

1. SCOPE

This specification details requirements for General Wiring cables up to and including 450/750V for use on lighting and general power wiring installations complying with BS 7671. Whilst most cables detailed in this specification are employed in situations that will not form part of our networks, several are used on SP Distribution plc, SP Transmission plc and SP Manweb plc networks.

2. ISSUE RECORD

This is a Reference document. The current version is held on the EN Document Library.

It is your responsibility to ensure you work to the current version.

Issue Date	Issue No.	Author	Amendment Details
August 2020	4	Gordon MacKenzie	General Revision. Update of industry standards. Addition of Section 12, Packaging and Environmental Management System
December 2021	5	Brian Thomas	Updated Scope. Removal of superfluous cables, revision of Sustainability section, addition of SAP codes and other minor alterations
June 2023	6	Ian Hancock	Updated sustainability section and added section on delivery

3. ISSUE AUTHORITY

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4. REVIEW

This is a Reference document which has a 5-year retention period after which a reminder will be issued to review and extend retention or archive.

5. DISTRIBUTION

This document is not part of a Manual maintained by Document Control and does not have a maintained distribution list. It is published on the SP Energy Networks website.

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7. RELATED DOCUMENTS

This specification makes reference to the following documents. It is important that Tenderers ensure that they are in possession of the latest issues of these documents together with any amendments.

7.1 CENELEC Documents

HD 308 Identification and use of cores of flexible cables

7.2 Other Industry Standards

BS EN IEC 60332-3-10 Tests on electric and optical fibre cables under fire conditions. Test for vertical flame spread of vertically mounted bunched wires or cables

BS EN IEC 60332-3-24 Tests on electric and optical fibre cables under fire conditions - Test for vertical flame spread of vertically mounted bunched wires or cables. Category C

EN 60332-1-1 Tests on electric and optical fibre cables under fire conditions: Test for vertical flame propagation for a single insulated wire or cable

EN 60332-1-2 Tests on electric and optical fibre cables under fire conditions

BS EN 60228 Conductors of insulated cables

BS 6387 Test method for resistance to fire of cables required to maintain circuit integrity under fire conditions

BS EN 50525-3-41 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) Cables with special fire performance. Single core non-sheathed cables with halogen-free crosslinked insulation, and low emission of smoke

BS EN 60754-1 Test on gases evolved during combustion of materials from cables. Determination of the halogen acid gas content

BS EN 60754-2 Test on gases evolved during combustion of materials from cables. Determination of acidity (by pH measurement) and conductivity

BS EN 61034-2 Measurement of smoke density of cables burning under defined conditions. Test procedure and requirements

BS 7211 Electric cables. Thermosetting insulated and thermoplastic sheathed cables for voltages up to and including 450/750 V for electric power and lighting and having low emission of smoke and corrosive gases when affected by fire

BS 7671 Requirements for Electrical Installations. IET Wiring Regulations

BS 7870-1 LV and MV polymeric insulated cables for use by distribution and generation utilities – General

BS 6004 PVC Insulated and PVC Sheathed cables for voltages up to and including 300/500V, for electrical power and lighting

BS 7629-1 Specification for 300/500 V fire resistant, screened, fixed installation cables having low emission of smoke and corrosive gases when affected by fire Multicore cables

BS EN 50200 Method of test for resistance to fire of unprotected small cables for use in emergency circuits

BS 6724 Electric cables. Thermosetting insulated, armoured cables of rated voltages of 600/1 000 V and 1 900/3 300 V for fixed installations, having low emission of smoke and corrosive gases when affected by fire.

BS EN 50525 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U)

BS 5839-1 Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises

BS 8434-2 Methods of test for assessment of the fire integrity of electric cables. Test for unprotected small cables for use in emergency circuits.

BS EN ISO 14001 Environmental Management Systems

BS EN ISO 14025 Environmental labels and declarations

7.3 BASEC British Approvals Service for Cables

All general wiring products must have valid BASEC certification. This includes certification for the factory of origin and of the product supplied. It must be made available to SPEN upon request. <https://www.basec.org.uk/>.

8. GENERAL

8.1 Definitions

For the purpose of this specification the following definitions shall apply:

SPEN

SP Energy Networks, the brand name for the division of the Scottish Power group of companies that encompasses SP Transmission plc, SP Distribution plc, SP Manweb plc, SP Power Systems Ltd and Scottish Power Energy Networks Holdings Ltd.

SP Transmission plc

The Transmission Licence Holder for the transmission service area formerly known as Scottish Power.

SP Distribution plc

The Distribution Licence Holder for the distribution service area formerly known as Scottish Power.

SP Manweb plc

The Distribution Licence Holder for the distribution service area formerly known as Manweb.

