NPS/002/003 – Technical Specification for Protection Tile, Protection Tape, Cable Ducting and Route Markers

1. Purpose

The purpose of this specification is to detail the specific technical requirements of Northern Powergrid (the Company) in relation to cable protection tiles, protection tape, cable ducting, route markers, and associated accessories for use on buried power, metallic auxiliary/pilot & telephone and fibre optic cable installations.

This document supersedes the following documents, all copies of which should be destroyed.

Reference	Version	Date	Title
NPS/002/003	6.0	March 2018	Technical Specification for Protective Tile, Tile Tape and Cable Ducting

2. Scope

This document describes the Company requirements for the supply of:

- Underground protection tape and tiles which are used to provide a clear visual warning to the presence of underground cables, cable ducting systems or cable joints.
- Ducting systems for power cables.
- Ducting systems for metallic auxiliary/pilot and telephone cables.
- Ducting systems for fibre optic cables.
- Route marker posts and warning signs which shall be used as an aid to locate and identify the route and presence of buried underground cables and ducting. They can also provide a means of indicating the presence of overhead lines etc.
- The document also describes the requirements for cable ducting and associated accessories.

Technical documents referenced within this specification refer to the latest versions of the relevant International Standards, British Standard Specifications and all relevant Energy Networks Association Technical Specifications (ENA TS) current at the time of supply.

The following appendices form part of this technical specification:

- Appendix 1 – Requirements,
- Appendix 2 - Logistical requirements,
- Appendix 3 - Self certification conformance declaration,
- Appendix 4 - Addendum to supplier requirements,
- Appendix 5 - Technical information check list, and,
- Appendix 6 – Typical arrangements for route marker posts and warning signs.

2.1. Table of contents

3. Technical Requirements

3.1. Protection Tiles and Tape

In order to provide visual identification of underground cables, it is the requirement of Northern Powergrid to apply:

- Protection tape for LV services, LV mains, 11kV and 20kV.
- Protection tape for metallic auxiliary/pilot and telephone.
- Protection tiles at 33kV, 66kV and 132kV.

3.1.1. Protection Tape for use on LV, Metallic Auxiliary/Pilot and Telephone, 11kV and 20kV Cables

The protection tape is intended primarily to, during excavation work; give a clear visual warning to persons carrying out excavations and other utilities of the presence of underground cables, joints or cable ducts. It is also intended to provide some level of protection against damage to the cable(s) and/or duct (s).

The tape shall be manufactured from reconstituted low or medium density polyethylene or a similar material, which shall be rot-proof and resistant to a wide variety of virgin and tipped soil conditions. The material used shall have no detrimental effect on the environment.

The protection tape shall be constructed to a thickness of 2.5mm (+/- 0.3mm) as specified in Section 6.3 of ENA TS 12-23.

The tape shall comply with the general requirements of ENA TS 12-23 including being laminated with suitable marker tape identification complying with ENA TS 12-23.

The tape shall be marked with the following legend. “Northern Powergrid”. The lettering shall be repeated every 300mm along the length in the centre of the tile tape in line with Section 10 and Figure 1 of ENA TS 12-23.

The legend will be 100mm in length with a yellow background and black lettering on a red/brown base.

As Northern Powergrid excavates trenches of various widths, it is required to supply tile tapes in the following sizes: 150mm, 200mm, 250mm and 600mm.

3.1.2. Protection Tiles for use on 33kV, 66kV and 132kV Cables

The protection tile is intended primarily to, during excavation work; give a clear visual warning to persons carrying out excavations and other utilities of the presence of underground cables, joints or cable ducts. It is also intended to provide some level of protection against damage to the cable(s) and/or duct (s).

The tile shall be manufactured from reconstituted low or medium density polyethylene or a similar material and comply with the requirements of ENA TS 12-23. The use of reworked, reprocessed or recycled materials is permitted, however, any material used shall have no detrimental effects on the environment and shall be rot-proof and resistant to a wide variety of virgin and tipped soil conditions.

The protection tile shall comply with the impact resistance test requirements to Class 2 as defined in Section 12.2 of ENA TS 12-23.

The tile ends shall be cleanly cut, square with the longitudinal axis of the tile, shall have no sharp edges.

The tile shall comply with the general requirements of ENA TS 12-23 including being laminated with suitable marker identification complying with ENA TS 12-23.

The tile shall be marked with the following legend. “Northern Powergrid”. The lettering shall be repeated every 300mm along the length in the centre of the tile board in line with Section 10 and Figure 1 of ENA TS 12-23.

The legend will be 100mm in length with a yellow background and black lettering on a red/brown base.

To allow interconnection of the tiles; located 25mm from each end of the tile along its centre line, each tile shall have pre drilled 12mm hole. A suitable peg or cable tie provided to enable tiles to be connected together.

Tile dimensions are detailed in Appendix 1.

3.2. Cable Ducting and Associated Accessories

It is the requirement of Northern Powergrid to install underground cables in:

- Class 1 ducts at 33kV, 66kV and 132kV.
- Class 2 ducts for LV services, LV mains, 11kV and 20kV.

3.2.1. Class 1 - Duct for Underground Cables at 33kV, 66kV and 132kV

All ducts shall be as detailed in the relevant sections of BS EN 61386-24, ENA TS 12-24 and this specification.

The ducts shall be non-coilable, in either 'twin walled' or 'single smooth walled', manufactured in either black uPVC or HDPE. Each duct type shall have a smooth inner surface.

