

ES281

COMPANY-SPECIFIC APPENDICES TO ENA ENGINEERING RECOMMENDATION G81

PART 2

Materials Specification for New Low Voltage Installations for Housing Developments

1. SCOPE

This appendix to ENA ER G81 Part 2 covers the materials specification for new low voltage services and mains, and associated high voltage to low voltage substations for the purpose of connecting housing developments to the electricity distribution network of Electricity North West Limited (Electricity North West). (This Part 2 of ES281 provides the information, specific to Electricity North West, required by Appendix A of Part 2 of ENA ER G81.)

2. GENERAL

This document provides details of Electricity North West's approved range of cables, plant, equipment and auxiliary items used to construct distribution assets for connection to Electricity North West's distribution network. Only equipment approved by Electricity North West and listed in this document shall be used to construct electricity networks, substations and services for adoption by Electricity North West in its distribution area.

For all new connections work, the approved installer (ICP) shall provide the Engineer with a full list of equipment to be used. The Engineer will then aim to formally accept or reject the proposal within 10 working days.

All materials for new connections shall conform to the latest Electricity North West Specifications. Where the interface between a new connection and existing assets (cables, switchgear etc) requires alternative material specification, this shall be agreed by Electricity North West's Policy and Standards Manager.

Where Electricity North West's requirements are not specified in this document, the ICP shall liaise with the Engineer, to gain approval from Electricity North West's Policy and Implementation Manager for its suggested equipment, prior to purchasing the equipment. The ICP may also refer to EPD307 – Equipment Approved for Use on Electricity North West Network, which compliments this document.

This document will be updated on a regular basis when new equipment is approved by the Electricity North West Policy and Implementation Manager. Further details will also be added as requirements for further information on the range of equipment used is identified.

This specification provides a description of the materials; the relevant Electricity North West specifications; agreed suppliers for the materials and useful comments on the materials' use. These details are tabulated below in Sections 3, 4, 5, 6 and 7.

3. UNDERGROUND HIGH VOLTAGE EQUIPMENT INCLUDING CABLES, JOINTS & TERMINATIONS

3.1 High Voltage Cables

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
95mm ² Aluminium XLPE, Single Core in Triplex Formation	ES400C9	NKT, Asnaes, Denmark. Prysmian, Wrexham, Wales.	EPD282 prescribes that new HV cables shall have a cross-section of 300mm ² aluminium. In general, 95 mm ² cross-section aluminium may only be used for the following – a connection from switchgear to a local transformer, a connection to or from an overhead line with equal or less current rating, a diversion, less than 100m long, of a cable with equal or less current rating.
300mm ² Aluminium XLPE, Single Core in Triplex Formation	ES400C9	Quintas & Quintas, Conductores, Portugal. TF Kable via CCC, Bydgoszcz, Poland. Hellenic Cables, Thiva, Greece. Cabelte, Oporto, Portugal. Tratos, Pieve Santo Stefano, Arezzo, Italy.	

3.2 High Voltage Cable Joints

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
95 Triplex Straight Joint 185 Triplex Straight Joint	ES400J11	For Joints: Prysmian, Wrexham, Wales.	Note: The agreed suppliers do not supply all types of joints and terminations. Before purchasing jointing materials the following documents shall be consulted: ES400 J11 and CP411 Part 2 Section 6 - Jointing Materials, Kit Contents and Application Charts.
300 Triplex Straight Joint			
95 Triplex Breech Joint 185 Triplex Breech Joint			
300 Triplex Breech Joint			
95 Triplex Bottle End 185 Triplex Bottle End			
300 Triplex Bottle End			
95 XLPE, Cold Applied Termination 185 XLPE, Cold Applied Termination		For Terminations: Prysmian, Wrexham, Wales.	Note: Older cables previously installed may consist of 185 mm ² cross-section aluminium (no longer installed). This may require the use of '185' joints.
300 XLPE, Cold Applied Termination			
95 XLPE, Shorted Capped End (SCE)		DKN Powerline, Padiham, Lancashire, England.	
300 XLPE, Shorted Capped End (SCE)		Sicame, Huddersfield, West Yorkshire.	
95 XLPE, Non-load Break Elbow	For non-load break Elbow Terminations:		
300 XLPE, Non-load Break Elbow			
95 XLPE, Load Break Elbow	For load break Elbow Terminations:	TE Connectivity, Witham, Essex.	
300 XLPE, Load Break Elbow			

