

Electricity Specification 400S12

Issue 4 February 2022

Permanent Shrouding for Overhead Line Structures



Amendment Summary

ISSUE NO. DATE	DESCRIPTION
Issue 4	New Template applied throughout
FEBRUARY 2022	Prepared by: D M Talbot Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, DSO Director

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1 Introduction

This Specification comprises general requirements for Approvals and testing of shrouds 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, a schedule of all shrouds in alphanumeric order, followed by drawings ([Appendix A](#)).

The shrouding covered by this Specification shall be designed and constructed to prevent vermin, including birds, rodents and squirrels, etc, causing phase-phase or phase-earth faults. The shrouding shall also be used to protect apparatus from phase-phase or phase-earth faults as a result of wind-blown debris.

2 Scope

This Specification covers all permanent shrouds required for the construction of overhead lines. Note that shrouds used for live-line work are not covered by this chapter; temporary shrouds used for low-voltage overhead structures are specified by ES400S15.

3 Definitions

Approval	Sanction by the Electricity North West Overhead Line Circuits Policy Manager that specified criteria have been satisfied
Contract	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.
Contractor	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.
Specification	The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract.
Supplier	Any person or person's firm or company who supplies goods to Electricity North West or to its Contractor.
Tender	An offer in writing to execute work or supply goods at a fixed price.
Tenderer	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 Policy Manager, and receipt of a written agreement to the proposed change from the Electricity North West Overhead Line Circuits Policy 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 Policy 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 Policy Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Overhead Line Circuits Policy 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 Policy Manager.

The Supplier and product shall comply with all the relevant requirements of Electricity North West document 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 Policy 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 Policy 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 Policy Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Overhead Line Circuits Policy 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 Policy 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 Policy 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 Policy 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 Policy Manager.

4.6 Minimum Life Expectancy

The minimum life expectancy of all products covered by this Specification is 20 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 Policy 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 Policy 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 Policy 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 Policy Manager.

6 Constructional Requirements

6.1 General Requirements

The shrouding material shall be designed to meet the requirements given in this Specification. (Example manufacturing drawings are included in [Appendix A.](#))

There shall be no conducting parts within the vermin shroud.

The shrouding shall be designed so that it can be fitted without the need to remove or unbolt connections. The shrouding shall also be suitable for fitting using live working techniques.

The shrouding shall be close fitting to the intended apparatus, thus preventing any possibility of birds/small animals residing within the interior of the shrouding.

The shrouding shall be fitted (and supplied) with retaining clips, or other suitable fixings or design features, which shall prevent the shrouding becoming inadvertently detached by contact with wind-blown debris, vermin or the effects of adverse weather.

6.2 Applicable Standards

The shrouding material shall comply with an appropriate British standard or European standard. (American National Standards Institute (ANSI) publications are deemed to be acceptable in the absence of an appropriate British or European standard.)

The Supplier shall declare which design standards have been used to comply with the above paragraph.

6.3 Material Properties

6.3.1 Mechanical Performance and Tensile Strength

The material shall be of sufficient mechanical strength and thickness to withstand the effects of repeated contact from wind-blown debris or vermin and the possibility of vandalism or impact from flying objects. The material shall be resistant to tearing during application and when exit holes are created for jumper connections to plant, etc.

The material needs to retain enough flexibility over its operating temperature range to allow for movement of the associated dropper in the wind.

6.3.2 Electrical Voltage Rating

The material shall be of sufficient dielectric strength to fully withstand the likely maximum phase-phase voltages experienced on the distribution network. Ideally, the material shall also be able to withstand temporary over-voltages as a result of switching surges or ferro resonance.

6.3.3 Hydrophobicity of the Material

The shrouding shall be of material that does not retain moisture. The hydrophobic nature of the material shall ensure that water droplets which form on the surface do not impede the electrical performance of the material, i.e. do not promote surface tracking.

6.3.4 UV Stabilisation

The effects of ultra-violet (UV) radiation shall not adversely affect the shrouding material. This property is relative to the lifetime of the material. Consideration shall be given to the life of the material based on its sole outdoor use.

6.3.5 Flame Retardant Capacity

Due to the nature of the application, it is important that the shrouding material has a flame retardant capacity such that in the event of electrical arcing or fire it shall be self-extinguishing, in the shortest time possible, and shall not promote fire.

