

Electricity Specification 400R5

Issue 3 May 2024

Materials for Restoration of Highways



Amendment Summary

ISSUE NO. DATE	DESCRIPTION
Issue 2 February 2022	New Template applied throughout Prepared by: D M Talbot Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, DSO Director
Issue 3 May 2024	Document updated to latest model template. Document updated throughout to reflect latest versions of regulations and specifications. Surround to Apparatus material updated to comply with ENA TS 97-1 All backfill and reinstatement materials updated to confirm to 4 th Edition of the Code of Practice “Specification for the reinstatement of openings in highways” issued by the Department of Transport Prepared by: P Howell Approved by: Policy Approval Panel and signed on its behalf by Paul turner, PAP Chairperson

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1 Introduction

This document provides the requirements for materials to be used for reinstatement of any highways such as roads, footways, footpaths, bridleways and cycle tracks that have been opened to install, remove, or maintain buried cables and associated equipment for use on the electricity distribution network (Network) owned by Electricity North West Limited, as Distribution Licensee, herein referred to as ENWL.

2 Scope

This specification shall apply for openings made in all highways used for public access. For openings made in land used of other purposes such as private access, agricultural, leisure, railways etc., the reinstatement shall be made using appropriate materials as directed by the ENWL Engineer. However, in all cases the requirements for the Surround to Apparatus material as defined in [Section 6.2](#) shall comply to this specification.

Reinstatements in highways will normally match the original construction unless there are specific local requirements for deviation.

The material surrounding ENWL apparatus (e.g. cables, joints, link boxes) is of particular importance to ensure it does not contain any large or sharp particles which may damage the apparatus, and the thermal characteristics enable suitable heat transfer to ensure the cables can safely carry their calculated maximum loadings.

The materials for backfill and the various layers up to the top surface shall always comply in full to the requirements laid out in the Department for Transport statutory code of practice "Specification for the Reinstatement of Openings in Highways Fourth edition" to ensure our obligations under Section 71 of the New Roads and Street Works Act 1991 are met.

Details on the dimensions, construction and design of cable trenches and joint bays, and protective ducts and marker tapes can be found in the following documents.

- ES400E4 –Specification for Installation, Commissioning and Repair of 11kV and LV Cables
- ES400E5- Specification for Installation, Commissioning and Repair of 33kV and 132kV Cables
- ES400D4- Specification for Cable Ducts
- ES400TT1 – Specification for Polyethylene Warning Tape, Protection Tape and Protection Tiles for Underground Cables

For any installation where cables are buried at shallow depths below the specified minimum depth of cover, it may be necessary to introduce additional protective layers such as steel plates or foamed concrete above the Surround material. Reference should be made to Chapter 6 of CP410 for details of shallow cable installations.

3 Definitions

The Contract	The agreement between ENWL 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 ENWL.
ENWL	Electricity North West Limited
Engineer	Person nominated by Electricity North West who is responsible for ensuring materials and methods of installation comply to this (or any other) specification on any particular Works
Footpath	A highway over which the public have a right of way on foot only, not being a footway.
Footway	A passage for pedestrians only, which is part of a highway that also comprises a carriageway
Highway	A way over which there exists a public right of passage.
MCHW	Manual of Contract Documents for Highway Works https://standardsforhighways.co.uk/mchw
Road	In the UK, the legal definition of a road is "any highway and any other road to which the public has access and includes bridges over which a road passes"
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 and services to ENWL 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 ENWL to submit a Tender.
Works	All materials, labour and actions required to be provided

4 General Requirements for Approvals and Testing

4.1 Product not to be Changed

Compliance with this clause shall be in accordance with ES001.

4.2 Electricity North West Limited Technical Approval

Compliance with this clause shall be in accordance with ES001.

4.3 Quality Assurance

Compliance with this clause shall be in accordance with ES001.

4.4 Formulation

Compliance with this clause shall be in accordance with ES001.

4.5 Identification Markings

Compliance with this clause shall be in accordance with ES001.

4.6 Minimum Life Expectancy

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

4.7 Product Conformity

Compliance with this clause shall be in accordance with ES001.

4.8 Confirmation of Conformance

The Tenderer shall complete the conformance declaration sheets in [Appendix A](#).

Failure to complete these declaration sheets may result in an unacceptable bid.

5 Requirements for Type and Routine Testing

Compliance with this clause shall be in accordance with ES001.

5.1 Requirement for Type Tests at Suppliers Premises

Compliance with this clause shall be in accordance with ES001.

