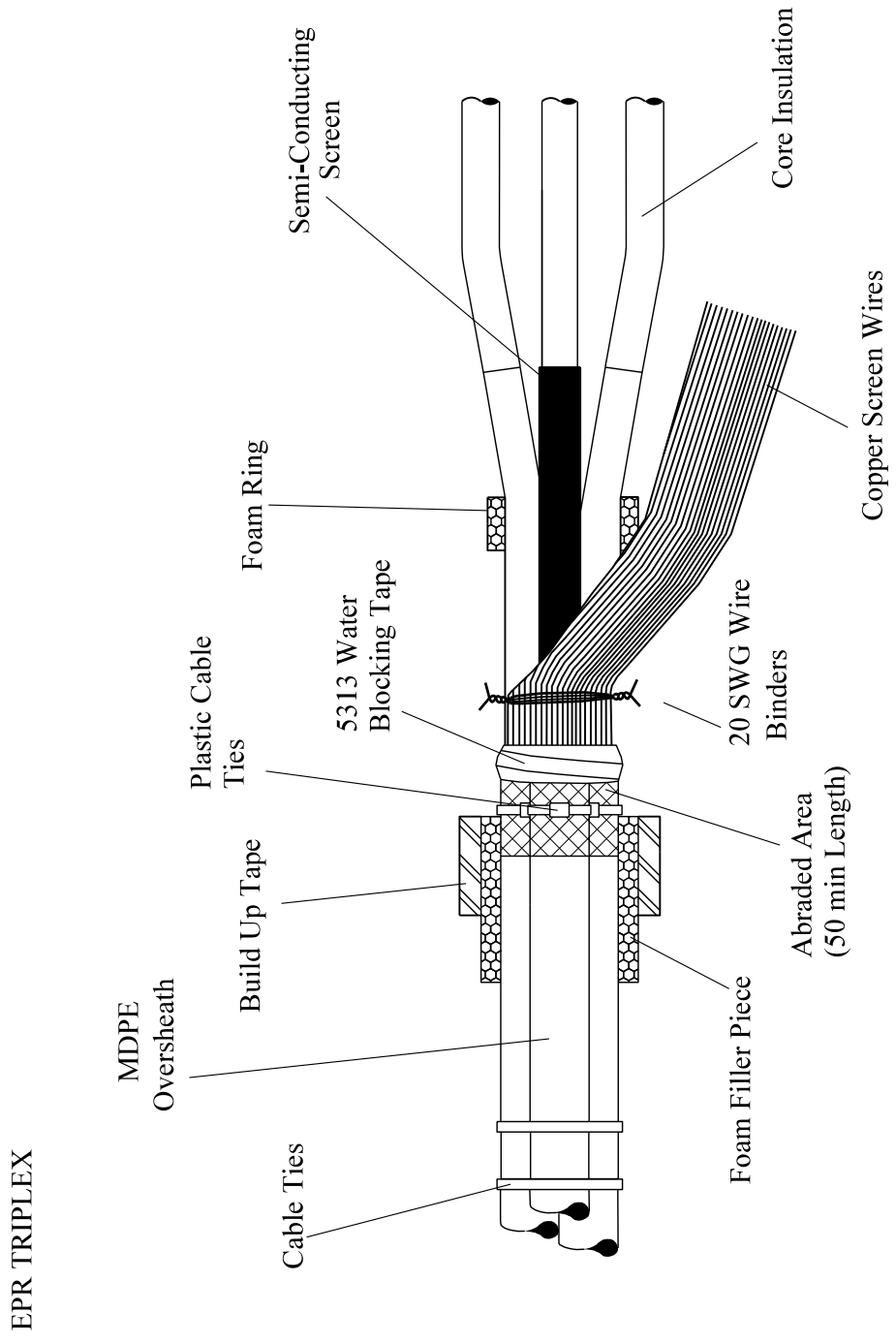
Title

PREPARATION OF 3 CORE COLLECTIVE SCREEN CABLES

Drg. No.	Rev No
JP2D 7.108.2	1

All dimensions in mm



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PREPARATION OF EPR TRIPLEX

Drg. No.	Rev No
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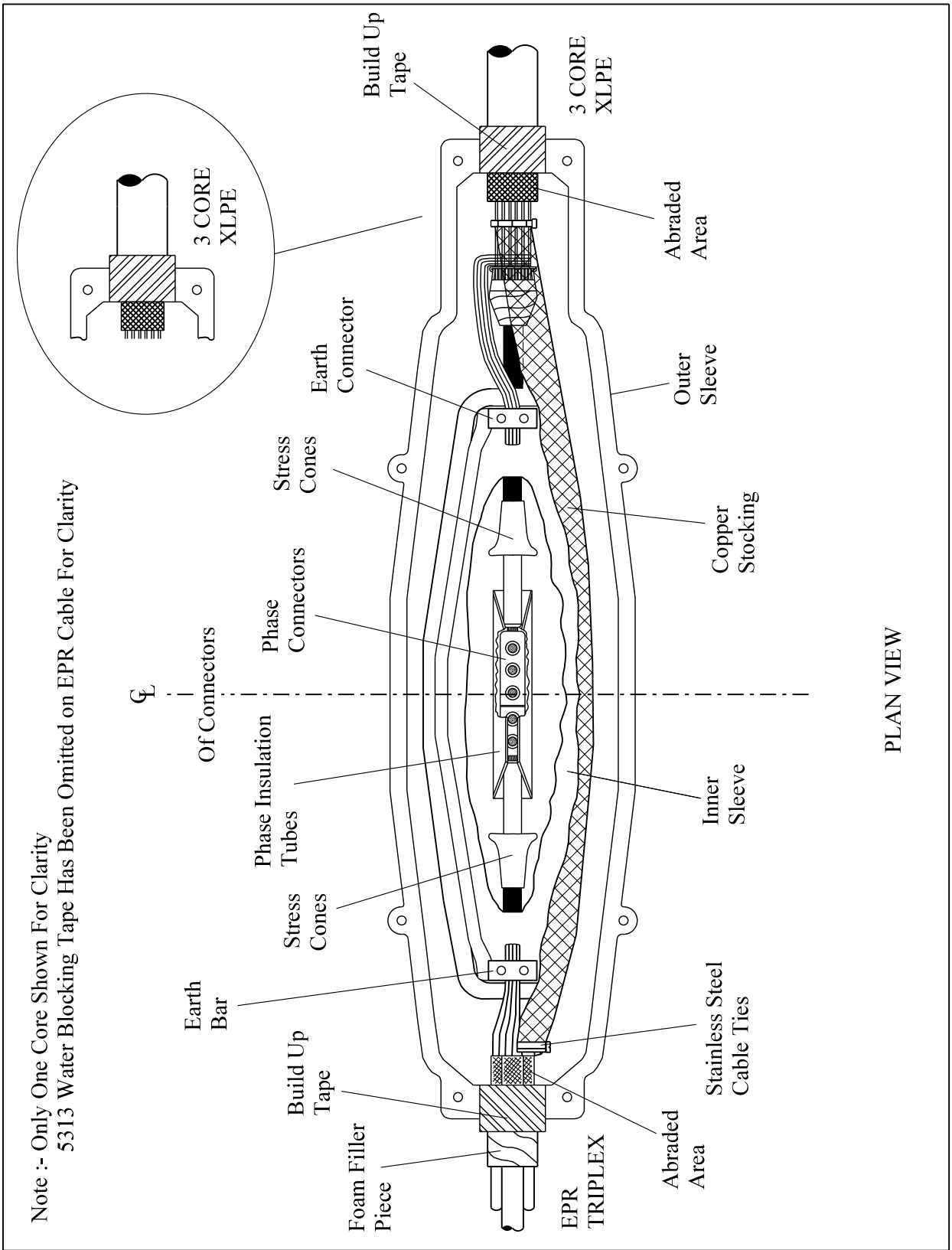

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Title: UP TO & INC 185mm² EPR TRIPLEX - 3 CORE XLPE STRAIGHT JOINT GENERAL LAYOUT

Drg. No. JP2D 7.108.4

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.109

300mm² 3 CORE XLPE - 300mm² EPR TRIPLEX CABLE 11kV STRAIGHT 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/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.109

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
From	**To**	**Straight Joint**
185 3 Core XLPE	300 EPR	SJ 1145
300 3 Core XLPE	300 EPR	SJ 1146
300 3 Core XLPE	70 EPR	SJ 1147
	95 EPR	SJ 1148
	185 EPR	SJ 1149
	300 EPR	SJ 1150

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

JOINTING PROCEDURE 7.109

JOINT KIT MATERIALS

KIT REF	Extended shell	BASE Module	RESIN MODULE			CABLE DEPENDING MODULE					FOAM TAPE BUILD UP MODULE	CONNECTOR	TUBE SET
	M105X	M 105	B	C	G	D	F	J	N	O	FTBM	MSFE-0010-0035/300	SMOE 28003
SJ 1145	1	1	1	1	1		1		1		1	3	1
SJ 1146	1	1	1	1	1		1			1	1	3	1
SJ 1147	1	1	1	1	1			1		1	1	3	1
SJ 1148	1	1	1	1	1	1				1	1	3	1
SJ 1149	1	1	1	1	1	1				1	1	3	1
SJ 1150	1	1	1	1	1		1			1	1	3	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.109

Actions		General Requirements (ST: CA2C/9)

Refer to Drawings **JP2D 7.109.1, 7.109.2, 7.109.3** and **7.109.4** whilst undertaking this Jointing Procedure.

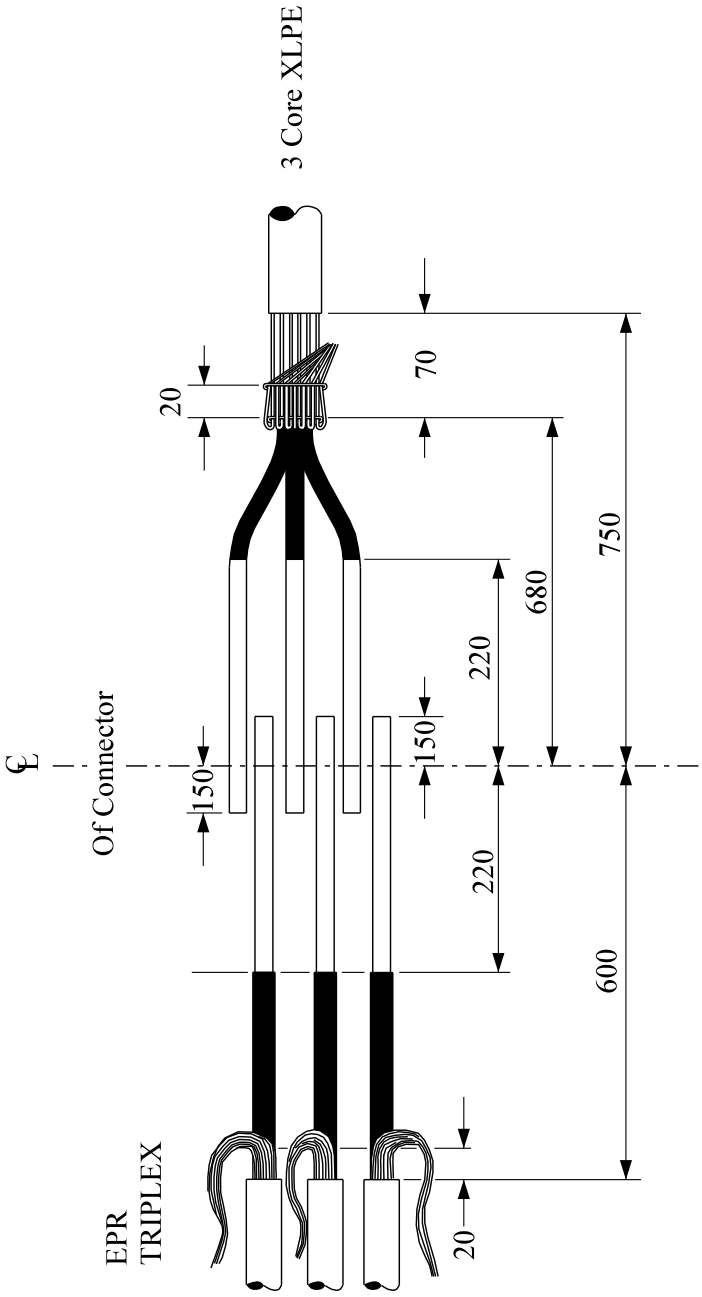
1.	Set and mark cables.	5/6
	3 CORE XLPE CABLE - Preparation	
2.	Clean each oversheath for a distance of 1.5m.	--
3.	Apply a temporary earth continuity bond clear of joint position.	10
4.	Park a mastic lined heat shrink tube next to temporary earth continuity bond .	--
5.	Remove oversheath.	15/16
6.	Apply 20 swg binding wire 70mm from oversheath termination point to collective copper wire screen.	21
7.	Straighten copper screen wires and form into a bunch.	--
9.	Remove the semi-conducting bedding layer.	--
10.	Apply Scotch 13 tape to screen wires and semi-conductor screens.	21
11.	Abrade oversheath.	17
12.	Set and mark cores ensuring one is at the top.	--
13.	Apply black mastic water blocking tape at the termination point of the oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the oversheath.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
14.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28

	Actions	**General Requirements (ST: CA2C/9)**
	EPR CABLE - Preparation	
15.	Unravel and straighten individual cores.	--
16.	Identify and mark core phasing clear of joint position.	--
17.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
18.	Clean each oversheath for a distance of 1.5m.	--
19.	Apply a temporary earth continuity bond clear of joint position.	10
20.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
21.	Set and mark cores ensuring two to the top.	--
22.	Remove oversheaths and bedding tapes.	16
23.	Abrade oversheaths.	17
24.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
25.	Straighten copper screen wires and form into a bunch.	--
26.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
27.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
28.	Cut cores and remove core insulation to allow connector fitting.	31
29.	Apply a stress cone to each core.	35

JOINTING PROCEDURES 7.108 – Continued

Actions		General Requirements (ST: CA2C/9)
30.	Fit foam filler piece and build up cable oversheaths.	32
31.	Fit inner sleeve foam rings.	34
32.	Connect phase conductors and shear bolts.	31/36
33.	Fit insulation tubes.	37
34.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
35.	Ensure joint is level and fill with Lovisil.	41
36.	Clean and degrease inner sleeve.	43
37.	Form copper screen wire bunches into one conductor and connect to earth braid.	42
38.	Remove temporary earth continuity bond applied in 3/21 and reseal EPR oversheaths.	51
39.	Wrap and stretch copper stocking across joint and connect to copper screen wires.	44
40.	Build up cable oversheaths. .	32
41.	Fit and support outer sleeve.	46
42.	Mix and pour resin.	47

All dimensions in mm



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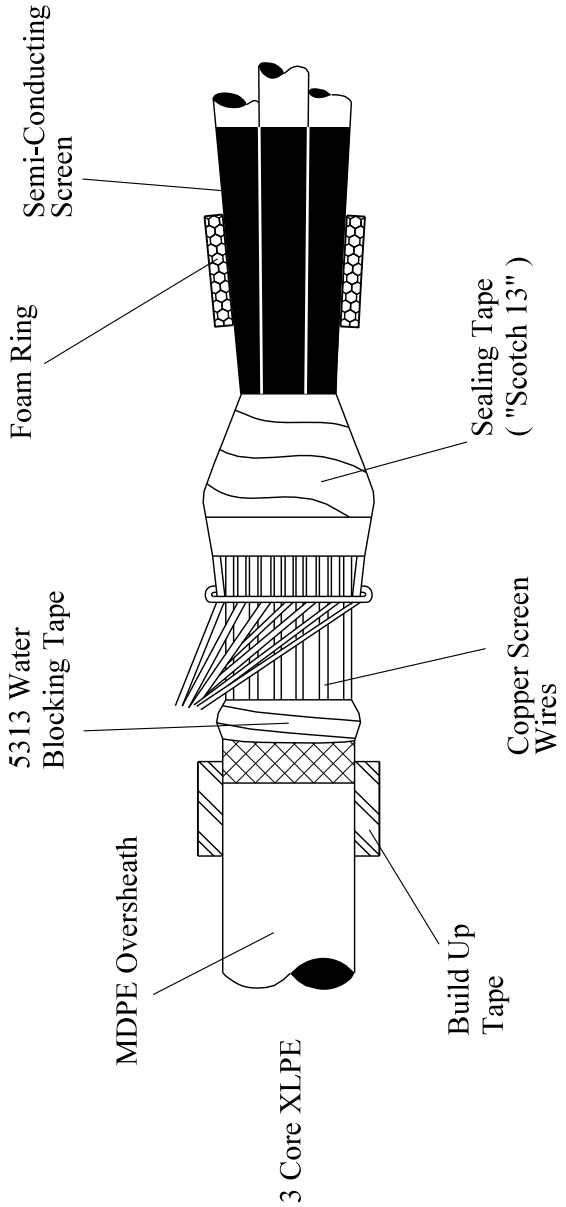
All dimensions in mm



