

# Electricity Specification 400C30

Issue 4      November 2021

## Overhead Line Copper-work



## Amendment Summary

ISSUE NO. DATE	DESCRIPTION
<b>Issue 4</b>	New Template applied.
<b>November 2021</b>	Prepared by: D M Talbot  Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director

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## 1 Introduction

This Specification comprises general requirements for approvals and testing of copper-work for use on overhead lines employed on the electricity distribution network owned by Electricity North West Limited (Electricity North West). Also included are technical particulars relating to the constructional requirements of all copper-work, and the markings that shall be applied to all copper-work prior to delivery. [Appendix A](#) comprises a schedule of all copper-work in alphanumeric order, followed by associated drawings (in drawing number order).

## 2 Scope

This Specification covers all separate copper-work items required for the construction of overhead lines (from LV to 132kV) as identified in the appropriate overhead line Specification (e.g. ES400O2, ES400O3).

## 3 Definitions

<b>ABC</b>	Aerial Bundled Conductor.
<b>Approval</b>	Sanction by the Electricity North West Overhead Line Circuits Manager that specified criteria have been satisfied
<b>Contract</b>	The agreement between Electricity North West and the Contractor for the execution of the Works including therein all documents to which reference may properly be made in order to ascertain the rights and obligations of the parties under the said agreement.
<b>Contractor</b>	The person or person's firm or company, including personal representatives, successors and permitted assigns, who's Tender has been accepted by Electricity North West.
<b>ENA TS</b>	Networks Association Technical Specification.
<b>OHL</b>	Overhead Line.
<b>Specification</b>	The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract.
<b>Sub-Contractor</b>	Any person (other than the Contractor) named in the Contract for any part of the Works or any person to whom any part of the Contract has been sub-let with the consent in writing of the Electricity North West Overhead Line Circuits Manager, and the legal representatives, successors and assigns of such person.

<b>Supplier</b>	Any person or person's firm or company who supplies goods to Electricity North West or to its Contractor.
<b>Tender</b>	An offer in writing to execute work or supply goods at a fixed price.
<b>Tenderer</b>	The person or person's firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West to submit a Tender.

## 4 General Requirements for Approvals and Testing

### 4.1 Product not to be Changed

No change in the product, packaging or labelling shall be made after Approval has been granted without prior notice to the Electricity North West Overhead Line Circuits Manager, and receipt of a written agreement to the proposed change from the Electricity North West Overhead Line Circuits Manager.

### 4.2 Electricity North West Technical Approval

The Tenderer shall submit, with this Tender, proposals for testing which will demonstrate, to the satisfaction of the Electricity North West Overhead Line Circuits Manager, compliance with this Specification. Such tests shall be carried out without expense to Electricity North West.

Alternatively, technical reports and other data may be submitted that the Tenderer considers will demonstrate, to the satisfaction of the Electricity North West Overhead Line Circuits Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Overhead Line Circuits Manager but will not be unreasonably withheld.

Approval shall be 'factory specific' and is not transferable to another factory without the written Approval of the Electricity North West Overhead Line Circuits Manager.

The Supplier and product shall comply with all the relevant requirements of Electricity North West documents EPD311 and CP311.

### 4.3 Quality Assurance

The Tenderer shall confirm whether or not Approval is held in accordance with a quality assurance scheme accredited under ISO 9000. If not, the Tenderer shall submit a statement of the quality assurance procedures employed to control the quality of the product, including the performance of Suppliers and Sub-Contractors.

The right is reserved for the repeat of such tests, from time to time, that the Electricity North West Overhead Line Circuits Manager may deem to be reasonably necessary to demonstrate continued compliance with the Specification.

The Tenderer shall submit, with the Tender, a list of tests and inspections which are carried out on the product prior to despatch which shall demonstrate, to the satisfaction of the Electricity North West Overhead Line Circuits Manager, fitness for installation and service.

The Tenderer shall provide free of charge to Electricity North West such samples as may, in the opinion of the Electricity North West Overhead Line Circuits Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Overhead Line Circuits Manager will confirm the requirement for samples at the time of Tendering.

The right is reserved for inspections to be made of Tenderer's facilities, from time to time, as deemed reasonably necessary by the Electricity North West Overhead Line Circuits Manager to ensure compliance with this Specification and any Contract of which it forms a part.

The Tenderer shall submit, with the Tender, such details of product packaging disposal, as will enable Electricity North West to comply with the requirements of BS EN ISO 14001 - Environmental Management Systems.

#### **4.4 Formulation**

The Tenderer shall submit, with the Tender, such details of the formulation and use of the product and associated substances as will enable Electricity North West to comply with the obligations of the Health and Safety at Work Act 1974 and the Control of Substances Hazardous to Health Regulations 2002, in the use, storage and disposal of the product. The Tenderer may stipulate, prior to submission of such information, that it is to remain confidential, and the Electricity North West Overhead Line Circuits Manager will, if requested, confirm agreement to this prior to receipt of the information.

#### **4.5 Identification Markings**

The Tenderer shall submit, with the Tender, details of markings which it is proposed to apply to the product or packaging to identify manufacturing batches or items. The forms and content of such markings shall be subject to the Approval of the Electricity North West Overhead Line Circuits Manager and shall in all cases include the Electricity North West approved description and commodity code number.

The Tenderer shall submit, with the Tender, such details of marking gross weight on components, assemblies and packages, as will enable Electricity North West to comply with the Health and Safety Manual Handling Operation Regulations 1992, for components, assemblies and packages supplied with a gross weight over 1kg. The forms and content of such markings shall be subject to the Approval of the Electricity North West Overhead Line Circuits Manager.

#### **4.6 Minimum Life Expectancy**

The minimum life expectancy of all products covered by this Specification is 75 years.

#### **4.7 Product Conformity**

Preference will be given to those Suppliers who can provide suitable product conformity certification to a recognised or specified standard, or an equivalent certification.

#### **4.8 Confirmation of Conformance**

The Tenderer shall complete the conformance declaration sheets in [Appendix B](#). Failure to complete these declaration sheets may result in an unacceptable bid.

## 5 Requirements for Type and Routine Testing

The Electricity North West Overhead Line Circuits Manager shall set out the requirement of the following tests to be carried out by the Supplier at the Supplier's cost.

### 5.1 Requirement for Type Tests at Suppliers Premises

These are a series of one-off type tests, which are carried out to ensure the satisfactory performance of the product design, under extremes of operating stresses, and of endurance, as may be appropriate, to be determined by the Electricity North West Overhead Line Circuits Manager.

These may or may not be destructive tests.

### 5.2 Requirement for Routine Tests at the Supplier's Premises

These tests may be required to be carried out on every individual unit or component, as specified, or at some regular frequency to be determined by the Electricity North West Overhead Line Circuits Manager.

The results of these tests may be required to be supplied to Electricity North West with each unit purchased or retained for inspection, at a period to be determined by the Electricity North West Overhead Line Circuits Manager.

## 6 Constructional Requirements

The copper-work included in this Specification, with the exception of the earth mat (see below), shall be manufactured from copper rod or bar which meets the requirements of BS EN 13601, product designation:

Bar EN13601 - CuAg0,04 - H065...

