Company Directive

STANDARD TECHNIQUE : CA1A/2

Relating to Standard Low Voltage Mains Jointing Configurations

This Standard Technique document details the various jointing configurations which are possible within the WPD standard practices for LV Mains jointing. It should be noted that because of the need to ensure adequate clearances in joints, the materials must not be used in any other manner than those laid down.

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

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

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

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Implementation Date:	**June 2012**
Approved by:	
	Policy Manager
Date:	1 June 2012

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

ST: CA1A/2 LOW VOLTAGE MAINS STANDARD JOINTING CONFIGURATIONS

This Standard Technique document details the various jointing configurations which are possible within the WPD standard practices for LV Mains jointing. It should be noted that because of the need to ensure adequate clearances in joints, the materials must not be used in any other manner than those laid down.

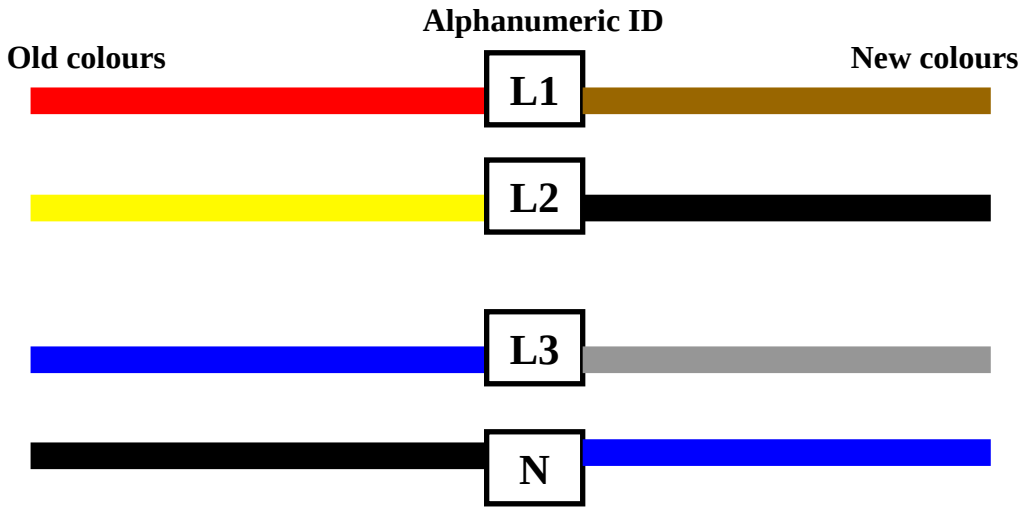
If a jointing procedure not covered in the Low Voltage Mains Jointing Manual is required, advice should be obtained from the Policy Manager, Avonbank, Bristol.

This Standard Technique document is an overview of the jointing configurations and for details of an individual joint, the appropriate jointing procedure should be consulted.

All the LV joints detailed below, unless stated otherwise are designed for live working.

1. BACKGROUND

Since 01/04/06 the British Standards BS EN 60446 document dictating the phase colours used in the various LV Mains cables has changed, this change is mandatory, the old and new colours along with the associated alphanumeric are shown on the graphic below: -



These new colours apply to all electrical industries, including the electrical utilities, it should be noted that the old colours are no longer allowed to be purchased and used on the WPD system. Therefore when working on the existing “old colours” care shall be taken in jointing the new colours to the old. To avoid confusion when jointing the existing old colour red shall be marked with the alphanumeric tape L1 and the new colour brown shall also be marked with alphanumeric tape L1 and then the two L1’s shall be jointed together; to avoid confusion when jointing the existing old colour yellow shall be marked with the alphanumeric tape L2 and the new colour black shall also be marked with alphanumeric tape L2 and then the two L2’s shall be jointed together; to avoid confusion when jointing the existing old colour blue shall be marked with the alphanumeric tape L3 and the new colour grey shall also be marked with alphanumeric tape L3 and then the two L3’s shall be jointed together. This will ensure colour true jointing with no inadvertent crosses.