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PREPARATION OF 3 CORE COLLECTIVE SCREEN CABLES

Drg. No.	Rev No
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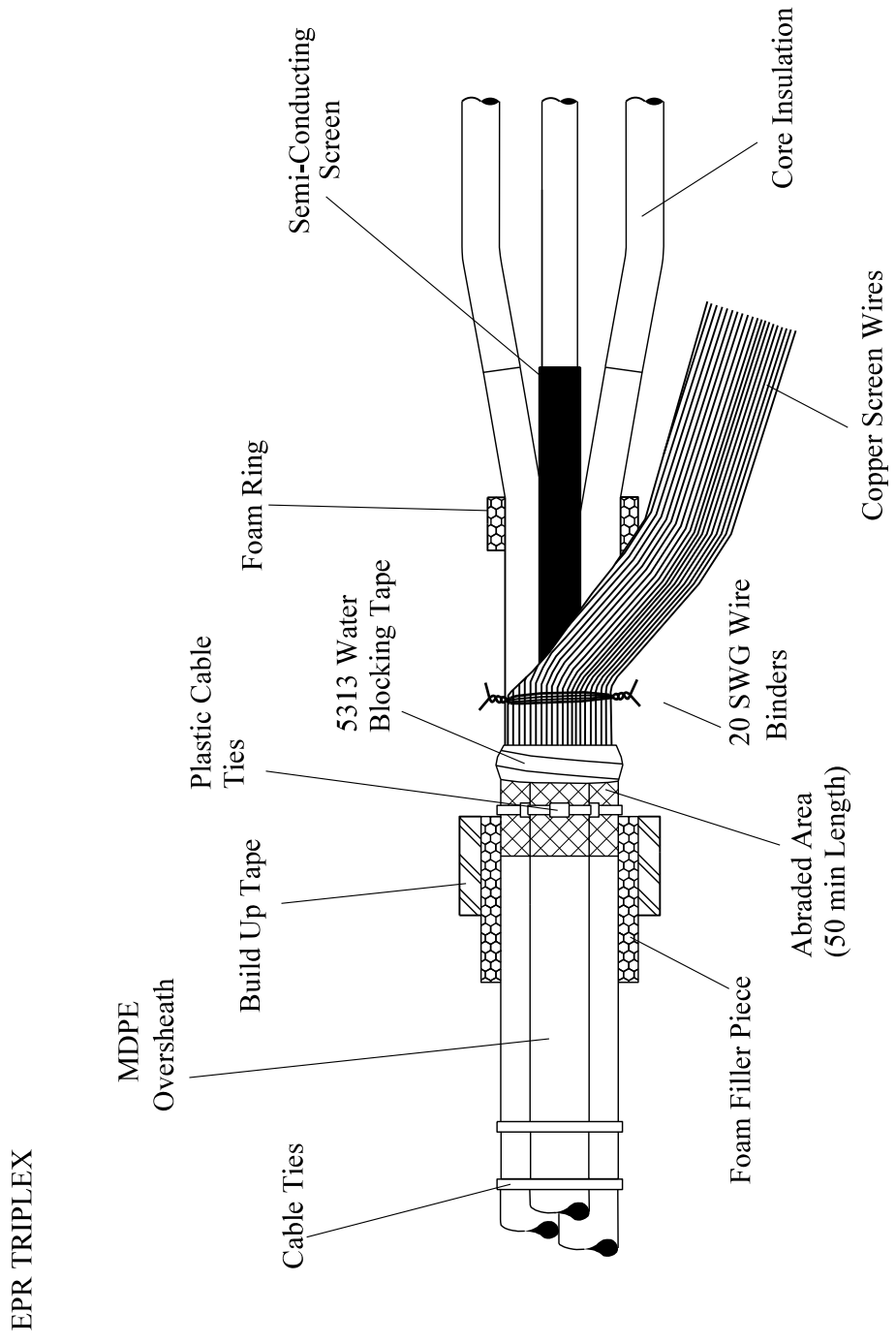
All dimensions in mm



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PREPARATION OF EPR TRIPLEX

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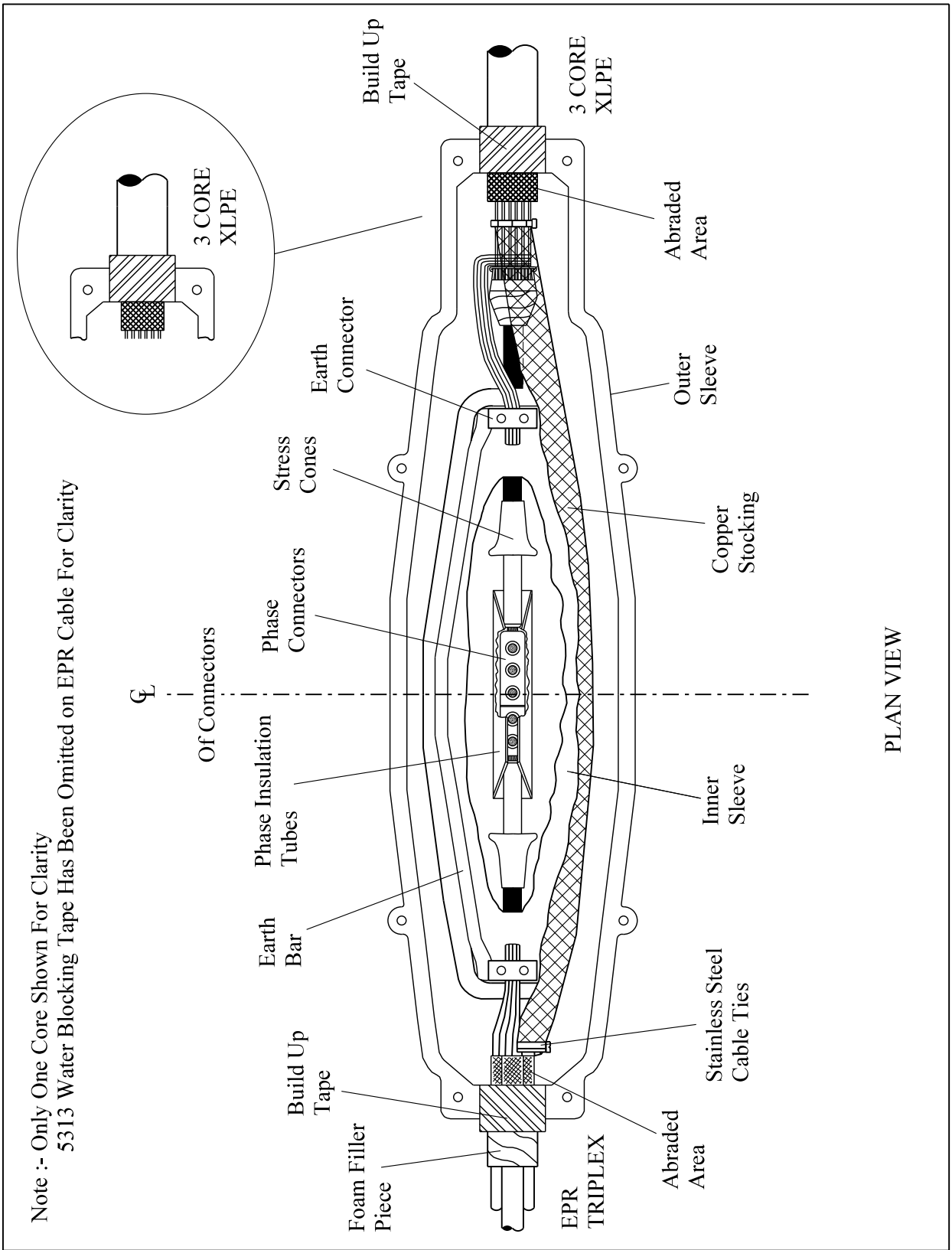

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.110

300/400mm² Cu 3 CORE XLPE – 300mm² EPR TRIPLEX CABLE 11kV STRAIGHT 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/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.110

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
From	**To**	**Straight Joint**
300 Cu 3 Core XLPE	300 EPR	SJ 1151
	400 EPR	SJ 1152
400 Cu 3 Core XLPE	300 EPR	SJ 1153
	400 EPR	SJ 1154

JOINTING PROCEDURE 7.110

JOINT KIT MATERIALS

KIT REF	Extended shell	BASE MODULE	RESIN MODULE			CABLE DEPENDING MODULE		CONNECTOR	TUBE SET
	M105X	M105	B	C	G	F	O	BAH-02-211-098	SMOE 28003
SJ 1151	1	1	1	1	1	1	1	3	1
SJ 1152	1	1	1	1	1	1	1	3	1
SJ 1153	1	1	1	1	1	1	1	3	1
SJ 1154	1	1	1	1	1	1	1	3	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.110

Actions		General Requirements (ST: CA2C/9)

Refer to Drawings **JP2D 7.110.1, 7.110.2, 7.110.3** and **7.110.4** whilst undertaking this Jointing Procedure.

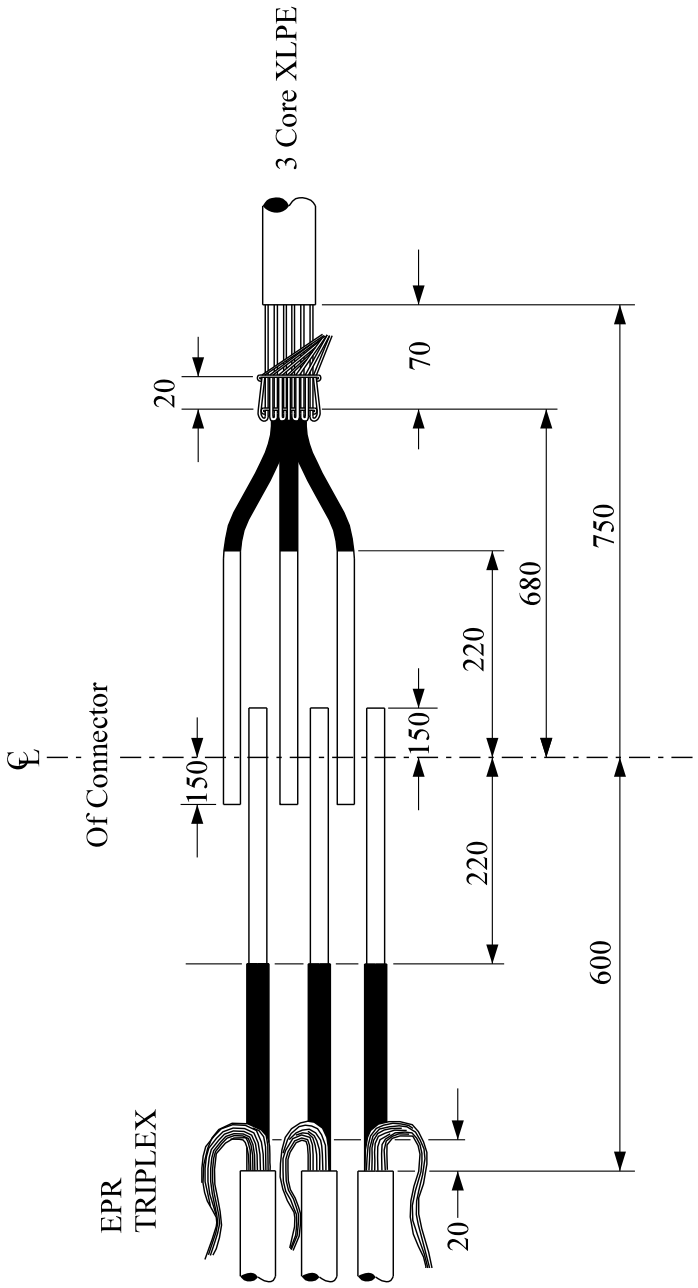
1.	Set and mark cables.	5/6
	3 CORE XLPE CABLE - Preparation	
2.	Clean each oversheath for a distance of 1.5m.	--
3.	Apply a temporary earth continuity bond clear of joint position.	10
4.	Park a mastic lined heat shrink tube next to temporary earth continuity bond .	--
5.	Remove oversheath.	15/16
6.	Apply 20 swg binding wire 70mm from oversheath termination point to collective copper wire screen.	21
7.	Straighten copper screen wires and form into a bunch.	--
9.	Remove the semi-conducting bedding layer.	--
10.	Apply Scotch 13 tape to screen wires and semi-conductor screens.	21
11.	Abrade oversheath.	17
12.	Set and mark cores ensuring one is at the top.	--
13.	Apply black mastic water blocking tape at the termination point of the oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the oversheath.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
14.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28

	Actions	**General Requirements (ST: CA2C/9)**
	EPR CABLE - Preparation	
15.	Unravel and straighten individual cores.	--
16.	Identify and mark core phasing clear of joint position.	--
17.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25
18.	Clean each oversheath for a distance of 1.5m.	--
19.	Apply a temporary earth continuity bond clear of joint position.	10
20.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
21.	Set and mark cores ensuring two to the top.	--
22.	Remove oversheaths and bedding tapes.	16
23.	Abrade oversheaths.	17
24.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
25.	Straighten copper screen wires and form into a bunch.	--
26.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
27.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
28.	Cut cores and remove core insulation to allow connector fitting.	31
29.	Apply a stress cone to each core.	35

JOINTING PROCEDURES 7.110 – Continued

Actions		General Requirements (ST: CA2C/9)
30.	Fit foam filler piece and build up cable oversheaths.	32
31.	Fit inner sleeve foam rings.	34
32.	Connect phase conductors and shear connector bolts.	31/36
33.	Fit insulation tubes.	37
34.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
35.	Ensure joint is level and fill with Lovisil.	41
36.	Clean and degrease inner sleeve.	43
37.	Form copper screen wire bunches into one conductor and connect to earth braid.	42
38.	Remove temporary earth continuity bond applied in 3/21 and reseal EPR oversheaths.	51
39.	Wrap and stretch copper stocking across joint and connect to copper screen wires.	44
40.	Build up cable oversheaths. .	32
41.	Fit and support outer sleeve.	46
42.	Mix and pour resin.	47

All dimensions in mm



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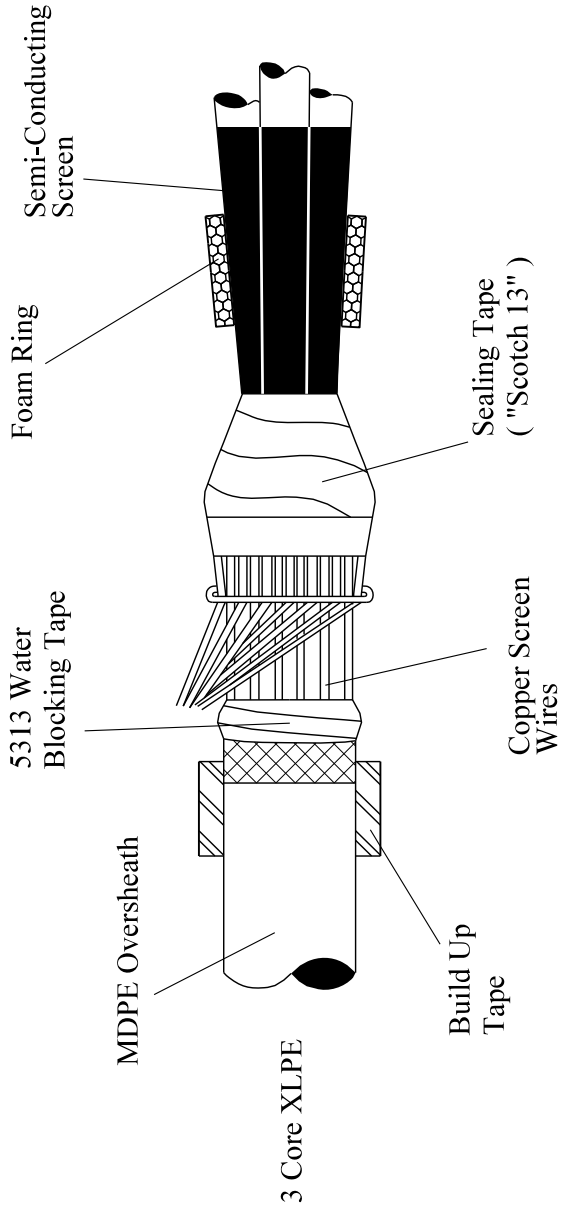
All dimensions in mm