The bends shall be in either 'twin walled' or 'single smooth walled', manufactured in either uPVC or HDPE. Each bend type shall have a smooth inner surface.

As the design stresses and the physical properties of uPVC and HDPE are different, duct bore/wall thickness ratios are likely to be different. However, Class 1 ducts (uPVC and HDPE) intended to be buried and used with high voltage power cables shall be capable of meeting the 5% deflection requirements with an applied force of 450N compression strength at 75^0C, as detailed in ENATS 12-24.

The cross section of all ducts shall be circular and ends cleanly cut and square with the longitudinal axis. They shall have no sharp edges, burrs or surface projections which are likely to damage the cables and shall not present any impedance to the installation or withdrawal of cable throughout its length.

Each duct length shall be supplied with a straight coupler either as a separate item or incorporated on one end and be so designed to be a close push fit onto a plain end of a duct with the similar nominal diameter. The couplers shall be suitable for application without the use of adhesive materials.

All ducts shall be indelibly and clearly marked with the legend 'ELECTRIC CABLE DUCT' the Class of duct and the manufacturers name or reference number in accordance with ENA TS 12-24. The lettering shall be 8mm high in Yellow or White and repeated three times per metre along its length with a minimum requirement of two print lines spaced 180° apart around the circumference.

3.2.2. Class 2 - Ducts for Underground Cables between 230V and 20kV (including LV services)

All ducts shall be as detailed in the relevant sections of BS EN 61386-24, ENA TS 12-24 and this specification.

All ducts for underground cables between 230V and 20kV shall be either 'twin walled' or 'single smooth walled' and manufactured in either black uPVC or HDPE.

All ducts for cables at voltages between 11kV and 20kV shall be non-coilable.

All ducts for service cables up to 400V can be supplied as:

- 1 Phase Service (Up to 35mm^2) - 38mm (OD)/34mm (ID), non-coilable or coilable duct (where the duct cannot be coiled to less than a minimum radius of 24 times the nominal inside diameter of the duct without undue distortion, as defined in ENA TS 12-24).

- 3 Phase Service (Up to 35mm²) - 44mm (OD)/38mm (ID), non-coilable or coilable duct (where the duct cannot be coiled to less than a minimum radius of 24 times the nominal inside diameter of the duct without undue distortion, as defined in ENA TS 12-24).
- 3 Phase Mains (Above 35mm², up to 300mm²) – 150mm*(OD)/125mm*(ID), non-coilable duct.

Note: All sizes for ducts installed in open trenches are nominal diameter measurement. Service ducts referenced are not to be used for road crossings. For all road crossing ducts, refer to NSP/002 – Policy for the Installation of Distribution Power Cables.

* Assumes twin wall ducting.

Ducts for other cables will be listed in Appendix 1.

Each duct type shall have a smooth inner surface as detailed in relevant sections of BS EN 61386-24, ENA TS 12-24 and to this specification.

The bends shall be in either 'twin walled' or 'single smooth walled', manufactured in either uPVC or HDPE. Each bend type shall have a smooth inner surface.

Each bend shall be supplied with a straight coupler at both ends and either supplied as a separate item or incorporated on both ends and so designed to be a close push fit onto a plain end of a duct with the similar nominal diameter. The couplers shall be suitable for application without the use of adhesive materials.

As the design stresses and the physical properties of uPVC and HDPE are different, duct bore/wall thickness ratios are likely to be different. However, Class 2 ducts (uPVC and HDPE) intended to be buried and used with pilot and telephone cables shall be capable shall be capable of meeting the 5% deflection requirements with an applied force of 450N compression strength at 50^0C, as detailed in ENA TS 12-24.

The cross section of all ducts shall be circular and ends cleanly cut and square with the longitudinal axis. They shall have no sharp edges, burrs or surface projections which are likely to damage the cables and shall not present any impedance to the installation or withdrawal of cable throughout its length.

Each duct length shall be supplied with a straight coupler either as a separate item or incorporated on one end and be so designed to be a close push fit onto a plain end of a duct with the similar nominal diameter. The couplers shall be suitable for application without the use of adhesive materials.

All ducts shall be indelibly and clearly marked with the legend 'ELECTRIC CABLE DUCT' the class of duct and the manufacturers name or reference number in accordance with the ENA TS 12-24. The lettering shall be 8mm high in Yellow or White and repeated three times per metre along its length with a minimum requirement of two print lines spaced 180° apart around the circumference.

Hockey Sticks - The 'Hockey Stick' shall be manufactured from uPVC or HDPE and have a nominal diameter of 38mm (OD)/34mm (ID) for single phase services and 44mm (OD)/38mm (ID) for 3 phase services to the requirements of ENA TS 12-24. The short end of the hockey stick shall be so designed to be a close push fit into the end of a duct or bend with the same nominal diameter.

After installation, the 'long' end of the hockey stick can be expected to be subjected to the full range of climatic conditions encountered in the UK and may be exposed to sunlight for a significant period.

3.2.3. Standard Dimensional Ratio (SDR) Ducts - For Directional Drilling

Northern Power grid requires an SDR ducting system for use on installations where directional drilling has been employed.

All ducts intended for directional drilled installations shall be manufactured in virgin polymers and have a smooth outer wall and manufactured from black polyethylene. Each duct type shall have a smooth inner surface as detailed in relevant sections of BS EN 61386-24, ENA TS 12-24 class 1+ and to this specification.