Approved

Equipment approved in accordance with SPEN's Equipment Approvals Procedure and which is considered suitable for use and/or installation on SPEN's networks. Approval shall be given in writing by the Specifying Engineer.

Specifying Engineer

Person nominated by SPEN having responsibility and authority for all technical matters relating to this specification.

Tenderer

The manufacturer/supplier invited to submit a tender in accordance with this specification.

Supplier

The successful Tenderer (may be more than one).

8.2 Abbreviations

BS	British Standard
BASEC	British Approvals for Cables
CENELEC	Comité Européen de Normalisation Electrotechnique
CO ² e	Embodied Carbon Dioxide Equivalent
CSP	Chlorosulphonated polyethylene
DNO	Distribution Network Operator
EN	Europäische Norm ("European Norm")
EPR	Ethylene Propylene Rubber
GHG	Greenhouse Gas
HD	Harmonisation Document
HOFR	Heat and oil resistant and flame retardant
ISO	International Standards Organisation
LSZH	Low Smoke Zero Halogen
PVC	Poly Vinyl Chloride
QA	Quality Assurance
XLPE	Cross Linked Polyethylene

8.3 Conditions of Installation

Cables specified in this document will be enclosed in trunking or conduit or clipped directly in air. Cables may also be installed within cable trenches.

During storage and after installation cables can be expected to be subjected to the full range of climatic conditions encountered in the UK. Cables shall not be installed in temperatures of less than zero degrees Celsius, or greater than forty degrees Celsius.

Cable installed in trenches 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.

Cables installed above ground will be supported by means of cleats, mounted vertically or horizontally, and may be exposed to direct sunlight for significant periods.

8.4 Conditions of Operation for General Wiring Cables

The following are the general conditions under which general wiring cables 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 +/- 1%.

Cables purchased in accordance with this specification may be laid alongside or are otherwise associated with power cables operating under the above conditions.

8.5 Cable Longevity

Cables offered shall be designed and manufactured to operate satisfactorily under the installation and operating conditions detailed above.

The Tenderer shall provide at the time of tender details of manufacturing location(s) for each cable offered.

Any Approval granted will be site and line specific and will not be transferable to any other site or line without the prior written agreement of the Specifying Engineer.

8.6 Technical Support

From time to time during the contract period questions will arise regarding unusual or non-standard applications where advice will be required on matters such as cable ratings etc. The successful Tenderer(s) will be expected to support SPEN with technical advice on these matters.

9. TESTING AND APPROVAL

9.1 Type Approval Testing

All cables offered must be BASEC Type-Tested and Qualified according to the requirements of the Technical Specifications and Standards detailed for the particular cable type. At the time of tender, the Tenderer shall, for all expected manufacturers over the contract period, provide BASEC certification numbers associated with Product Certification Schedules together with the corresponding manufacturer's cable data sheets. Should the Contractor wish to change cable manufacturer during the course of the contract, that manufacturer shall be BASEC approved for the specified cable type and the cable Qualified according to the requirements of the Technical Specifications and Standards detailed for the particular cable type. In these circumstances, the Contractor shall notify the Specifying Engineer in writing, providing the BASEC certification numbers associated with Product Certification Schedules and the corresponding manufacturer's cable data sheets prior to supply of the cable to SPEN.

Similarly, if, during the period of the contract, the Contractor wishes to make any change to the Approved product packaging or labelling, proposals for such changes shall be notified in writing to the Specifying Engineer.

No changes to contract shall be implemented without the prior written approval of the Specifying Engineer. If the Specifying Engineer deems that the changes require the Type Approval Testing to be repeated, in full or in part, the cost of such testing shall be borne by the Contractor.

If an item of concern is raised with the product or any of its components, SPEN reserves the right to withdraw Approval, quarantine suspected stock and suspend use of the product on SPEN's network until the issue can be resolved and the Approval status restored.

9.2 Routine and Sample Testing

The Supplier shall carry out all routine and sample tests as required to gain BASEC Approval for each cable. Tenderers shall state at the time of tender their proposals for sample test frequencies where such frequencies are not detailed specifically by this specification or the relevant referenced Standards or specifications. The Specifying Engineer reserves the right to be present and witness routine and sample tests. Where the Specifying Engineer wishes to witness any such test, the date and time of testing shall be mutually agreed.

9.3 Samples

During the tender period the Tenderer shall submit samples for approval as required by the Specifying Engineer. Such samples shall remain the property of SPEN.

During the period of contract, the Contractor shall provide samples as dictated by the Specifying Engineer. Such samples shall remain the property of SPEN.

During the period of contract, the Tenderer shall make available all BASEC audit findings, recommendations and non-conformances.

10. TECHNICAL REQUIREMENTS

Where a requirement of this specification differs from that of another quoted specification or Standard, the requirement of this specification shall apply.

If a Tenderer is unsure regarding any requirement of this specification, clarification shall be sought in writing from the Specifying Engineer.

SPEN welcomes innovation and will consider alternatives to traditional designs where it can be demonstrated, to the satisfaction of the Specifying Engineer, that these alternatives meet the functional requirements of this specification.

10.1 Cable Rating Data

For each power cable offered the Tenderer shall provide the following cable rating data:

- Cable rating laid direct (Amps)
- Cable rating laid in PVC/Metal Trunking (Amps)
- Cable rating laid in PVC/Metal Conduit (Amps)
- Cable rating in air (Amps)

The following assumptions shall be made when quoting ratings:

Single core cables are laid in touching trefoil

Maximum spacing factor when installed in trunking as per BS 7671

Maximum spacing factor when installed in conduit as per BS 7671

Ground temperature = 15°C

Air temperature = 25°C

Tenderers shall also provide data to show the variation in rating with changes in ambient temperature.

10.2 Cable Impedance Data

For each General Wiring cable offered the Tenderer shall provide the following data:

- Maximum dc resistance per phase conductor at 20°C (Ohms/km)
- Maximum ac resistance per phase conductor at maximum conductor temperature (Ohms/km)
- Star reactance at 50Hz (Ohms/km)
- Star capacitance at 50Hz (Ohms/km)
- Charging current per phase at normal voltage and frequency (mA/m)
- Zero sequence impedance $R_0 + jX_0$ (Ohms/km)

10.3 Installation Parameters

For each General Wiring cable offered the Tenderer shall provide the following parameters:

- Minimum dynamic bending radius (mm)
- Minimum static bending radius (mm)
- Recommended pulling method and maximum pulling tension (kgF)

10.4 Testing

The measurement of insulation shrinkage, which is a Type-Test in BS 7870-1, shall be carried out as a sample test at a frequency of one test per production batch of service cable.

10.5 Reporting

The results of the insulation shrinkage tests shall be reported by e-mail to the Specifying Engineer at the time of contract award. The test report shall also include a QA traceability number and manufactured length associated with that production batch in addition to the line operating speed, conductor resistance, screen resistance, sheath thickness, overall diameter and spark test pass/fail.

10.6 Other Requirements

At the time of tender the manufacturer shall provide details of their understanding of the factors contributing to insulation shrinkage and shall detail control measures taken in their production to minimise insulation shrinkage in the final product.

10.7 Cable Marking and identification

The oversheaths of all cables shall be marked in accordance with the requirements of the relevant standard specified in this document.

All cables shall be metre marked throughout the length of the cable and the start and end values shall be marked on the drum label.

Three phase low voltage cables shall have the letter "H" embossed on the oversheath to indicate that the cable has Harmonised core colours in accordance with CENELEC HD 308.

10.8 Identification

Each delivery length of cable shall be allocated a unique reference number. This number shall appear on the factory test records covering the cable length, shall be clearly marked on the drum on which the length is delivered and shall be referred to on all invoices and advice notes.

11. SEALING AND DRUMMING

11.1 Sealing

The ends of all cables shall be effectively sealed against the ingress of moisture by a method appropriate to the cable type. For cables having inner and outer sheaths (e.g. multicore cables) the sealing arrangement shall be applied to the innermost sheath. Tenderers shall detail at the time of tender their proposed sealing arrangement for each cable type offered.

11.2 Drumming

11.2.1 Cable Protection

The cable and cable end projecting from the drum shall be protected from damage during transit, storage and handling on site and include the use of a heat shrink end cap.

Tenderers shall state at the time of tender their proposed method of protection for each cable type offered.

11.2.2 Drums

Service cable shall be supplied on non-returnable drums. All other drums shall be designed to be recyclable and the Supplier shall arrange to collect empty drums from SPEN's normal delivery locations.

Tenderers shall state at the time of tender their proposed cable drum sizes and weights for each cable type offered.

11.2.3 Drum Labels

All cable drums shall be marked in accordance with the relevant BASEC Approved specification or Standard. The drum label shall also contain the metre marking start and end values and the unique reference number.

All drum labels shall remain legible and durable under normal indoor storage conditions.

12. QUALITY REQUIREMENTS

Analysis of any defective items either on receipt or in use will be taken into account by SPEN during any future tender analysis.

Tenderers shall operate a fully documented quality assurance system and should confirm this with their tender submission and provide a copy of their overall quality policy statement.

Tenderers shall also provide, at the time of tender, copies of any relevant QA Approvals held by them and quality plans for each cable type offered (these should identify the control stages during manufacture and test).

Tenderers shall provide BASEC registration documentation, and product certification schedules for all cable types listed in this document.

SPEN will carry out random goods inward inspections to confirm compliance with the requirements of this specification.

13. INFORMATION REQUIRED FROM THE TENDERER

In addition to completing the attached schedules in full, the Tenderer shall provide the following information at the time of tender:

Manufacturing location(s) for all cables offered

BASEC Type-Test Cert, reports for all cables (see section 9.1)

Details of any alternative Type-Test standards proposed (see section 9.1)

Long term ageing test evidence for all cables (see section 9.2)

Sample test frequencies for all cables (see section 9.2)

Cable ratings data for all cables (see section 10.1)

Cable impedance data for all cables (see section 10.2)

Cable installation parameters for all cables (see section 10.3)

Proposed sealing arrangement for each cable type (see section 11.1)

Proposed cable protection for each cable type (see section 11.2.1)

Drum sizes and weights for each cable type (see section 11.2.2)

Confirmation of documented quality assurance system (see section 12)

Quality policy statement, QA approvals and plans (see section 12)

14. SUSTAINABILITY

As a leading electricity networks business, SP Energy Networks has a critical role to help the UK in meeting its ambitious climate change targets and enabling the transition to a low carbon economy. We will work together to deliver a better future, quicker. We have committed to achieve Net Zero by minimising the environmental impacts of our business and networks operations, increasing efficiency and scaling to have a more resilient network, driving decarbonisation and embedding the principle of sustainability to meet the needs for current and future networks customers. Our vision of sustainability is central to all that we do: it guides our business plans, underpins our innovation approaches, and

shapes our day. SPEN's ability to meet these targets is dependent upon the environmental impact of its supply chain.

To assist SPEN in meeting these targets, the Tenderer shall at the time of tender confirm commitment to and provide evidence of the following:

- Optimise material use – including using low carbon alternatives where possible.
- Optimise transportation of all materials / equipment and commit to reducing the amount of packaging* and increasing the amount of return of packaging for reuse over the contract period.
- Consider the waste hierarchy at all times – minimising waste through all operations relating to this contract.
- Consider end of life requirements for individual components and component packaging, including any circular economy practices and sustainable resource management.
- Provide evidence of how the Tenderer has been delivering sustainability and reducing carbon emissions over the last 3 years.
- Ensure there is no net loss of biodiversity as a result of operations relating to this contract.

*Despite the requirement to optimise transportation and packaging arrangements, the Tenderer shall ensure that each item is suitably packaged and protected to maintain the product and packaging as “fit for service” prior to use. All packaging shall be sufficiently durable giving regard to the function, reasonable use and contents of the packaging.

Tenderers with the mechanisms described in this section already in place shall be preferred. If all the above information requested is not available, the Tenderer shall provide commitment and evidence to as many points as possible and commit to developing mechanisms to provide this information within the contract period. Milestones shall be set before the commencement of the contract award and progress checked through business review meetings.

14.1 Influence of the Product on the Environment

The Tenderer shall provide evidence at the time of tender that they are certified to the environmental management system ISO 14001 or comparable environmental management system for the products tendered for as detailed in this specification.

14.2 Supply Chain Sustainability Knowledge

The Tenderer shall agree at the time of tender to register as members of the Supply Chain Sustainability School at commencement of the contract and undertake training requested by SPEN. Free registration and membership can be obtained using the following link:

<https://www.supplychainschool.co.uk/>

14.3 Carbon Footprint Calculator

The Tenderer shall provide information on the carbon footprint of all major equipment using the UK Network Operator Carbon Product Calculator. The Carbon Product Calculator and associated guidance document is freely available via download from the SP Energy Networks – Supply Chain Sustainability School using the following link:

<https://www.supplychainschool.co.uk/partners/sp-energy-networks/>

SPEN along with the other UK Network Operators are working in partnership with the ENA to develop and improve a shared Carbon Database which will be used to develop a better understanding of the carbon impact associated with the infrastructure we develop. This will allow us to ultimately work towards reducing our direct and indirect carbon impact in line with the goals of the Paris Agreement. The act of submitting a populated carbon calculator is acceptance by the Supplier that SP Energy Networks has the right to store such information within the UK Networks Operator's Carbon Database.

Where available, the Tenderer shall provide Environmental Product Declarations aligned to ISO 14025 for significant materials streams, products and packaging.

14.4 Periodic Reporting

SPEN are improving supply, installation and construction reporting through the use of the SmartWaste tool and the successful Tenderer will be required to provide monthly reports on sustainability aspects and environmental compliance requirements directly related to contract delivery.

The Tenderer shall agree at the time of tender that monthly reports will be submitted through the SmartWaste tool. SPEN's Sustainability team shall provide further information regarding the SmartWaste tool at the time of tender.

14.5 Science Based Targets

For any contract award over £0.5m, any successful Tenderer who has not already set Science Based Targets, shall commit to setting Science Based Targets (<https://sciencebasedtargets.org/>) for reducing their greenhouse gas emissions, providing a timeline with key milestones demonstrating that this will be accomplished within five years of contract award (unless the Tenderer has already set Science Based Targets). Confirmation shall be provided in writing at the time of tender that the Tenderer has either set Science Based Targets – or will commit to setting Science Based Targets if they are awarded the contract.



15. DELIVERY

If successful, the Supplier shall be required to deliver the awarded product(s) to SPEN's central stores, Bonnybridge (SPD) and/or Queensferry (SPM). If an order is high volume, the Supplier may be required to deliver the order directly to one of SPEN's local depots or a large project/CDM site within the SPEN SPD and/or SPM licence areas (please refer to table below).

If applicable, the Tenderer shall provide bids in the issued tender schedules based on delivery location to each of the depots listed below and for project site locations within the SPEN licence area at the time of tender.

The Tenderer shall state at the time of tender, any minimum logistical requirements to be able to deliver their product to a local SPEN depot or a project site location within the SPEN licence areas. For example, but not limited to:

- minimum notification period.
- minimum order quantity.
- staffed site.
- access.
- forklift for unloading

SPEN Licence Area	District Area	Depot Name	Address
<p>SPD/SPT</p> 	Central & Fife	Bonnybridge Stores	SP Energy Networks, Bonnybridge Depot, Falkirk Road, Bonnybridge, Stirlingshire, FK4 1SN
		Central and Fife Depot	SP Energy Networks, Woodgate Drive, Glenrothes, Fife, KY7 4PD
	Glasgow	Glasgow	SP Energy Networks, St Vincent Crescent, Glasgow, G3 8LT
	Lanarkshire	Lanarkshire Depot	SP Energy Networks, 55 Fullarton Drive, Cambuslang, Glasgow, G32 8FA
	Edinburgh & Borders	Edinburgh/Borders Depot	SP Energy Networks, Telferton House, 53 Fishwives' Causeway, Edinburgh, EH7 6UX
	Ayrshire & Clyde South	Ayrshire Depot	SP Energy Networks, Rowallan Business Park, Southcraig Avenue, Kilmarnock, KA3 6BQ
	Dumfries	Dumfries and Galloway Depot	SP Energy Networks, Leafield Road, Dumfries, DG1 2DN
<p>SPM</p> 	Dee Valley & Mid Wales	Queensferry Stores	SP Energy Networks, Queensferry Depot, Factory Road, Sandycroft, Deeside, CH5 2QJ
	Merseyside	Merseyside Depot	SP Energy Networks Lister Drive, Tuebrook, Liverpool, L13 7HJ
	Wirral	Wirral Depot	SP Energy Networks, North Cheshire Trading Estate, Prenton Way, Prenton, CH43 3ET
	Mid Cheshire	Mid Cheshire Depot	SP Energy Networks, ERF Way, Middlewich, Cheshire, CW10 0QJ
	North Wales	North Wales Depot	<p><u>Llandudno Junction Office</u></p> <p>SP Energy Networks, 1 Narrow Lane, Llandudno Junction, Conwy, LL31 9BB</p> <p><u>Caernarfon Office</u></p> <p>SP Energy Networks, St Helens Road, Caernarfon, Gwynedd, LL55 2YB</p>
	Dee Valley & Mid Wales	Dee Valley/Mid Wales Depot	SP Energy Networks, Wrexham Road, Pentre Bychan, Wrexham, LL14 4DU

16. SUMMARY OF CABLE TYPES REQUIRED

16.1 General Wiring Cables

16.1.1 Single Core Cables: BS EN 50525-3-41 LSZH insulated

Stranded plain annealed compacted circular copper conductors to BS EN 60228, Low Smoke Zero Halogen (LSZH) insulation, 450/750 volts grade to BS EN 50525-3-41. Acid gas emission to BS EN 60754-1, BS EN 60754-2, smoke emission to BS EN 61034-2, EN 60332-1-2.

