

Electricity Specification 400D4

Issue 4 October 2021

Plastic Ducts, Conduit & Accessories



Amendment Summary

ISSUE NO. DATE	DESCRIPTION
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1 Scope

This Specification comprises general requirements for the Approval and testing of plastic ducts used for buried cable installations, plastic conduit for electrical installations and associated accessories employed on the electricity distribution network owned by Electricity North West Limited (Electricity North West).

2 Definitions

Approval	Sanction by the Electricity North West Underground 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.
Sub-Contractor	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 Underground Circuits Policy Manager, and the legal representatives, successors and assigns of such person.
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.

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 Underground Circuits Policy Manager, and receipt of a written agreement to the proposed change from the Electricity North West Circuits 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 Underground 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 Underground Circuits Policy Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Underground 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 Underground Circuits 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 Underground 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 Underground 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 Underground Circuits Policy Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Underground 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 Underground 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.

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 Underground Circuits 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 Underground 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 Underground Circuits Policy Manager.

3.6 Minimum Life Expectancy

The minimum life expectancy of all products covered by this Specification is 60 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.

3.8 Confirmation of Conformance

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

4 Requirements for Type and Routine Testing

The Electricity North West Underground Circuits 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 Underground Circuits 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 Underground 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 Underground Circuits Policy Manager.

5 Technical Particulars

Cable ducts and accessories shall comply with the requirements of the Energy Networks Association Technical Specification 12-24 and any additional specifications detailed in the Technical Particulars and Schedules.

Cable ducts and accessories shall be red unless specified otherwise. Red shall be to BS 5252: 04.

The duct shall be marked "CAUTION Electricity North West Ltd ELECTRICITY DUCT". Include the Class of duct, the manufacturers name, date of manufacturer and manufacturer's reference number for traceability. The marking shall be laser printed or equivalent agreed with the Electricity North West Underground Circuits Manager. High Strength uPVC ducting shall be along the duct.

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The markings shall be on three print lines, 120 degrees apart.

A dotted line, as shown below, shall be added to the male end of every duct signifying the point at which the duct is correctly inserted into the female end. (The purpose of this line is to ensure correct fitment during installation.)

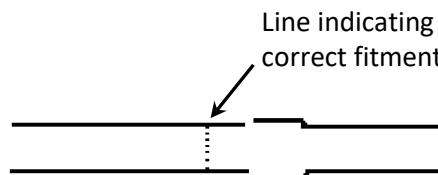


Figure 1

6 Schedules

6.1 ENA TS 12-24 Class 1 Ducts and Accessories

These ducts and accessories shall meet the requirements of ENA TS 12-24, Class 1. Additionally, the non-coilable uPVC ducts and preformed bends shall comply with [Appendix A](#). Details are given in [Tables 1](#) and [2](#) below.

Ducting for trenchless cable installations shall be suitable for friction welding.

Bespoke preformed bends may be required from time-to-time. The Supplier shall be required to supply these items on request.

The "high-strength" HDPE duct is included to replace the use of steel ducts in shallow-laid trenches, etc, as specified in ES400E4 and ES400E5.

Table 1: ENA TS 12-24 Class 1 Ducts

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable duct, coilable, HDPE, straight-walled, red, 40mm internal diameter, 50m length, trenchless cable installations	229574
Cable duct, coilable, HDPE, straight-walled, red, 52mm internal diameter, 50m length, trenchless cable installations	229580
Cable duct, non-coilable, uPVC, high-strength (1500N), red, 146mm internal diameter, 3m length	229101
Cable duct, non-coilable, uPVC, high-strength (1500N), red, 100mm internal diameter, 3m length	229102
Cable duct, non-coilable, uPVC, single socket, red, 103mm internal diameter, 6m length	229619
Cable duct, non-coilable, uPVC, single socket, red, 103mm internal diameter, 3m length	229620
Cable duct, non-coilable, uPVC, single socket, red, 150mm internal diameter, 3m length	229590
Cable duct, non-coilable, uPVC, single socket, red, 150mm internal diameter, 6.6m length	229597
Cable duct, non-coilable, uPVC, single socket, red, 188mm internal diameter, 6m length	229621
Cable duct, non-coilable, uPVC, single socket, red, 188mm internal diameter, 3m length	229622

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Table 2: ENA TS 12-24 Class 1 Duct Accessories

