

# Electricity Specification 301

Issue 5      May 2021

## GRP Distribution Substation Housing



## Amendment Summary

ISSUE NO. DATE	DESCRIPTION
<b>Issue 5</b> <b>May 2021</b>	Reformatting of this Electricity Specification into the new format. UU drawing references updated.  Prepared by: Kelvin Smith and Matthew Kayes Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director

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## 1 Scope

This Specification covers the general design of Glass Reinforced Plastic (GRP) housings for use on the 6.6kV or 11kV network of Electricity North West Limited (hereafter referred to as Electricity North West).

## 2 Definitions

<b>Approval</b>	Sanction by the Electricity North West Plant Policy Manager that specified criteria have been satisfied
<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>GRP</b>	Glass Reinforced Plastic
<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 Plant Policy 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.
<b>WBP</b>	Weather and Boil Proof Plywood
<b>Words</b>	Words importing persons shall include firms and corporations; words importing the singular only, also include the plural, and vice versa where the context requires.
<b>Work</b>	All materials, labour and actions required to be provided or performed by the Contractor under the Contract.

**Writing**

Any manuscript, typewritten or printed statement under seal or hand as the case may be.

### 3 General Requirements for Approvals and Testing

#### 3.1 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 Plant Policy Manager, and receipt of a written agreement to the proposed change from the Electricity North West Plant Policy Manager.

#### 3.2 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 Plant 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 Plant Policy Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Plant 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 Plant Policy Manager.

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

#### 3.3 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 Plant 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 Plant 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 Plant Policy Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Plant 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 Plant 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.

### **3.4 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 Plant Policy Manager will, if requested, confirm agreement to this prior to receipt of the information.

### **3.5 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 Plant 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, 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 Plant Policy Manager.

### **3.6 Minimum Life Expectancy**

The minimum life expectancy of all products covered by this Specification is 40 years.

### **3.7 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 Requirements for Type and Routine Testing**

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

### **4.1 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 Plant Policy Manager.

These may or may not be destructive tests.

## 4.2 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 Plant 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 Plant Policy Manager.

## 4.3 Requirement for on-site Tests

These will normally be included within the scope of on site commissioning, but may be included if appropriate.

# 5 Technical Requirements

## 5.1 Drawings

All drawing numbers referenced below do not contain the version number as they are continually updated. The latest versions are available on request from Electricity North West Plant Policy Manager and from Electricity North West Civil Projects Manager.

## 5.2 Prefabricated / Flat Pack GRP Housings

### 5.2.1 Size

The overall size and height of the GRP housing can vary depending on equipment and location, the standard being 3100mm wide, 3700mm deep. Electricity North West standard drawings for all required sizes are available on request.

The height shall be 2440mm (measured to eaves height) unless otherwise specified.

### 5.2.2 Material

The core shall be of 18mm exterior grade WBP, hardwood faced, graded BB/CC all encapsulated in polyester resin laminate reinforced with fibreglass chopped strand mat of minimum 450 g/m<sup>2</sup> on all surfaces.

The door, walls and roof shall comply with BS 476 Part 22 (or equivalent).

Resin shall comply with BS 476 Part 7 Class 2 (or equivalent) fire rating regarding surface spread of flame.

### 5.2.3 Construction

#### 5.2.3.1 Doors

Material shall be as per [section 5.2.2](#) with the left-hand door opening and the right hand door shall be fixed with an approved rebate detail, unless otherwise specified. Each door shall be 2150mm high x 1200mm wide and both doors shall open outwards through 90 degrees.

### 5.2.3.2 Roof

The roof shall be of pitched construction with material as per [section 5.2.2](#). It shall be designed to support a load of 1.8kN/m<sup>2</sup>.

All housings shall have explosion relief devices which allow the roof to lift under explosion conditions and then drop to former position after any forces have dissipated. Type tests shall be undertaken in accordance with section 5.2.7.

### 5.2.4 Finishes (Walls, Doors and Roofs)

The roof shall be of pitched construction with material as per [section 5.2.2](#). It shall be designed to support a load of 1.8kN/m<sup>2</sup>.

All housings shall have explosion relief devices which allow the roof to lift under explosion conditions and then drop to former position after any forces have dissipated. Type tests shall be undertaken in accordance with Section 5.2.7.

### 5.2.5 Door Fittings

Door furniture shall comprise the following:

- (a) Two spring loaded shoot bolts (minimum length 200mm) on the fixed leaf.
- (b) One locking plate as per ES352 Electricity North West drawing 900350-0020.
- (c) Manufacturer's own 3 way locking device with lockable handle. This shall be easy to use and reliable.
- (d) Two heavy duty garage door stays (minimum length 600mm) with cord operated automatic stops.
- (e) Three strap type hinges (minimum length 200mm) shall be fitted to each door leaf. The hinge shall be constructed from stainless steel and bolted through the door leaf and frame and fitted with backplates.
- (f) Doors shall be pre-assembled to the frame.
- (g) Three-point locking handle shall be fitted 1000mm above floor level and the locking plate shall be no higher than 1600mm above floor level

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### 5.2.6 Ventilation

Refer to Electricity North West standard drawing ES352 A2 010 02F for details and dimensions of louvres to be fitted.