Size and shape information shall be as defined by the appropriate drawing from [Appendix A](#). Manufacturing tolerances shall be those given in BS EN 13601, unless otherwise stated.

All copper components, with the exception of the earth mat, shall be electro-tin-plated in accordance with BS 1872 Classification Cu/Zn/Sn/10/b. Plating thickness shall be not less than 10µm. Plating shall be free from stains.

The copper earth mat (Drawing I-400C30-cuWK-008) included in this Specification shall be manufactured from copper sheet which meets the requirements of BS EN 1652, product designation:

Sheet EN1652 – CW024A – H065 – 1.5 x ...

Size and shape information shall be as defined by Drawing I-400C30-cuWK-008 (refer to [Appendix A](#)). Manufacturing tolerances shall be those given in BS EN 1652, unless otherwise stated.

## 7 Documents Referenced

DOCUMENTS REFERENCED	
<b>Health and Safety at Work Act 1974</b>	
<b>Control of Substances Hazardous to Health Regulations 2002.</b>	
<b>Health and Safety Manual Handling Operation Regulations 1992.</b>	
<b>BS EN ISO 9000:</b>	Quality management systems.
<b>BS EN ISO 14001: 2004:</b>	Environmental management systems. Requirements with guidance for use.
<b>BS EN 13601:</b>	Copper and copper alloys. Copper rod, bar and wire for general electrical purposes.
<b>BS EN 1652:</b>	Copper and copper alloys. Plate, sheet, strip and circles for general purposes.
<b>BS 1872:</b>	Specification for electroplated coatings of tin.
<b>CP311:</b>	Equipment Approval Policy and Process