3.3 Jointing Accessories and Cable Protection

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
Cold Poor Resin Compound	ES400R10	WT Henley, Gravesend, Kent Prysmian, Wrexham, Wales.	
Binding Wire	ES400W1	MSS Products Ltd	
Cotton Tape	ES400T3	3M (Scapa UK, Manchester)	
PVC Tape	ES400T5	3M (Scapa UK, Manchester)	
Cable Marker Tape	ES400T2	Centriforce, Liverpool.	
Cable Tiles	ES400T8	Centriforce, Liverpool	
Plastic Ducts	ES400D4	Emtelle Ltd, Hawick, Scotland	
Duct Seal	ES400D5	Raychem Rayflate, TE Connectivity, Witham, Essex.	
Copper bonded Steel Earth Rods Extensible Type Earth Rod Coupling Steel Driving Stud Earth Rod Connector Saddle Clamp Type or "U" Bolted (Bulldog Grip) Type	CP411 Pt 1 Section 5	W J Furse	For Earth Rods, refer to CP411 Part 1 Module 30. Also refer to ENA TS 43-94 for Earth Rods
Earth Wire, (6491X) 16mm ² - 95mm ² , stranded copper, green and yellow insulated	CP411 Pt 1 Section 5	TFK, Bienzow, Krakow, Poland. Cabelte, Oporto, Portugal.	BS 6004 is applicable for earth wire.

4. UNDERGROUND LOW VOLTAGE EQUIPMENT INCLUDING CABLES, JOINTS, LINK BOXES & TERMINATIONS

4.1 Low Voltage Mains Cables

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
3 and 4 core, 95mm ² Aluminium cored, XLPE insulated, copper neutral (Waveform)	ES400C11	Prysmian, Wrexham, Wales.	Minimum size of low voltage (LV) mains cable to be installed on Electricity North West's LV distribution network.
3 and 4 core, 185mm ² Aluminium cored, XLPE insulated, copper neutral (Waveform)		NKT, Asnaesn, Denmark.	Minimum size of cable to be used on interconnecting LV mains.
3 core, 300mm ² Aluminium cored, XLPE insulated, copper neutral (Waveform)		TFK, Bienzow, Krakow, Poland.	To be used for tailed out LV fuse ways not required for immediate use, and elsewhere as required.
3 and 4 core, 95mm ² Low Smoke Zero Halogen Aluminium cored, XLPE insulated, copper neutral (Waveform)	ES400C11	Hellenic Cables, Thiva, Greece.	To be used exclusively for internal building installations, but not elsewhere.
3 and 4 core, 185mm ² Low Smoke Zero Halogen Aluminium cored, XLPE insulated, copper neutral (Waveform)		NKT, Asnaesn, Denmark.	
3 and 4 core, 300mm ² Low Smoke Zero Halogen Aluminium cored, XLPE insulated, copper neutral (Waveform)		Prysmian, Wrexham, Wales.	