The roof shall have a minimum 50mm continuous ventilation between the wall and fascia fitted internally with stainless steel mesh and vermin screen, or equivalent approved by the Electricity North West Plant Policy Manager.

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## 5.2.7 Type Test

All prefabricated housings shall be subjected to a type test in which the effects of an internal arc within a sealed chamber inside the enclosure are demonstrated.

The following tests shall be recorded on high speed video recorder (in accordance with BRE test report TCR 20/97) and submitted to Electricity North West for consideration.

The arc energy shall be 250MVA (13.1kA at 11kV) for 1 second. This may be achieved either by test at an accredited short circuit test station, or by a synthetic fuel/air explosion. Full details of the proposed method shall be submitted for Approval. The method detailed in the BRE confidential report TCR 20/97 is approved.

The criteria for the test shall be approved by Electricity North West but shall include:

- (a) Doors to remain closed and latched.
- (b) Minimum projection of flame through door and joint gaps.
- (c) No breakage of wall or roof material or any other joints.
- (d) If pressure relief is achieved by a lifting and tethered roof, then the roof to return to original position.
- (e) Deflection of any ejected flame away from persons directly adjacent to building.

Housings which have been previously tested may have type test evidence submitted for consideration at time of tender. The undertaking of a type test for each contract is not required, but significant changes will require a new test.

Significant design changes may include, but are not limited to:

- (a) A 10% decrease in housing volume.
- (b) A 10% increase in door width.
- (c) A 10% change in available roof lift.
- (d) Any change in floor fixing or position.
- (e) Any change in panel joint system.
- (f) Any change of panel material composition.
- (g) Any change in door locking systems and their fixing.
- (h) Changes in ventilation grille type and position.

The judgement on the acceptability of the housing design as having passed the explosion test will be based on:

- (a) A high-speed video to the requirements of BRE test report TCR 20/97
- (b) The written report of the accepted testing authority.

### 5.2.8 Core Samples

Electricity North West reserve the right for core samples to be taken on site and infilled at the supplier's cost. Any deviation from the specification found from samples shall be fully rectified at the supplier's cost. Samples shall be taken by the suppliers representative and Electricity North West Engineer on site. Suppliers shall make good following the removal of samples with no effect to warranty.

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### 5.2.9 Fixing and Sealing of GRP Housings

GRP housings shall be sealed to concrete bases (see ES352 drawing 900350-013) using 6mm evazote or similar neoprene strips fixed to the base of the housing before it is set down and shall be sealed on the outer edge with low modulus silicone sealant.

## 6 Documents Referenced

DOCUMENTS REFERENCED	
Health and Safety at Work Etc Act 1974	
Control of Substances Hazardous to Health Regulations 2002	
Manual Handling Operations Regulations 1992	
BRE Report TCR 20/97	
ISO 9000	Quality Systems. Guide to Dependability Management
BS EN 14001	Environmental Management Systems Requirements with Guidance For Use
BS 4800	Colour Specification for schedule of paint colours for building purposes
BS 476	Fire tests on building materials and structures.
BS5252	Framework for Colour Co-ordination for Building Purposes
CP311	Equipment Approval Policy and Processes

## 7 Keywords

Construction; Distribution; Housing; Substation

## Appendix A – Conformance Declaration

### A.1 Self Certification Conformance Declaration

#### Clause by Clause Conformance with this ES

The manufacturer shall declare conformance or otherwise, clause by clause, using the following levels of conformance declaration

#### 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 s**

**Signature**

**SECTION-BY-SECTION CONFORMANCE**

Section	Section Topic	Conformance Declaration Code	Remarks * (must be completed if code is not C1)
1	Scope		
3.1	Product not to be changed		
3.2	Electricity North West Technical Approval		
3.3	Quality Assurance		
3.4	Formulation		
3.5	Identification Marking		
3.6	Manufacturers Already Approved		
3.7	Product Conformity		
4.1	Requirement for type Tests at the Suppliers' Premises		
4.2	Requirement for Routine Tests at the Suppliers' Premise		
4.3	Requirement for One Site Test		
5.2	Prefabricated GRP Housing		
5.2.1	Size		
5.2.2	Material		
5.2.3.1	Doors		

5.2.3.2	Roof		
5.2.4	Finishes		
5.2.5	Door Fittings		
5.2.6	Ventilation		
5.2.7	Type Tests		
5.2.8	Core Samples		
5.2.9	Fixing and Sealing of GRP Housing		

**Additional Notes:**