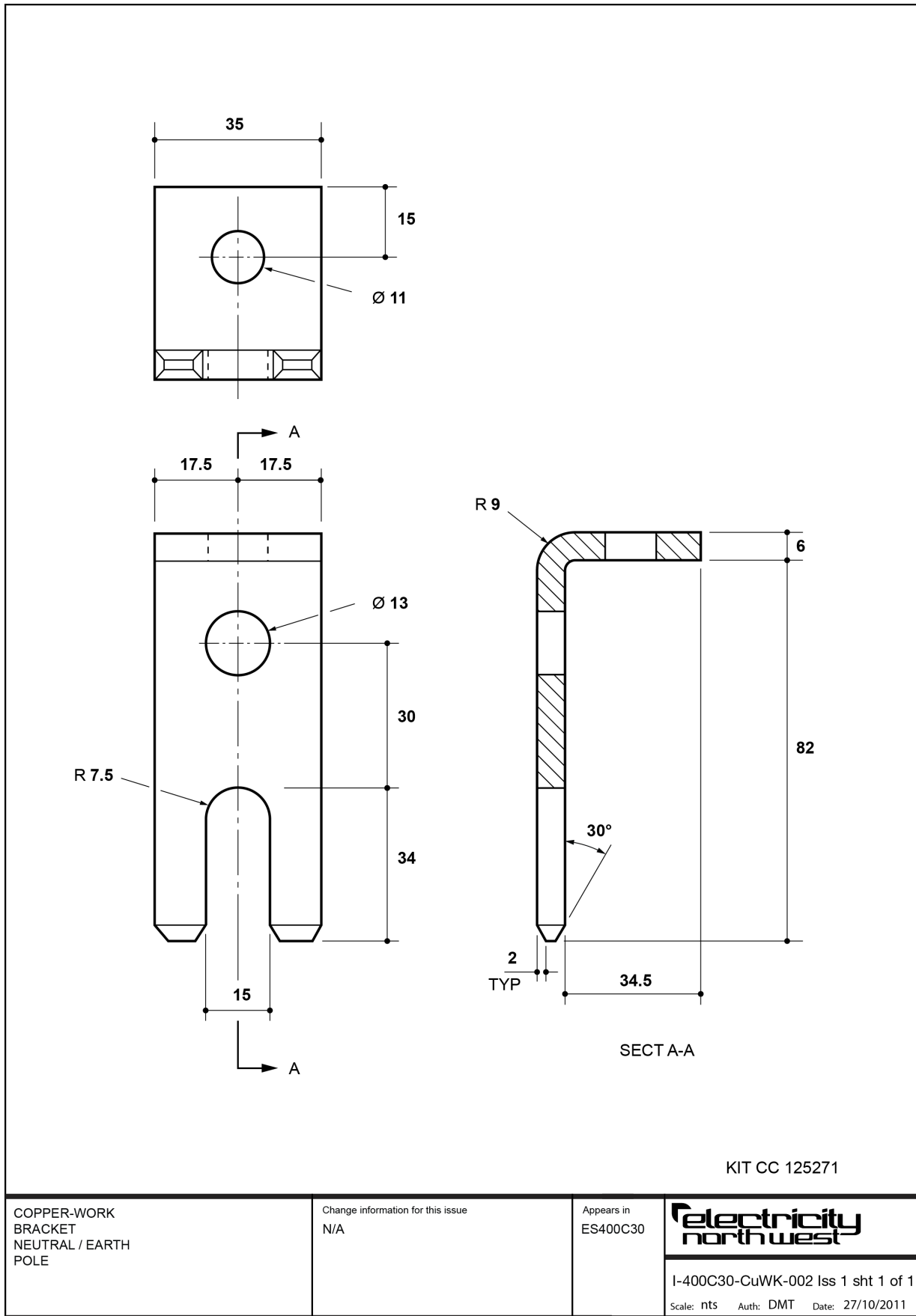
## 8 Keywords

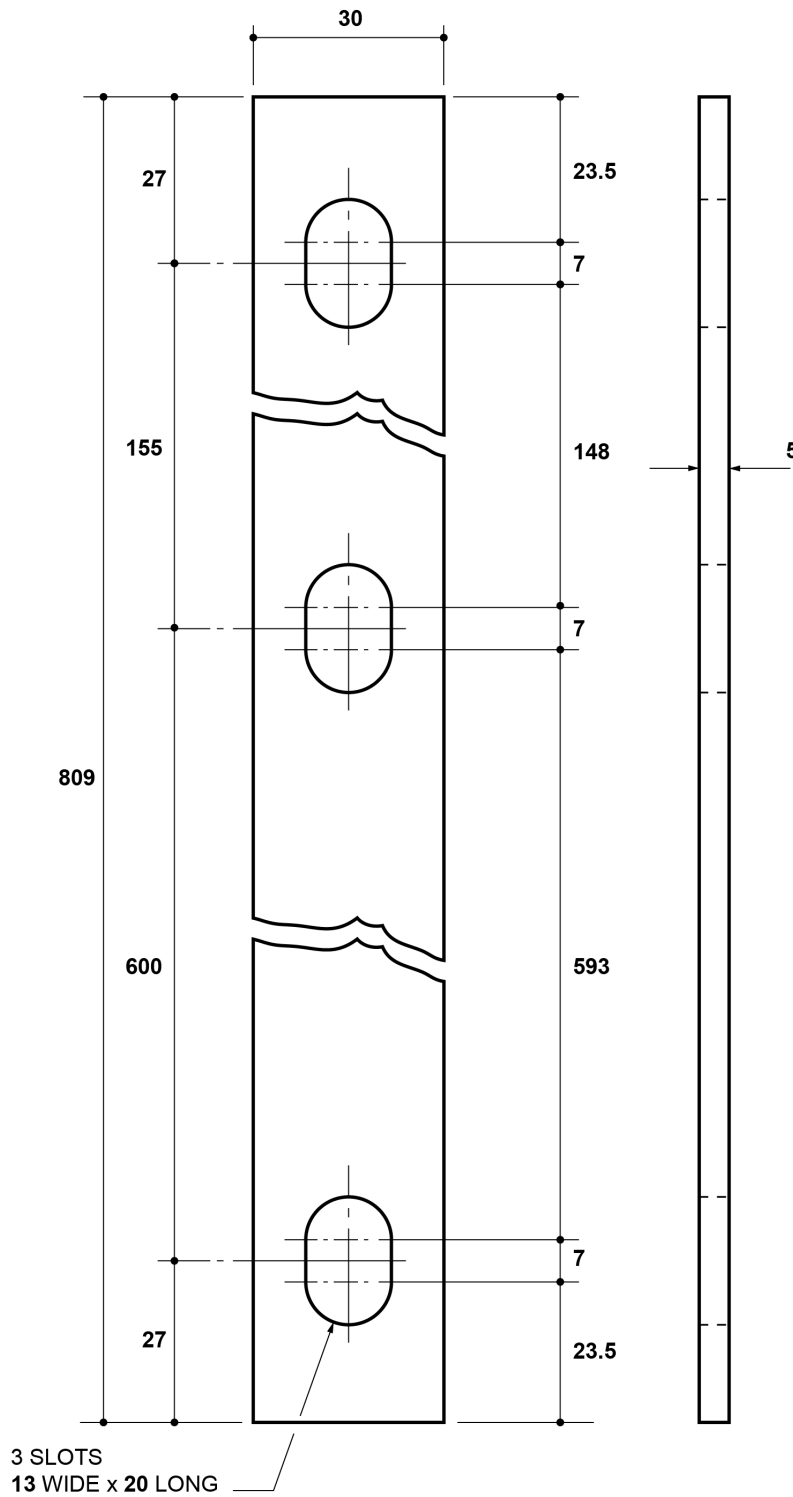
Copper;



## Appendix A – Schedule of all OHL Copper-work

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	DRAWING REFERENCE (DERIVED FROM)	USED IN SPEC:	CC NUMBER
Copper-work kit, H-pole, terminal	Refer to Appendix B for kit contents (Electricity North West development)	ES40002 ES40003	787933
Copper-work, bracket, neutral/earth, pole (Dwg I-400C30-CuWK-002)	I-400C30-CuWK-002 (Electricity North West development)	ES40003 ES40004	125271
Copper-work, busbar kit, surge arrester, ABS (Dwg I-400C30-CuWK-004)	I-400C30-CuWK-004 (Electricity North West development)	ES40002 ES40003	110470
Copper-work, busbar kit, surge arrester, GVR (Dwg I-400C30-CuWK-005)	I-400C30-CuWK-005 (Electricity North West development)	ES40002 ES40003	121898
Copper-work, busbar kit, surge arrester, PMT (Dwg I-400C30-CuWK-006)	I-400C30-CuWK-006	ES40002 ES40003	121700
Copper-work, earth mat (Dwg I-400C30-CuWK-008)	I-400C30-CuWK-008	ES40002 ES40003	260841
Copper-work, earthing parking bar, cable termination (pack of 3) (Dwg I-400C30-CuWK-007)	I-400C30-CuWK-007 (Electricity North West development)	ES40002 ES40003	177320





KIT CC 110470

COPPER-WORK  
BUSBAR KIT  
SURGE ARRESTER  
ABS

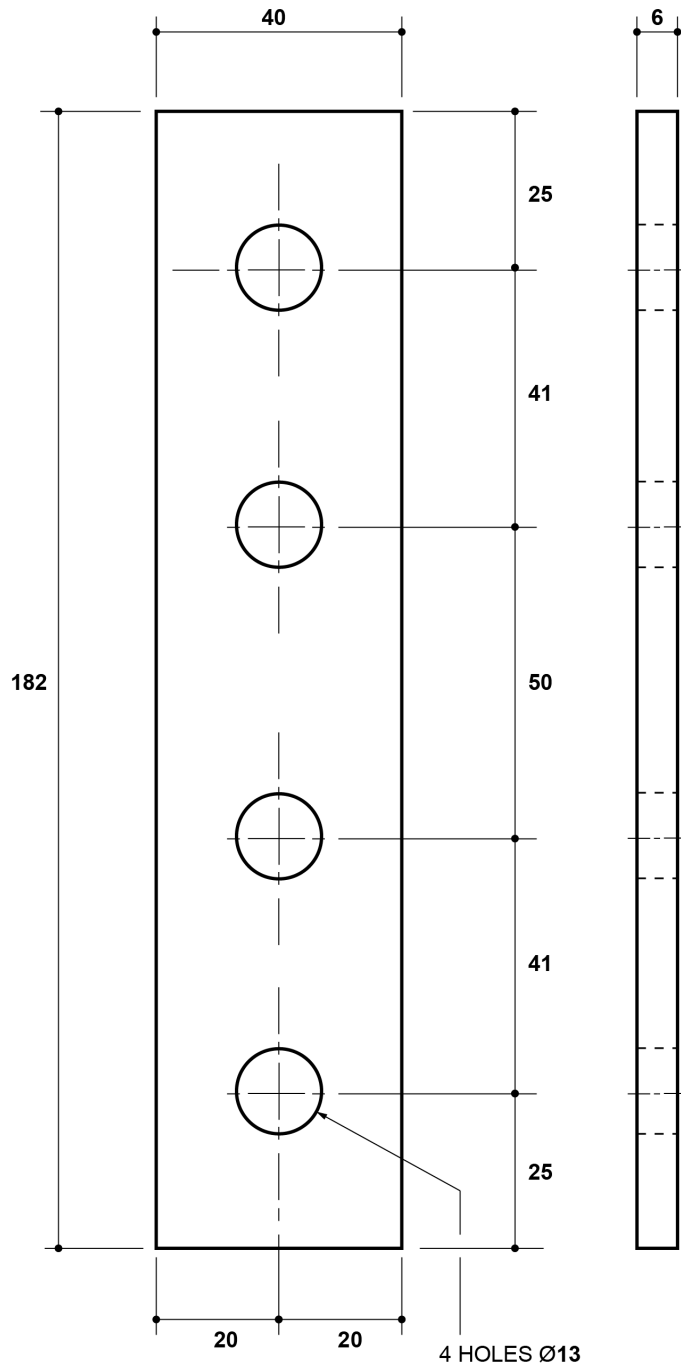
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Appears in  
ES400C30