Class 1+ ducts intended to be buried and used with power cables shall be capable of meeting the 5% deflection requirements with an applied force of 450N compression strength at 75^{0}C, as detailed in ENA TS 12-24, Class 1+.

The cross section of all ducts shall be circular and ends cleanly cut and square with the longitudinal axis. They shall have no sharp edges, burrs or surface projections which are likely to damage the cables and shall not present any impedance to the installation or withdrawal of cable throughout its length.

All ducts shall be indelibly and clearly marked with the legend 'ELECTRIC CABLE DUCT' the Class of duct and the manufacturers name or reference number in accordance with the ENA TS 12-24. The lettering shall be 8mm high in Yellow or White and repeated three times per metre along its length with a minimum requirement of two print lines spaced 180° apart around the circumference.

Diameters required as detailed in Appendix 1.

3.2.4. Fibre Optic Cable Ducts

Fibre optic cable ducts shall be manufactured as 96.5mm (OD)/90mm (ID) green uPVC or HDPE solid wall cable ducts designed in accordance with BS EN 61386-24.

The ducts shall be supplied in 6m lengths with a 100mm heat formed taper socket at one end and a parallel spigot at the other end to provide an IP rating of IP4X.

The duct shall be marked with the following legend. 'Northern Powergrid Fibre Cable'. The lettering shall be 8mm high in Yellow or White and repeated three times per metre along its length with a minimum requirement of two print lines spaced 180° apart around the circumference. In addition, the duct shall be provided with the manufactures batch number.

The duct shall be designed to provide a min compression test of 450N as detailed in BS EN 61386-24. This requirement must be achieved at 50^{o}C to account for the heating effects of underground power cables which will be in close proximity.

The duct shall be designed to withstand a 5k striker (normal duty) impact test as detailed in BS EN 61386-24, Table 102.

3.2.5. Fibre Optic Sub-Ducts

Fibre optic sub-ducts shall be manufactured as 32mm(OD)/27mm(ID) black uPVC or HDPE solid wall cable ducts featuring a bonded low friction dry liner and designed in accordance with BSEN 61386-24

The ducts shall be supplied in 500m coils or on returnable wood drums. The ducts shall be supplied complete with 8kN orange polypropylene or equivalent rot-proof draw rope.

Sub ducts to this specification shall be designed to with withstand minimum installation tensions of 110kg and minimum bend radius of 0.45m (temperatures >5°C) or 0.55m (temperatures <5°C).

The duct shall be marked at 1m intervals with the following information:-

- Manufactures batch number
- Production date
- Duct size.

3.2.6. Metallic Auxiliary/Pilot and Telephone Cable Ducts

All ducts shall be as detailed in the relevant sections of BS EN 61386-24, ENA TS 12-24 and this specification.

Metallic auxiliary/pilot and telephone cable ducts shall be constructed to Class 2 as defined in ENA TS 12-24, section 6.

Metallic auxiliary cable/pilot and telephone ducts shall be manufactured as 96.5mm (OD)/90mm (ID) black uPVC or HDPE 'single smooth wall', non-coilable design.

Each duct length shall be supplied with a straight coupler either as a separate item or incorporated on one end and be so designed to be a close push fit onto a plain end of a duct with the similar nominal diameter. The couplers shall be suitable for application without the use of adhesive materials.

All ducts shall be indelibly and clearly marked with the legend 'ELECTRIC CABLE DUCT' the class of duct and the manufacturers name or reference number in accordance with the ENA TS 12-24. The lettering shall be 8mm high in Yellow or White and repeated three times per metre along its length with a minimum requirement of two print lines spaced 180° apart around the circumference.

3.3. Route Markers and Associated Warning Signs

Route marker posts and associated warning signs shall be used as an aid to locate and identify the route and the presence of buried underground cables and cable ducting systems. They shall also to be utilized as a means of indicating the presence of 'Live' overhead conductors.

Route Marker Posts

Marker posts shall be manufactured from high-density polyethylene (HDPE) material or equivalent. After installation, the marker posts can be expected to be subjected to the full range of climatic conditions encountered in the UK. The buried section of the marker post may also be surrounded by standing ground water for most of its minimum functional life of 20 years. See drawings in Appendix 6.

Warning signs

Warning signs shall provide colour fastness for a minimum period of 10 years in direct sunlight and be manufactured from ABS Grade 'A' plastic or equivalent with lettering and background colours as specified on the appropriate drawings. See Appendix 6. Warning signs shall conform with all requirements as defined in NPS/001/011 – Technical Specification for Notice Plates and Signs.

4. References

The products described within this document shall comply with the relevant International Standards, British Standard Specifications and all relevant Energy Networks Association Technical Specifications (ENA TS) current at the time of tendering, except where varied by this standard. In respect the following documents are particularly relevant.

The supplier shall provide with the tender full technical details of the equipment offered and shall indicate any divergence from these standards or specifications.

4.1. External Documentation

Reference	Version / Date	Title
BS EN 61386-24	2010	Conduit systems for cable management. Part 24: Particular requirements - Conduit systems buried underground
BS 3412	1992	Methods of specifying general purpose polyethylene materials for moulding and extrusion
ENA TS 12-23	3.0 / 2013	Polyethylene Warning Tape, Polyethylene Protection Tape and Polyethylene Protection Tiles for Buried Electricity Supply Cable
ENA TS 12–24	3.0 / 2014	Technical Specification for Plastic Ducts for Buried Electric Cables

4.2. Internal Documentation

Reference	Title
NPS/001/011	Technical Specification for Notice Plates and Signs
NSP/002	Policy for the Installation of Distribution Power Cables

4.3. Amendments from Previous Version

Reference	Amendment
Appendix 1 – Requirements	- Additional ducting & 'Hockey Stick' requirements for 3 phase services - Remove 50mm duct requirements - Additional section in table for: Metallic Auxiliary/Pilot and Telephone cables
3.2.2	Additional 3 Phase Service duct requirement
3.2.6	Change references to: Metallic Auxiliary/Pilot and Telephone

5. Definitions

Term	Definition
(ID)	Internal diameter
(OD)	Outside diameter
HDPE	High-density polyethylene
The Company	Northern Powergrid
uPVC	Unplasticized polyvinyl chloride

6. Authority for Issue

6.1. CDS Assurance

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

		Date
Liz Beat	Governance Administrator	21/06/2023

6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

Review Period – This document should be reviewed within the following time period.

Standard CDS review of 3 years	Non Standard Review Period & Reason	
No	**Period:** 5 Years	**Reason:** Update will be dictated by contract renewal date or any significant changes in the specification or documents referenced.
Should this document be displayed on the Northern Powergrid external website?		Yes

		Date
Paul Hanrahan	Engineer – Asset Management	26/06/2023

6.3. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
Steven Salkeld	Policy & Standards Engineer	22/06/2023
Joe Helm	Policy & Standards Manager	03/07/2023

6.4. Authorisation

Authorisation is granted for publication of this document.

		Date
Paul Black	Head of System Engineering	24/07/2023

Appendix 1 – Requirements

Please note that all internal diameters (ID) and external diameters (OD) are nominal. Further detail for duct application can be found in NSP/002 – Policy for the Installation of Distribution Power Cables.

NSP/002 – Policy for the Installation of Distribution Power Cables, section 3.2.10 gives guidance on the installation and positioning of power cables.

Item	Description	Commodity Code
Protection Tape for 230v up to and inc 20kV		
1	Cable Protection Tape: 150mm x 40M x 2.5mm	140765
2	Cable Protection Tape: 200mm x 40M x 2.5mm	140761
3	Cable Protection Tape: 250mm x 30M x 2.5mm	140750
4	Cable Protection Tape: 600mm x 20M x 2.5mm	140766
Protection Tiles for 33kV, 66kV and 132kV		
5	Cable Protection Tile: 1000mm x 244mm (c/w pegs or cable tie)	261925
6	Cable Protection Tile: 1000mm x 260mm (c/w pegs or cable tie)	140751
7	Cable Protection Tile: 1000mm x 450mm (c/w pegs or cable tie)	140752
Class 2 Ducts for 230v up to and inc 20kV and Metallic		
8	38mm(OD)/34mm(ID) Class 2 duct for low voltage single phase service cables x 3m rigid	140348
9	38mm(OD)/34mm(ID) coilable duct for low voltage single phase service cables	140350
10	44mm(OD)/38mm(ID) Class 2 duct for low voltage 3 phase service cables x 3m rigid	140522
11	44mm(OD)/38mm(ID)) coilable duct for low voltage 3 phase service cables	140523
12	38mm(OD)/34mm(ID) “hockey stick” (WHITE) – Single Phase Services up to 35mm²	140225
13	38mm(OD)/34mm(ID) “hockey stick” (BLACK) – Single Phase Services up to 35mm²	140351
14	44mm(OD)/38mm(ID) “hockey stick” (WHITE) – 3 Phase Services up to 35mm²	140524
15	44mm(OD)/38mm(ID) “hockey stick” (BLACK) – 3 Phase Services up to 35mm²	140525
16	38mm(OD)/34mm(ID) x 900mm bend	140352
17	44mm(OD)/38mm(ID) x 900mm bend	140526
18	150mm(OD)/125mm(ID) x 3m twin walled duct	140314
19	150mm(OD)/125mm(ID) x 900mm slow bend twin walled duct	140371
20	175mm(OD)/150mm(ID) x 2m twin walled duct	262535
21	175mm(OD)/150mm(ID) x 6m twin walled duct	262550
22	Coupler for above (175mm to 150mm)	140367
Class 1 Ducting for 33kV, 66kV and 132kV		
23	160mm(OD)/150mm(ID) smooth wall duct	140356
24	180mm(OD)/170mm(ID) smooth wall duct	140357
Standard Directional Drilling (SDR) Ducting		
25	32mm(OD) PE SDR-11 black duct	140358
26	75mm(OD) PE SDR-11 black duct	140359
27	125mm(OD) PE SDR-11 black duct	140360
28	160mm(OD) PE SDR-11 black duct	140361
29	180mm(OD) PE SDR-11 black duct	140362
Fibre Optic Cable Ducting		
30	96.5mm(OD)/90mm(ID) green smooth wall duct	140363
31	32mm(OD)/27mm(ID) Black smooth wall duct	140364
Class 2 - Metallic Auxiliary/Pilot and Telephone		
32	96.5mm(OD)/90mm(ID) smooth wall duct	140355
Route Markers and Associated Warning Signs		
33	Cable Route Marker Post: Plastic Type. To be used in Conjunction with Warning Notices	225960
34	Notice: Underground Electricity Cable Warning Notice. Northern Area	363481
35	Notice: Underground Electricity Cable Warning Notice. Yorkshire Area	363482

Appendix 2 – Logistical Requirements

To enable the Company to store the product(s) in accordance with the manufacturer's recommendations the Tenderer shall provide details of the recommended storage environment with respect to each tendered product.

Details shall be provided where relevant, in respect of the minimum and maximum exposure levels, frequency of exposure and duration of exposure of the packaged item with respect to;

- Ambient temperature
- Atmospheric corrosion
- Humidity
- Impact
- Water
- Vibration
- Dust
- Solar radiation

The Tenderer shall ensure that each item is suitably packaged and protected to enable storage in an outdoor environment whilst maintaining the product and packaging as "fit for service" prior to installation.

All packaging shall be sufficiently durable giving regard to the function, reasonable use and contents of the packaging. Where product packages tendered are made up of sub packages all the sub packages shall unless varied by this specification, be supplied securely packaged together. Where items are provided in bagged/boxed form the material from which the bags are manufactured shall be capable of sustaining the package weight and resisting puncture by the materials within.

Tenderer shall submit at the time of tendering the details of the proposed packaging (i.e. materials composition and structure) to be used for each product. Where the Tenderer is unable to provide packaging suitable for outdoor storage then this should be stated at the time of tender.

In order to maximise storage space all palletised goods shall be supplied in standard returnable box pallets with the following specification. Where applicable, suppliers shall also indicate the maximum number of units of each product that are storable per box pallet.

- Size - 1200mm (w) x 1000mm (d) x 750mm (h)
- Weight (empty) – Up to 33kg
- Load Capacity – Up to 450kg
- Maximum Stacking Capacity – 10 High

Suppliers shall also include details of the type of material used to manufacture the box pallets.
The Company will give consideration to innovative alternatives to this specification.

Clearly legible, easily identifiable, durable and unambiguous labelling shall be applied to each individual and where relevant, multiple packages of like products. Where products packages tendered are made up of sub packages each sub packages shall be marked. As a minimum requirement the following shall be included;

- Manufacturer's trademark or name
- Supplier's trademark or name
- Description of item
- Date of packaging and/or batch number
- Northern Powergrid product code
- Weight
- Shelf Life

Tenderer shall submit at the time of tendering a sample of the proposed labelling for each product package type.

Appendix 3 – Self Certification Conformance Declaration

Protection tiles, protection tape, cable ducting, route markers and warning signs are required to be supplied against this specification shall comply with the latest issues of the relevant ENA TS, British and International Standards specified. The following tables are intended to amplify and/or clarify the requirements of elements of these Standards but do not preclude meeting all requirements of the standards.

The manufacturer shall declare conformance or otherwise, clause by clause, using the following levels of conformance declaration codes, where appropriate indicating if tests are type or routine tests.

Conformance declaration codes

N/A = Clause is not applicable/ appropriate to the product
Cs1 = The product conforms fully with the requirements of this clause
Cs2 = The product conforms partially with the requirements of this clause
Cs3 = The product does not conform to the requirements of this clause
Cs4 = The product does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

Instructions for completion

- When Cs1 code is entered the supplier shall provide evidence to confirm conformance.
- When any other code is entered the reason and supporting evidence for non - conformance shall be entered.
- Prefix each remark with the relevant 'BS EN' 'IEC' or 'ENATS' as appropriate.
- Provide technical data sheets and associated drawings for each product.

Manufacturer / Supplier:

Manufacturer / Supplier Product Reference:

Northern Powergrid Product Reference (Commodity Code):

Details of the Product Type (Voltage, Type and Size):

Name:

Signature:

Date:

NOTE: One sheet shall be completed for each type of product item offered.

NPS/002/003 – Cable Protection Tape (NPS Ref: 3.1.1)				
	Clause / Requirements	Conformance Code	Evidence Reference	Remarks / Comments
General	Conforms to ENA TS 12-23			
Routine Tests	ENA TS 12-23 / 11			
Adhesion of Printing	ENA TS 12-23 / 11.2			
Surface Finish and Voids	ENA TS 12-23 / 5.0			
Type Tests	ENA TS 12-23 / 12			
Chemical Tests	ENA TS 12-23 / 8.0			
Chemical Solutions	ENA TS 12-23 / 8.0			

NPS/002/003 – Cable Protection Tiles (NPS Ref: 3.1.2)				
	Clause / Requirements	Conformance Code	Evidence Reference	Remarks / Comments
General	Conforms to ENA TS 12-23			
Routine Tests	ENA TS 12-23 / 11			
Adhesion of Printing	ENA TS 12-23 / 11.2			
Surface Finish and Voids	ENA TS 12-23 / 5.0			
Type Tests	ENA TS 12-23 / 12			
Chemical Tests	ENA TS 12-23 / 8.0			
Chemical Solutions	ENA TS 12-23 / 8.0			
Impact Resistance test	ENATS 12-23 / 12.2			

NPS/002/003 – Cable Ducting - High, Medium and Low Voltage Electric Power Cable Ducts (NPS Ref: 3.2.1/3.2.2/3.2.3)				
	Clause / Requirements	**Conformance Code**	**Evidence Reference**	**Remarks / Comments**
General	Conforms to BS EN 61386-24 & ENA TS 12-24			
Classification	ENA TS 12-24 / 6.0			
Markings	ENA TS 12-24 / 7.0			
Construction	ENA TS 12-24 / 9.0			
Deflection	ENA TS 12-24 / 10.ii			
Impact Test	ENA TS 12-24 / 10.v			

NPS/002/003 – Cable Ducting - Fibre Optic Cable Ducts (NPS Ref: 3.2.4/3.2.5)				
	Clause / Requirements	**Conformance Code**	**Remarks / Comments**	**Remarks / Comments**
General	Conforms to BS EN 61386-24			
Classification	BS EN 61386-24 / 6.0			
Markings	BS EN 61386-24 / 7.0			
Construction	BS EN 61386-24 / 9.0			
Deflection	BS EN 61386-24 / 10.2			
Impact Test	BS EN 61386-24 / 10.3			

NPS/002/003 – Cable Ducting – Metallic Auxiliary Cable Ducts (NPS Ref: 3.2.6)				
	Clause / Requirements	**Conformance Code**	**Evidence Reference**	**Remarks / Comments**
General	Conforms to BS EN 61386-24 & ENA TS 12-24			
Classification	ENA TS 12-24 / 6.0			
Markings	ENA TS 12-24 / 7.0			
Construction	ENA TS 12-24 / 9.0			
Deflection	ENA TS 12-24 / 10.ii			
Impact Test	ENA TS 12-24 / 10.v			

NPS/002/003 – Route Marker Posts (NPS Ref: 3.3)				
	Clause / Requirements	Conformance Code	Evidence Reference	Remarks / Comments
Asset life	Estimated asset life in outdoor environment (min 20 years)			
Asset life	Estimated life test evidence			
Asset life	Estimated life customer references			
Dimensions	Dimensions			
Construction	Material employed (HDPE or equivalent)			

NPS/002/003 – Warning Signs (NPS Ref: 3.3)				
	Clause / Requirements	Conformance Code	Evidence Reference	Remarks / Comments
Asset life	Estimated asset life in outdoor environment (min 10 years)			
Asset life	Estimated life test evidence			
Asset life	Estimated life customer references			
Dimensions	Dimensions			
Construction	Material employed (Polycarbonate or equivalent)			

Appendix 4 – Addendum to Supplier Requirements

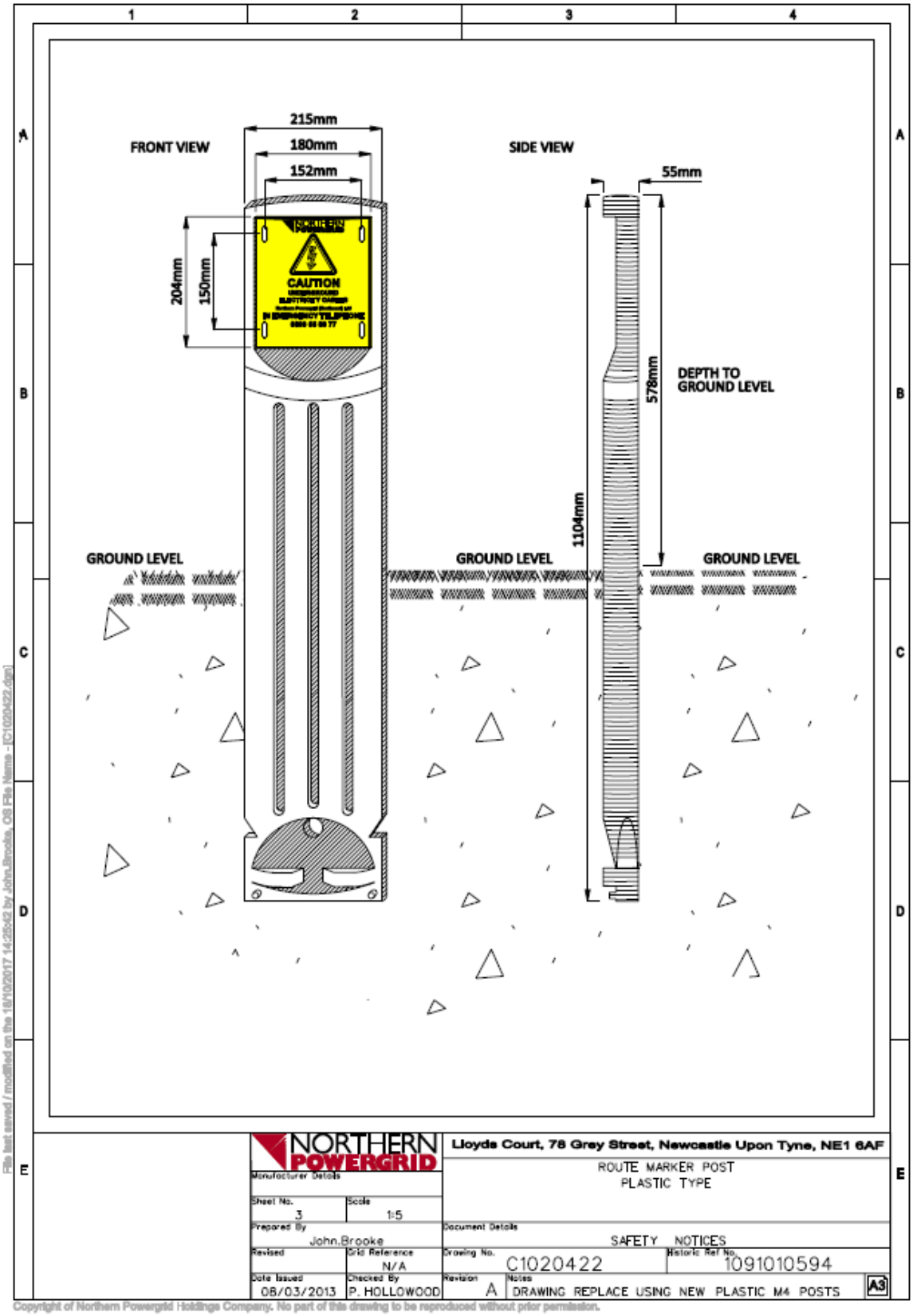
To enable the Company to install the product(s) in accordance with the manufacturer's recommendations the supplier shall provide a single copy of drawings, descriptive leaflets and instruction manuals appropriate to the goods being offered, which shall incorporate details of an approved installation procedure / work instruction required in order to provide optimal performance of the goods during their operational life.

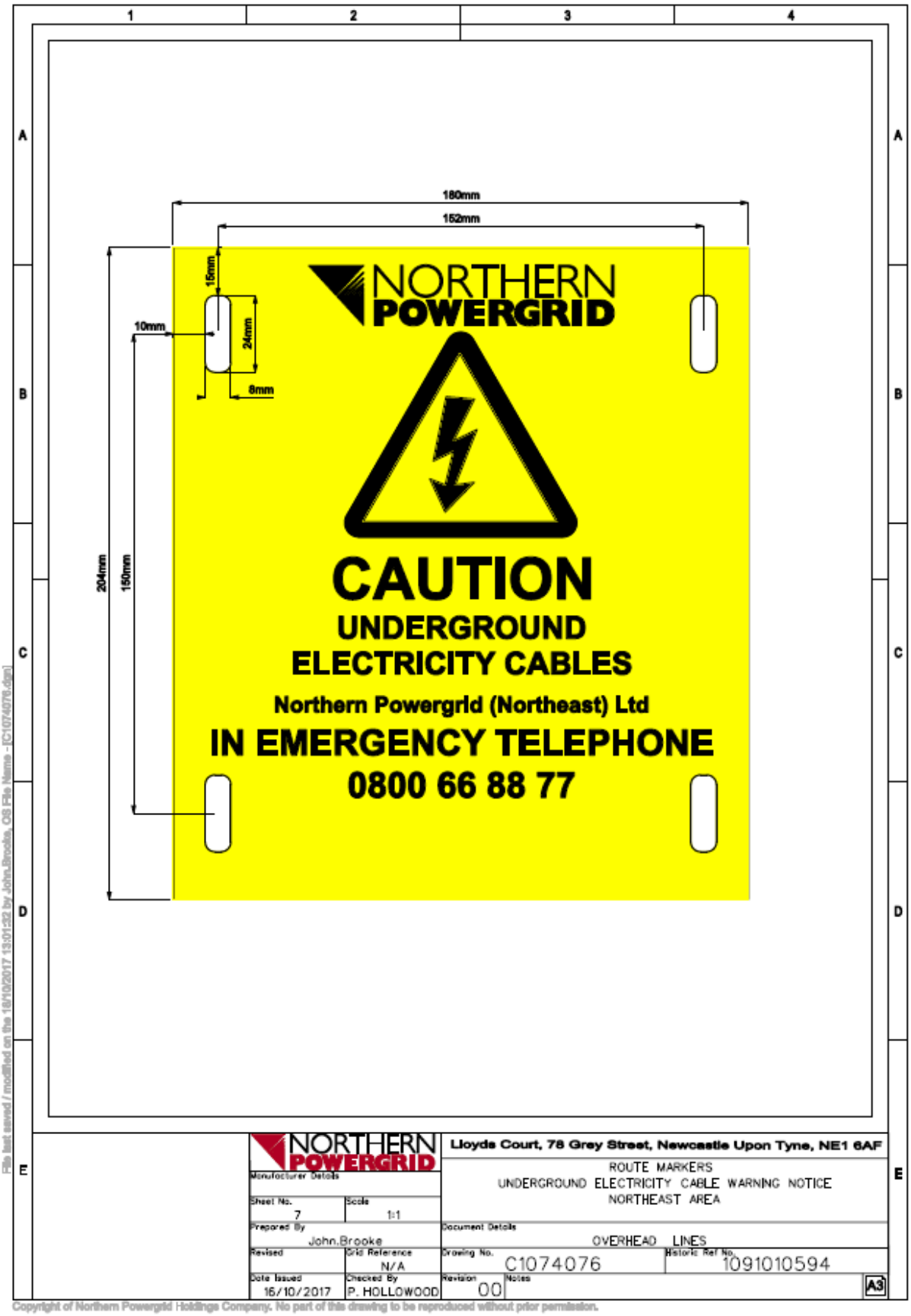
Appendix 5 – Technical Information Check List

The following information shall be provided by the supplier for technical review by Northern Powergrid. Additional information shall be provided if requested.