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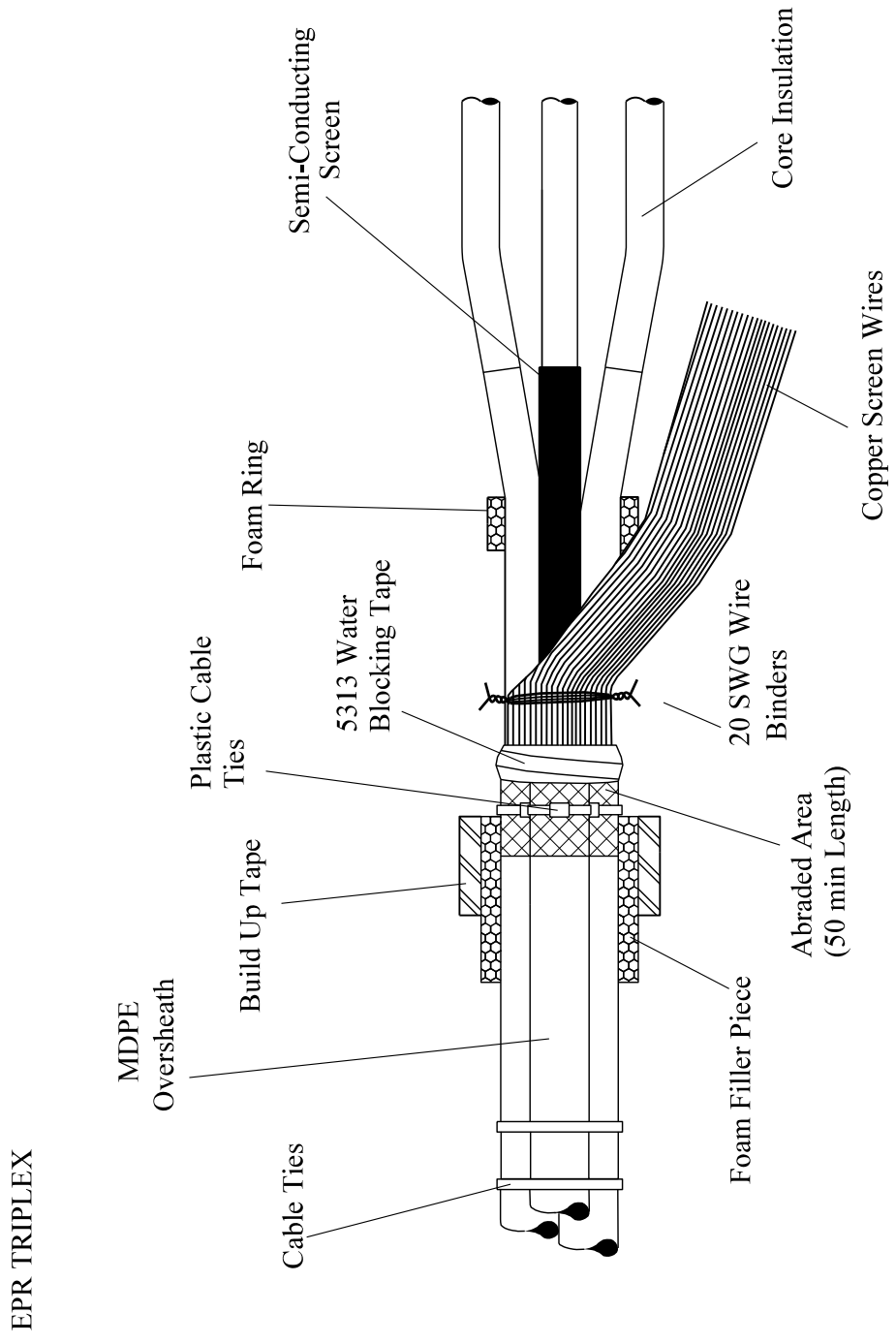

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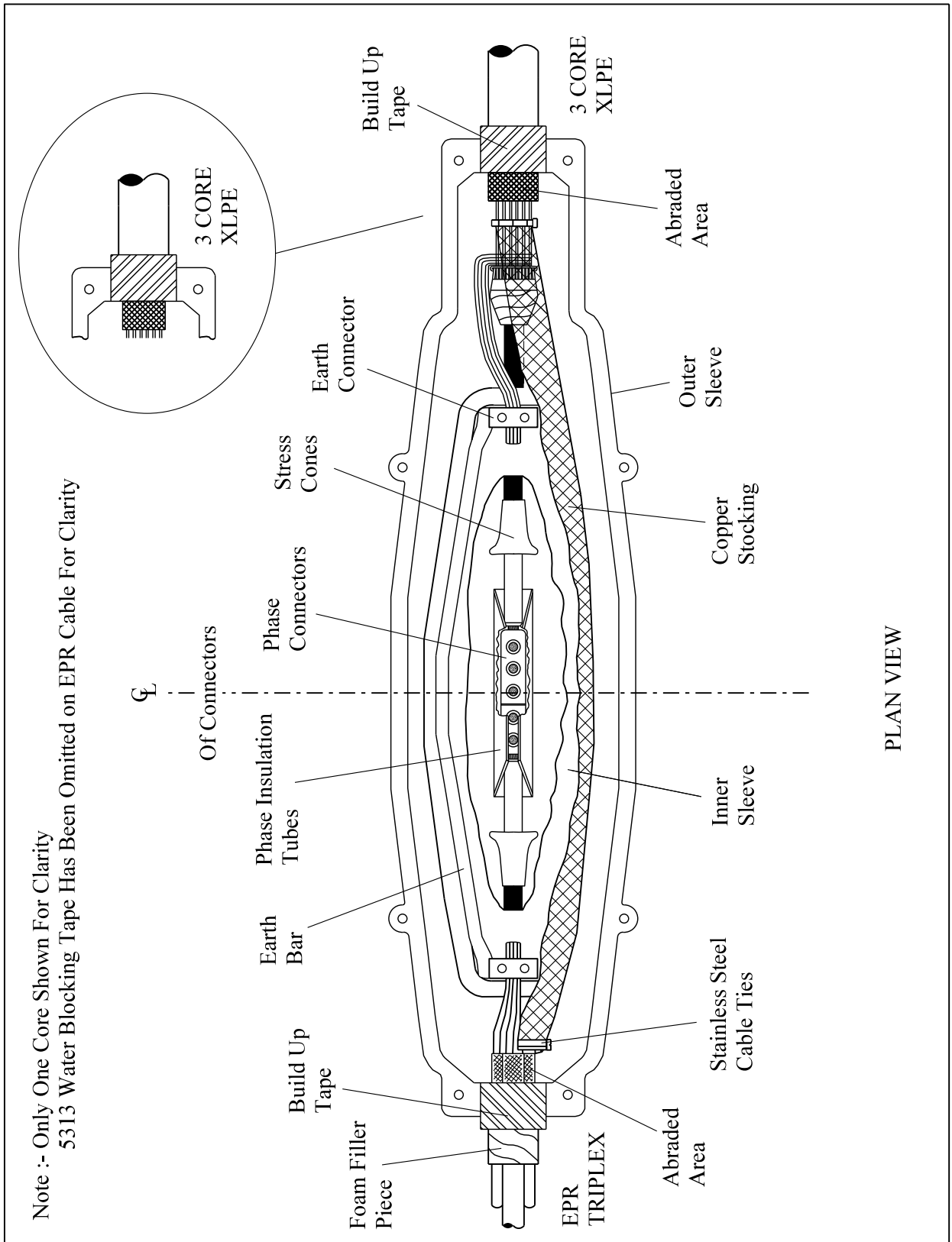

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.111

185mm² 3 CORE SWA XLPE - 185mm² EPR TRIPLEX CABLE 11kV STRAIGHT 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/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.111

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
From	**To**	**Straight Joint**
95 3 CORE SWA XLPE	70 EPR	SJ 1155
	95 EPR	SJ 1156
	185 EPR	SJ 1157
185 3 CORE SWA XLPE	70 EPR	SJ 1158
	95 EPR	SJ 1159
	185 EPR	SJ 1160

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

JOINTING PROCEDURE 7.111

JOINT KIT MATERIALS

KIT REF	Extended shell	BASE MODULE	RESIN MODULE		CABLE DEPENDING MODULE			FOAM TAPE BUILD UP MODULE	CONNECTORS	TUBE SET
	M85X	M85	B	G	D	J	P	FTBM	MSFE-0009-0035/185	SMOE 28003
SJ 1155	1	1	1	1		1	1	1	3	1
SJ 1156	1	1	1	1	1		1		3	1
SJ 1157	1	1	1	1	1		1		3	1
SJ 1158	1	1	1	1		1	1	1	3	1
SJ 1159	1	1	1	1	1		1		3	1
SJ 1160	1	1	1	1	1		1		3	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.111

Actions		General Requirements (ST: CA2C/9)

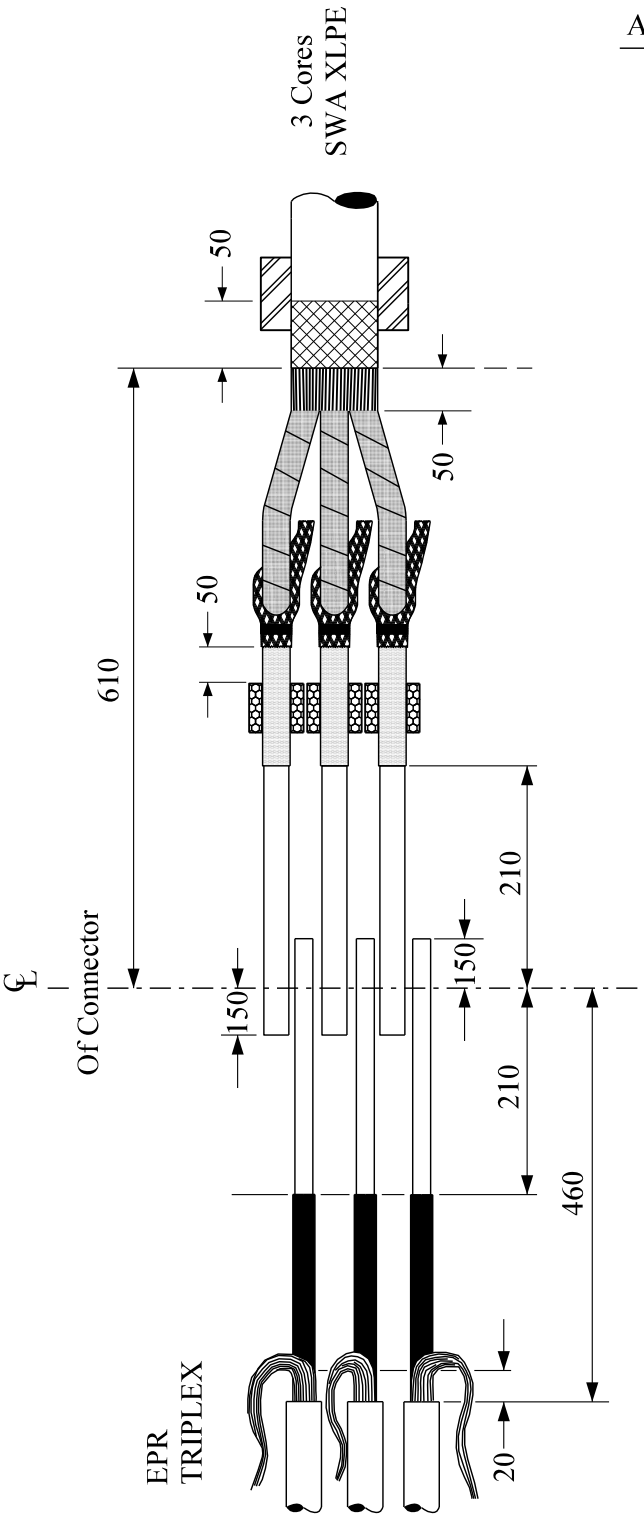
Refer to Drawings **JP2D 7.111.1, 7.111.2, 7.111.3** and **7.111.4,** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	3 CORE SWA XLPE CABLE - Preparation	
2.	Clean each oversheath for a distance of 1.5m.	--
3.	Apply a temporary earth continuity bond clear of joint position.	10
4.	Park a mastic lined heat shrink tube next to temporary earth continuity bond .	--
5.	Remove oversheath.	15/16
6.	Apply 20 swg binding wire 70mm from oversheath termination point to steel wire armour.	13
7.	Fit support ring and bond SWA.	14
8.	Remove bedding layer and core fillers.	--
9.	Terminate and remove the copper tape from semi-conducting screens.	14/29
10.	Fit braids to semi-conductor screens.	14
11.	Abrade oversheath.	17
12.	Set and mark cores ensuring one to the top.	--
13.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	EPR CABLE - Preparation	
14.	Unravel and straighten individual cores.	--
15.	Identify and mark core phasing clear of joint position.	--
16.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25

Actions		General Requirements (ST: CA2C/9)
17.	Clean each oversheath for a distance of 1.5m.	--
18.	Apply a temporary earth continuity bond clear of joint position.	10
19.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
20.	Set and mark cores ensuring one to the top.	--
21.	Remove oversheaths and bedding tapes.	16
22.	Abrade oversheaths.	17
23.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
24.	Straighten copper screen wires and form into a bunch.	--
25.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
26.	Remove semi-conducting screens ensuring insulation is free from all conducting material	28
	COMPLETION OF JOINT	
27.	Cut cores and remove core insulation to allow connector fitting.	31
28.	Apply a stress cone to each core.	35
29.	Fit foam filler piece and build up cable oversheaths.	32
30.	Fit inner sleeve foam rings.	34
31.	Connect phase conductors and shear connector bolts.	31/36
32.	Fit phase insulation tubes.	37

Actions		**General Requirements (ST: CA2C/9)**
33.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
34.	Ensure joint is level and fill with Lovisil.	41
35.	Clean and degrease inner sleeve.	43
36.	Form copper screen wire bunches into one conductor, then add the three braids and connect to copper earth bar clamp.	42
37.	Remove temporary earth continuity bond applied in 3/18 and reseal EPR oversheaths.	51
38.	Wrap and stretch copper stocking across joint and connect to metallic sheath and copper screen wires.	44
39.	Build up cable oversheaths.	32
40.	Fit and support outer sleeve.	46
41.	Mix and pour resin.	47

All dimensions in mm



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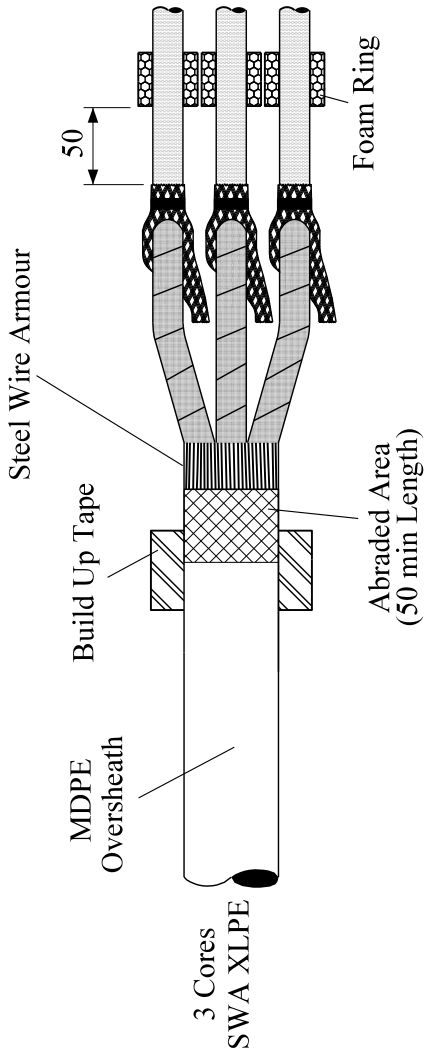
All dimensions in mm



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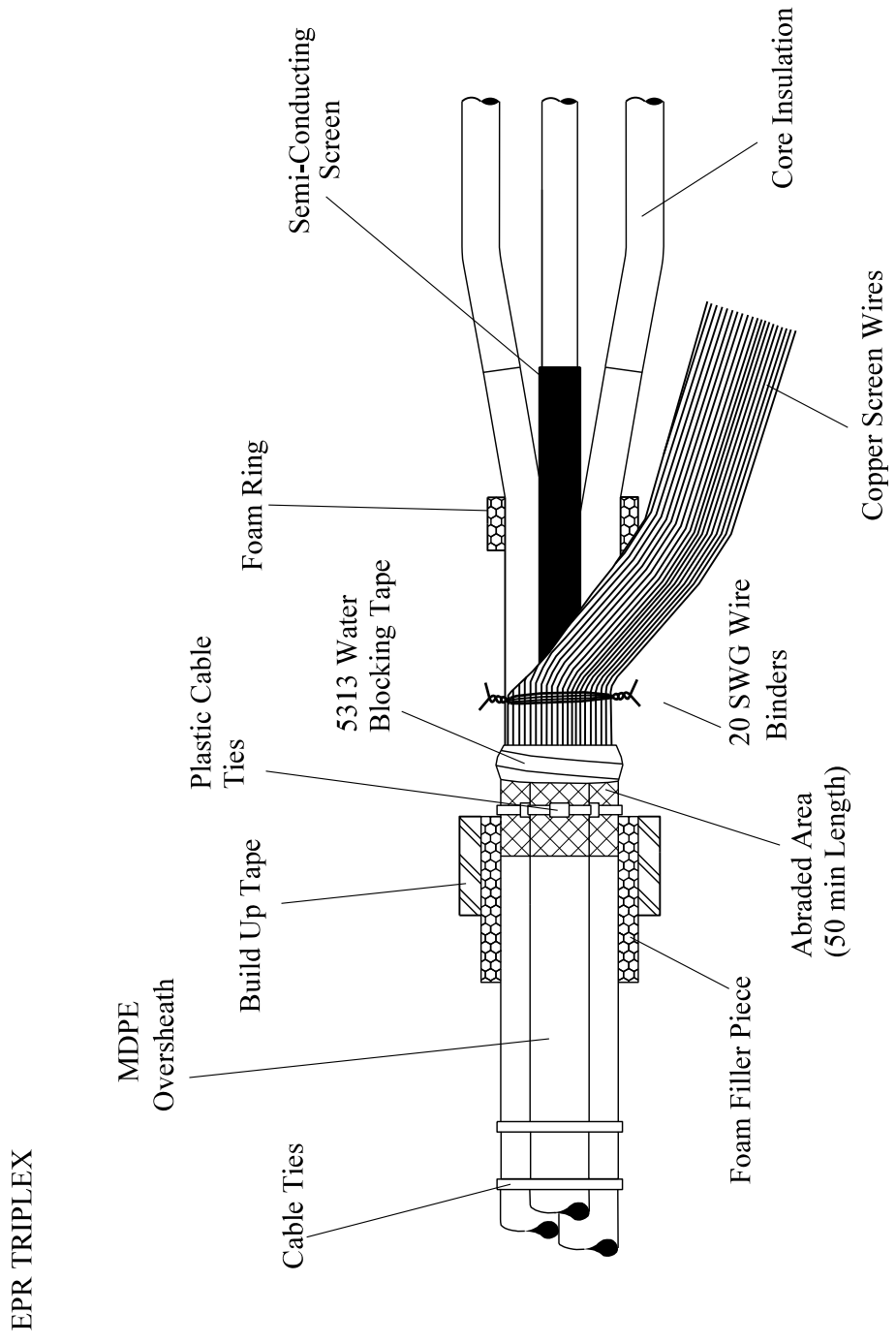

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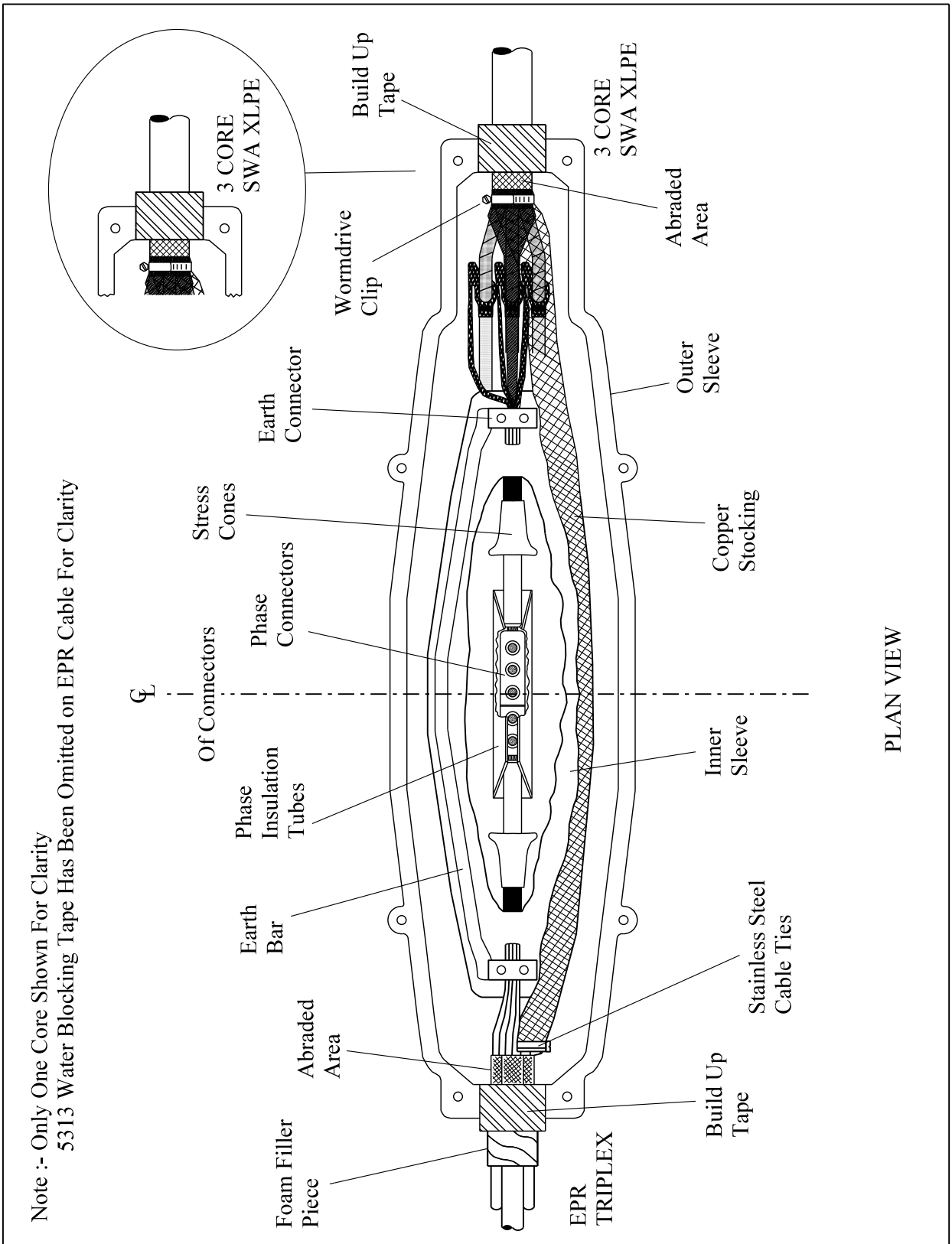

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Title: UP TO & INC 185mm² 3 CORE SWA XLPE - EPR TRIPLEX STRAIGHT JOINT GENERAL LAYOUT

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.112

300mm² 3 CORE SWA XLPE - 300mm² EPR TRIPLEX CABLE 11kV STRAIGHT 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/9 Section 6 of the 11kV Jointing Manual

JOINTING PROCEDURE 7.112

JOINT KIT REFERENCES

CABLE SIZE		JOINT REFERENCE
From	**To**	**Straight Joint**
185 3 Core SWA XLPE	300 EPR	SJ 1161
300 3 Core SWA XLPE	300 EPR	SJ 1162
300 3 Core SWA XLPE	70 EPR	SJ 1163
	95 EPR	SJ 1164
	185 EPR	SJ 1165
	300 EPR	SJ 1166

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

JOINTING PROCEDURE 7.112

JOINT KIT MATERIALS

KIT REF	Extended shell	BASE Module	RESIN MODULE			CABLE DEPENDING MODULE					FOAM TAPE BUILD UP MODULE	CONNECTORS	TUBE SET
	M105X	M105	B	C	G	D	F	J	P	R	FTBM	MSFE-0010-0035/300	SMOE 28003
SJ 1161	1	1	1	1	1		1		1		1	3	1
SJ 1162	1	1	1	1	1	1				1	1	3	1
SJ 1163	1	1	1	1	1			1		1	1	3	1
SJ 1164	1	1	1	1	1	1				1	1	3	1
SJ 1165	1	1	1	1	1	1				1	1	3	1
SJ 1166	1	1	1	1	1		1			1		3	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.112

Actions		General Requirements (ST: CA2C/9)

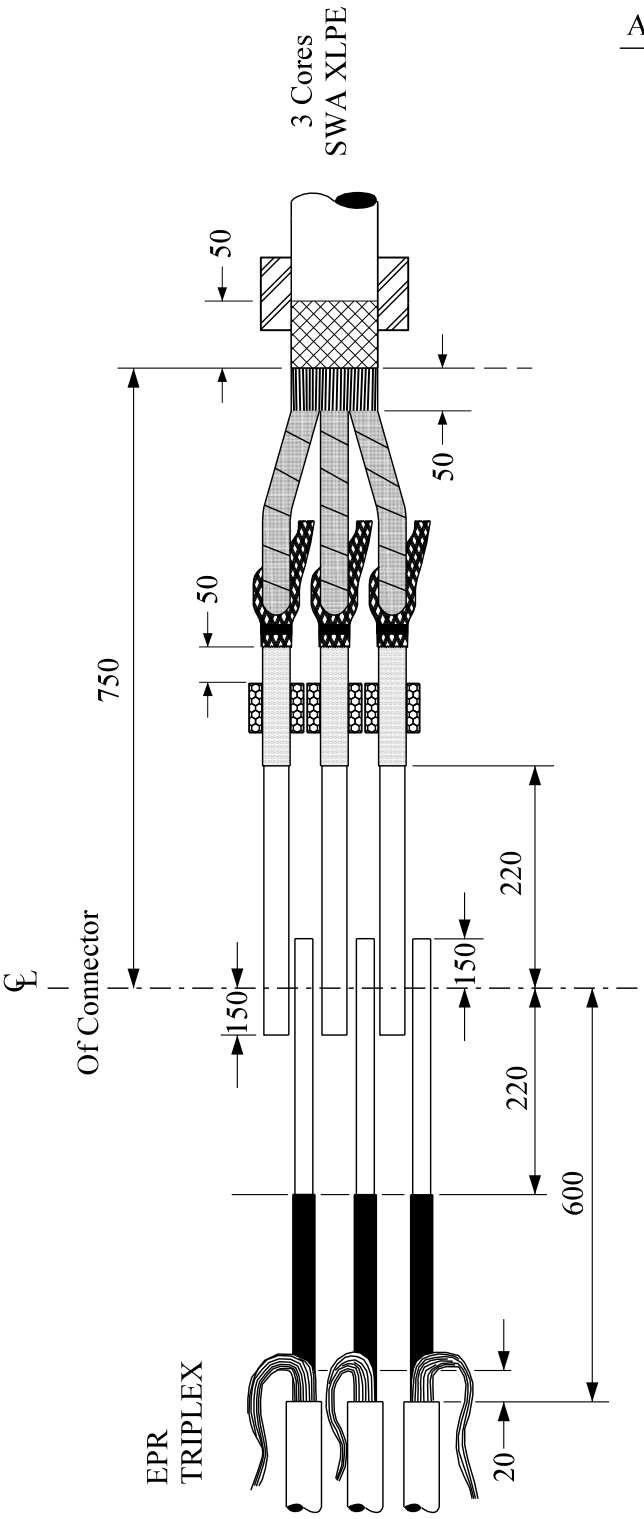
Refer to Drawings **JP2D 7.112.1, 7.112.2, 7.112.3** and **7.112.4** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
	3 CORE SWA XLPE CABLE - Preparation	
2.	Clean each oversheath for a distance of 1.5m.	--
3.	Apply a temporary earth continuity bond clear of joint position.	10
4.	Park a mastic lined heat shrink tube next to temporary earth continuity bond .	--
5.	Remove oversheath.	15/16
6.	Apply 20 swg binding wire 70mm from oversheath termination point to steel wire armour.	13
7.	Fit support ring and bond SWA.	14
8.	Remove bedding layer and core fillers.	--
9.	Terminate and remove the copper tape from semi-conducting screens.	14/29
10.	Fit braids to semi-conductor screens.	14
11.	Abrade oversheath.	17
12.	Set and mark cores ensuring one to the top.	--
13.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	EPR CABLE - Preparation	
14.	Unravel and straighten individual cores.	--
15.	Identify and mark core phasing clear of joint position.	--
16.	Set and align cores into their joint positions, ensuring that any cross is undertaken well away from joint position.	25

Actions		General Requirements (ST: CA2C/9)
17.	Clean each oversheath for a distance of 1.5m.	--
18.	Apply a temporary earth continuity bond clear of joint position.	10
19.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
20.	Set and mark cores ensuring one to the top.	--
21.	Remove oversheaths and bedding tapes.	16
22.	Abrade oversheaths.	17
23.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
24.	Straighten copper screen wires and form into a bunch.	--
25.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
26.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
27.	Cut cores and remove core insulation to allow connector fitting.	31
28.	Apply a stress cone to each core.	35
29	Fit foam filler piece and build up cable oversheaths.	32
30.	Fit inner sleeve foam rings.	34
31.	Connect phase conductors and shear connector bolts.	31/36
32.	Fit phase insulation tubes.	37

Actions		**General Requirements (ST: CA2C/9)**
34.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
35.	Ensure joint is level and fill with Lovisil.	41
36.	Clean and degrease inner sleeve.	43
37.	Form copper screen wire bunches into one conductor, then add the three braids and connect to copper earth bar clamp.	42
38.	Remove temporary earth continuity bond applied in 3 and reseal EPR oversheaths.	51
39.	Wrap and stretch copper stocking across joint and connect to metallic sheath and copper screen wires.	44
40.	Build up cable oversheaths.	32
41.	Fit and support outer sleeve.	46
42.	Mix and pour resin.	47

All dimensions in mm



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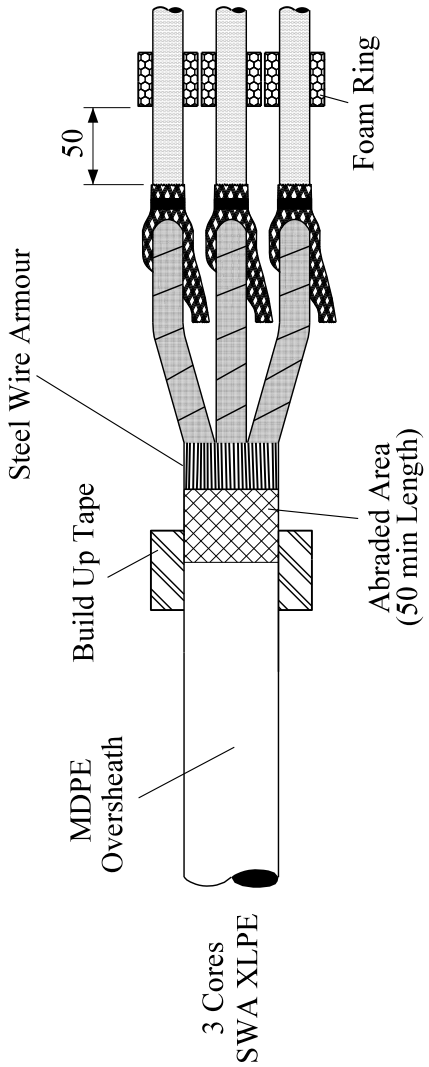