4.2 Low Voltage Cable Joints

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
3 core, 95 Waveform Straight Joint	ES400C21 (Mechanical Connectors)	<u>Joint Shells:</u> TE Connectivity, Witham, Essex	<p>Low voltage joints consist of items sourced from various manufacturers.</p> <p>Before purchasing jointing materials the following documents shall be consulted: ES400 J3 and CP411 Part 1 Section 5 - Jointing Materials, Kit Contents and Application Charts,.</p> <p>Note: Section 3.3 of this document includes details for the following relevant items.</p> <ul style="list-style-type: none"> - Resins. - PVC/Cotton tape. - Binding wires.
3 core, 185 Waveform Straight Joint	ES400J3 (Joint Shells)	<u>Shear Off Lugs:</u> TE Connectivity, Witham, Essex	
3 core, 300 Waveform Straight Joint	ES400P1 (Insulating Patch)	<u>Earth Bonding Kits:</u> TE Connectivity, Witham, Essex.	
3 core, 95 Waveform Breech Joint	CP411 Pt 1 Section 5	<u>Cable Ties:</u> Hellermann Tyton Ltd, Manchester.	
3 core, 185 Waveform Breech Joint		<u>Insulating Patch:</u> Trafford Rubber Products, Manchester.	
3 core, 300 Waveform Breech Joint		<u>Heat Shrink:</u> Hellermann Tyton Ltd, Manchester.	
3 core, 95 Waveform Bottle End		Raychem, TE Connectivity, Witham, Essex.	
3 core, 185 Waveform Bottle End			
3 core, 300 Waveform Bottle End			

4.3 Underground Link Boxes

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
2 way Link Box 4 way Link Box	ES400L5	2 way only: TE Connectivity, Witham, Essex 2 way and 4 way: Sicame, Huddersfield.	TE Connectivity reference: TYCO Mark 1 Only. Sicame part references: HMFLBLVD/2/3C-ENW (LV 2 way 3 core link box) HMFLBLVD/4/3C-ENW (LV 4 way 3 core link box) HMFLBLVD/2/3C/T-ENW (LV 2 way 3 core tailed link box) HMFLBLVD/4/3C/T-ENW (LV 4 way 3 core tailed link box) HMFLBLVD/2/3C-ENW-2 (LV 2 way 3 core link box extra height) HMFLBLVD/4/3C-ENW-2 (LV 4 way 3 core link box extra height) HMFLBLVD/2/CK (4 core conversion kit for 2 way link box)

4.4 Low Voltage Underground Service Cables

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
3 Core, 25mm ² Aluminium core, XLPE insulated, copper neutral	ES400C8	NKT (Erisson), Falun, Sweden.	To be used only for street lighting services not exceeding 25A and 15m route length from main's service joint. Otherwise see ES 211 for alternative arrangements.
Single Core, 4mm ² Copper core, XLPE insulated, copper neutral		Tratos Ltd, Knowsley, Merseyside, UK.	
Single Core, 35mm ² Aluminium core, XLPE insulated, copper neutral		TFK, Bienzow, Krakow, Poland. Cabelte, Oporto, Portugal	

4.5 Low Voltage Underground Service Joints

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
Service to Mains Breech Joints (up to 4 service connections). Service to Service Straight Joint. Service Bottle End.	See Section 4.2 of this document.	See Section 4.2 of this document.	Low voltage joints consist of items sourced from various manufacturers. Before purchasing jointing materials the following documents shall be consulted: ES400 J3 and CP411 Part 1 Section 5 - Jointing Materials, Kit Contents and Application Charts.

4.6 Ducts, Service Pipes & Meter Cabinets

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
Red, Smooth Walled, 117mm Internal Diameter Red, Smooth Walled, 150mm Internal Diameter	ES400D4	Emtelle, Hawick, Scotland.	Approved preformed bends, couplings etc are detailed in ES400D4.
Duct Seal	ES400D5	Raychem Rayflate, TE Connectivity, Witham, Essex.	Rayflate Duct Sealing System
Marker Tape	ES400T2	Centriforce, Liverpool.	
Cable Tiles	ES400T8	Centriforce, Liverpool.	