**electricity**  
north west

I-400C30-CuWK-004 Iss 1 sht 1 of 2

Scale: nts Auth: DMT Date: 27/10/2011



KIT CC 110470

COPPER-WORK  
BUSBAR KIT  
SURGE ARRESTER  
ABS

Change information for this issue  
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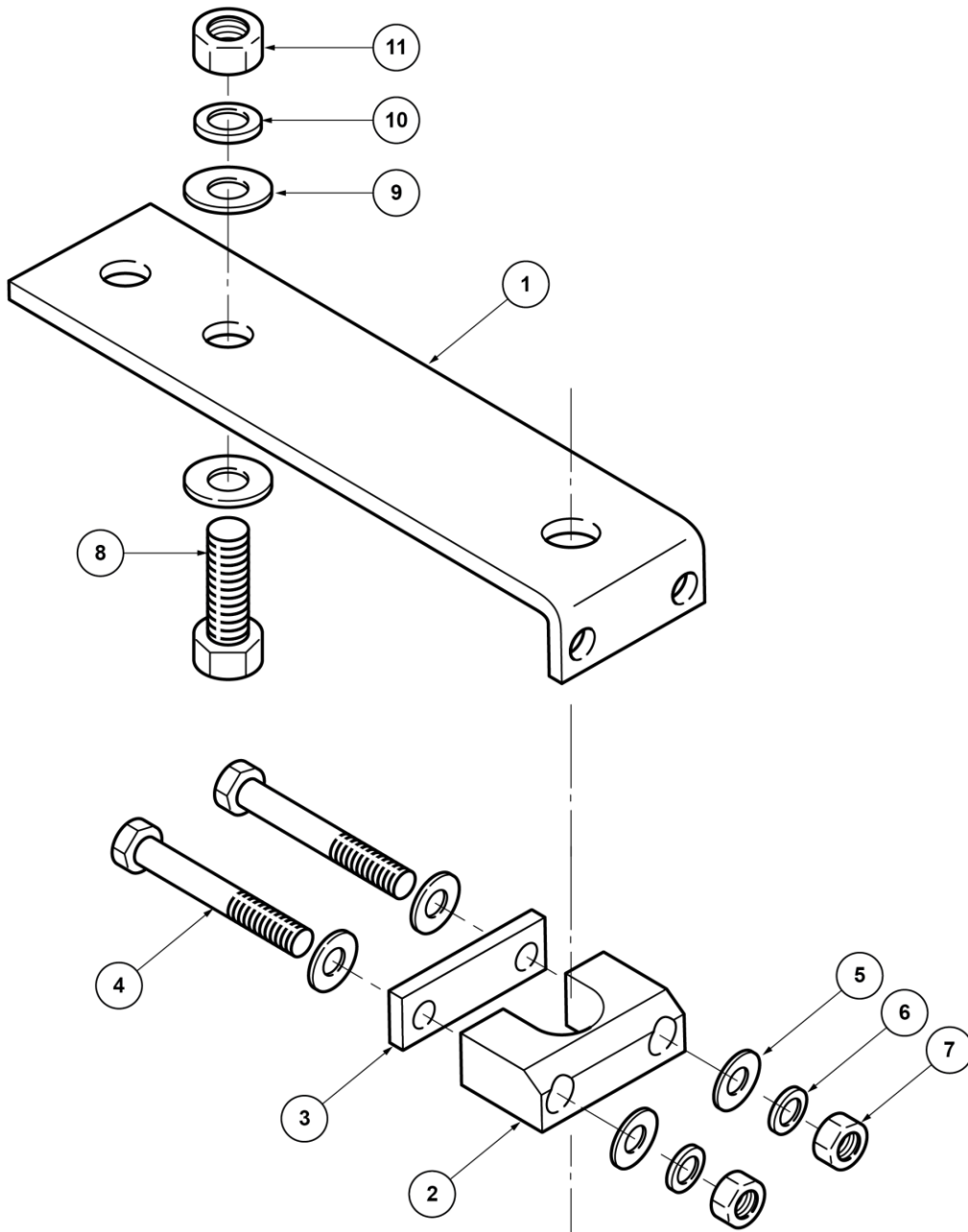
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I-400C30-CuWK-004 Iss 1 sht 2 of 2  
Scale: nts Auth: DMT Date: 27/10/2011

**Copper-Work, Busbar Kit, Surge Arrester, ABS**

		DRAWING NO: I-400C30-CUWK-004	
Approved Description (for purchasing and product labelling)	Qty	CC Number	
Mounting, bottom bar piece (Dwg I-400C30-CuWK-004-12)	2	787943	
Mounting, extension piece (Dwg I-400C30-CuWK-004-22)	3	787944	



KIT CC 121898

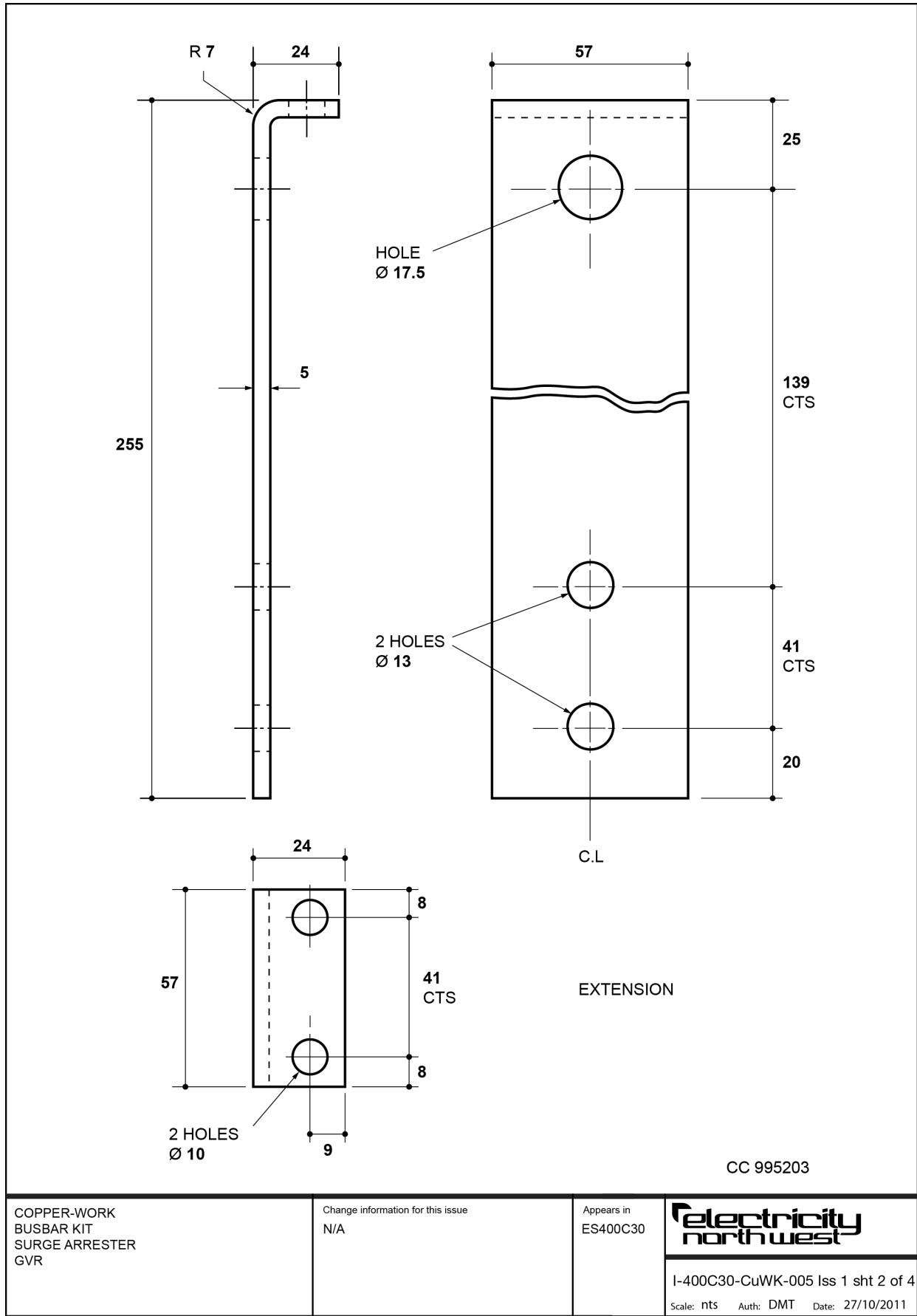
COPPER-WORK  
BUSBAR KIT  
SURGE ARRESTER  
GVR

Change information for this issue  
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Appears in  
ES400C30



I-400C30-CuWK-005 Iss 1 sht 1 of 4  
Scale: nts Auth: DMT Date: 27/10/2011

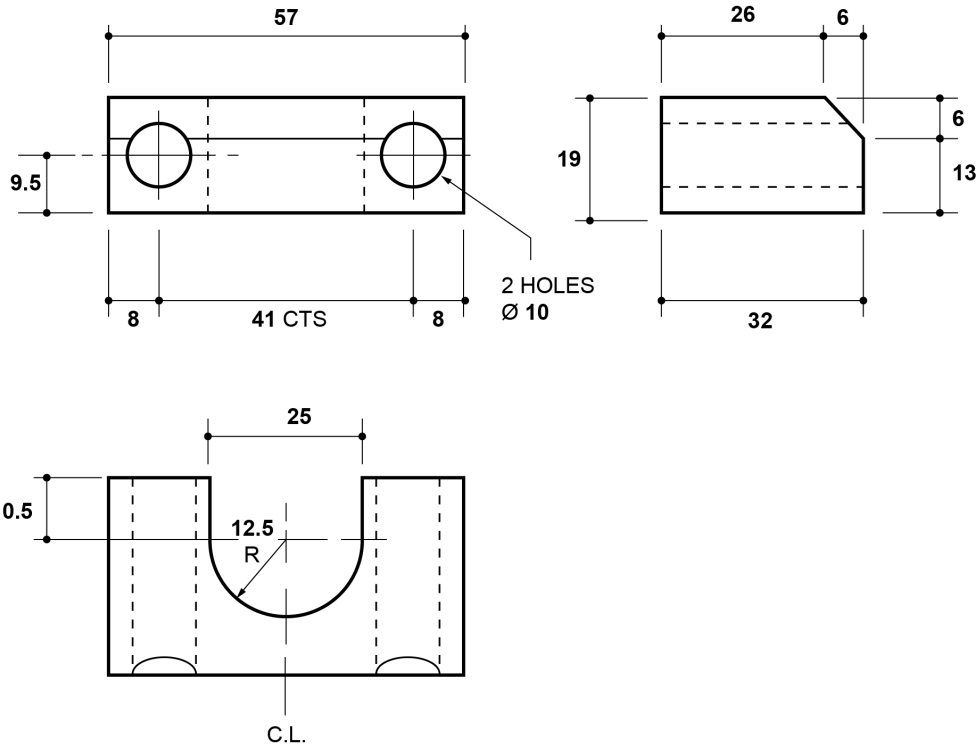


COPPER-WORK  
BUSBAR KIT  
SURGE ARRESTER  
GVR

Change information for this issue  
N/A

Appears in  
ES400C30

**Electricity  
north west**  
I-400C30-CuWK-005 Iss 1 sht 2 of 4  
Scale: nts Auth: DMT Date: 27/10/2011



SADDLE BLOCK

CC 995204

COPPER-WORK  
BUSBAR KIT  
SURGE ARRESTER  
GVR

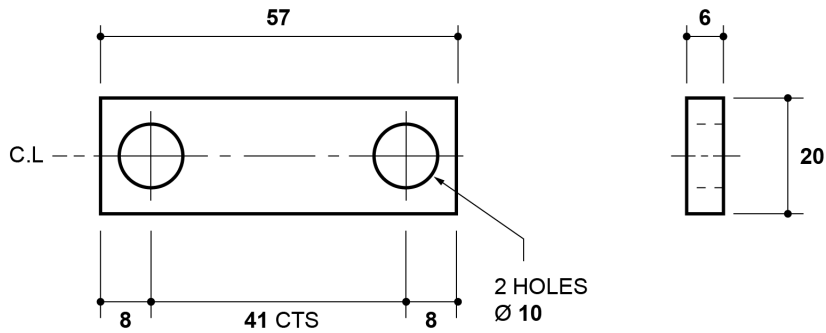
Change information for this issue  
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Appears in  
ES400C30



I-400C30-CuWK-005 Iss 1 sht 3 of 4  
Scale: nts Auth: DMT Date: 27/10/2011





RETAINING STRAP

CC 995205

COPPER-WORK  
BUSBAR KIT  
SURGE ARRESTER  
GVR

Change information for this issue  
N/A

Appears in  
ES400C30



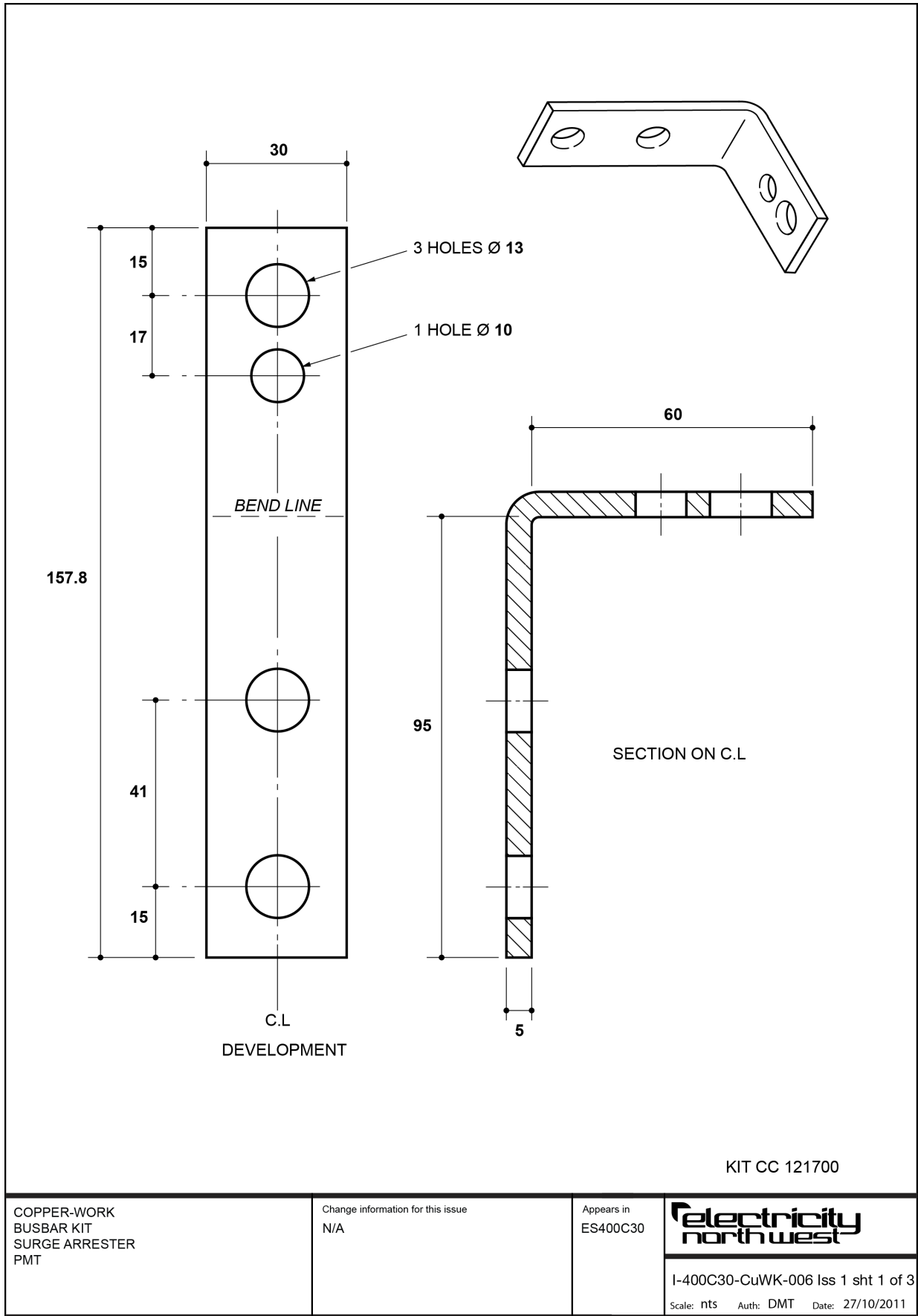
I-400C30-CuWK-005 Iss 1 sht 4 of 4

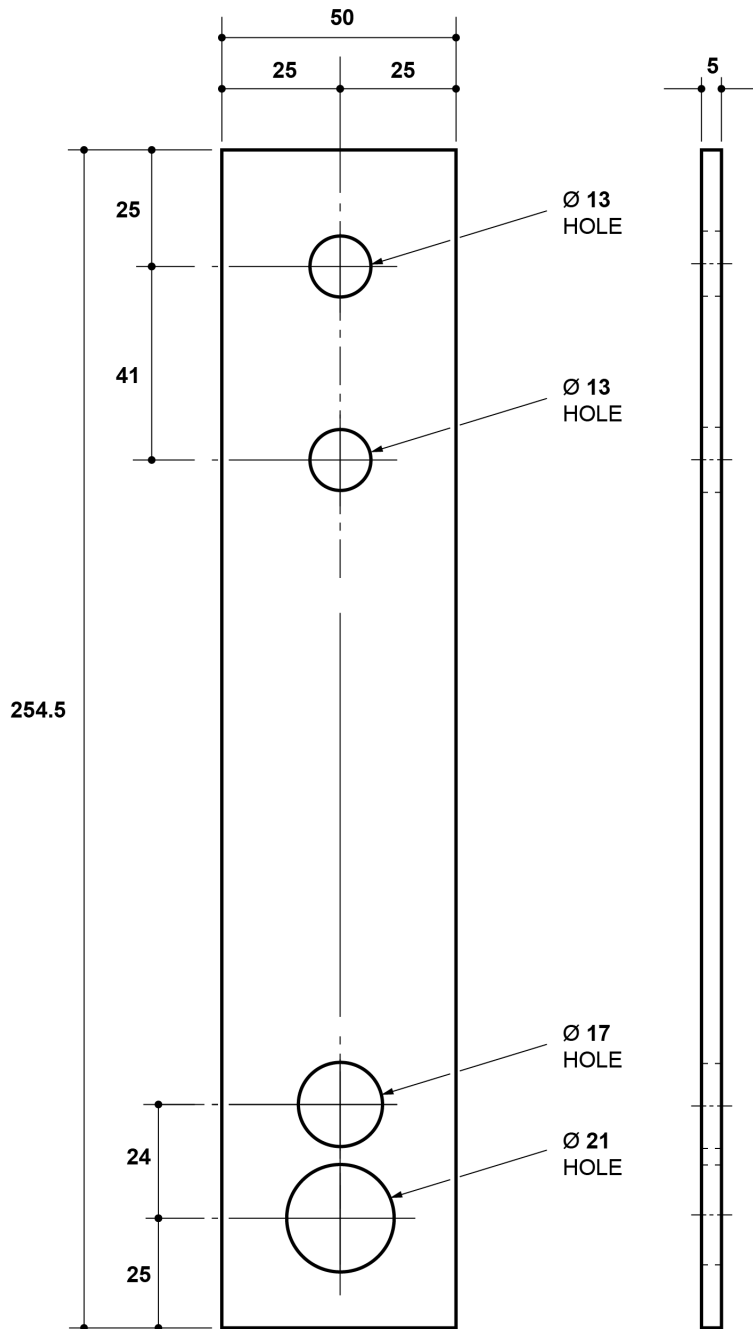
Scale: nts Auth: DMT Date: 27/10/2011

**Copper-Work, Busbar Kit, Surge Arrester, GVR**

		Drawing No: I-400C30-CuWK-005	
Item No	Approved Description (for purchasing and product labelling)	Qty	CC Number
1	Extension (Dwg I-400C30-CuWK-005-24)	3	995203
2	Saddle block, brass (Dwg I-400C30-CuWK-005-34)	3	995204
3	Retaining strap, stainless steel (Dwg I-400C30-CuWK-005-44)	3	995205
4	Bolt, M8, 60mm, hex head, stainless steel	6	-
5	Washer, M8, stainless steel	12	-
6	Washer, spring, M8, stainless steel	6	-
7	Nut, full, M8, stainless steel	6	-
8-11	Bolt, M12, length 40mm, stainless steel, c/w hex full nut, two flat round washers and a stainless steel spring washer	6	*

\* For information only: the CC number 177360 is assigned to a pack of three of the items in the "Approved Description" column.





KIT CC 121700

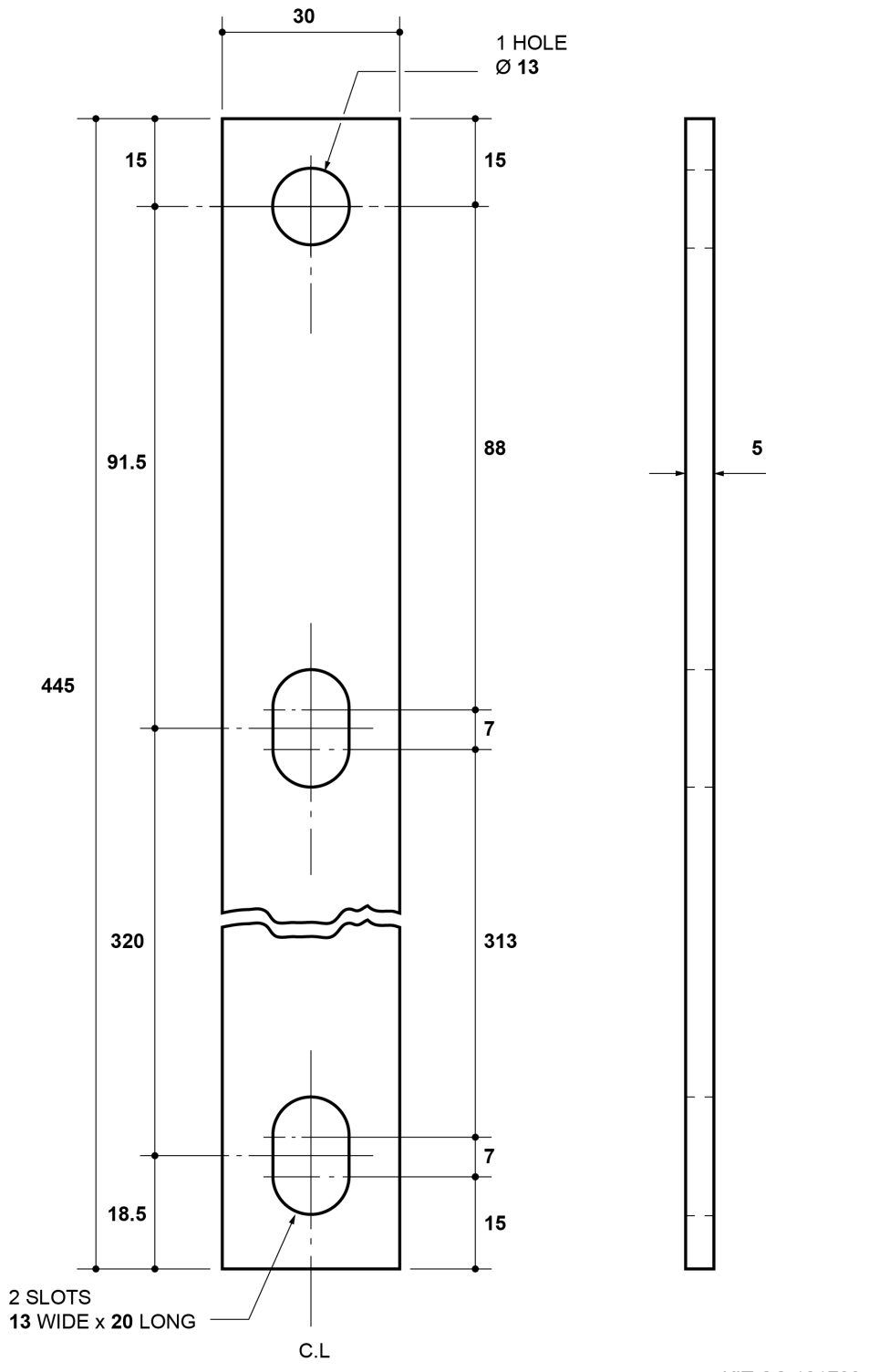
COPPER-WORK  
BUSBAR KIT  
SURGE ARRESTER  
PMT

Change information for this issue  
N/A

Appears in  
ES400C30



I-400C30-CuWK-006 Iss 1 sht 2 of 3  
Scale: nts Auth: DMT Date: 27/10/2011



COPPER-WORK  
 BUSBAR KIT  
 SURGE ARRESTER  
 PMT

Change information for this issue  
 N/A

Appears in  
 ES400C30

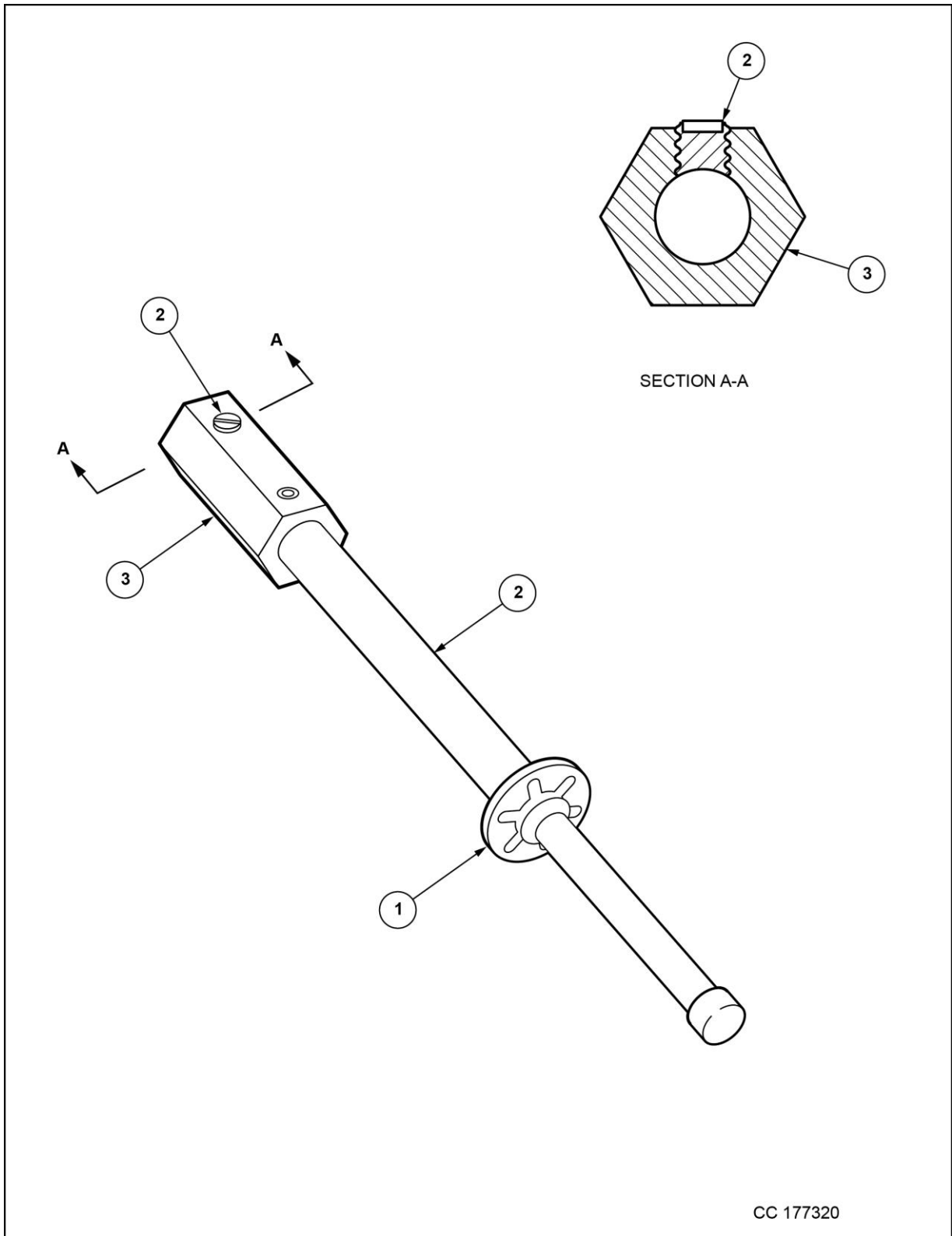
**electricity north west**

I-400C30-CuWK-006 Iss 1 sht 3 of 3  
 Scale: nts Auth: DMT Date: 27/10/2011

**Copper-Work, Busbar Kit, Surge Arrester, Pmt**

		DRAWING NO: I-400C30-CUWK-006	
Approved Description (for purchasing and product labelling)	Qty	CC Number	
Mounting, busbar 1 (Dwg I-400C30-CuWK-006-13)	1	995214	
Mounting, busbar 2 (Dwg I-400C30-CuWK-006-23)	3	995215	
Mounting, busbar 3 (Dwg I-400C30-CuWK-006-33)	2	995216	
Bolt, M12, length 40mm, stainless steel, c/w hex full nut, two flat round washers and a stainless steel spring washer	5	*	

\* For information only: the CC number 177360 is assigned to a pack of three of the items in the "Approved Description" column.