Any LV Mains single core circuit that is laid shall be laid in a trefoil group of L1, L2 and L3, the three cables shall be cable tied every 1.5m in a straight run and every 1m when going around a corner, the cable ties to be used are SHOPS number 35370. If a second circuit is being laid in the same trench then there shall be a minimum centre to centre spacing of 300mm between the two circuits, at no time shall a phase of one trefoil group be laid with the second trefoil group.

BS EN 60446 - *Basic and Safety Principals for Man-Machine Interface, Marking and Identification (2007)* – Quote: - "The identification by colours, for identification of conductors, the following colours are permitted: - black, brown, red, orange, yellow, green, blue, violet, grey, white, pink, turquoise.

The identification by colour shall be used at terminations and preferably throughout the length of the conductor either by colour of the insulation or by colour markers. Additional marking, for example alphanumerical or numerals, are allowed, provided that the colour identification remains unambiguous."

Therefore at all times Jointers shall joint 'colour true', or if there is a mixture of old and new phase colours jointing shall be as indicated in the coloured graphic on page 2 of this document. The only dispensation for this is unless the Jointer has been instructed to do otherwise by their Team Manager.

2. MAINS STRAIGHT JOINTS

Mains straight joints for all the cables normally found on the WPD LV Mains network are included; it is possible to combine services in mains straight joints. The procedures are equally applicable to split or plain concentric.

Provision is made for a neutral/earth or earth electrode to be taken out of each joint.

Wavecon – Wavecon

All sizes of three and four core Wavecon may be straight jointed together.

There is also a combined straight and service joint. Due to the configuration of the shell, it is possible to take out services from one end only. Either two single phase or one three phase service may be accommodated.

This joint is seen as a repair joint, but may be also be used for new construction.

Wavecon – Consac

All sizes of Wavecon and Consac may be straight jointed together.

There is also a combined straight and service joint. Due to the configuration of the joint shell, it is possible to take out services from the Wavecon end only. Either two single phase or one three phase service may be accommodated.

This joint is seen as a repair joint, but may also be used for new construction.

Wavecon – PILC

All sizes of Wavecon and PILC may be straight jointed together.

There is also a combined straight and service joint. Due to the configuration of the shell, it is possible to take out one single phase or one three phase service together with a neutral earth from one end of the shell only.

This joint is seen as a repair joint, but may be used for new construction.

Solidal – Solidal

The joint is designed to accommodate 600mm² and 740mm² size cable.

Solidal – PILC

The joint is designed to accommodate 600mm² and 740mm² Solidal to 0.75in² PILC.

3. MAINS BRANCH JOINTS

Mains branch joints for all cables normally found on the WPD LV network are included.

Provision is made for a neutral/earth or earth electrode to be taken out of each joint.

Wavecon Main – Wavecon Branch

This joint is designed for cut and uncut main and all sizes of three and four core Wavecon may be accommodated.

Consac Main – Wavecon Branch

This joint is designed for uncut main and all sizes of Consac and Wavecon may be accommodated.

PILC Main – Wavecon Branch

This joint is designed for uncut main and all sizes of Wavecon and PILC may be accommodated.

4. MAINS STOP ENDS

In some cases it is possible to combine services into the stop end. The procedures provide provision for taking services out of the various stop ends and the service cables can be equally applicable to split or plain concentric service cable.

Wavecon

All sizes of three and four Wavecon may be accommodated.

Provision is made for a neutral/earth or earth electrode to be taken out of each joint.

There is also provision for taking out services from this stop end. Two-single phase or one three phase service may be taken from each end, the neutral/earth electrode being taken from the free main cable entry.

Consac

All sizes of Consac may be accommodated.

Provision is made for the neutral/earth electrode to be taken out of each joint.

There is also provision for taking out services from this stop end. Two single phase or one three phase service may be taken from one end and the neutral/earth electrode being taken from the free main cable entry.

PILC

All sizes of PILC may be accommodated

There is provision for a neutral/earth or earth to be taken out of each joint.