4.6 continued, Ducts, Service Pipes & Meter Cabinets

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
38mm Service Duct Service Entry Pipe (Hockey Stick) 38mm internal diameter 50mm Service Duct	ES400D4	Emtelle, Hawick, Scotland.	
Outdoor Meter Cupboard		Mitras Composite UK Ltd. Tricel (Gloucester) Ltd.	BS 8567 is relevant for outdoor meter cupboards.
Meter Board Particle board, minimum 18mm thick		Wootton & Co Ltd.	BS EN 312 is relevant for particle boards. Required for: i) Small outdoor meter cupboard (505mm x 340mm) ii) Medium outdoor meter cupboard, or internal meter position, single phase (575mm x 375mm) iii) Large outdoor meter cupboard, or internal meter position, poly-phase (650mm x 460mm) iv) Narrow outdoor meter cupboard (740mm x 220mm)

4.7 Low Voltage Underground Single Service Terminations

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
25A Single Phase Street Lighting Cut Out	ES400C6	Lucy Electric, Oxford, England. Tofco Ltd, Ponteland, Northumberland. W T Henley, Gravesend, Kent.	Lucy – SLF 25A SNE and CNE Tofco – ZA F144/DP/E/ABS W T Henley – 54715-53 (CNE Double Pole), 54715-54 (SNE Double Pole)
100A Single Phase Cut Out	ES332	Lucy Electric, Oxford, England. W T Henley, Gravesend, Kent.	Lucy – Mark 3 Version 2, Mark 4. Henley – Series 5 and 6
100A 3 Phase Street Cut Out	ES400C5	Lucy Electric, Oxford, England. W T Henley, Gravesend, Kent.	
400A 3 Phase Industrial Metering Cubicle	ES400C5	Ritherdon, Darwen, England.	To be used for all CT metered connections between 61kVA and 300kVA
Remote Metering Panel for substation connections	ES400C5	Ritherdon, Darwen, England. Bemco, Glasgow, Scotland.	To be used for all CT metered connections above 300 kVA. Specific panels for LV metered connections and HV metered connections: please specify which to supplier.

4.8 Low Voltage Underground Multi -Way Service Distribution Units

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
MODE Range MODE MK II Range	ES502	Schneider Electric, Scarborough, England.	All products in the MODE range are approved for use in Electricity North West.
DB Range: Model DB6, 200A 2 way, direct to busbars Model DB9, 200A 3 way, direct to busbars		Bemco, Glasgow, Scotland.	Provides up to 6 outgoing single phase, 100A connections. Provides up to 9 outgoing single phase, 100A connections.
SDB Range: Model SDB15, 300 & 500A fused incomer, up to 5 x 100A outgoing ways per phase Model SDB30, 500A fused incomer with between 6 and 10, 100A outgoing ways per phase Model SDB60, 500A fused incomer with between 11 and 20, 100A outgoing ways per phase			Provides up to 15 outgoing single phase, 100A connections. Provides up to a maximum of 30 outgoing single phase, 100A connections (500A, 10 Way model) Provides up to a maximum of 60 outgoing single phase, 100A connections (500A, 10 Way model) For other BEMCO models & equipment – consult the Engineer before specifying or using any other BEMCO equipment for approval.

5. DISTRIBUTION SUBSTATIONS – PLANT, EQUIPMENT & HOUSING

5.1 High Voltage Switchgear

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
11/6.6 kV Non Extensible Ring Main Unit	ES314	Schneider Electric Ringmaster Leeds, England for RN2c & RN6c	
		Lucy Electric, Oxford, England for SABRE VRN/VRN2/VRN2 A, FRMU MK2A	
11/6.6 kV Non Extensible Switchgear		Schneider Electric Ringmaster Leeds, England for CN2	
11/6.6 kV Extensible Switchgear		Schneider Electric Ringmaster Leeds, England for Range CE2, CE6, SE6.	Where required the protection shall be provided by self powered relays. Approved models are either Schneider Electric VIP 300 or Areva P124S.
11/6.6 kV Metering Units		Schneider Electric, Leeds, England for MU2, MU6. Lucy Electric, Oxford, England for SABRE AIMU	
11/6.6 kV Fixed Pattern Switchgear		Schneider Electric Leeds, England for HWX, PIX, Genie EVO. Hawker Siddeley, Loughborough, England for Eclipse	NOTE – Schneider Genie EVO 2000A version is excluded. Protection equipment shall be in accordance with EPD307 and agreed by the Electricity North West Engineer.