Requirement	Provided (Y/N)
Full product descriptions and part number/reference	
Appendix 3 – completed self-certification conformance declaration	
Complete set of drawings for each variant	
Type test evidence	
Routine test plan (example)	
Pre-commissioning testing/inspection requirements	
Recommended periodical inspection and maintenance requirements	
Packaging/delivery information	

Appendix 6 – Typical Arrangements for Marker Posts and Warning Signs




180mm
152mm
15mm
10mm
24mm
8mm
204mm
150mm
NORTHERN POWERGRID
CAUTION
UNDERGROUND
ELECTRICITY CABLES
Northern Powergrid (Northeast) Ltd
IN EMERGENCY TELEPHONE
0800 66 88 77
Lloyds Court, 78 Grey Street, Newcastle Upon Tyne, NE1 6AF
ROUTE MARKERS
UNDERGROUND ELECTRICITY CABLE WARNING NOTICE
NORTHEAST AREA
Manufacturer Details
Sheet No. 7
Scale 1:1
Prepared By John.Brooke
Document Details OVERHEAD LINES
Revised
Grid Reference N/A
Drawing No. C1074076
Historic Ref No. 1091010594
Date Issued 16/10/2017
Checked By P. HOLLOWOOD
Revision 00
Notes
A3
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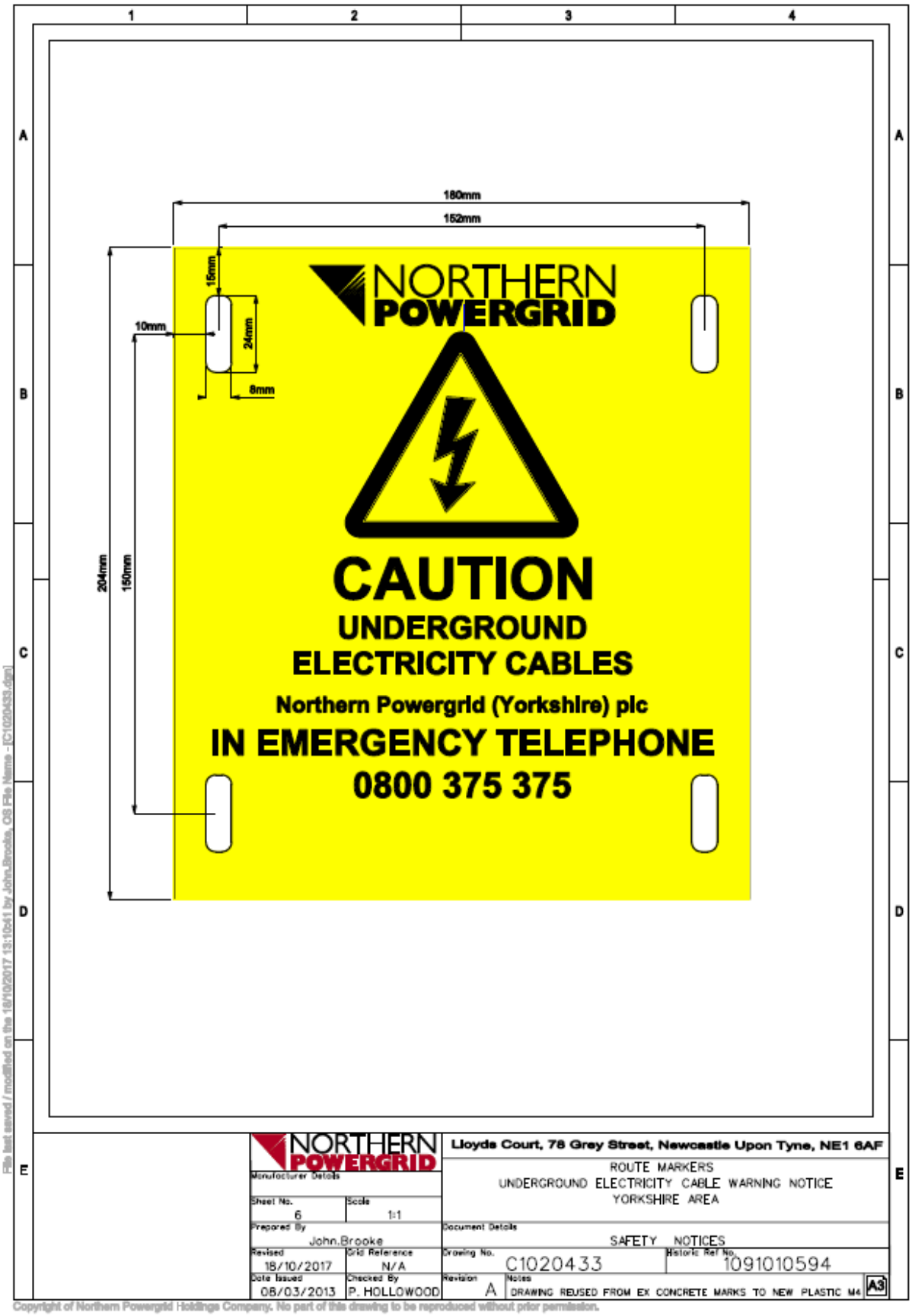
180mm
152mm
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204mm
150mm
NORTHERN POWERGRID
CAUTION
UNDERGROUND
ELECTRICITY CABLES
Northern Powergrid (Yorkshire) plc
IN EMERGENCY TELEPHONE
0800 375 375
NORTHERN POWERGRID
Lloyds Court, 78 Grey Street, Newcastle Upon Tyne, NE1 6AF
Manufacturer Details
ROUTE MARKERS
UNDERGROUND ELECTRICITY CABLE WARNING NOTICE
YORKSHIRE AREA
Sheet No. 6
Scale 1:1
Prepared By John.Brooke
Document Details SAFETY NOTICES
Revised 18/10/2017
Grid Reference N/A
Drawing No. C1020433
Historic Ref No. 1091010594
Date Issued 08/03/2013
Checked By P. HOLLOWOOD
Revision A
Notes DRAWING REUSED FROM EX CONCRETE MARKS TO NEW PLASTIC M4
A3
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