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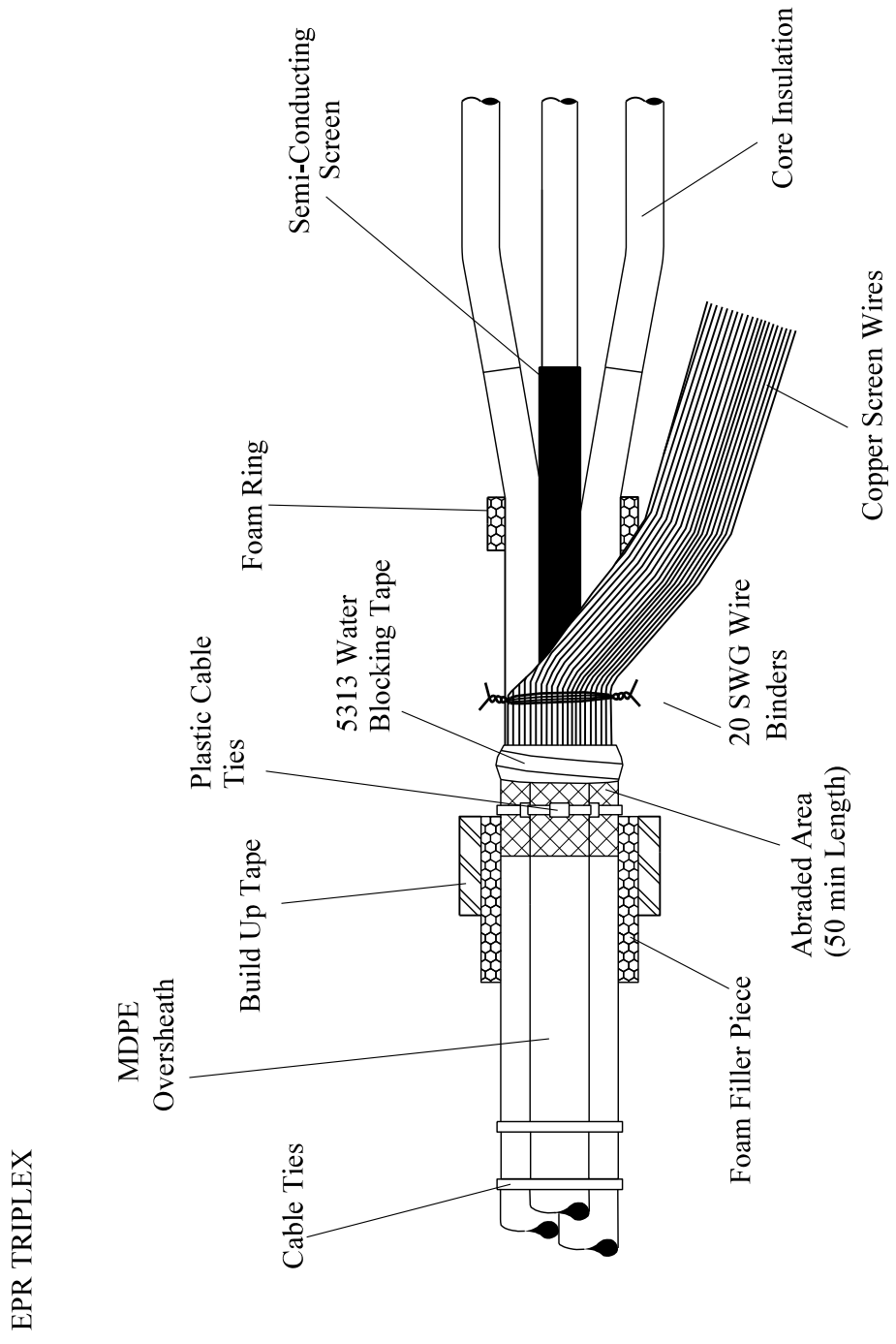

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.113

630mm² EPR – 630mm² EPR SINGLE CORE CABLE 11kV STRAIGHT JOINT

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual.

JOINTING PROCEDURE 7.113

JOINT KIT MATERIALS

CABLE SIZES: - 630mm² EPR – 630mm² EPR Single Core

Item	Quantity
Base Module BM M75	1
Resin Module RM-A	1
Connector VTPC36UTB	1
Sealing Sleeve WCSM 120/40x350	2

Note: - The Base Module contains the Cable Depending Modules.

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
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 (ST: CA2S).

JOINTING PROCEDURE 7.113

Actions		General Requirements (ST: CA2C/9)

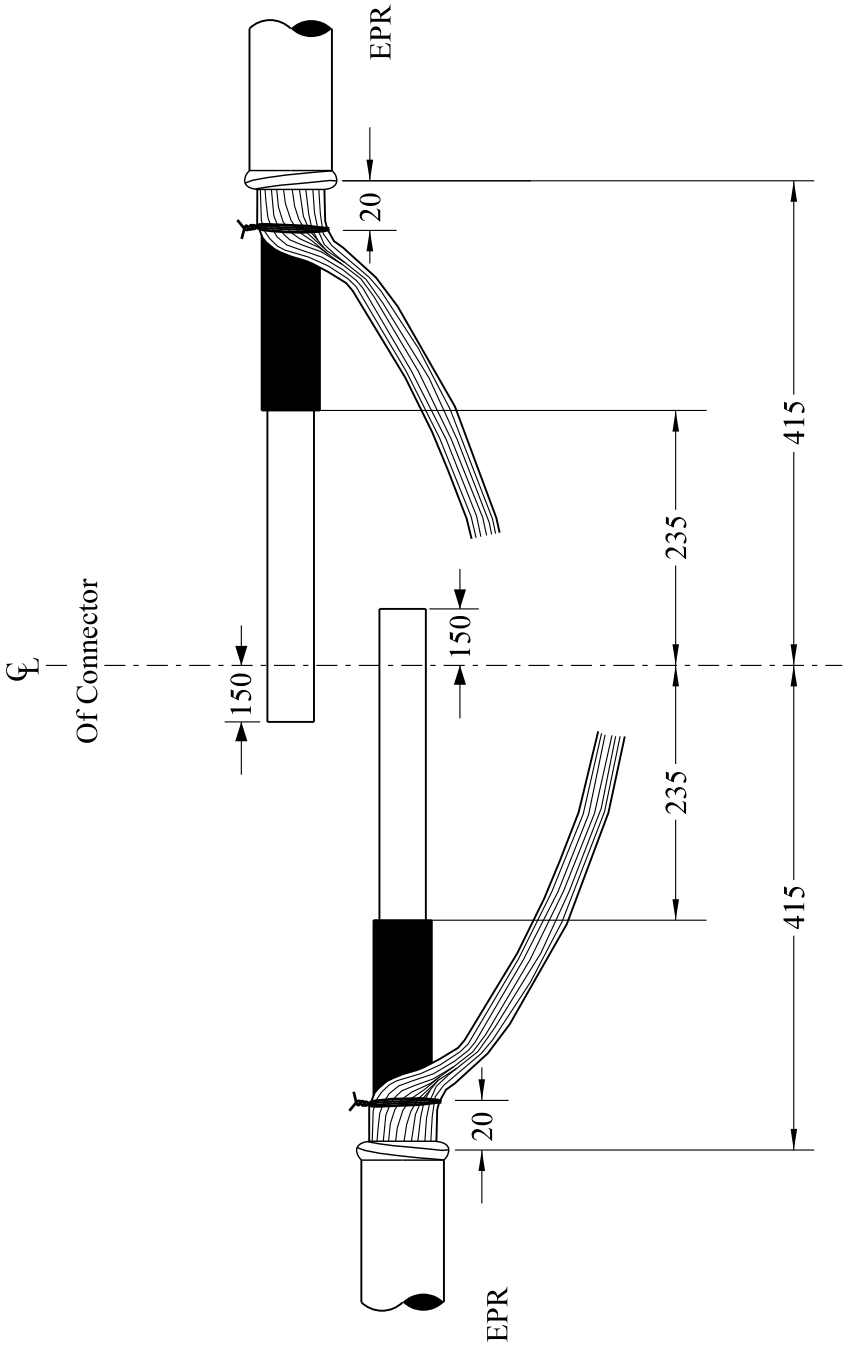
Refer to Drawings **JP2D 7.113.1, 7.113.2** and **7.113.3** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
2.	Identify and mark core phasing clear of joint position.	--
	EPR 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 of each cable.	--
6.	Remove oversheaths and bedding tapes.	16
7.	Abrade oversheaths.	17
8.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
9.	Straighten copper screen wires and form into a bunch.	--
10.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths. **Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.**	45
11.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
12.	Apply a stress cone to each core.	35
13.	Park insulation spacer over a core.	37
14.	Connect phase conductors and shear connector bolts.	31/36

JOINTING PROCEDURE 7.113- Continued

Actions		General Requirements (ST: CA2C/9)
15.	Fit inner sleeve foam rings.	34
16.	Position insulation spacer.	37
17.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
18.	Ensure joint is level and fill with Lovisil.	41
19.	Clean and degrease inner sleeve.	43
20.	Form copper screen wires into one conductor and connect to copper earth bar clamp.	42
21.	Remove temporary earth continuity bond applied in 4 and reseal EPR oversheaths.	51
22.	Wrap and stretch copper stocking across joint and connect to copper screen wires.	44
23.	Build up cable oversheaths.	32
24.	Fit and support outer sleeve ensuring 15mm clearance.	46
25.	Mix and pour resin.	47

All dimensions in mm



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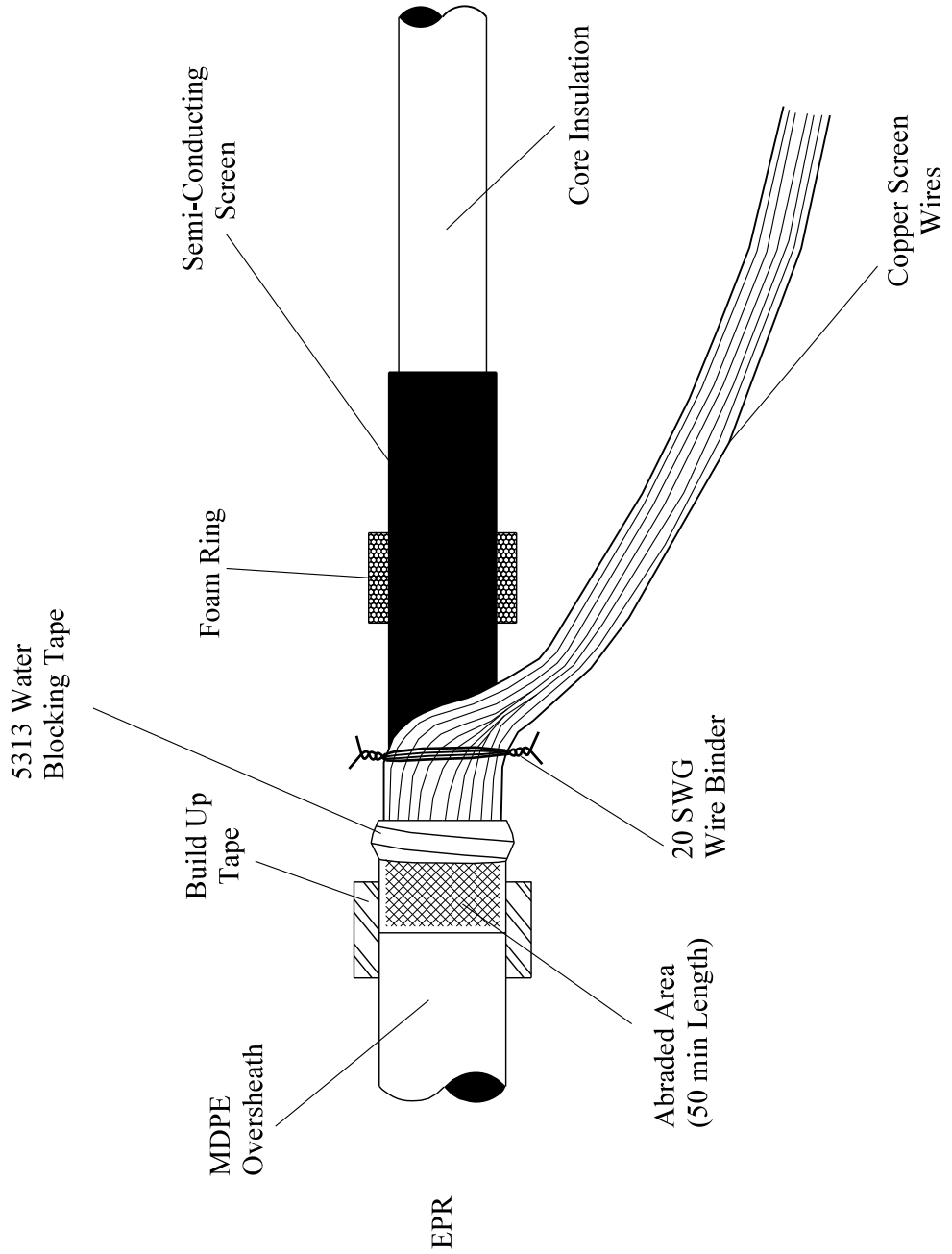

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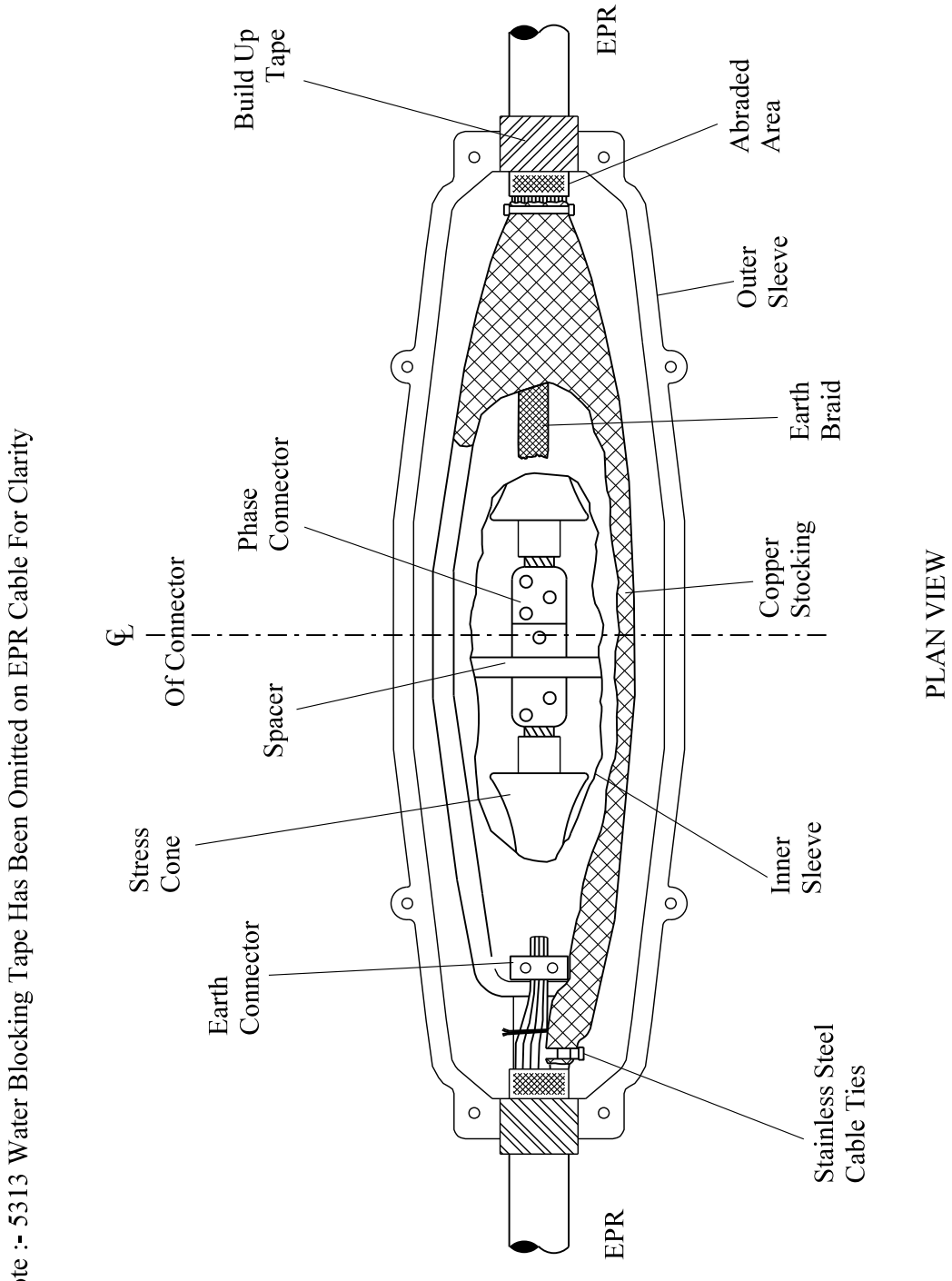

Note :- 5313 Water Blocking Tape Has Been Omitted on EPR Cable For Clarity

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.114

630mm² EPR – 500/630mm² PILC SINGLE CORE CABLE 11kV STRAIGHT JOINT.

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual.

JOINTING PROCEDURE 7.114

JOINT KIT MATERIALS

CABLE SIZES: - 630mm² EPR – 500/630mm² PILC Single Core

Item	Quantity
Base Module BM M75	1
Resin Module RM-A	1
Connector VTPC36UTB	1
Sealing Sleeve WCSM 120/40x350	1

Note: - The Base Module contains the Cable Depending Modules.

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
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 (ST: CA2S).

JOINTING PROCEDURE 7.114

Actions		General Requirements (ST: CA2C/9)

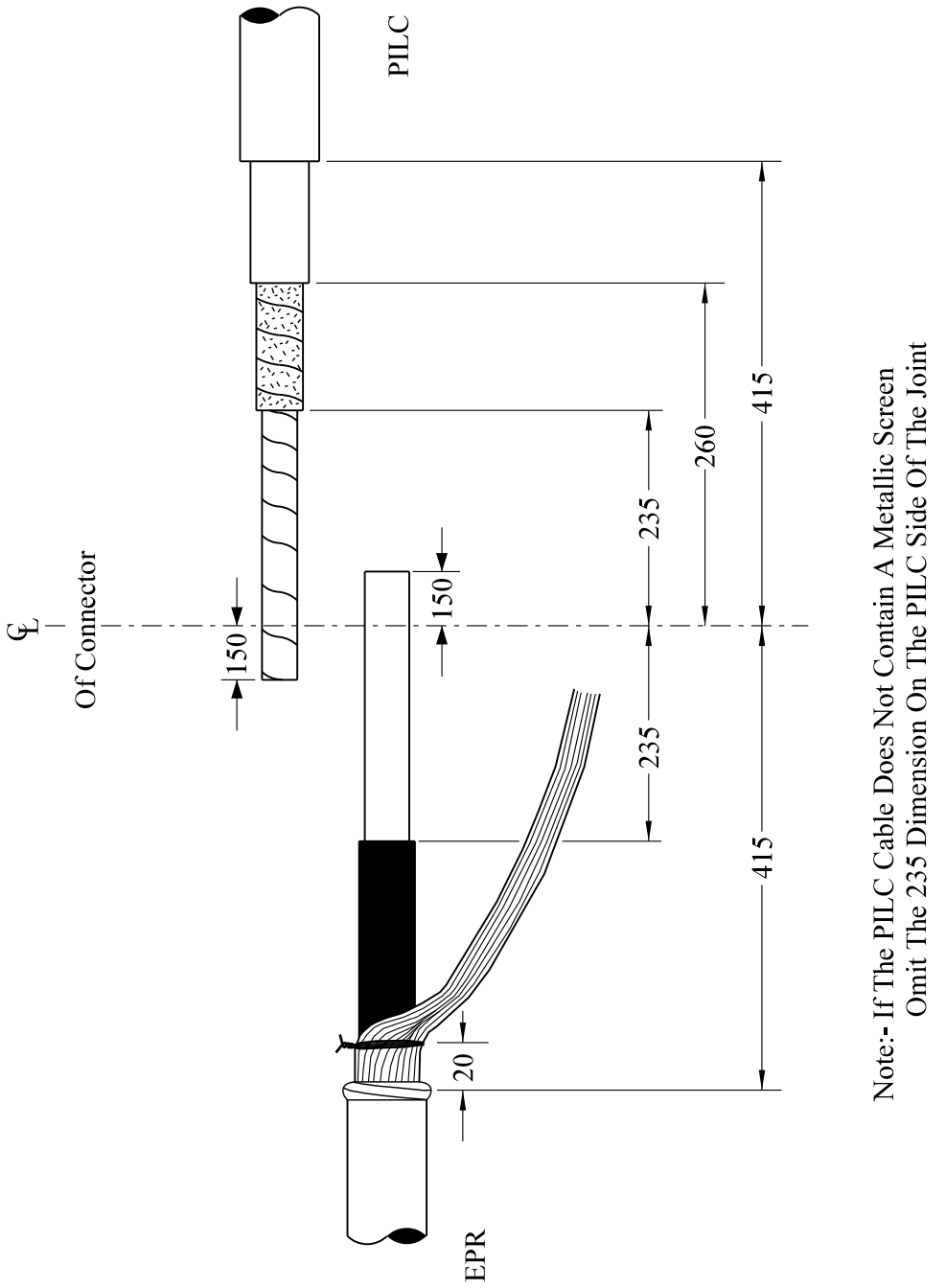
Refer to Drawings **JP2D 7.114.1, 7.114.2, 7.114.3** and **7.114** whilst undertaking this Jointing Procedure.

1.	Set and mark cables.	5/6
2.	Identify and mark core phasing clear of joint position.	--
	PILC CABLE - Preparation	
3.	Remove serving and clean lead sheath.	11
4.	Abrade metallic sheath from its termination point to serving termination point.	--
5.	Abrade PVC oversheath (if present).	17
6.	Apply a temporary earth continuity bond to metallic sheath.	10
7.	Remove metallic sheath.	18
8.	Carry moisture test.	8
9.	Remove metallic screen (if present), carbon papers and two conductor papers.	27
10.	Apply a silicon tape seal to metallic screen or conductor papers and metallic sheath.	24
11.	Using a clean dry wipe remove excess impregnate from core.	--
12	Apply a stress cone to core (if metallic screen present)	35
	EPR CABLE – Preparation	
13.	Clean oversheath for a distance of 1.5m.	--
14.	Apply a temporary earth continuity bond clear of joint position.	10
15.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of cable.	--

Actions		**General Requirements (ST: CA2C/9)**
16.	Remove oversheath and bedding tapes.	16
17.	Abrade oversheath.	17
18.	Apply a 20 swg binder around copper screen wires 20mm from oversheath termination point.	--
19.	Straighten copper wire screens and form into a bunch.	--
20.	Apply black mastic water blocking tape at the termination point of the MDPE oversheaths, 10mm on the coppers screen wires and overlapping 10mm onto the MDPE oversheaths.	45
	Note: - Wrap the fitted water blocking mastic with the yellow wax backing paper to prevent sticking and allow removal on completion of the joint.	
21.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
22.	Apply a stress cone to core.	35
23.	Park insulation spacer over a core.	37
24.	Connect phase conductors and shear connector bolts.	31/36
25.	Fit inner sleeve foam rings.	34
26.	Position insulation spacer.	37
27.	Fit inner sleeve, ensure bolts tightened in correct sequence and catch is fully home on second click.	39/40
28.	Ensure joint is level and fill with Lovisil.	41
29.	Clean and degrease inner sleeve.	43
30.	Apply metallic sheath bond to PILC cable and connect to copper earth bar clamp.	42

Actions		**General Requirements (ST: CA2C/9)**
31.	Form copper screen wire bunches into one conductor and connect to copper earth bar clamp.	42
32.	Remove temporary earth continuity bond applied in 6/14 and reseal EPR oversheath.	51
33.	Wrap and stretch copper stocking across joint and connect to metallic sheath and copper screen wires.	44
34.	Apply water block tape to metallic sheath.	45
35.	Build up cable oversheaths.	32
36.	Fit and support outer sleeve.	46
37.	Mix and pour resin.	47

All dimensions in mm



Note:- If The PILC Cable Does Not Contain A Metallic Screen
Omit The 235 Dimension On The PILC Side Of The Joint

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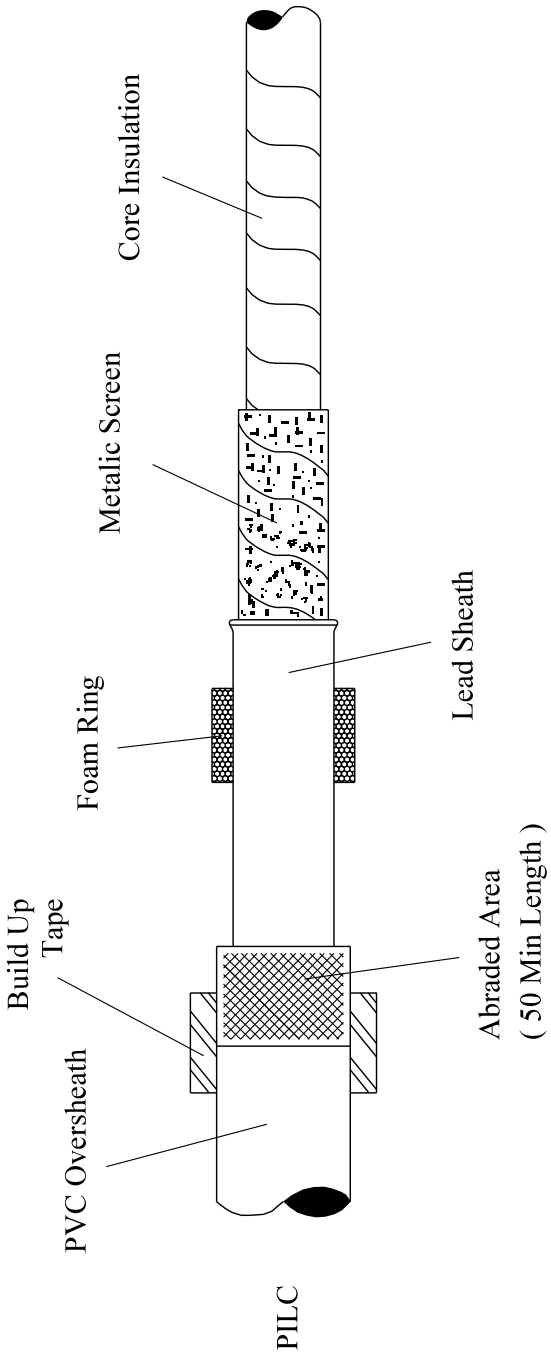
Title: 630mm² EPR - 500 / 630mm² PILC SINGLE CORE STRAIGHT JOINT STRIPPING DIMENSIONS

Drg. No.	Rev No
JP2D 7.114.1	1

All dimensions in mm



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1	RJB			07/17	FOAM RING ALTERED

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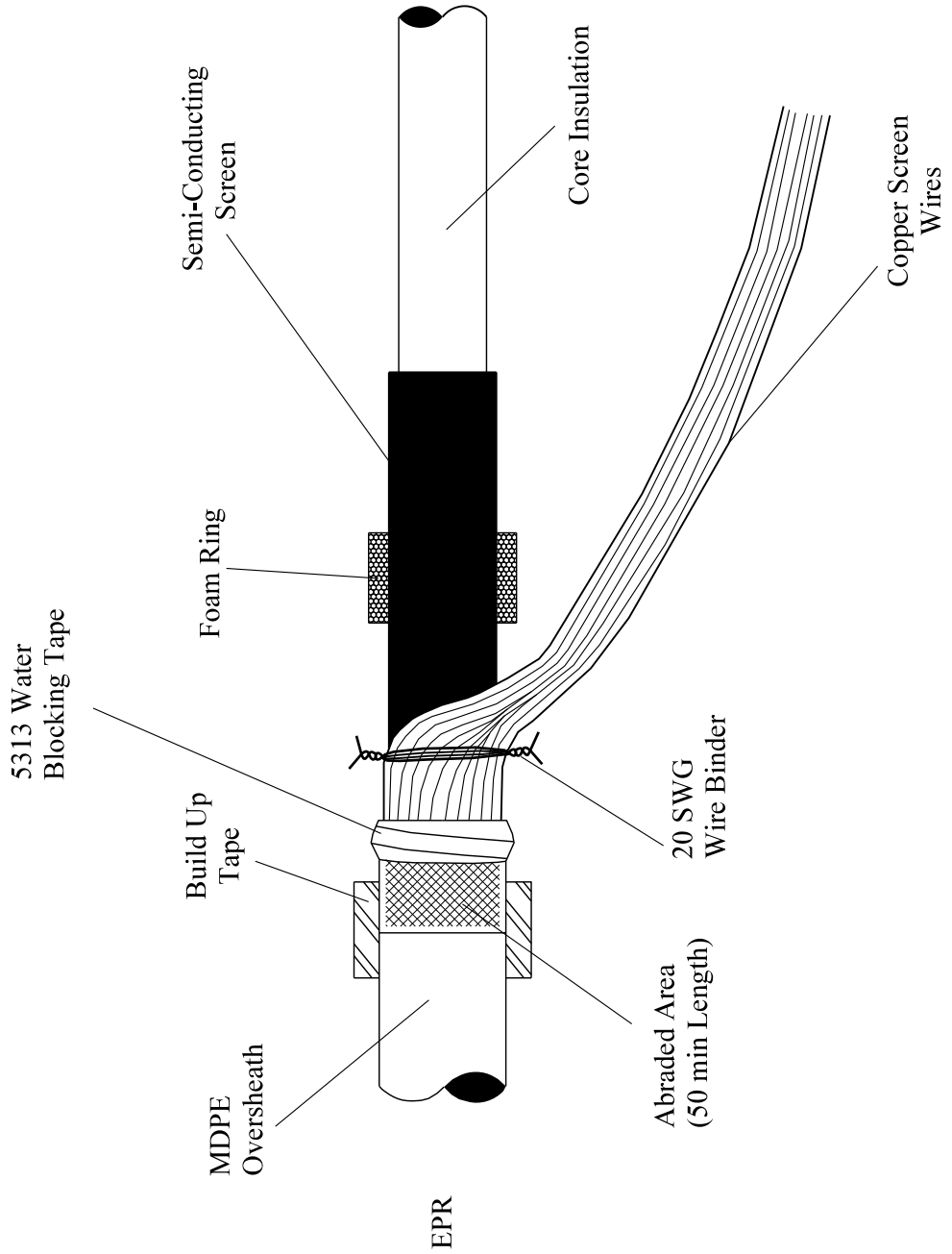
PREPARATION OF PILC

Drg. No.	Rev No
JP2D 7.114.2	1

All dimensions in mm



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Title

PREPARATION OF EPR

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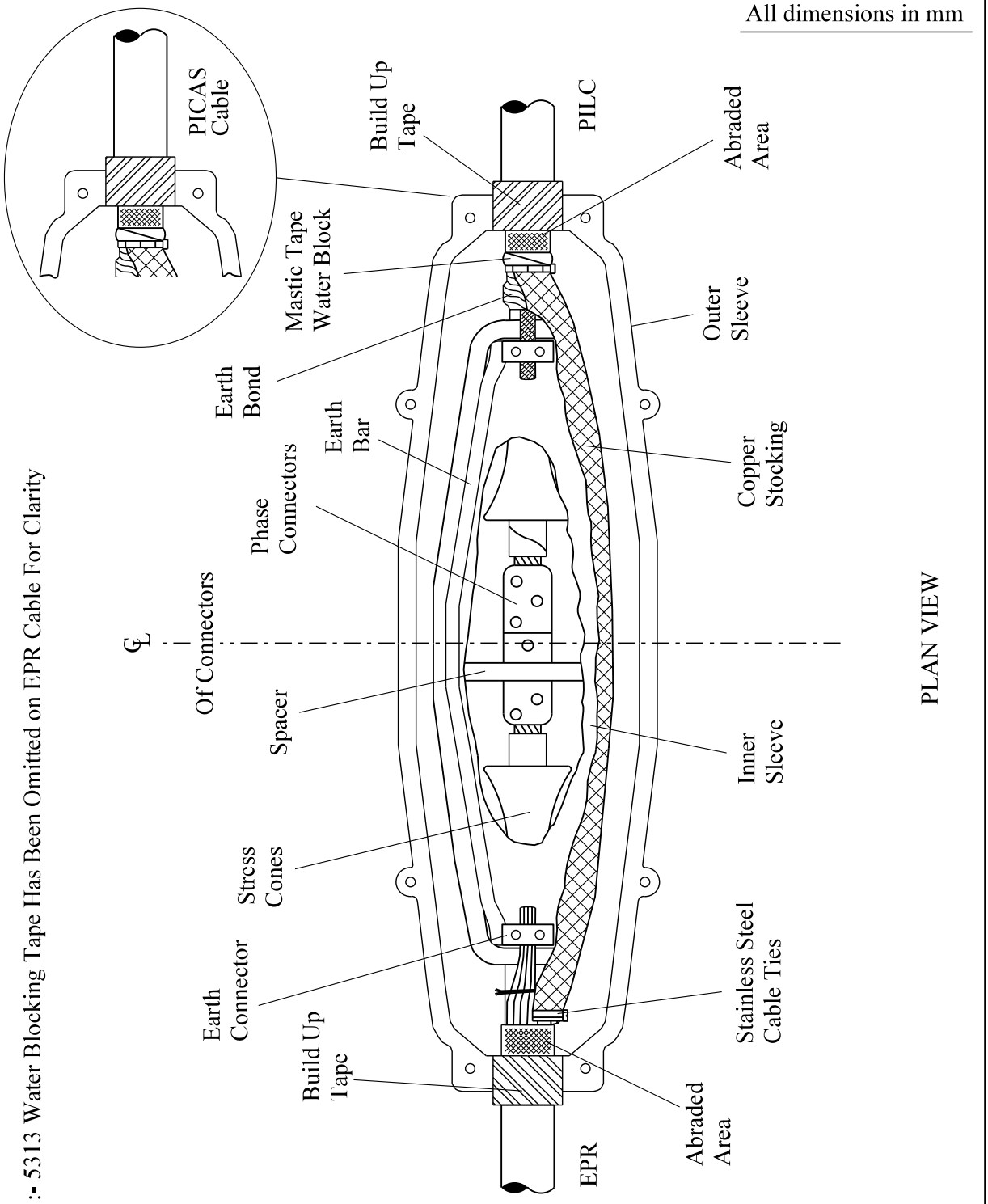
All dimensions in mm



Note :- 5313 Water Blocking Tape Has Been Omitted on EPR Cable For Clarity

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Title: 630mm^2 EPR - 500 / 630mm^2 PILC SINGLE CORE STRAIGHT JOINT GENERAL LAYOUT

Drg. No. JP2D 7.114.4

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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.115

185mm² EPR SINGLE CORE – 185mm² EPR SINGLE CORE CABLE 11kV STRAIGHT JOINT.

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

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual.

JOINTING PROCEDURE 7.115

JOINT KIT REFERENCES

CABLE SIZE		JOINT KIT REFERENCES
From	**To**	**Straight Joint**
70 EPR	70 EPR	SJ 1167
	95 EPR	SJ 1168
	185 EPR	SJ 1169
95 EPR	95 EPR	SJ 1170
	185 EPR	SJ 1171
185 EPR	185 EPR	SJ 1172

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

JOINTING PROCEDURE 7.115

JOINT KIT MATERIALS

KIT REF	BASE MODULE	BUILD UP MODULE	RESIN 3 Part	CONNECTOR	TUBE SET
	EJS CX 11A	CSJ-BuildUp-Kit-C-GB02	5 Litres	BAH-02-210-0023	SMOE 28003
SJ 1167	1	2	1	1	1
SJ 1168	1	1	1	1	1
SJ 1169	1	1	1	1	1
SJ 1170	1		1	1	1
SJ 1171	1		1	1	1
SJ 1172	1		1	1	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.115

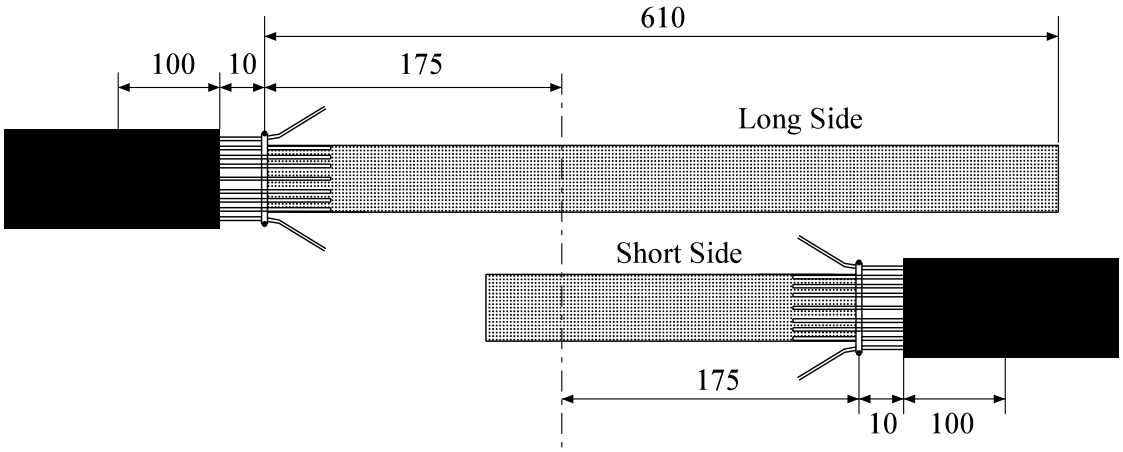
Actions		General Requirements (ST: CA2C/9)

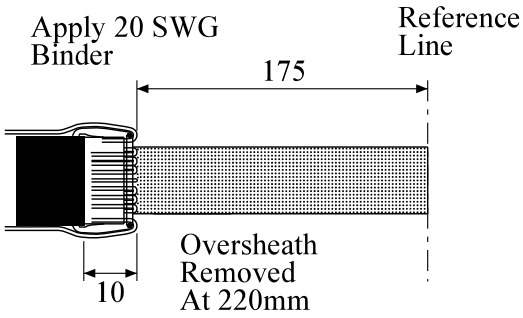
Refer to Drawings **JP2D 7.115.1, 7.115.2, 7.115.3 and 7.115.4** whilst undertaking this Jointing Procedure.

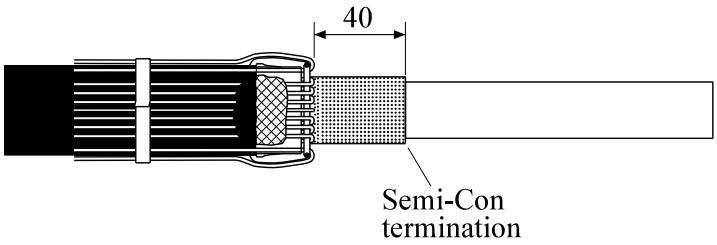
1.	Set and mark cables.	5/6
	EPR CABLE – PREPARATION	
2.	Clean each oversheath for a distance of 1.5m.	--
3.	Apply a temporary earth continuity bond clear of joint position.	10
4.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
5.	Remove oversheaths and bedding tapes.	16
6.	Apply 20swg binder to copper wire screens 10mm up from oversheath termination.	48
7.	Abrade oversheath for 100mm.	17
8	Apply one layer Scotch 5313 tape at oversheath termination.	48
9.	Turn back copper screen wires over earth arrangement applied in 6 and secure with Scotch 88 tape. Do not trim copper screen wires at this stage.	48
10.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
11.	Connect phase conductors. Do not shear connector bolts at this stage.	36
12.	Remove connector applied in 9. Check measurement between semi-conducting screens is correct.	48
13.	Position cold shrink joint body over a core.	48
14.	Reconnect phase conductors ensuring correct connector set up.	--

Actions		**General Requirements (ST: CA2C/9)**
Note: -	Ensure actions 12/13 are complete before final shearing off connector bolts.	
15.	Fit cold shrink insulation tube.	48
16.	Clean and degrease joint length.	43
17.	Apply one layer of 50% overlap knit mesh over joint body.	49
18.	Fold copper screen wires over knit meshed joint body, cut the screen wires and fit into tunnel connector.	49
19.	Apply the remainder of the knit mesh to the insulation tube centre.	49
20.	Remove temporary earth continuity bond applied in 3 and reseal oversheaths.	51
21.	Apply VM tape binders at shell stand-off positions.	49
22.	Build-up cable oversheaths.	--
23.	Fit and support shell ensuring 15mm clearance.	49
24.	Mix and pour resin.	50

All dimensions in mm







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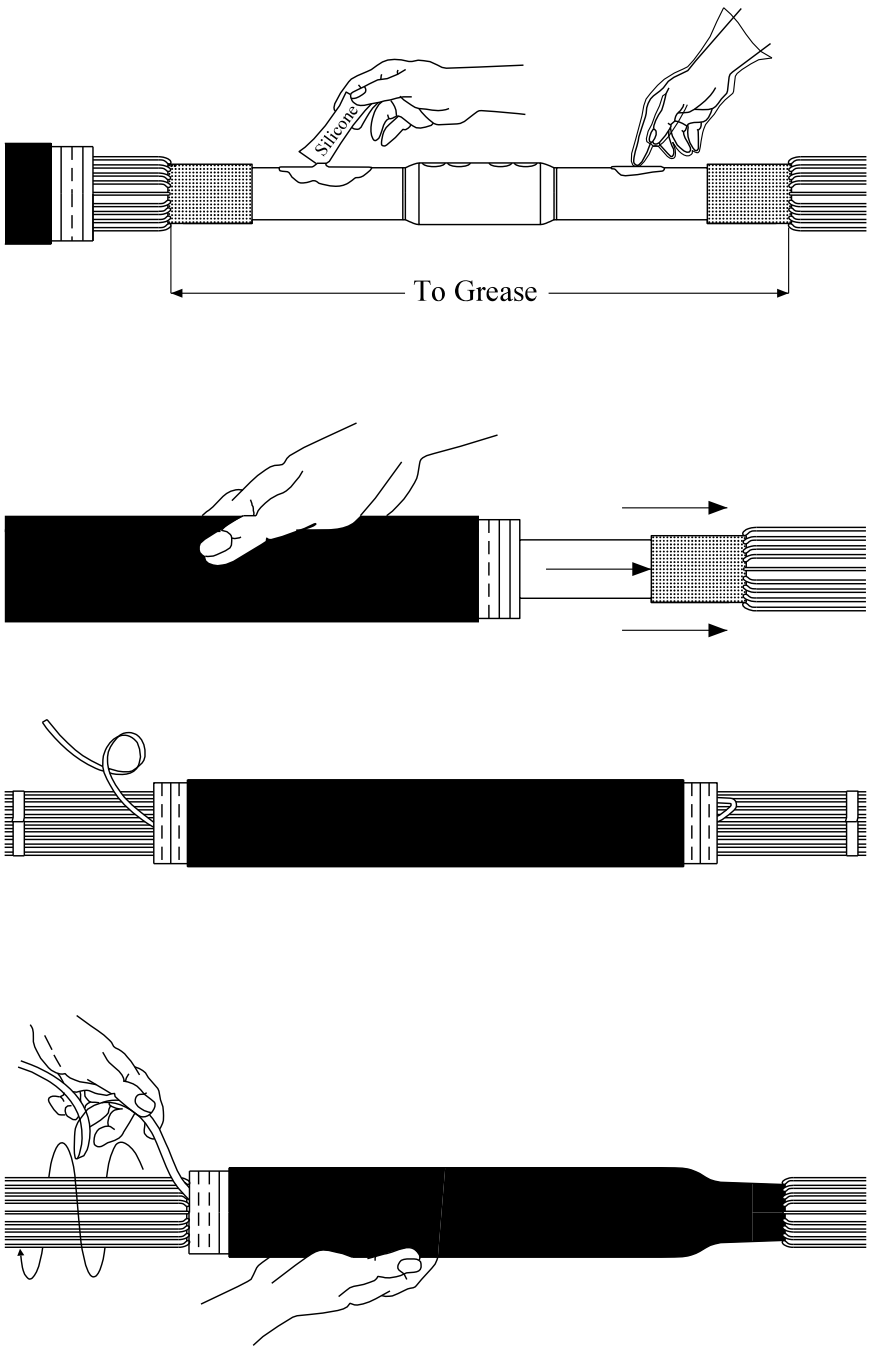
All dimensions in mm



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Drg. No. JP2D 7.115.2

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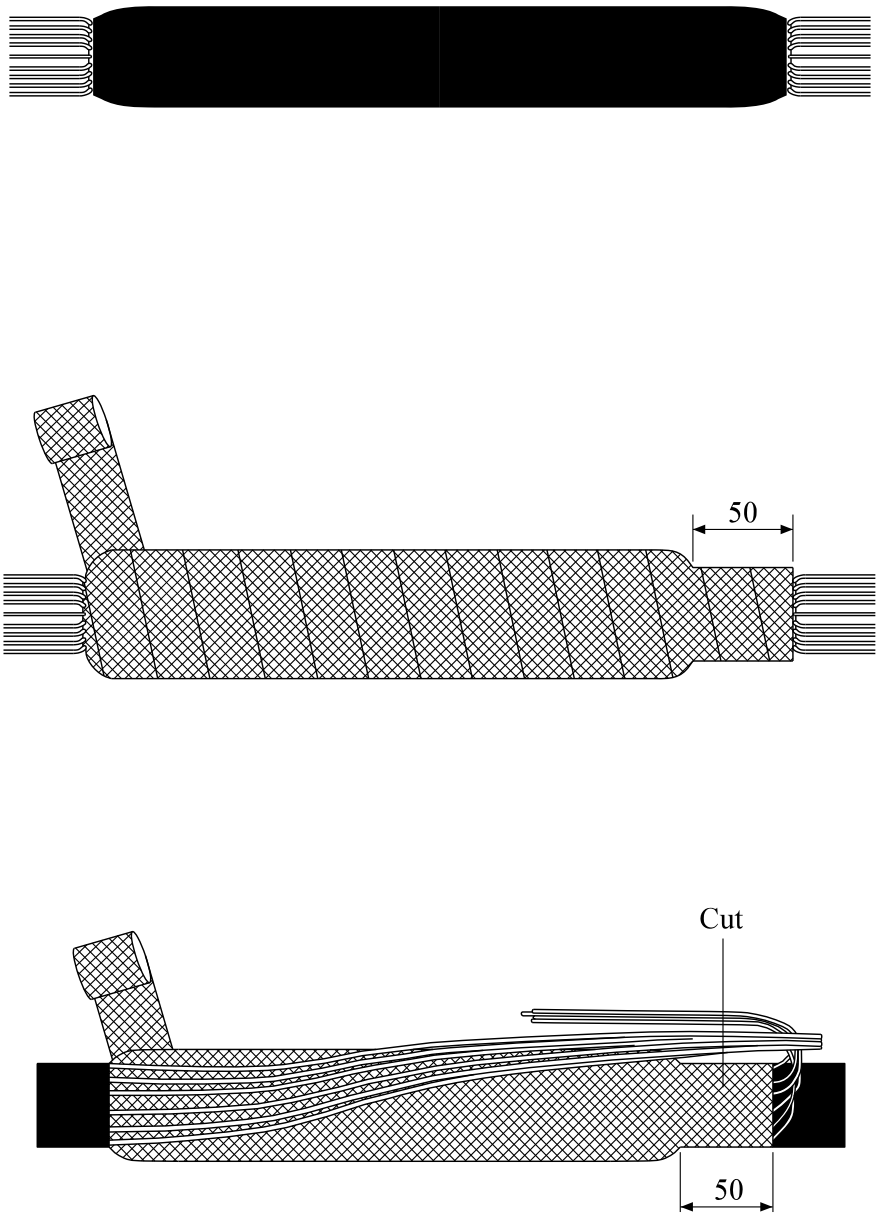
All dimensions in mm



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Title
185mm² EPR SINGLE CORE - 185mm² EPR SINGLE CORE STRAIGHT JOINT

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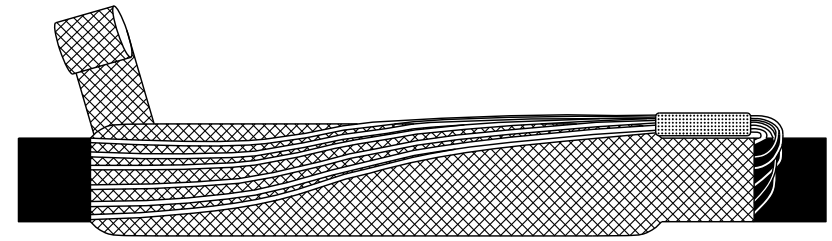
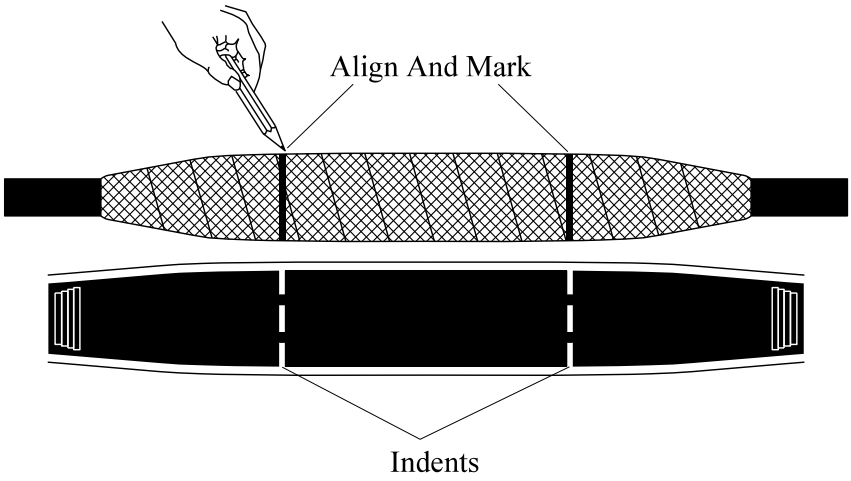
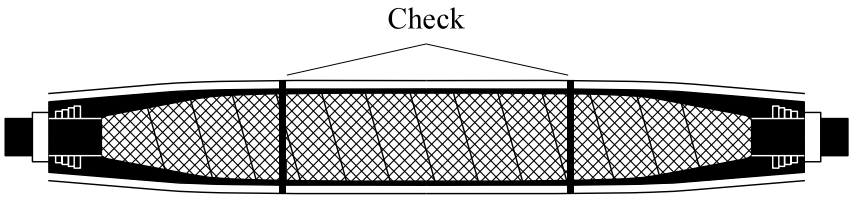
Rev No

All dimensions in mm







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ST CA2V/4 PROCEDURES FOR MAKING 11kV CABLE STRAIGHT JOINTS.

JOINTING PROCEDURE 7.116

300mm² EPR SINGLE CORE – 300mm² EPR SINGLE CORE CABLE 11kV STRAIGHT JOINT.

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

This procedure is to be read in conjunction with the appropriate General Requirements ST: CA2C/9 Section 6 of the 11kV Jointing Manual.

JOINTING PROCEDURE 7.116

JOINT KIT REFERENCES

CABLE SIZE		KIT REFERENCES
From	**To**	**Straight Joint**
185	185	SJ 1173
	300	SJ 1174
300	300	SJ 1175

Note: - The jointing materials for 240mm² EPR will be as 300mm² EPR.
Any reference to EPR equally applies to XLPE.

JOINTING PROCEDURE 7.116

JOINT KIT MATERIALS

KIT REF	BASE MODULE	RESIN 3 Part	CONNECTOR	CONNECTOR	TUBE SET
	CSJT-12C/1XU-1XU-GB01	6.5 Litre	BAH-02-210-0023	Brass Tunnel connector	SMOE 28003
SJ 1173	1	1	1	1	1
SJ 1174	1	1	1	1	1
SJ 1175	1	1	1	1	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
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 (ST: CA2S).

JOINTING PROCEDURE 7.116

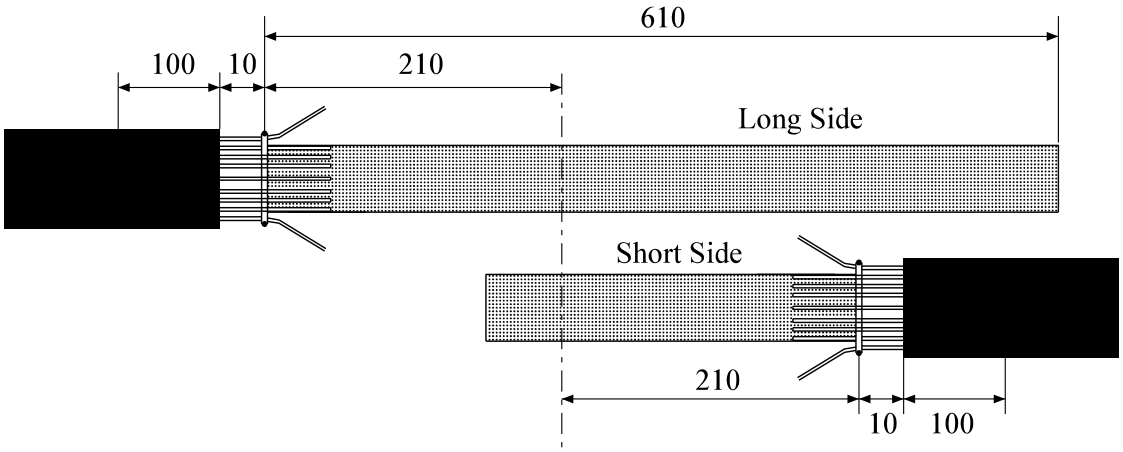
Actions		General requirements (ST: CA2C/9)

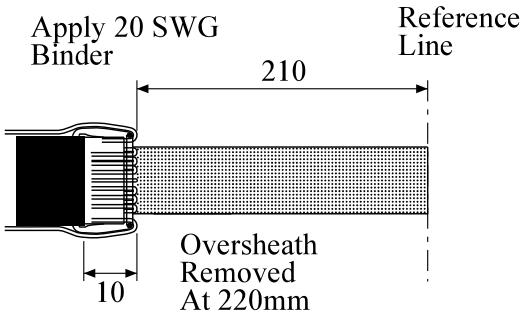
Refer to Drawings **JP2D 7.116.1, 7.116.2, 7.116.3 and 7.116.4** whilst undertaking this Jointing Procedure.

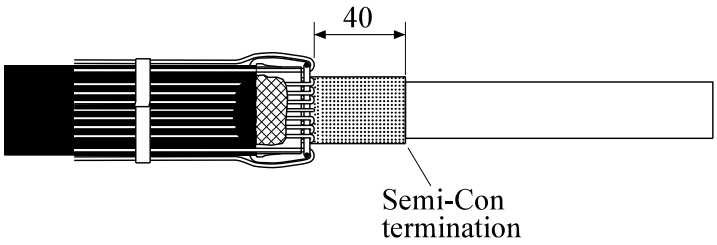
1.	Set and mark cables.	5/6
	EPR CABLE – PREPARATION	
2.	Clean each oversheath for a distance of 1.5m.	--
3.	Apply a temporary earth continuity bond clear of joint position.	10
4.	Park a mastic lined heat shrink tube next to temporary earth continuity bond of each core.	--
5.	Remove oversheaths and bedding tapes.	16
6.	Apply 20swg binder to copper wire screens 10mm up from oversheath termination.	48
7.	Abrade oversheath for 100mm.	17
8	Apply one layer Scotch 5313 tape at oversheath termination.	48
9.	Turn back copper screen wires over earth arrangement applied in 6 and secure with Scotch 88 tape. Do not trim copper screen wires at this stage.	48
10.	Remove semi-conducting screens ensuring insulation is free from all conducting material.	28
	COMPLETION OF JOINT	
11.	Connect phase conductors. Do not shear connector bolts at this stage.	36
12.	Remove connector applied in 9. Check measurement between semi-conducting screens is correct.	48
13.	Position cold shrink joint body over a core.	48
14.	Reconnect phase conductors ensuring correct connector set up.	--

Actions		**General Requirements (ST: CA2C/9)**
Note: - Ensure actions 12/13 are complete before final shearing off connector bolts.		
15.	Fit cold shrink insulation tube.	48
16.	Clean and degrease joint length.	43
17.	Apply one layer of 50% overlap knit mesh over joint body.	49
18.	Fold copper screen wires over knit meshed joint body, cut the screen wires and fit into tunnel connector.	49
19.	Apply the remainder of the knit mesh to the insulation tube centre.	49
20.	Remove temporary earth continuity bond applied in 3 and reseal oversheaths.	51
21.	Apply VM tape binders at shell stand-off positions.	49
22.	Build-up cable oversheaths.	--
23.	Fit and support shell ensuring 15mm clearance.	49
24.	Mix and pour resin.	50

All dimensions in mm







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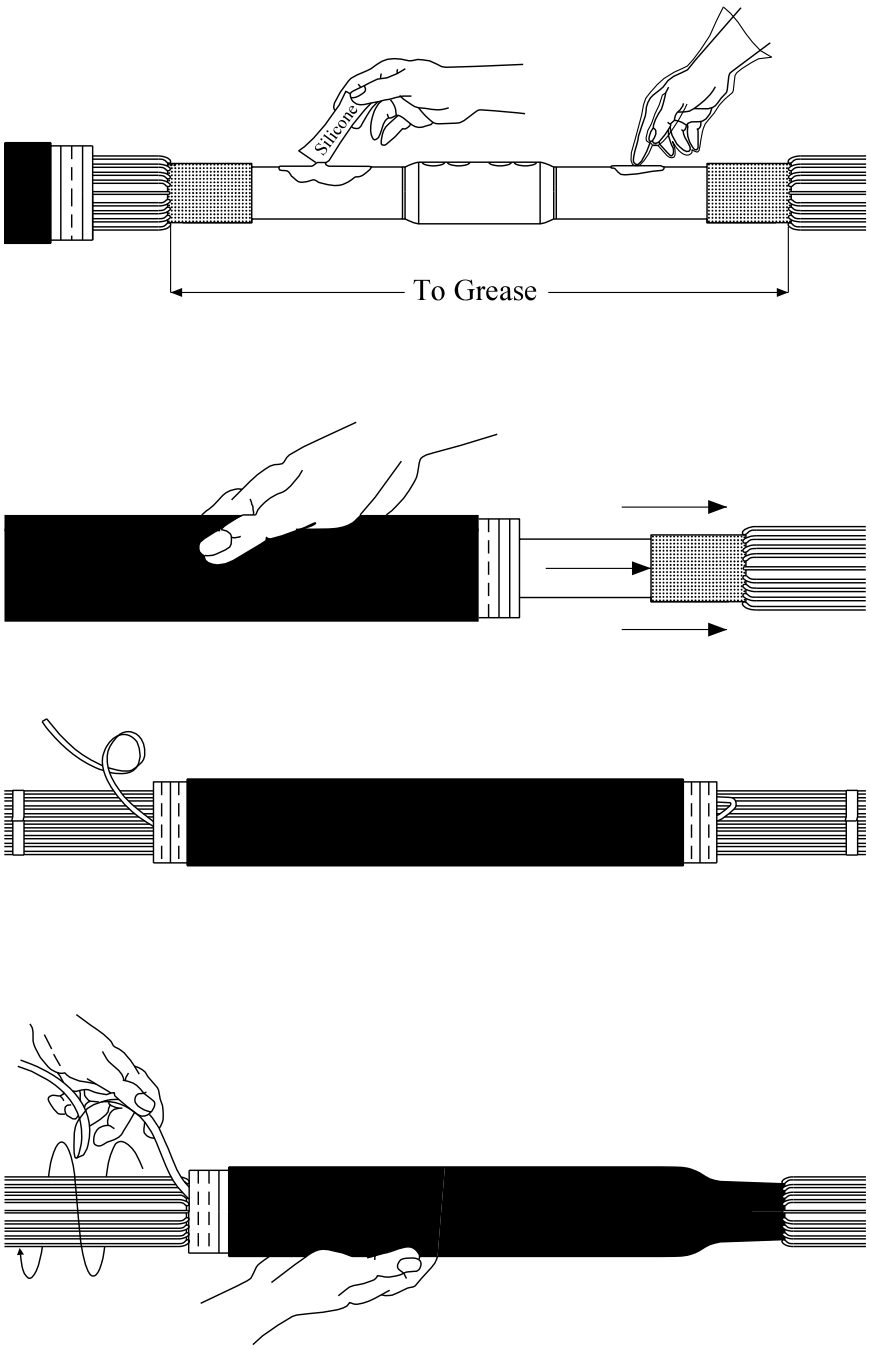
All dimensions in mm



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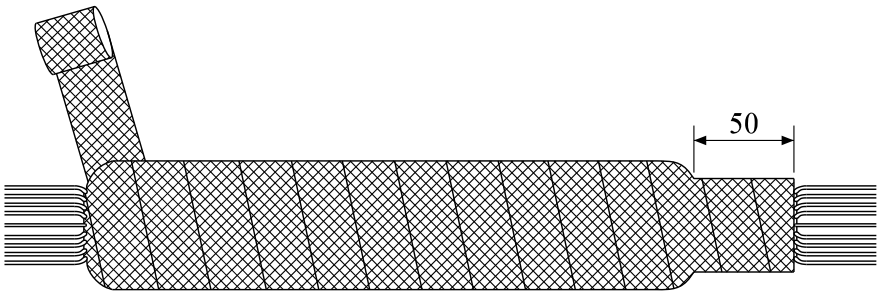
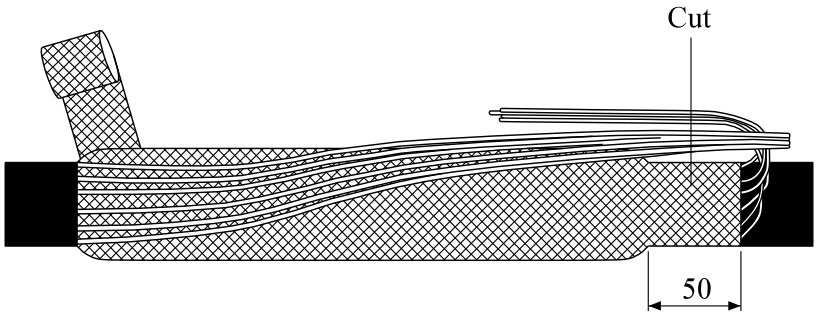
JP2D 7.116.2	

All dimensions in mm





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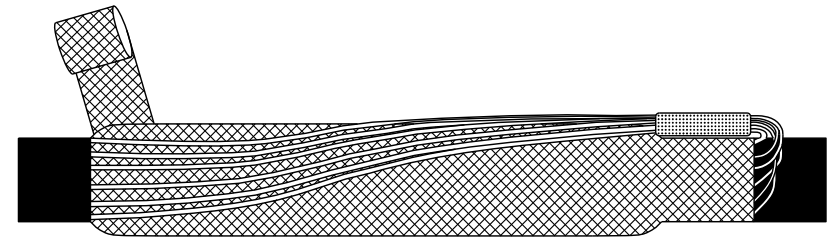
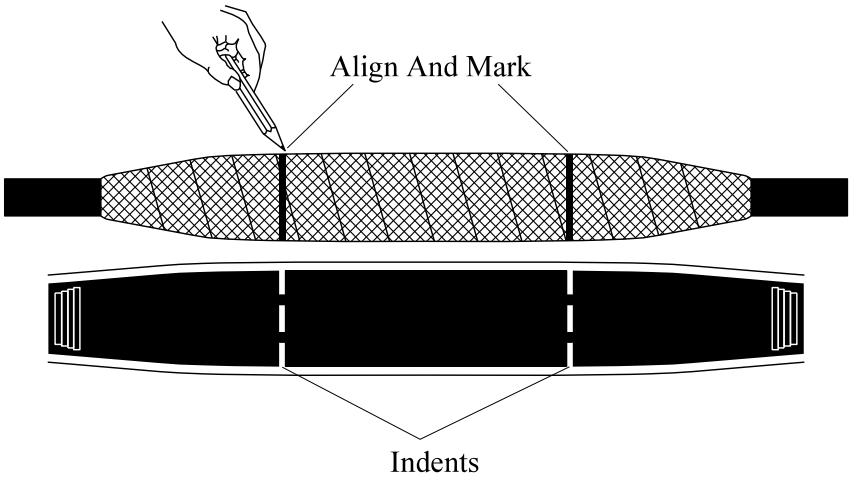
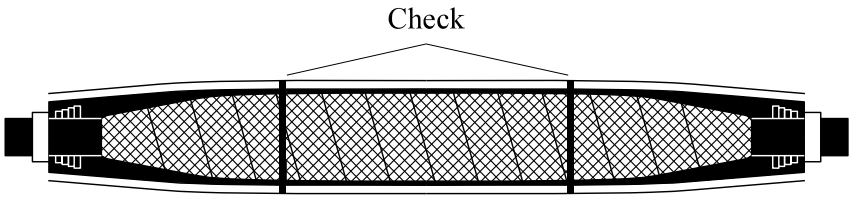
All dimensions in mm







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APPENDIX A

SUPERSEDED DOCUMENTATION

This document replaces ST: CA2V/3 dated May 2016 which should now be withdrawn.

APPENDIX B

ASSOCIATED DOCUMENTATION

ST: CA2A/2, ST: CA2C/8, ST: CA2M/4, ST: CA2N/4, ST: CA2O/3, ST: CA2S/3, ST: CA2T/3, ST: CA2U/3.

APPENDIX C

KEY WORDS

11kV straight joints, 11kV transitional straight joints.