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable duct accessory, uPVC, coupling (slip), red, 103mm internal diameter duct (bag of 50)	229628
Cable duct accessory, uPVC, coupling (slip), red, 150mm internal diameter duct (bag of 15)	229095
Cable duct accessory, uPVC, coupling (slip), red, 188mm internal diameter duct (bag of 5)	229629
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 1200mm bending radius, 150mm internal diameter duct	229490
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 1200mm bending radius, 103mm internal diameter duct	229623
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 3900mm bending radius, 188mm internal diameter duct	229626
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 3900mm bending radius, 150mm internal diameter duct	229515
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 1200mm bending radius, 150mm internal diameter duct	229550
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 1200mm bending radius, 103mm internal diameter duct	229618
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 3900mm bending radius, 188mm internal diameter duct	229627
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 3900mm bending radius, 150mm internal diameter duct	229516
Cable duct accessory, uPVC, preformed bend (single socket end), 45°, red, 1200mm bending radius, 150mm internal diameter duct	229560
Cable duct accessory, uPVC, preformed bend (single socket end), 45°, red, 1200mm bending radius, 103mm internal diameter duct	229624

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Cable duct accessory, uPVC, preformed bend (single socket end), 90°, red, 1200mm bending radius, 150mm internal diameter duct	229570
Cable duct accessory, uPVC, preformed bend (single socket end), 90°, red, 1200mm bending radius, 103mm internal diameter duct	229625

6.2 ENA TS 12-24 Class 2 Ducts and Accessories

These ducts and accessories shall meet the requirements of ENA TS 12-24, Class 2. Additionally: the non-coilable uPVC duct, hockey stick and preformed bends shall comply with [Appendix A](#); the coilable HDPE duct shall comply with [Appendix B](#). Details are given in [Tables 3](#) and [4](#) below.

The hockey stick is detailed in drawing I-400D4-GA-001.

Table 3: ENA TS 12-24 Class 2 Ducts

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable duct, coilable, HDPE, red, 32mm internal diameter, 50m length	234966
Cable duct, non-coilable, uPVC, single socket, red, 32mm internal diameter, 2m length	229586

Table 4: ENA TS 12-24 Class 2 Accessories

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable duct accessory, uPVC, coupling (slip), red, 32mm internal diameter duct	229091
Cable duct accessory, uPVC, hockey stick, 2-part, red & white, 400mm bending radius, 32mm internal diameter duct (Dwg I-400D4-GA-001)	229512
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 400mm bending radius, 32mm internal diameter duct	229482
Cable duct accessory, uPVC, preformed bend (single socket end), 45°, red, 400mm bending radius, 32mm internal diameter duct	229474

Cable duct accessory, uPVC, preformed bend (single socket end), 90°, red, 400mm bending radius, 32mm internal diameter duct	229466
Cable duct accessory, uPVC, saddle (with 8mm fixing holes), white, 32mm internal diameter duct	229504

6.3 BS EN 61386-1 Very Heavy Impact Conduit and Accessories

Very heavy impact conduit and accessories shall meet the requirements of BS EN 61386-1. Details are given in [Tables 5](#) and [6](#).

Saddles shall be black “flat type”.

Table 5: BS EN 61386-1 Very Heavy Impact Conduit

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable conduit, PVC, very heavy impact, black, 20mm internal diameter, 3m length	229720
Cable conduit, PVC, very heavy impact, black, 27mm internal diameter, 3m length	229721

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Table 6: BS EN 61386-1 Very Heavy Impact Conduit Accessories

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable conduit accessory, uPVC, coupling, black, 25mm diameter conduit	229726
Cable conduit accessory, uPVC, coupling, black, 32mm diameter conduit	229727
Cable conduit accessory, uPVC, saddle, black, 25mm diameter conduit	229728
Cable conduit accessory, uPVC, saddle, black, 32mm diameter conduit	229729
Cable conduit accessory, uPVC, 90°, black, 150mm bending radius, 25mm diameter conduit with 2 Black Couplings	229724
Cable conduit accessory, uPVC, 90°, black, 200mm bending radius, 25mm diameter conduit with 2 Black Couplings	229725

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6.4 BS EN 61386-23 Flexible Conduit

This flexible conduit and accessories shall meet the requirements of BS EN 61386-23. Note that BS EN 61386-23 needs to be read in conjunction with BS EN 61386-1. Details are given in [Tables 7](#).