Ref	SAP	Description	Supplier Code
SC-01	30057744	1.5 mm ² stranded Copper LSZH (Brown)	6491B1/5
SC-01	30057742	1.5 mm ² stranded Copper LSZH (Black)	6491B1/5
SC-01	30057776	1.5 mm ² stranded Copper LSZH (Grey)	6491B1/5
SC-01	30057743	1.5 mm ² stranded Copper LSZH (Blue)	6491B1/5
SC-01	30057775	1.5 mm ² stranded Copper LSZH (Green/Yellow)	6491B1/5
SC-02	30980080	2.5 mm ² stranded Copper LSZH (Brown)	6491B2/5
SC-02	30057786	2.5 mm ² stranded Copper LSZH (Black)	6491B2/5
SC-02	30980077	2.5 mm ² stranded Copper LSZH (Grey)	6491B2/5
SC-02	30057785	2.5 mm ² stranded Copper LSZH (Blue)	6491B2/5
SC-02	30980078	2.5 mm ² stranded Copper LSZH (Green/Yellow)	6491B2/5
SC-03	30057795	4.0 mm ² stranded Copper LSZH (Brown)	6491B4
SC-03	30057796	4.0 mm ² stranded Copper LSZH (Black)	6491B4
SC-03	30057799	4.0 mm ² stranded Copper LSZH (Grey)	6491B4
SC-03	30057797	4.0 mm ² stranded Copper LSZH (Blue)	6491B4
SC-03	30057798	4.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B4
SC-04	30057807	6.0 mm ² stranded Copper LSZH (Brown)	6491B6
SC-04	30057805	6.0 mm ² stranded Copper LSZH (Black)	6491B6
SC-04	30057808	6.0 mm ² stranded Copper LSZH (Grey)	6491B6
SC-04	30057806	6.0 mm ² stranded Copper LSZH (Blue)	6491B6
SC-04	30980054	6.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B6
SC-05	30057779	10.0 mm ² stranded Copper LSZH (Brown)	6491B10
SC-05	30057777	10.0 mm ² stranded Copper LSZH (Black)	6491B10
SC-05	30057778	10.0 mm ² stranded Copper LSZH (Blue)	6491B10
SC-05	30057780	10.0 mm ² stranded Copper LSZH (Grey)	6491B10
SC-05	30980055	10.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B10
SC-06	30057783	16.0 mm ² stranded Copper LSZH (Brown)	6491B16
SC-06	30057781	16.0 mm ² stranded Copper LSZH (Black)	6491B16
SC-06	30057782	16.0 mm ² stranded Copper LSZH (Blue)	6491B16
SC-06	30057784	16.0 mm ² stranded Copper LSZH (Grey)	6491B16
SC-06	30980057	16.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B16
SC-07	30057789	25.0 mm ² stranded Copper LSZH (Brown)	6491B25
SC-07	30057787	25.0 mm ² stranded Copper LSZH (Black)	6491B25
SC-07	30057788	25.0 mm ² stranded Copper LSZH (Blue)	6491B25
SC-07	30057791	25.0 mm ² stranded Copper LSZH (Grey)	6491B25

Ref	SAP	Description	Supplier Code
SC-07	30057790	25.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B25
SC-08	30057793	35.0 mm ² stranded Copper LSZH (Brown)	6491B35
SC-08	30057792	35.0 mm ² stranded Copper LSZH (Black)	6491B35
SC-08	30980058	35.0 mm ² stranded Copper LSZH (Blue)	6491B35
SC-08	30057794	35.0 mm ² stranded Copper LSZH (Grey)	6491B35
SC-08	30980059	35.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B35
SC-09	30057802	50.0 mm ² stranded Copper LSZH (Brown)	6491B50
SC-09	30057800	50.0 mm ² stranded Copper LSZH (Black)	6491B50
SC-09	30057801	50.0 mm ² stranded Copper LSZH (Blue)	6491B50
SC-09	30057804	50.0 mm ² stranded Copper LSZH (Grey)	6491B50
SC-09	30057803	50.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B50
SC-10	30057811	70.0 mm ² stranded Copper LSZH (Brown)	6491B70
SC-10	30057810	70.0 mm ² stranded Copper LSZH (Black)	6491B70
SC-10	30980060	70.0 mm ² stranded Copper LSZH (Blue)	6491B70
SC-10	30057812	70.0 mm ² stranded Copper LSZH (Grey)	6491B70
SC-10	30980061	70.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B70
SC-11	30057815	95.0 mm ² stranded Copper LSZH (Brown)	6491B95
SC-11	30057813	95.0 mm ² stranded Copper LSZH (Black)	6491B95
SC-11	30057814	95.0 mm ² stranded Copper LSZH (Blue)	6491B95
SC-11	30057817	95.0 mm ² stranded Copper LSZH (Grey)	6491B95
SC-11	30057816	95.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B95
SC-12	30056666	120.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B120
SC-13	30056667	150.0 mm ² stranded Copper LSZH (Green/Yellow)	6491B150

16.1.2 Surface Wiring Cables: Low Smoke Zero Halogen (LSZH) insulated LSZH sheathed (twin and earth) to BS 7211

Plain annealed copper conductor to BS EN 60228, Low Smoke Zero Halogen (LSZH) insulated one, two or three cores laid flat with an uninsulated circuit protective conductor and LSZH sheathed white. 450/750 volts grade to BS 7211. Acid gas emission to BS EN 60754-1, BS EN 60754-2, smoke emission to BS EN 61034-2, EN 60332-1-1, EN 60332-1-2.

Ref	SAP	Description	Supplier Code
SW-01	30980074	1.5 mm ² , 2-core and earth (Blue/Brown)	6242B 1.5
SW-03	30980075	2.5 mm ² , 2-core and earth (Blue/Brown)	6242B 2.5

16.1.3 Surface Wiring Cables: PVC single core, double insulated

Plain annealed stranded circular copper conductor, single core, PVC insulated, Ref 6181Y. 300/500 volts grade to BS 6004. Brown/White or Blue/White. Flame propagation to EN 60332-1-1, EN 60332-1-2.

Ref	SAP Code	Description	Supplier Code
MC-01	30038304	37/2.03 120 mm ² Grey/Brown Double Insulated PVC	6181Y120 37/2.03
MC-02	30038303	37/2.03 120 mm ² Grey/Blue Double Insulated PVC	6181Y120 37/2.03
MC-03	30038301	19/2.14 70 mm ² Grey/Brown Double Insulated PVC	6181Y70 19/2.14
MC-04	30038302	19/2.14 70 mm ² Grey/Blue Double Insulated PVC	6181Y70 19/2.14
MC-05	30038300	19/1.53 35 mm ² Grey/Brown Double Insulated PVC	6181Y35 19/1.53
MC-06	30038299	19/1.53 35 mm ² Grey/Blue Double Insulated PVC	6181Y35 19/1.53
MC-07	30038297	19/1.35 25 mm ² Grey/Brown Double Insulated PVC	6181Y25 19/1.35
MC-08	30038298	19/1.35 25 mm ² Grey/Blue Double Insulated PVC	6181Y25 19/1.35
MC-09	30038296	19/1.35 25 mm ² Brown/Brown Double Insulated PVC	6181Y25 19/1.35
MC-10	30038295	19/1.35 25 mm ² Blue/Blue Double Insulated PVC	6181Y25 19/1.35
MC-11	30038274	7/1.70 16 mm ² Grey/Brown Double Insulated PVC	6181Y16 7/1.70
MC-12	30038273	7/1.70 16 mm ² Grey/Blue Double Insulated PVC	6181Y16 7/1.70
MC-13	30038272	7/1.70 16 mm ² Brown/Brown Double Insulated PVC	6181Y16 7/1.70
MC-14	30038271	7/1.70 16 mm ² Blue/Blue Double Insulated PVC	6181Y16 7/1.70
MC-15	30038270	7/1.35 10 mm ² Grey/Brown Double Insulated PVC	6181Y10 7/1.35
MC-16	30038269	7/1.35 10 mm ² Grey/Blue Double Insulated PVC	6181Y10 7/1.35
MC-17	30038306	7/1.35 10 mm ² Brown/Brown Double Insulated PVC	6181Y10 7/1.35
MC-18	30038305	7/1.35 10 mm ² Blue/Blue Double Insulated PVC	6181Y10 7/1.35
MC-19	30057809	7/1.04 6.0 mm ² Grey/Brown Double Insulated PVC	6181Y6 7/1.04
MC-20	30057772	7/1.04 6.0 mm ² Grey/Blue Double Insulated PVC	6181Y6 7/1.04
MC-21	30038315	7/1.04 6.0 mm ² Brown/Brown Double Insulated PVC	6181Y6 7/1.04
MC-22	30038294	7/1.04 6.0 mm ² Blue/Blue Double Insulated PVC	6181Y6 7/1.04
MC-23	30038316	1-core 2.5 mm ² Brown/Brown Double Insulated PVC	6181Y2/5
MC-24	30038317	1-core 2.5 mm ² Blue/Blue Double Insulated PVC	6181Y2/5

16.2 Other cables not part of the SPEN network

The following specifications are intended for general guidance only, as that to which would be acceptable for use by SPEN. These cables **are not** SPEN issued and are not part of a SPEN tendered framework.

16.2.1 SWA Standard Power Cables. BS 6724, Low Smoke Zero Halogen (LSZH)

Armoured Power Cables

Plain annealed copper conductor, solid or stranded, circular to BS EN 60228. XLPE insulation. LSZH bedding, galvanised steel wire armour, LSZH outer sheath. Construction to BS 6724. Flame propagation to EN 60332-1-2 (single) and BS EN IEC 60332-3-24 (multiple cables). Corrosive and acid gas to BS EN 60754-1, BS EN 60754-2, smoke emission to BS EN 61034-2.

Fire Alarm and Security Wiring Cables

Plain annealed copper conductor to BS EN 60228, silicon rubber insulated aluminium/polyester tape screen, tinned annealed copper earth wire Low Smoke Zero Halogen (LSZH). Cables to BS 7629-1 and fire performance to BS 5839-1 clause 26.2(d) (standard grade) [and clause 26.2(e) (enhanced grade)]. Outer sheath red, white, orange or black. Fire resistant to BS EN 50200 (standard grade) and BS 8434-2 (enhanced grade). Flame resistant to BS EN IEC 60332-3-10, BS EN IEC 60332-3-24, BS 6387 CAT CWZ. Corrosive and acid gas emission to BS EN 60754-1, BS EN 60754-2, smoke emission to BS EN 61034-2, and flame propagation to EN 60332-1-2.

16.2.2 Flexible Mains and Control Cables EPR, BS EN 50525 Electric Cables

Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U). Cables with special fire performance. Flexible cables with halogen-free crosslinked insulation, and low emission of smoke.

Tinned annealed flexible copper conductors to BS EN 60228, ethylene propylene rubber (EPR) insulated, chlorosulphonated polyethylene (CSP) outer sheath, 450/750 volts grade to BS EN 50525. Black or White. Heat and oil resistant and flame retardant (HOFR). Flame retardant to EN 60332-1-2, BS EN IEC 60332-3-10, BS EN IEC 60332-3-24, Harmonised code designation HO7BN4-F.

17. SCHEDULES FOR CONFIRMATION OF TECHNICAL COMPLIANCE

In each of the schedules below the Tenderer shall indicate whether the cable offered complies in full or not with the identified requirements by placing a “Yes” or “No” in the column against each requirement. Where compliance is indicated by placing a “Yes” in the appropriate column, the relevant BASEC Type-Test report number or Product Certification Schedule, or reference to other evidence of compliance shall be inserted in the “Comments” field.

Each sheet of this schedule should be signed by a responsible representative of the Tendering Company.

This Schedule has been completed by:

Signed	Name	Position	Company

17.1 General Requirements

Clause No.	Spec Section	Brief Description	Compliant?		Comments
			Yes	No	
1	8.3/8.4/ 8.5	Cables designed and manufactured for installation and operation under specified conditions			
2	8.6	Technical support available during contract period			
3	9.1/9.2	Compliant with all conditions of testing and approval in sections 9.1 and 9.2			
4	9.3	Samples will be provided as specified			
5	10	Where the Tenderer is unsure regarding any requirement of this specification, clarification has been sought from SP Energy Networks in writing and this written clarification has been received and understood by the Tenderer			
6	10.7	Cable marking and identification			
7	11.2.3	Drum label legibility and durability			
8	14	All of the information requested in section 14 – Sustainability – is included in the tender return			

Signed

17.2 Single Core Cables: BS EN 50525-3-41 LSZH insulated

Clause No.	Spec Section	Brief Description	Compliance?		Comments
			Yes	No	
9	15.1.1	Compliant with BS EN 50525-3-41			
10	15.1.1	Compliant with BS EN 60228			
11	15.1.1	Compliant with BS EN 60754-1, BS EN 60754-2			
12	15.1.1	Compliant with BS EN 61034-2			
13	15.1.1	Compliant with EN 60332-1-2			
14	9.1	BASEC Product Certification Schedule			
15	9.2	Long term ageing test			

Signed

17.3 Surface Wiring Cables: LSZH insulated LSZH sheathed (twin and earth) to BS 7211

Clause No.	Spec Para	Brief Description	Compliance?		Comments
			Yes	No	
16	15.1.2	Compliant with BS EN 60228			
17	15.1.2	Compliant with BS 7211			
18	15.1.2	Compliant with BS EN 60754-1, BS EN 60754-2			
19	15.1.2	Compliant with BS EN 61034-2			
20	15.1.2	Compliant with EN 60332-1-1, EN 60332-1-2			
21	9.1	BASEC Product Certification Schedule			
22	9.2	Long term ageing test			

Signed

17.4 Surface Wiring Cables: PVC single core, double insulated

Clause No.	Spec Para	Brief Description	Compliance?		Comments
			Yes	No	
23	15.1.3	Compliant with BS 6004			
24	15.1.3	Compliant with EN 60332-1-1, EN 60332-1-2			
25	9.1	BASEC Product Certification Schedule			
26	9.2	Long term ageing test			

Signed