5.2 Requirement for Routine Tests at the Supplier's Premises

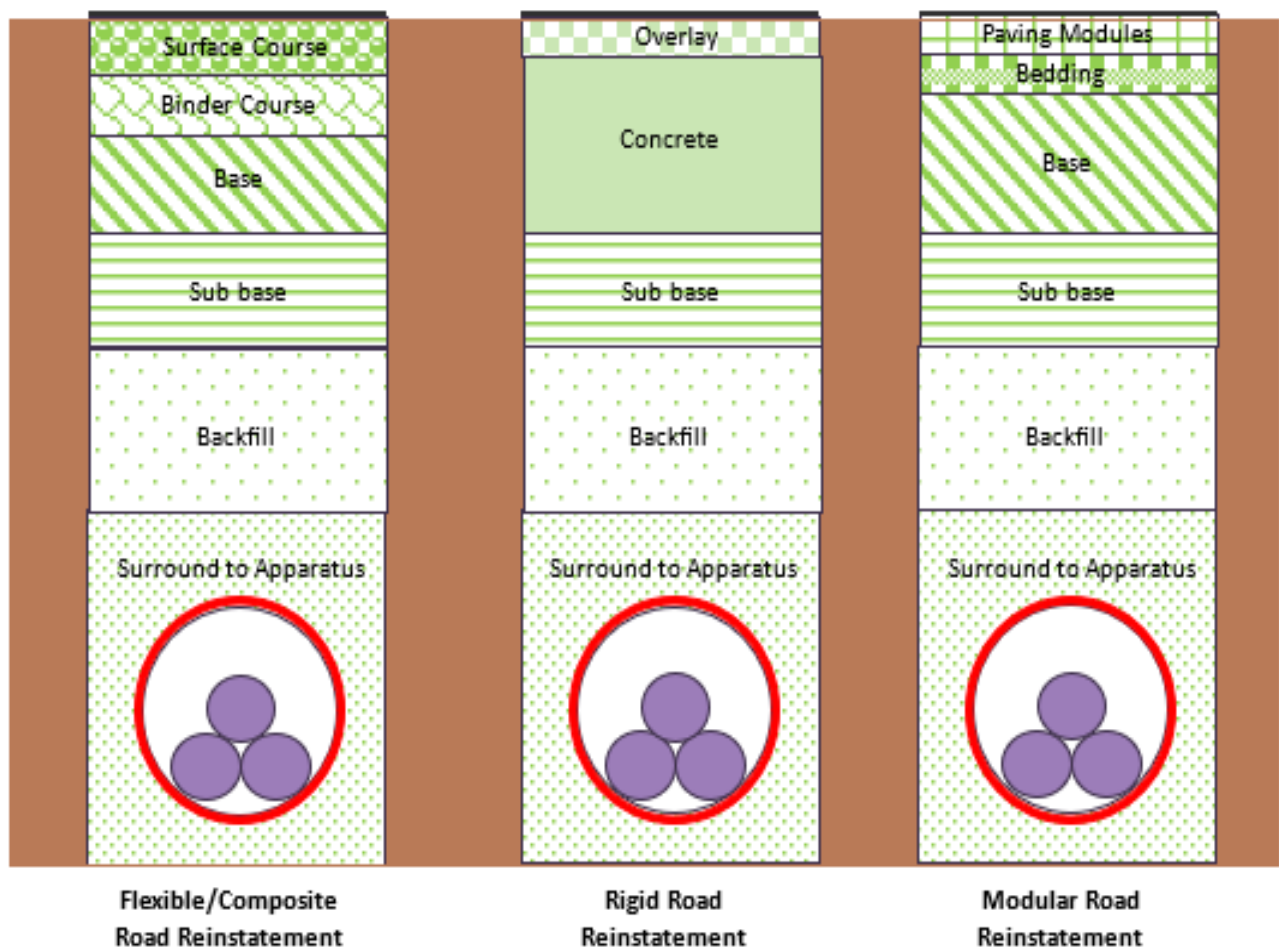
Compliance with this clause shall be in accordance with ES001.

6 Technical Specifications

6.1 General Arrangements

Highways such as roads, footways, footpaths and cycle tracks will normally have been constructed to one of these designs:

- Flexible/Composite (i.e. part bitumen)
- Rigid (i.e. concrete)
- Modular (i.e. setts, blocks, paving slabs etc.)



Reinstatements will normally match the original construction.

6.2 Surround to Apparatus Materials

Materials used to surround apparatus shall comply with the relevant requirements of ENA TS 97-1.

When considering the maximum cable ratings for naturally cooled underground circuits, the surrounding material can influence the ratings, particularly as they dry out in the Summer months and the ability to transmit heat away is reduced.

The materials covered in ENA TS 97-1 are characterised by having thermal resistivities in the fully dried-out state that do not exceed specified values and allow the maximum permissible cable conductor temperature to be attained throughout the year to enable designated ratings the cable to be applicable in all seasons.

CP203 – (ENWL Code of Practice on Cable Ratings for Underground Cables) uses a standard thermal resistivity value of 1.2 Km/W in the calculations of maximum ratings for cables. Therefore, for standard installations the materials used to surround apparatus shall comply with requirements of stabilised backfills or alternative materials having a maximum dried-out thermal resistivity of 1.2 Km/W.

Materials used to surround apparatus shall be a stabilised backfill of selected sand mix complying to Section 6 of ENA TS 97-1 or finely crushed limestone or granite dust 0 to 4mm complying to Section 7 of ENA TS 97-1. The use of cement bound sand or foamed concrete may be required on certain installations if explicitly specified.