Table 7: BS EN 61386-23 Flexible Conduit

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable duct, flexible conduit, black, 25mm diameter, 30m length	229722
Cable duct, flexible conduit, black, 32mm diameter, 30m length	229723

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6.5 End Caps

Table 8: Other Accessories

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ELECTRICITY NORTH WEST CC NO
Cable duct accessory, uPVC, Spigot end cap, red, 103mm internal diameter	229616
Cable duct accessory, uPVC, Spigot end cap, red, 150mm internal diameter	229615
Cable duct accessory, uPVC, Spigot end cap, red, 188mm internal diameter	229650
Cable duct accessory, Cable Lube	229699

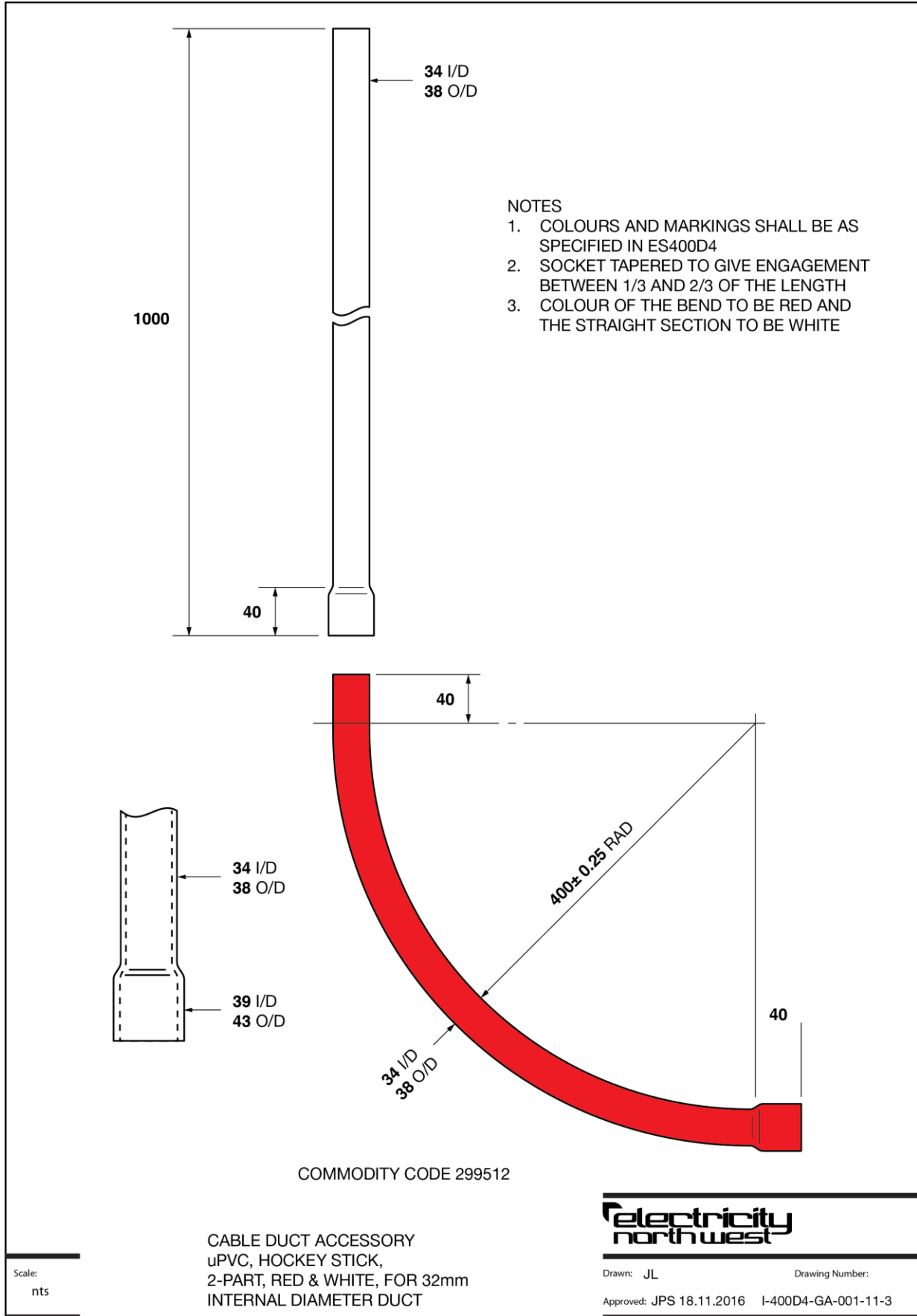
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7 Documents Referenced