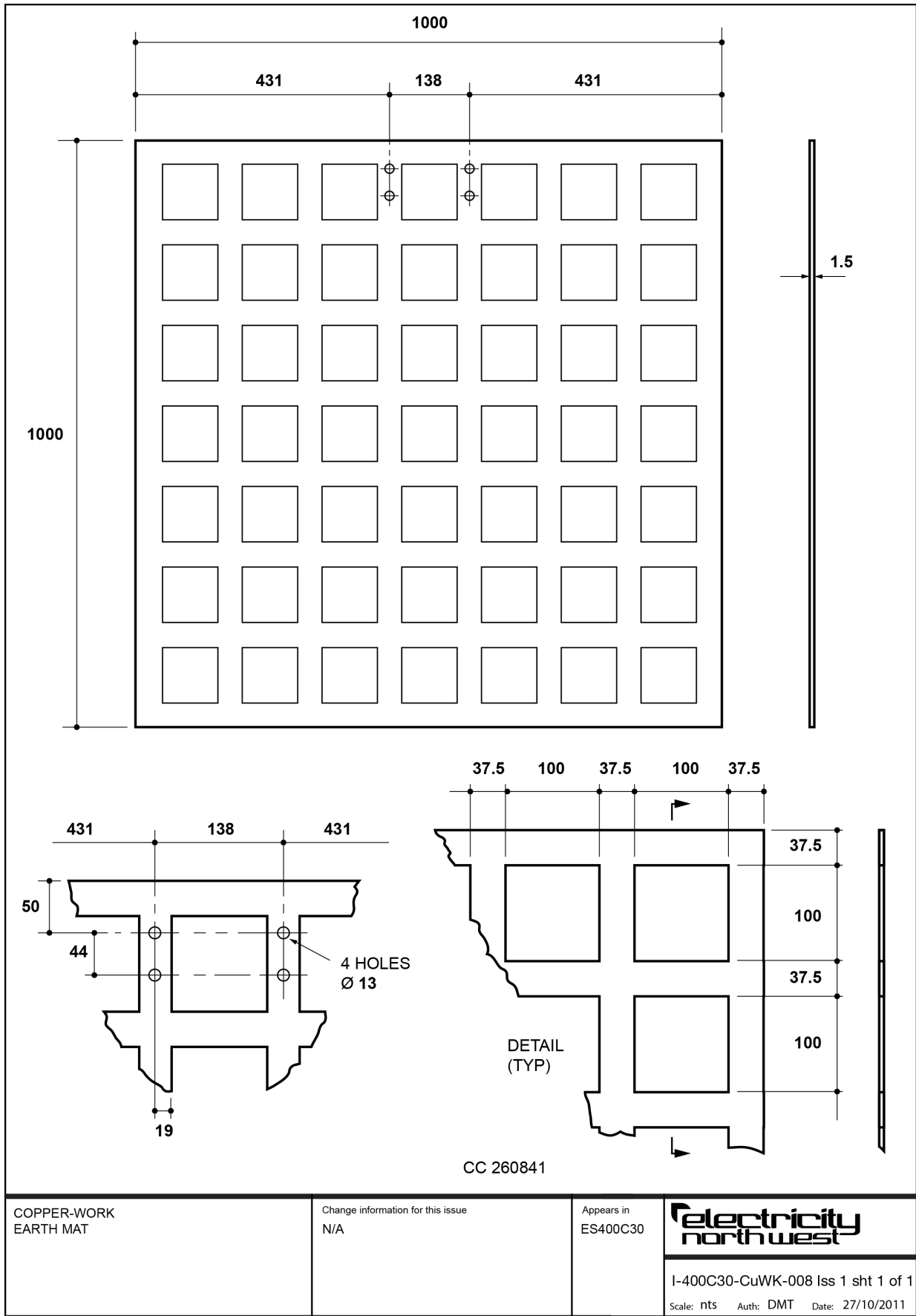
CC 177320

<p>COPPER-WORK EARTHING PARKING BAR CABLE TERMINATION (PACK OF 3)</p>	<p>Change information for this issue N/A</p>	<p>Appears in ES400C30</p>	<p><b>Electricity north west</b> I-400C30-CuWK-007 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 27/10/2011</p>
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**Copper-Work, Earthing Parking Bar, Cable Termination (Pack Of 3)**

		DRAWING NO: I-400C30-CUWK-007
Item No	Item	Manufacturing Notes
1	Washer, star, $\phi 25.0$ O/D, $\phi 12.0$ I/D, stainless steel	<p>The components shown in the drawing, and listed opposite, are for guidance only. Any design deemed practicable by Electricity North West is acceptable provided it meets the following functional requirements:</p> <p>a) The parking bar shall be capable of carrying 17.5kVA for one second throughout its lifetime, ie 75 years as stated in Section 4.6.</p> <p>b) The construction materials shall meet all necessary weather and environmental requirements.</p> <p>c) The construction materials shall not cause electrolytic action.</p>
2	Grubscrew, M6 x 1.0, 5.0mm, nylon *	
3	Earth parking bar, hex-head, brass	
4	Earthing parking bar, body, copper	





## Appendix B – Conformance Declaration

### SECTION-BY-SECTION CONFORMANCE WITH SPECIFICATION

The Tenderer shall declare conformance or otherwise for each product/service or range of products/services, section-by-section, using the following Conformance Declaration Codes.

#### Conformance Declaration Codes:

<b>N/A =</b>	Clause is not applicable/appropriate to the product/service.
<b>C1 =</b>	The product/service conforms fully with the requirements of this clause.
<b>C2 =</b>	The product/service conforms partially with the requirements of this clause.
<b>C3 =</b>	The product/service does not conform to the requirements of this clause.
<b>C4 =</b>	The product/service does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

**Manufacturer:**

**Product/Service Description:**

**Product/Service Reference:**

**Name:**

**Company:**

**Signature:**

**SECTION-BY-SECTION CONFORMANCE**

Section	Section Topic	Conformance Declaration Code	Remarks * (must be completed if code is not C1)
4.1	Product not to be Changed		
4.2	Electricity North West Technical Approval		
4.3	Quality Assurance		
4.4	Formulation		
4.5	Identification Markings		
4.6	Minimum Life Expectancy		
4.7	Product Conformity		
4.8	Confirmation of Conformance		
5.1	Requirements for Type Tests at the Supplier's Premises		
5.2	Requirement for Routine Tests at the Supplier's Premises		
6	Constructional Requirements		

\* Applicable specifications shall be stated in the Remarks column where alternatives are quoted within a section. The Remarks column shall also be used to indicate cases where the products or services exceed the quoted specifications.

**Additional Notes:**