In situations where unit, directional and other levels of protection are required or specified by Electricity North West then a bespoke engineering solution will be required, including an indoor substation. The specification and design would be non-standard and the above equipment would not be approved for connection. In such cases detailed specifications will be issued by Electricity North West.

5.2 Low Voltage Switchgear

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
Close coupled Fuse board/Cabinet (433/250V)	ES319	Schneider Electric, Scarborough, England Lucy Electric, Oxford, England	3 way cabinets with 800A rated busbars shall be fitted only to 315kVA and 500kVA transformers. Further details are given in ES352. NOTE - Lucy AcuLoK TMO is excluded.
Wall Mounted Fuse board (433/250V)	ES319	Schneider Electric, Scarborough, England Lucy Electric, Oxford, England	NOTE - Lucy AcuLoK TMO is excluded

5.3 Compact Substations

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
200 kVA & 315 kVA Compact Substations, 11,000V/433V and 6,600V/433V	ES322	Schneider Electric, Leeds, England.	MDS Range: fitted with Schneider CN2 transformer switch and integral LV fusegear with shielded pattern, 800A, 2 way. Unit is in a stainless steel enclosure
315 kVA Compact Substations, 11,000V/433V and 6,600V/433V	ES322	Schneider Electric, Leeds, England.	Mini MDS Range: fitted with Schneider RN2c non extensible Ring Main Unit and integral LV fusegear with shielded pattern, 800A, 3 way. Unit is in a stainless steel enclosure.

5.4 Ground Mounted Distribution Transformers

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
315 kVA, 500 kVA, 800 kVA and 1000 kVA Close Coupled, Unit Type Transformers; 11,000V / 433 V and 6,600V / 433 V	ES322	CG Power Systems Ireland Ltd, Cavan, Ireland. Efacec, Porto, Portugal.	
315 kVA, 500 kVA, 800 kVA and 1000 kVA Cable Connect Type Transformers; 11,000V / 433 V and 6,600V / 433 V	ES322	CG Power Systems Ireland Ltd, Cavan, Ireland. Efacec, Porto, Portugal.	

5.5 Distribution Substation Housings

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
<p>11/6.6 Glass Reinforced Plastic Housings for –</p> <p>Unit substations: 1) Lucy Sabre fitted equipment, see drawing – ES352 A2 022. 2) Schneider RN2c fitted equipment, see drawing – ES352 A2 016.</p> <p>HV Metered Connections: 1) Lucy Sabre AIMU and RMU, see drawing – ES352 A2 026. 2) Schneider MU2/MU6 and RMU, see drawing – ES352 A2 025</p> <p>HV Metered Connections (extensible gear): Schneider fitted equipment, see drawing – ES352 A2 011.</p>	<p>ES301 ES352</p>	<p>Envico Engineering Swansea, Wales.</p> <p>Kingsley Plastics, Devon, England.</p> <p>Kinpars Industrial Plastics, Lauder, Scotland.</p> <p>E B Solutions Ltd, Bradford, England.</p> <p>Morgan Marine, Llandybie, Ammanford, Carmarthenshire Wales.</p>	<p>Door locks, danger notices, safety signs, substation name plates and substation locks to be supplied by Electricity North West and be included as part of the non contestable charges.</p> <p>Note: Individual plinth details are provided on Electricity North West Drawings indicated in “Item” column to the left. Latest versions to be obtained from the Engineer.</p> <p>The location of the proposed substation must be agreed with the Engineer prior to construction.</p> <p>Designs for substations can be found in ES352. Any deviations from this standard design shall be agreed by Electricity North West.</p>
<p>GRP Air Inlet Louvre: Drawing No – ES352 A2 010</p>	<p>ES301</p>	<p>Eurofab Ltd, Bromborough, The Wirrall.</p>	<p>The specification for substation lighting and power is detailed in ES397.</p>