6.3.6 Colour

The colour of the material shall aesthetically blend into the environment of the intended application. For example, typical colours could be grey or brown. (Note that grey is the preferred colour).

6.3.7 Operating Temperature

The properties of the material listed above shall not be affected (they shall not change), when exposed to temperatures ranging from -10°C to +75°C. Note that the maximum temperature is relative to the maximum operating temperature of the distribution system. It is however likely that maximum operating temperatures in practice shall be lower than 75°C, although consideration shall be given to the effects of solar gain.

6.4 Summary of Technical Data to be Provided by the Supplier

The Supplier shall provide the following technical data for Approval:

- Material type and description.
- A list of British, European or ANSI standards to which the product will conform.
- Mechanical and electrical specifications.
- Dimensions and applications.
- Colour.

7 Documents Referenced

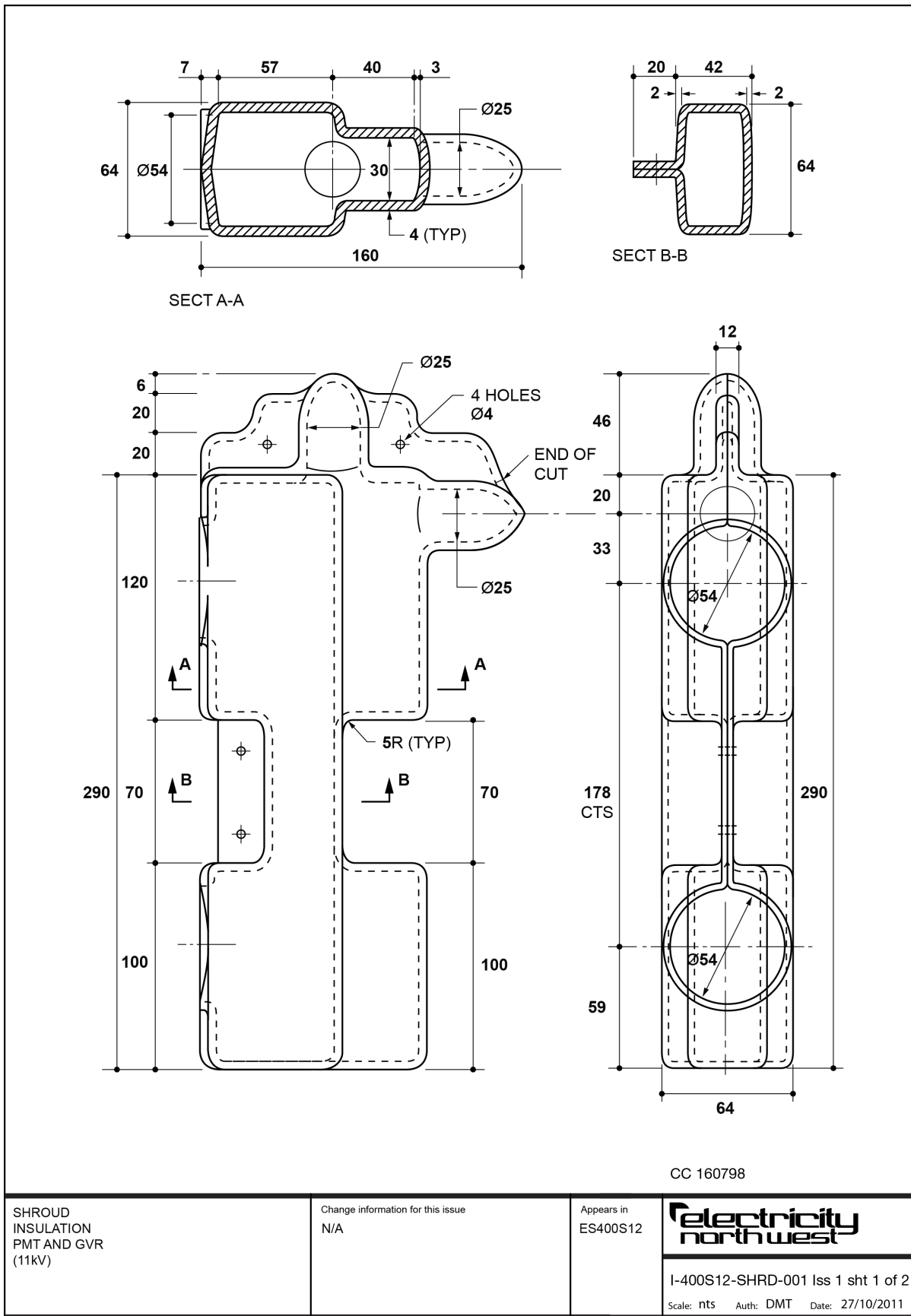
DOCUMENTS REFERENCED	
Health and Safety at Work Etc Act 1974.	
Control of Substances Hazardous to Health Regulations 2002.	
Manual Handling Operations Regulation 1992.	
BS EN ISO 9000	Quality management systems
BS EN ISO 14001: 2004	Environmental management systems. Requirements with guidance for use
CP311	Equipment Approval Policy and Process

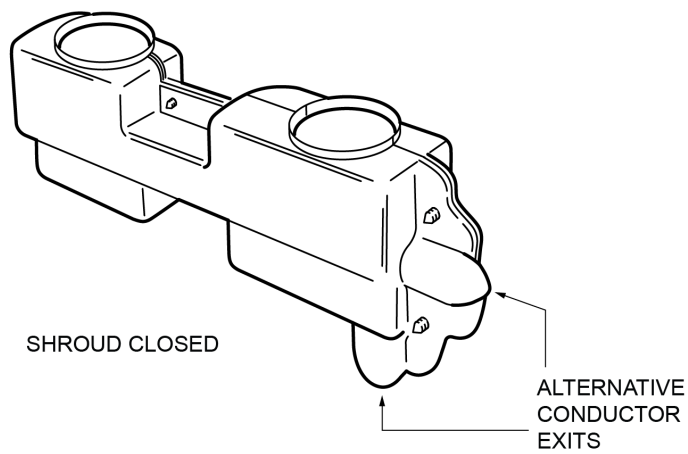
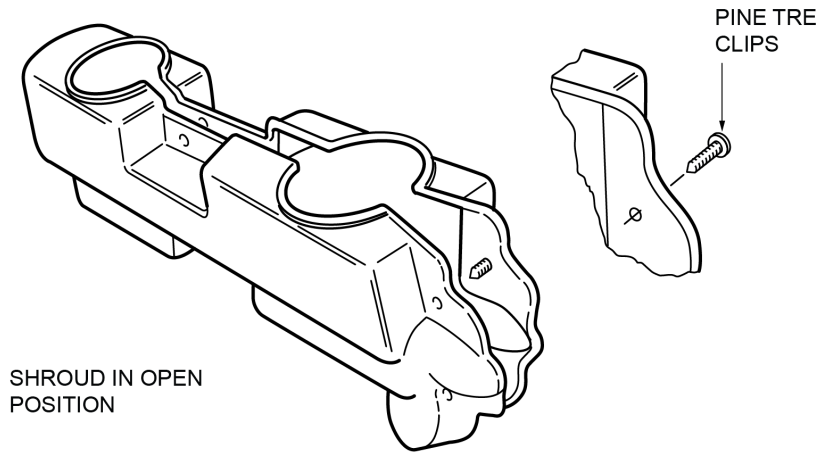
8 Keywords

None applicable.

Appendix A – Schedule of all Permanent Shrouding for Overhead Line Structures

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	CC NUMBER
Shroud, insulation, PMT and GVR (11kV), c/w pine tree clips (Dwg I-400S12-SHRD-001)	160798





CC 160798

SHROUD
INSULATION
PMT AND GVR
(11kV)

Change information for this issue
N/A

Appears in
ES400S12

**Electricity
north west**

I-400S12-SHRD-001 Iss 1 sht 2 of 2
Scale: nts Auth: DMT Date: 27/10/2011

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:

N/A =	Clause is not applicable/appropriate to the product/service.
C1 =	The product/service conforms fully with the requirements of this clause.
C2 =	The product/service conforms partially with the requirements of this clause.
C3 =	The product/service does not conform to the requirements of this clause.
C4 =	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		
6.1	General requirements		
6.2	Applicable standards		
6.3.1	Mechanical performance and tensile strength		
6.3.2	Electrical voltage rating		

6.3.3	Hydrophobicity of the material		
6.3.4	UV stabilisation		
6.3.5	Flame retardant capacity		
6.3.6	Colour		
6.3.7	Operating temperature		
6.4	Summary of technical data to be provided by the Supplier		

* 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: