NPS/002/012 - Technical Specification for Low Voltage Underground Link Boxes, and Protection Blankets

1. Purpose

The purpose of this document is to detail the requirements of Northern Powergrid in relation to underground disconnecting link boxes, which will be utilised on the company's low voltage distribution network.

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

Document Reference	Document Title	Version	Published Date
NPS/002/012	Technical Specification for Low Voltage Underground Link Boxes	3.0	March 2014

2. Scope

This document details the technical requirements of Northern Powergrid in relation to 2 and 4-way resin filled underground link disconnecting boxes. The proposed link boxes shall include pit frame; concrete filled cover and links and shall match the current rating of the largest cable size.

Link Boxes shall comply with the latest version of Energy Networks Association Technical Specification ENA TS 09-23. Link Boxes, unless varied by this specification; in which case this specification shall take precedence.

The following appendices form part of this technical specification: -

Appendix 1 – Requirements

Appendix 2 – Addendum to Supplier Requirements

Appendix 3 – Logistical Requirements

Appendix 4 – Self Certification Conformance Declaration

Appendix 5 - Technical Information Check List

2.1. Table of Contents

3. Requirements

3.1. Conditions of Installation.

Link Boxes specified in this document shall be installed on cables laid in accordance with the Northern Powergrid policy document for the installation of cables NSP/002. During storage and after installation link boxes are subjected to the full range of climatic conditions encountered in the UK. Link boxes may be surrounded by ground water for most of its operating life. Where cable is installed in ducts, flooding of ducts can occur resulting in permanently wet sections along the cable route.

3.2. Conditions of Operation for Link Boxes

Link Boxes purchased in accordance with this specification are required to operate under conditions stipulated in the Northern Powergrid policy document IMP/001/911. The following are the general conditions under which cable joints purchased in accordance with this specification are required to operate:

- Nominal system voltages: 400/230 volts
- The working voltage of any part of the system does not normally exceed the normal system voltage by more than 10%
- Nominal system frequency: 50Hz
- The system operates with the neutral point earthed directly at one or more points.

3.2.1. Range of Cables to be Jointed

- 3 or 4 core solid Aluminium Waveform cables in the range 185mm2 - 300mm2 to BS7870, Part 3, Section 3.40
- 4 core Stranded Copper Waveform cables in the range 185mm2 - 300mm2 to BS7870, Part 3, Section 3.40 may also be used

3.2.2. Protection Blankets

- Link boxes shall be required to operate with protection blankets as specified within this specification

3.3. General Requirements

Components specified shall be compatible with other materials normally used in the construction of cable joints, terminations or stop ends, and shall not increase the rate of corrosion of any metal with which they come into contact.

Assembled components forming part of a cable system shall be capable of operating under the normal and fault temperature conditions specified in the relevant cable specifications.

Heat shrink materials used shall be in accordance with ENA TS 09-11 Heat Shrinkable Material for use on 600/1000v Cables & Accessories.

3.4. Link Box Shell

For resin filled joints, the joint shell shall be horizontally split and with a minimum 2mm thick plastic or an alternate material, alternative designs will be considered, which shall be approved by Northern Powergrid The shell shall have stepped cable entry ports for varying cable diameters

The joint shell shall be compatible with a cold pour natural or synthetic oil based polyurethane resin and so designed to allow at a minimum 15mm encapsulation at every point within its internal length. The shell

assembly shall be supplied complete with sealing clips/strips and a means of sealing the cable entry ports. Capable of accepting 3 or 4 core Waveform cables in the range 185mm^2 - 300mm^2 to BS7870, Part 3, and Section 3.40

The lower section shall be flat bottomed to provide a positive location either onto an integral base supplied by the manufacturer, or the base of a trench, or joint bay prepared by the installer

The upper half of the shell shall be transparent to provide visible verification of correct installation especially cable core clearances.

3.4.1. Link Box Base

The strengthened base to ensure the link box passes the ENA test listed under testing may either be an integral part of the lower shell or as a separate component.

If supplied as a separate component the manufacturer should state such, including how it is to be fitted during link box installation.

3.5. Turret Assembly

A factory-assembled turret which positively fits into the lower half of the joint shell shall be capable of accommodating either solid links or fuse carrier, operated by wedge tightening thumb screws which will incorporate a "J" type fuse link with 83mm centres as per BS HD 60269-2 & BS88-2. Links shall be supplied for each cable way.

Cable terminations/contacts shall be manufactured from tinned hard drawn copper and capable of carrying the rated current of the largest cable to be terminated.

Adequate phase to phase and phase to neutral/earth segregation shall be provided with suitable insulating barriers as appropriate. This barrier shall also be sufficient to prevent electrical tracking between links caused by condensation.

Provision of suitable neutral and earth connection facilities for testing and fault location shall be provided within the turret assembly.

Range taking phase and neutral connectors to meet the requirements of Engineering Recommendation C79-2 and/or BS EN 61238-1, capable of accepting stranded copper or solid aluminium conductors in the range 185mm^2 to 300mm^2, shall be factory fitted and utilise shear head technology.

Plastic removable shrouds shall be provided for covering unused contacts.

3.6. Bell Cover

The 2 and 4-way link box shall be supplied with an insulated bell cover and shall be so designed to prevent water entering the link chamber when submerged to a minimum depth of 1metre head of water. This shall incorporate a notice indicating "Danger Electric" or equivalent Danger of Death Sign to BS EN ISO 7010:2012.

3.7. Pit Assembly

The 2 & 4-way link boxes shall be supplied with either a GRP or HDPE housing. This will sit over the link box and locate on it so that the bell cover is central. It will prevent the ingress of any backfill material to the link box.

The assembly shall be horizontally sectionalised to enable sections to be added or removed, depending on the depth of the link box to finished ground level. The pit frame shall meet the test load requirements of BS EN 124 class B125 when installed.

3.8. Pavement Access Cover & Frame

The frame for the pavement access cover shall fit onto the top of the pit assembly and shall be fabricated from hot dipped galvanised steel. The frame shall be complete with integral "Skirt" to prohibit the ingress of backfill material into the pavement chamber. The frame shall incorporate an adjustment system that allows up to approximately 100mm vertical movement of the cover. The adjustment shall only be achieved from inside the pit with the pavement access cover removed.

The pavement cover for the 2-way link box assembly shall be a single galvanised steel tray, concrete filled with 2 x "keyhole" type slots to aid removal from the frame. This shall incorporate a notice indicating “Danger Electric” or equivalent Danger of Death Sign to BS EN ISO 7010:2012.

The steel frame for the 4-way link box shall incorporate removable galvanised steel cross-member to allow 2 x single pavement covers (as detailed above) to be installed.

The access cover and frame shall meet the test load requirements of BS EN124 class B125 when installed.

There is also a requirement for an un-filled pavement cover. This cover will be utilised when a link box is to be installed and integrated into surfaces such as block paving.

3.9. Circuit Identification

Circuit identification label(s) of an appropriate size, manufactured from insulating material and suitable for engraving shall be incorporated into the link box, below the bell cover for each feeder way. Labels shall be positively located and easy to remove.

3.10. Tool Box/Container

The link box shall include an insulated waterproof container for the safe keeping of removable links and plastic shrouds. The container shall be either located on top of or under the bell housing.

3.11. Extras

The tool box shall also include a suitable tube of contact grease (or similar) for lubricating the jaws of the links to aid installation.

3.12. Testing requirements for Link Boxes

Link boxes will be tested in accordance with ENATS 09-23 issue 2 2017.

The supplier shall take note of the test requirements and sequence in section 7. The supplier shall give evidence in appendix 4 self-certification, of type tests carried out as set out in section 8, and a list of the routine tests set out in section 9.

3.13. Requirements for Protection blankets

3.13.1. Scope

To mitigate the effects from a disruptive failure within a link box turret or chamber, a protection blanket is often installed over the link box.

The blanket shall be positioned above the link box bell housing and below the pavement cover.

The aim of the blanket is to encapsulate the link box turret, thus stopping any air from entering the turret in the event of a disruptive failure. Evidence has shown that it is the influx of oxygen enriched air, into the turret during a disruptive failure that causes damage beyond the remit of the link box pit and chamber.

The list of Protection blankets is in Appendix 1

3.13.2. Requirements

- The Protection blanket shall be filled with layers of fibreglass.
- The blanket jacket shall be of a heavy duty silicon material or equivalent.
- The blanket jacket shall be made from Low Smoke and Fume or Low Smoke Zero Halogen material. The jacket shall be of substantive thickness and quality to withstand handling, storage and operations for a minimum of 12 years.
- The blanket jacket shall be red or yellow in colour.
- The blanket jacket shall incorporate a waterproof label with the wording “Danger Electricity” and danger of death sign. Minimum size 300mm x 200mm.
- Heavy duty jacket handle(s) shall be fitted to assist with carrying, installation, positioning and removal of the bag in the link box.
- The blanket is required to perform if the link box chamber is submerged in water,
- Moisture drainage shall be incorporated in the jacket design.
- The size requirements for the blankets are given at the rear of this section.

3.14. Testing Requirements for Protection Blankets

3.14.1. Blast Mitigation Test

The product shall mitigate a link box explosion. Evidence shall be provided of the design and relevant tests carried out to demonstrate the mitigation.

3.14.2. Electrical Test

The Blanket shall be tested as per IEC 61112 (2009). Class 0, 5kV for three minutes acceptance test

3.14.3. Water Ingress Test

The product shall be immersed in 1 metre head of water for 48 hours and removed by the handles. No tears or breakages should be seen or noted in the outer jacket material, stitching or handles. The product shall function as normal after 10 minutes of drying out.

3.14.4. LSF Test

The product shall have a Low Smoke and Flame or Low Smoke Zero Halogen bag or jacket. Evidence of smoke and halogen tests of the bag / jacket and the results shall be submitted with the Tender.

3.14.5. Impact Test

The product shall be designed to withstand on site mishaps such as accidentally dropping / slipping of the bag. A drop test shall be carried out to demonstrate the performance of the product jacket. The height shall be 1 metre with an ambient temp of 5 degrees Celsius. There shall be no tears or breakages seen in the jacket material.

4. References

4.1. External Documentation

The products described within this specification shall comply with the latest versions of the relevant International Standards, British Standard Specifications and all relevant Energy Networks Association Technical Specifications (ENATS) current at the time of supply.

Reference	Title
BS 7870-3.40	LV and MV polymeric insulated cables for use by distribution and generation utilities. Specification for distribution cables of rated voltage 0.6/1kV. XLPE insulated, copper wire waveform concentric cables with solid aluminium conductors.
BS EN 124	Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking and quality control.
BS EN 60282-1	High-voltage fuses. Current limiting fuses BS EN 60947-1: - Low-voltage switchgear and control gear. General rules.
BS EN 61238-1	Compression and mechanical connectors for power cables for rated voltages up to 36kV.
BS EN ISO 7010:2020	Graphical symbols. Safety colours and safety signs. Registered safety signs
BS HD 60269-2, BS 88 - 2	Low-voltage fuses. Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application). Examples of standardized systems of fuses A to J.
ENA Technical Specification 09-23	Issue 2- 2018Link Boxes

4.2. Internal Documentation

Reference	Title
n/a	

4.3. Amendments from Previous Version

Clause	Subject	Amendments
2	Scope	Reference to external documents updated.
2.1	Contents	Table of contents added.
3	Purpose	Previous versions table amended.
3	Requirements	Updated to align with other underground specifications.
3.12	Testing	New section to clarify testing requirements.
3.13	Protection blankets	New section to state protection blankets.
6	Authority for Issue	Amended to reflect new business structure.
Appendix 1	Requirements	Descriptions and commodity codes updated.
Appendix 4	Self-Certification Conformance Declaration	Up-date to reflect testing specified within ENA TS document.
Appendix 5	Technical Information Check List	Updated.
Appendix 6	Protection blanket requirements	New section clarifying requirements.

5. Definitions

Term	Definition
GRP	Glass Reinforced Plastic
HDPE	High Density Polyethylene

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	22/04/2021

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	Reason: In alignment with contract award
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
David Gazda	Senior Policy and Standards Engineer	27/04/2021

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 and Standards Engineer	23/04/2021
Joseph Helm	Policy and Standards Manager	27/04/2021

6.4. Authorisation

Authorisation is granted for publication of this document.

		Date
Greg Farrell	Head of System Engineering	27/04/2021

Appendix 1 - Requirements

Link Boxes

Lot	Line	Item	Description	Usage
Link boxes suitable for 3core waveform Must include complete link box inc base				
1	1	160606	4-Way Underground Link Box Suitable for 3 Core WF up to 300mm2.)	
1	2	160605	2-Way Underground Link Box Suitable for 3 -Core Waveform Cables up to 300mm2.	
Link boxes suitable for 4core waveform Must include complete link box inc base, and any parts required for 4core waveform cables				
2	3	TBC	4-Way Underground Link Box Suitable for 4 Core WF up to 300mm2.) This item must include any items required to make a 4 core link box	
2	4	TBC	2-Way Underground Link Box Suitable for 4 -Core Waveform up to 300mm2 This item must include any items required to make a 4 core link box	
Auxiliary components				
3	5	160610	Solid Link for LV Link Box. Wedge Type. with 82.5mm centres	
3	6	106608	2-Way Link Box concrete Replacement Pavement Cover	Small usage
3	7	160609	2-Way Link Box Un-filled Pavement Cover	Small usage
3	8	TBC	4-Way Link Box concrete Replacement Pavement Cover	Small usage
3	9	TBC	4-Way Link Box Un-filled Pavement Cover	Small usage

Link Box Protection Blankets

Lot	Item	Description	Size	Catalogue Number
4	1	Red large Link box protection blanket Suitable for older cast iron 4 way link box in brick built pit Remedial work required	1100mm x 900mm	189890
4	2	Red Medium Link box protection blanket Suitable for new 4 way link box in purpose built Plastic pit Remedial work required	800mm x 700mm	189891
4	3	Red Small Link box protection blanket Suitable for 2 way link box in brick or purpose built plastic pit Remedial work required	600mm x 450mm	189862
4	4	Yellow large Link box protection blanket Suitable for older cast iron 4 way link box in brick built pit High risk site	1100mm x 900mm	189863
4	5	Yellow Medium Link box protection blanket Suitable for new 4 way link box in purpose built Plastic pit High risk site	800mm x 700mm	189864
4	6	Yellow Small Link box protection blanket Suitable for 2 way link box in brick or purpose built plastic pit High risk site	600mm x 450mm	189865

Appendix 2 - Addendum to Supplier Requirement

Supporting evidence of compliance with type tests shall be submitted with the completed tender document.

Link box kits shall incorporate all the necessary components (excluding the resin) to carry out a specific joint combination.

When resin free type joints are proposed, they will meet the requirements of the relevant parts of Engineering Recommendation C81/3. Any heat shrinkable materials used shall be in accordance with ENATS 09-11.

Each individual link box kit shall include the relevant jointing instruction/drawing and a kit contents list. The volume of resin required to complete the joint (where applicable) shall clearly be displayed. A label shall be attached to the outer packaging of all commodity codes detailing the part description, application, batch number/date and the NPg commodity code.

The production of the jointing instruction is the responsibility of the supplier and subject to approval by the Northern Powergrid. Any amendments required shall be agreed and approved by the Northern Powergrid.

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

Suppliers should provide details of how they will provide technical support to NPg. For example provision of training, online hosted support or telephone support etc.

Appendix 3 - Logistical Requirements

To enable the Northern Powergrid 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	Shelf Life

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.

Clearly legible, easily identifiable, durable and unambiguous labelling shall be applied to each individual and where relevant, multiple package 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

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

Appendix 4 - SELF CERTIFICATION CONFORMANCE DECLARATION

The Technical Specification for Low Voltage Underground Link Boxes shall comply with the latest issues of the relevant national and international standards, including ENATS 09-23. Additionally this technical specification is intended to amplify and/or clarify requirements relating to these Standards.

This self-declaration sheet identifies the clauses of the aforementioned standards relevant to the Technical Specification for Low Voltage Underground Link Boxes for use on the Northern Powergrid distribution network. The manufacturer shall declare conformance or otherwise, clause by clause, using the following levels of conformance declaration codes.

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.

Manufacturer:

Product Reference:

Name:

Signature:

Date:

NOTE: One sheet shall be completed for each item or variant submitted.

Instructions for Completion

When Cs1 code is entered provide the reference of the document providing evidence.

- When any other code is entered the reason for non-conformance shall be entered.

- Prefix each remark with the relevant 'BS EN' 'IEC' or 'ENATS' as appropriate. • Prefix each remark with the relevant 'BS EN' 'IEC' or 'ENATS' as appropriate.

Appendix 4 Cont'd - Technical Specification for Low Voltage Underground Link Boxes

NPS/002/012			
	Requirement	**Conformance Code**	**Remarks**
General	Available in 2 way or 4 way options.		
3.4 Link Box Shell	Suitable for cable sizes 1855mm^2 – 300mm^2.		
	Suitable for either polyurethane or acrylic based resins.		
	Flat bottomed, horizontally split shell. Min thickness 2mm, upper part clear to enable clearances to be checked.		
3.4.1 Lower strengthened base	Has a strengthened base, state if the base is a separate unit.		
3.5 Turret Assembly	Positively located with appropriate mechanical and heat resisting properties.		
	Hard draw tinned copper contacts, suitable for links or J type fuse link with 83mm centres to BS 88-2:2007. Current rated for largest cable size.		
	Integral connectors suitable for stranded copper or solid aluminium conductors in the range 185mm^2 to 300mm^2, tested to Engineering Recommendation BSEN 61238-1.		
	Links provided (for all cable ways).		
	Inter- Phase Barriers.		
	Neutral / Earth Connection Access (testing / fault location / generator connection).		

NPS/002/012			
	Requirement	**Conformance Code**	**Remarks**
3.5 Turret Assembly	Shrouds for unused cable ways.		
3.6 Bell Cover	Insulated, suitable to prevent water ingress.		
	Incorporates a notice indicating “Danger Electric” or equivalent Danger of Death Sign to BS EN ISO 7010:2012.		
3.7 Pit Assembly	GRP or HDPE housing, to provide access to and prevent backfill material covering link box assembly.		
	Horizontally stackable sections to enable adjustment for depth of link box assembly.		
	Suitable for access frame and cover 3.5		
3.8 Pavement Access Frame and Cover	Frame manufactured from hot dipped galvanised steel, with adjustable “skirt” to allow 100mm of vertical movement and prevent ingress of backfill material link box assembly. .		
	Covers shall comprise a galvanised steel tray, concrete filled with 2 x "keyhole" type slots to aid removal from the frame:- 1 x cover / 2 way link box. 2 x covers / 4 way link box.		
Load Test Requirements	Pit assembly, access frame and covers shall meet the load requirements of BS EN124 class B125.		
	Incorporates a notice indicating “Danger Electric” or equivalent Danger of Death Sign to BS EN ISO 7010:2012.		
3.9 Circuit Labels	Non-conductive, appropriately sized, suitable for engraving, positively located and easy to remove without tools.		

NPS/002/012			
	Requirement	**Conformance Code**	**Remarks**
3.10 Tool Box	Waterproof container suitable for storing unused links, contact grease and shrouds.		
3..11 Extras	Contact Grease		
3..12	Testing requirements in line with ENA 09-23 Link boxes		
Name:	**Signature:**		**Date:**
	ENA		
ENA Clause	**Requirement**	**Conformance Code**	**Remarks**
4	**Components**		
	4.1 Link box shell		
	4.2 Link box lid (bell housing)		
	4.3 Connectors		
	4.4 Stalk and link assembly		
	4.5 Fuses		
	4.6 Solid links		
	4.7 Metallic components		
	4.8 Labelling		
	4.9 Link box frame pit cover		
5	**Electrical characteristics**		
	5.1 Rated voltage		
	5.2 Current rating		
6	**Design considerations**		
	6.1 General		

NPS/002/012			
	Requirement	**Conformance Code**	**Remarks**
	6.2 Cables		
	6.3 Connectors for link boxes		
	6.4 Water immersion depth and pressure		
	6.5 Phase identification		
	6.6 Nameplate		
	6.7 Other design parameters		
7	**Type tests requirements and sequence**		
	7.1 General		
	7.2 Test samples		
	7.3 Sequence of tests		
	7.4 Type test for resin		
8	**Type test methods**		
	8.1 General		
	8.1.1 Test conditions		
	8.1.2 Temperature calibration of cable		
	8.1.2.1 Application		
	8.1.2.2 Test procedure		
	8.2 Impact test at ambient temperature		
	8.3 Cantilever load withstand test		
	8.4 AC voltage withstand test		
	8.4.1 Test installation		
	8.4.2 Test procedure		
	8.5 Insulation resistance test procedure		

NPS/002/012			
	Requirement	**Conformance Code**	**Remarks**
	8.6 Heating cycle test		
	8.6.1 Test installation		
	8.6.2 Test procedure		
	8.7 Live make/break tests		
	8.8 Temperature rise tests		
	8.9 Long-term soak test		
	8.10 Lifting test		
	8.11 Examination		
	8.11.1 General		
	8.11.2 Procedure		
9	**Routine tests**		
10	**Installation**		

Clause 3.15	Protection Blanket Requirements		
	Requirement	Conformance Code	Remarks
Requirements 3.15.1	• The Protection blanket shall be filled with layers of fibreglass.		
3.15.2	• The blanket jacket shall be of a heavy duty silicon material or equivalent.		
3.15.3	• The blanket jacket shall be made from Low Smoke and Fume or Low Smoke Zero Halogen material. The jacket shall be of substantive thickness and quality to withstand handling, storage and operations for a minimum of 12 years.		
3.15.4	• The blanket jacket shall be red or yellow in colour.		
3.15.5	• The blanket jacket shall incorporate a waterproof label with the wording "Danger Electricity" and danger of death sign. Minimum size 300mm x 200mm.		
3.15.6	• Heavy duty jacket handle(s) shall be fitted to assist with carrying, installation, positioning and removal of the bag in the link box.		
3.15.7	• The blanket is required to perform if the link box chamber is submerged in water, • Moisture drainage shall be incorporated in the jacket design.		
Testing 3.16.1	• **Blast mitigation test**		
3.16.2	• **Electrical Test**		
3.16.3	• **Water Ingress Test**		
3.16.4	• **LSF Test**		
3.16.5	• **Impact Test**		

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
Full product descriptions and part number/reference against commodity codes complete with volume of resin required where applicable.	
Appendix 4 – completed self-certification conformance declaration	
Complete set of drawings and/or jointing instructions for each variant	
Type test evidence	
Production quality plan (example)	
Packaging/delivery information	
Provide details of technical support provided to Northern Powergrid during the term of the contract	