The material shall be of consistent composition, and shall not contain readily visible foreign matter, such as pieces of clay or organic detritus. The material shall not contain sharp stones or flints.

6.3 Backfill Materials

Backfill materials shall comply to the requirements of the Appendix A1 of the Department for Transport Statutory Code of Practice - Specification for the Reinstatement of Openings in Highways (Fourth Edition).

6.4 Sub-base Materials

Granular sub-base materials Type 1 to MCHW Volume 1, series 800, Clause 803 used in accordance with the Department for Transport Statutory Code of Practice - Specification for the Reinstatement of Openings in Highways (Fourth Edition).

6.5 Road-base Materials

Cement bound granular material Category 3 to MCHW Volume 1, series 800, Clause 822 used in accordance with the Department for Transport Statutory Code of Practice - Specification for the Reinstatement of Openings in Highways (Fourth Edition).

Concrete to MCHW Volume 1, Series 1000, Clause 1001 used in accordance with the Department for Transport Statutory Code of Practice - Specification for the Reinstatement of Openings in Highways (Fourth Edition).

The concrete strength class shall be C40/50 for roads and C32/40 for Footways as defined in BS8500-1

6.6 Surface Layer Materials

All materials used above the base layers for surface dressing, binders and bedding to comply with the Department for Transport Statutory Code of Practice - Specification for the Reinstatement of Openings in Highways (Fourth Edition).

6.7 Modular Materials

For any modular roads, footways or footpaths, the materials may be either:

- Recycled – originally removed from the site and preserved undamaged.
- Equivalent Replacement – as agreed with the responsible Authority.
- Otherwise approved – by the responsible Authority.

6.8 Road Markings

Road markings shall comply with the requirements of the Department for Transport Statutory Code of Practice - Specification for the Reinstatement of Openings in Highways (Fourth Edition).

All thermoplastic materials and road paint supplied to restore road markings to their original state shall be in accordance with BS EN. 1436. When required, solid glass beads shall be supplied to BS EN 1823.

Where Local Highways Authorities have individual specifications for the restoration of road markings, Tenderers are to consult with them to ensure compliance with the local requirements.

6.9 Storage

The Tenderer shall indicate which the storage conditions are required to ensure that, independent of seasonal temperature variations, the materials shall remain in effective condition (i.e. capable of use directly from storage without recourse to additional measures) for a period of 21 days in the case of bulk materials, or 6 months in the case of bagged materials.

6.10 Alternative Materials

Tenderers are free to offer for evaluation items which do not fully comply with the technical requirements of this Specification if, in their opinion, they consider them satisfactory technical alternatives to those stated.

Any such alternative items must, however, be accompanied by documentary evidence to support the Tenderers claim of compatibility.

7 Documents Referenced

DOCUMENTS REFERENCED	
Health and Safety at Work Etc Act 1974.	
Control of Substances Hazardous to Health Regulations 2002.	
New Roads and Street Works Act 1991 Section 71	Statutory Code of Practice: Specification for the Reinstatement of Openings in Highways. Fourth Edition Issued by the Department for Transport and in consultation with HAUC (UK) Specification for the Reinstatement of Openings in Highways - Fourth edition (publishing.service.gov.uk)
MCHW	Manual of Contract Documents for Highway Works https://standardsforhighways.co.uk/mchw
ENA TS 97-1	Special backfill material for cable installations
BS EN ISO 9000	Quality management systems.
BS EN ISO 14001	Environmental Management Systems.
BS EN 1436	Road marking materials. Road marking performance for road users and test methods
BS EN 1423	Road marking materials. Drop on materials. Glass beads, antiskid aggregates and mixtures of the two
BS8500-1	Concrete – Complementary British Standard to BS EN 206 – Part 1: Method of specifying and guidance for the specifier
Practical Guide to Street Works Issued by the Department for Transport and in consultation with HAUC (UK)	Practical Guide to Street Works (publishing.service.gov.uk)
ES001	ENWL Main Specifications
ES400D4	ENWL Specification for Plastic Ducts, Conduit and Accessories
ES400E4	ENWL Specification for Installation, Commissioning and Repair of Solid HV and L V Cables

ES400E5	ENWL Specification for Installation, Commissioning and Repair of 33kV and 132kV Cables
ES400TT1	ENWL Specification for Polyethylene Warning Tape, Protection Tape and Protection Tiles for Underground Cables
CP203	ENWL Code of Practice for Ratings of Underground Cables
CP311	ENWL Code of Practice for Approval Policy and Process
CP410	Underground Mains Cable Practice

8 Keywords

Reinstatement; Backfill; Road; Footpath

Appendix A – 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	Surround to Apparatus Materials		
6.3	Backfill Materials		
6.4	Sub Base Materials		
6.5	Road Base Materials		
6.6	Surface Layer Materials		
6.7	Modular Materials		
6.8	Road Markings		
6.9	Storage		

*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.