5.5 continued, Distribution Substation Housings

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
<p>Brick Built Housings for –</p> <p>Unit substations: 1) Lucy Sabre fitted equipment, see drawing – ES352 A2 006. 2) Schneider RN2c fitted equipment, see drawing – ES352 A2 006.</p> <p>HV Metered Connections (non extensible gear): 1) Lucy Sabre AIMU and RMU, see drawing – ES352 A2-003 2) Schneider MU2 and RMU, see drawing – ES352 A2 024</p> <p>HV Metered Connections (extensible gear): Schneider fitted equipment, see drawing – ES352 A2-017</p>	ES352		<p>Door locks, danger notices, safety signs, substation name plates and substation locks to be supplied by Electricity North West and be included as part of the non contestable charges.</p> <p>Note: Individual plinth details are provided on Electricity North West Drawings indicated in “Item” column to the left. Latest versions to be obtained from the Engineer.</p> <p>The location of the proposed substation must be agreed with the Engineer prior to construction.</p> <p>Designs for substations can be found in ES352. Any deviations from this standard design shall be agreed by Electricity North West.</p>
<p>Substation Wall Louvre: Drawing No – ES352 A2 019</p>	ES352	Eurofab Ltd, Bromborough, The Wirral	<p>The specification for substation lighting and power is detailed in ES397.</p>

5.5 continued, Distribution Substation Housings

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
Substation Doors: Type A (Steel) Type B (Aluminium) Type C (Timber), drawing No. – ES352 A2 014 Drawing No. – ES352 014A Replacement Doorsets and Combination Detail Drawing No. – ES352 071 Aluminium and Timber Door Section Details	ES326 ES352	TS Designs Ltd, Marlow. Prima Doors Ltd, Hazel Grove, Stockport. Bradbury Group Ltd, Scunthorpe.	Door Type (A, B, C) shall be selected in accordance with ES326.
Door Louvre Drawing No – ES352 A2 020	ES352	Eurofab Ltd, Bromborough, The Wirral	Note: Door manufacturer may also provide louvre with a finished door.
Hasp & Staple Arrangement Drawing No – ES352 A2 021	ES352 ES326	Crescent Sheet Metal Ltd, Mosley. ASSA ABLOY, Willenhall, West Midlands.	
Rubber Mat	ES602	Rayflex Rubber	

6. FUSES

6.1 Fuses - LV Switchgear and cut outs

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
100A	ES334	Lawson Fuses Ltd Cooper Bussmann Ltd	
160A			
200A			
250A			
315A			
355A			
400A			
500A			
630A			

6.2 Fuses - Services

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
6A	ES334	Lawson Fuses Ltd Cooper Bussmann Ltd	6A, 16A and 25A to be used in street lighting cut outs
16A			
25A			
60A			
80A			
100A			

6.3 Fuses - TLF

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
3A	ES334	Lawson Fuses Ltd	Model: XF 3
5A		Cooper Bussmann Ltd	Model: XF 5
7.5A			Model: XF 7.5
10A			Model: XF 10
12.5A			Model: XF 12.5
15A			Model: XF 15

7. OVERHEAD CIRCUITS

Equipment for overhead circuits shall be acquired in accordance with EPD307 and the ICP shall gain approval from Electricity North West's Policy and Standards Manager for suggested equipment, prior to purchasing the equipment. Some of the equipment applicable for overhead circuits is shown below.

Item	Electricity North West Specification	Agreed Supplier(s)	Comments
Pole Mounted Distribution Transformer	ES322	CG Power Systems Ireland Ltd, Cavan, Ireland.	Refer to ES322 for relevant transformer sizes.
11/6.6kV Pole Mounted Recloser	ES315	Whipp & Bourne GVR (Hawker Siddeley Switchgear Ltd), Blackwood, South Wales	
11/6.6kV Pole Mounted Air Break Switch Disconnectors	ES311	MLE Gevea Power Isolators Ltd, Banbury, UK.	MLE – 'R' Type, handle operated. MLE – 'RXL' Type, rod or handle operated. Gevea – 3-silicone insulator, rod or handle operated. Power Isolators – Rapier AX
11/6.6kV Pole Mounted Link and Fuse Mounts	ES400F4	MLE Pfisterer Ltd	MLE – Trip all phase ASL mounts, 1phase/2gang. MLE – Trip all phase ASL mounts, 3phase/3gang. Pfisterer-Sefag fuse mount Note: Cooper Busmann Ltd ASL units to fit all of the above.

8. DOCUMENTS REFERENCED

British Standards

BS 8567	Specification for outdoor electricity meter cupboards
BS EN 312	Particleboards. Specifications
BS 6004	Electric cables. PVC insulated and PVC sheathed cables for voltages up to and including 300/500 V, for electric power and lighting

Note: Electricity North West is not able to supply copies of any of the above documents, but copies may be obtained from the British Standards Institution.

Energy Networks Association engineering documents

ENA ER G81 Part 2	Framework for new low voltage housing development installations - Part 2 Materials specification
ENA TS 43-94	Earth Rods and their Connectors

Note:

Electricity North West is unable to supply copies of any of the above documents, but copies may be obtained from the Energy Networks Association.

Electricity North West documents

EPD282	Distribution System Design - HV Network
EPD307	Equipment Approved for Use on Electricity North West Network
CP411 Part 1	Mains Practice up to and Including 132kV - Cable Jointing up to and Including 1000Volts
CP411 Part 2	Mains Practice up to and Including 132kV - 6.6/11kV Cable Jointing
ES211	Third-Party Provided New Connections of Street Electrical Fixtures
ES301	Distribution Substation Housings, Replacement Roofs and Doors
ES311	Overhead Line Air Break Switch-Disconnectors
ES314	12kV and 7.2kV 21.9kA Switchgear
ES315	Pole Mounted Auto Reclosers and Auto Sectionalisers
ES319	LV Distribution Fusegear
ES322	Ground Mounted Distribution Transformers
ES326	Substation Security Doors
ES332	100A House Service Cut-outs
ES334	HV and LV Fuse-Links

ES352	Design of Distribution Substations and Transforming Points
ES397	Electrical Installations within Distribution Substations
ES400C5	Specification for Heavy-Duty Three-Phase Cut-Outs
ES400C6	Specification for Street-Lighting Cut-outs
ES400C8	LV Service Cables
ES400C9	11kV Distribution Cables
ES400C11	Low Voltage Mains Cables
ES400C21	Mechanical Connectors and Lugs for Cables (operating in the range LV to 33kV)
ES400D4	Plastic Ducts, Conduit & Accessories
ES400D5	Duct Seal
ES400F4	Pole-Mounted Assemblies for Drop-Out Expulsion Fuses and Links
ES400J3	Low Voltage Cable Joint Shells
ES400J11	11kV Joints, Terminations, Associated Sealants and Components
ES400L5	Two-Way and Four-Way Underground Link Boxes
ES400P1	Insulating Patch Material
ES400R10	Cold-Pour Resin Compound for Encapsulating Joints on LV, 11kV and
ES400T2	Specification for Plastic Underground Marker Tape
ES400T3	Specification for Tape, Cotton, Plain
ES400T5	Specification for PVC Tapes for Electrical Purposes
ES400T8	Specification for Cable tiles - Plastic
ES400W1	Specification for Aluminium and Copper Binding Wire, Plain and PVC
ES502	Multi-way Service Distribution Boards
ES602	Rubber Mats

9. KEYWORDS

Cable; connection; domestic; ICP; joint; material; plant; service.