There is also provision for taking out services from this stop end. Two single phase or one three phase may be taken from each end, the neutral /earth electrode being taken from the free main cable entry.

5. MAINS TERMINATIONS

All terminations are **DEAD WORKING** only.

Only terminations for three and four Wavecon and Solidal cables are included in this code of practice. There are no approved jointing procedures for terminating other types of mains cable. In these cases it will be necessary to let in a Wavecon tail.

Terminations for the following applications are included.

(i) Indoor termination for fuse boards, pillars etc.

(ii) 200/300/400/600A cut-outs.

(iii) Isolatable multi-way fuse board.

(iv) LV CT metering panel.

(v) Pole termination to open-wire line.

(vi) Pole termination to ABC.

(vii) Pole termination to fuses.

(viii) Solidal termination.

6. LINK DISCONNECTING BOXES (LDB's)

The new Prysmian 2 way SHOPS No. 30809 and 4 way LDB's SHOPS No 30808 can be used with LIVE working methods on Wavecon and PILC cables ONLY.

Use of other LV Mains cable types will involve letting in a Wavecon tail.

Procedures are included for:

(i) Two-way (CNE & SNE).

(ii) Four-way (CNE & SNE).

Provision is made for a neutral/earth or earth electrode to be taken out of each joint.

7. MAINS SERVICE JOINTS

Jointing procedures for servicing from all types of mains cables are included. They are equally applicable to split or plain concentric service cables.

Wavecon (three and four core)

It is possible to take out two single phase or one three phase service, from each end of the joint.

Consac

It is possible to take out two single phase or one three phase service, from each end of the joint.

PILC

It is possible to take out two single phase or one three phase service, from each end of the joint.

8. MAINS LOOP JOINTS

Mains loop joints for all cables normally found on the WPD LV network are included.

Provision is made for a neutral/earth or earth electrode to be taken out of each joint.

Wavecon-Wavecon

All sizes of three and four core Wavecon may be accommodated.

Wavecon-Consac

All sizes of three core Wavecon and Consac may be accommodated.

Wavecon-PILC

All sizes of three and four Wavecon and PILC may be accommodated.

9. MAINS PILC TWIN AND TRIPLE CONCENTRIC JOINTING

Provision is made for a neutral/earth or earth to be taken out of each joint.

Twin Concentric – straight joint

All sizes of three and four core Wavecon and Twin Concentric may be accommodated.

Twin Concentric –stop ends

All sizes of Twin Concentric may be accommodated.

Twin Concentric – service branch

This joint is restricted to two single phase services, one from each end of the joint. Split or plain concentric may be accommodated.

Triple Concentric – straight joint

All sizes of three and four core Wavecon and Triple Concentric may be accommodated.

Triple Concentric – stop end

All sizes of triple concentric may be accommodated.

Triple Concentric – service branch

This joint is restricted to two single phase services, one from each end of the joint. Split or plain concentric service cable may be accommodated.

Note: - There are no joints available for branch jointing LV mains three or four core Wavecon on to Twin or Triple PILC Concentric cables.

APPENDIX A

SUPERSEDED DOCUMENTATION

This Standard Technique supersedes ST:CA1A/1 dated October 2001 which should now be withdrawn.

APPENDIX B

ASSOCIATED DOCUMENTATION

ST: CA1B, ST: CA1C/5, ST: CA1 D, ST: CA1E, ST: CA1F, ST: CA1G, ST: CA1H, ST: CA1I, ST: CA1U, ST: CA1W, ST: CA1X, ST: CA1Y, ST: CA1Z, ST: CA1AA, ST: CA1AB, ST: CA7A, ST: CA7B, ST: CA7C, ST: CA7D.

APPENDIX C

IMPACT ON COMPANY POLICY

None, as this document has just been updated to incorporate the latest ST: HS8H and other minor changes.

APPENDIX D

IMPLEMENATION OF POLICY

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

APPENDIX E

KEY WORDS

Jointing configurations available for LV Mains jointing.

APPENDIX F

DOCUMENT LAST REVIEWED

June 2012