DOCUMENTS REFERENCED	
Health and Safety at Work Act 1974	
Control of Substances Hazardous to Health Regulations 2002	
Manual Handling Operations Regulations 1992	
BS EN ISO 9000:	Quality management systems.
BS EN ISO 14001:	Environmental management systems. Requirements with guidance for use.
BS EN 61386:	Specification for conduit systems for cable management.
BS 5252:	Framework for colour co-ordination for building purposes.
ENA TS 12-24:	Plastic Ducts for Buried Electric Cables.
CP311	Equipment Approval Policy and Process

8 Keywords

Cable; duct; service



Appendix A – Detail for Non-Coilable uPVC Ducts

A1 Duct Internal Diameter (Mean)

32mm ducting = 32.0mm – 32.5mm.

100mm ducting = 100.0mm – 100.5mm

103mm ducting = 103.0mm – 103.5mm.

146mm ducting = 146.0mm – 146.5mm.

150mm ducting = 150.0mm – 150.5mm.

188mm ducting = 188.0mm – 188.5mm.

A2 uPVC Quality

100% Virgin Material.

A3 Duct Colour: Outside Minimum Thickness

1mm.

A4 Duct Wall Thickness Requirements

Minimum wall thickness of 3.8mm required for cable pulling.

A5 Duct End – Spigot End

Spigot: plain end shall be bevelled to allow easy jointing of duct on site. Minimum thickness of plain end shall be 1.3mm. Bevel length shall be ≥ 5 mm.

A6 Push-In Marker on Plain Pipe End

A circumferential mark is required to indicate the correct push-in distance for duct jointing for spigot and socket joints. Location: 105mm - 110mm to suit socket length below.

A7 Duct End – Socket End

Push-type fit: 3.4mm minimum wall thickness; 110/160/200mm - 116mm socket length.

A8 Eccentricity of Socket Relative to Duct

Less than 1mm eccentricity and less than 1° angle between the centre line of the socket and the longitudinal axis of the duct – to avoid rippling of cable sheath during cable pulling.

A9 Duct Inner Surface

The duct shall have a smooth, low-friction surface completely free of ripples, sharp edges and protrusions. The friction coefficient shall be <0.28 .

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A10 End Caps

A bag of 15 lightweight end caps for the ducts shall be supplied with each bale of ducts. The end caps shall be capable of fitting each duct end (ie inside of socket and outside of plain end).

A11 Preformed Bends for Duct

The material shall be as the pipe section. Minimum wall-thickness – 3.8mm.

Appendix B – Detail for Coilable HDPE Ducts

B1 Duct Internal Diameter (Mean)

32mm ducting = 32.0mm – 32.5mm.

42mm ducting = 42.0mm – 42.5mm.

54mm ducting = 54.0mm – 54.5mm.

B2 HDPE Quality

100% Virgin Material.

B3 Duct Colour: Outside Minimum Thickness

1mm.

B4 Eccentricity of Socket Relative to Duct

Less than 1mm eccentricity and less than 1° angle.

B5 Duct Inner Surface

The duct shall have a smooth, low-friction surface completely free of ripples, sharp edges and protrusions. The friction coefficient shall be <0.28.

B6 Couplers

Slip or rubber gasket type with no internal obstructions/sharp edges. A centring ridge is required which does not protrude.

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Appendix C – 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)
3.1	Product not to be Changed		
3.2	Electricity North West Technical Approval		
3.3	Quality Assurance		
3.4	Formulation		
3.5	Identification Markings		
3.6	Minimum Life Expectancy		
3.7	Product Conformity		
3.8	Confirmation of Conformance		
4.1	Requirements for Type Tests at the Supplier's Premises		
4.2	Requirement for Routine Tests at the Supplier's Premises		
5.	Technical Particulars		
6.1	ENA TS 12-24 Class 1 Ducts and Accessories		
6.2	ENA TS 12-24 Class 2 Ducts and Accessories		
6.3	BS EN 61386-1 Very Heavy Impact Conduit and Accessories		

6.4	BS EN 61386-23 Flexible Conduit		
6.5	End Caps		
<p>* 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.</p>			

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Additional Notes: