



Ergon Energy Corporation Limited

**Technical Specification for Single
Core 38/66kV TR-XLPE Insulated
Underground Cable**

ETS04-03-01

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable



Contents

1. Purpose and Scope	1
1.1 General.....	1
1.2 Goods to be supplied.....	1
1.3 Installation Design Parameters.....	1
1.4 Special Conditions.....	1
2. References	1
2.1 Applicable Standards.....	1
3. Drawings	2
3.1 Drawings by the Purchaser.....	2
3.2 Drawings by the Tenderer.....	2
4. Service Conditions	2
5. Design and Construction	3
5.1 General.....	3
5.2 Core Conductors.....	3
5.3 Insulation.....	3
5.4 Water Blocking.....	3
5.5 Moisture Barrier.....	4
5.6 Metallic Screen.....	4
5.7 Non -Metallic Sheath.....	4
5.8 Protection from Insect Attack.....	4
5.9 Cable Markings.....	4
5.10 Sealing of Cable Ends.....	4
5.11 Optic Fibres.....	4
6. Performance and Testing	6
6.1 General.....	6
6.2 Tests on Completed Cable.....	7
7. Risk Assessment	7
8. Quality Assurance	7
8.1 Purchasers Policy.....	7



Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

8.2	Documentary Evidence	7
9.	Samples	8
9.1	Production Samples	8
10.	Packaging and Marking	8
10.1	General	8
11.	Service Performance	9
12.	Reliability	9
12.1	Service Life	9
12.2	Evidence in Support of Reliability	9
13.	Training	9
14.	Environmental Considerations	10
15.	Information to be Provided	10
15.1	Specific Technical Requirements	10
15.2	Checklist of Supporting Documentation	10
16.	Attachment 1 – Technical Details	11
17.	Attachment 2 – Underground Cable Current Rating	14
18.	Attachment 3 – Technical Documentation Checklist	15

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

1. Purpose and Scope

1.1 General

This specification sets out the technical requirements for the design, manufacture, testing at works, supply and delivery of single core 38/66kV tree-retardant cross-linked polyethylene (TR-XLPE) underground cable.

1.2 Goods to be supplied

Cable to be supplied:

- 1Core - 630mm² Cu or alternatively 1000mm² Al – 38/66 (72.5) kV TR-XLPE insulated, insect protected underground cable.
- 1Core - 630mm² Cu or alternatively 1000mm² Al – 38/66 (72.5) kV TR-XLPE insulated, insect protected underground cable incorporating optic fibre

1.3 Installation Design Parameters

For purposes of calculation the following installation parameters may be assumed:

- Cables will be direct buried in a touching trefoil arrangement or in PVC conduits
- The cables may be single-point bonded or solidly bonded.
- Depth of burial will be - 1200mm
- Maximum Soil Temperature will be - 350C
- Maximum ambient air Temperature - 450C
- Soil Thermal Resistivity will be – 1.2 0C-m/watt
- Nominal Short Circuit Duty of Cable Screen - 25kA for 1 second

Also refer to the clause 4, Service Conditions.

1.4 Special Conditions

The area in which the cable will be installed is home to subterranean termite, *Mastotermes darwiniensis* and the coastal brown ant, *Pheidole megacephala*. A protective jacket has been specified for the cable.

2. References

2.1 Applicable Standards

The cables shall be constructed, manufactured and tested in accordance with the relevant parts of the following Standards and all amendments issued from time to time except where varied by this specification.

STANDARD	TITLE
AS1125	Conductors in insulated electric cables and flexible cords
AS1429	Electric cables - Polymeric insulated
AS1660	Test methods for electric cables, cords and conductors

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

STANDARD	TITLE
AS1931	High-voltage test techniques
TS 008	ACA Technical Standard 008 – Requirements for Authorised Cabling Products.
	International Telecommunications Union –Telecommunications (ITU-T) Recommendation G.652
AS2857	Timber drums for insulated electric cables and bare conductors
AS3983	Metal drums for insulated electric cables and bare conductors
AS/NZS 3808	Insulation and sheathing for electric cables
AS/NZS ISO 9001	Quality management systems – requirements
ASTM D1603	Carbon black in ethylene plastics

3. Drawings

3.1 Drawings by the Purchaser

There are no drawings attached to this specification.

3.2 Drawings by the Tenderer

The Supplier shall supply with the Invitation to Offer, drawings, sketches or pamphlets showing the cross sections of the cable in a similar manner to that shown in AS1429.2. The various components of the cable shall be labeled and dimensioned. The overall diameter of the cable and the diameter over the insulation shall be given.

4. Service Conditions

The conditions under which the cables will be required to operate are:

Installed, directly buried in fine grain bedding material, or, in PVC conduits at a nominal depth of up to 1 200 mm, with cable ends rising up concrete or timber poles and exposed to direct sunlight.
Ambient air temperature not exceeding 45°C as determined by a shaded thermometer.
Ambient ground temperature not exceeding 35°C.
An altitude not exceeding 1000 metres above sea level.
A high humidity (90%) combined with a high temperature (45°C) followed by a sudden drop in temperature of up to 10°C.

Exposed sections of cable will be subject to the following additional service conditions:

Solar radiation intensity of 1 100W/m with high ultraviolet content
Tropical summer storms with high winds and an annual rainfall in excess of 1

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

500mm.

Areas of coastal salt spray and/or industrial pollution with equivalent salt deposits densities in the range of 2.0 - 3.0g/m ² .

The power cable will operate in Ergon Energy's three phase, 50 Hertz 66kV sub-transmission network which has the star point effectively earthed. The lightning impulse insulation withstand level of the system is 350 kVp.

5. Design and Construction

5.1 General

The cable shall be constructed and manufactured in accordance with AS1429.2 except where specified otherwise in this specification.

During the contract period, the Supplier shall not change the design, manufacturing process or compounding of the materials without the written approval of the Purchaser.

5.2 Core Conductors

The conductor shall have a nominal cross-sectional area of 630mm² for copper conductor or 1000mm² for aluminium conductor. The conductor shall be comprised of multi-stranded circular, compacted or compressed, plain annealed copper wires or aluminium. The individual wires shall be of the same nominal diameter before stranding into the compacted circular formation. Successive layers of wires shall have opposite directions of lay.

Any lubricants used during compaction of the conductor shall be removed from the conductors prior to application of the core screen. Greasing of the conductors is not permitted.

5.3 Insulation

The insulation shall be tree-retardant cross-linked polyethylene (TR-XLPE) complying with AS3808.

The insulation shall be applied by an extrusion process; simultaneously with the semi-conductive conductor and insulation screens within one crosshead.

It is desirable that the process has facilities at the point of extrusion to monitor and control the thickness of the extruded screens and the insulation and the concentricity of the cable (this may be done by X Ray scanning and control or similar techniques).

Suppliers must state in the tender submission how they will control the concentricity of the cable and the thickness of the extruded cable screens and the cable insulation. This will be considered in assessing tenders.

5.4 Water Blocking

Semi conducting water blocking tapes shall be applied over the insulation screen.

The Tenderer shall submit with their tender submission the results of tests carried out in accordance with Appendix C of AS 1429.2 demonstrating the effectiveness of water-blocking method and materials proposed.

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

5.5 Moisture Barrier

The metal sheath comprising the moisture barrier shall be lead alloy E in accordance with Section 2.10 of AS1429.2.

5.6 Metallic Screen

The metallic screen (including the fault duty of the lead sheath, moisture barrier) shall be designed and constructed for a system fault level of 25kA for 1sec.

The screen wires shall be applied over the bedding of semi conductive tapes applied over the moisture barrier.

5.7 Non -Metallic Sheath

The non-metallic sheath of the cable shall be a composite sheath consisting of an inner layer of 5V-90 PVC and an outer layer of HDPE in accordance with Clause 2.13 of AS1429.2.

The HDPE sheath shall have a minimum shore D hardness of 60 and a density of not less than 0.955 gm/cm³ and shall be black in colour. A graphite coating shall be applied on the over-sheath to allow for present and future testing of the integrity of the cable sheath.

5.8 Protection from Insect Attack

The insect protection layer consists of a continuous UV stabilised nylon jacket (polyamide 12) of radial thickness of not less than 0.8mm. It must have a smooth glossy surface, free from defects of scratches. The insect protection layer will be extruded over the PVC sheath and covered by the extruded HDPE sheath. Full details of nylon insect protection jacket shall be included with the tender including evidence of effectiveness.

The nylon jacket must be capable of being removed without damage to the PVC sheath. The jacket colour shall be black.

Alternative methods of insect protection will not be considered.

5.9 Cable Markings

Cable identification markings and meter markings shall be provided on the outer sheath of the cable in accordance with Clauses 2.15 and 2.16 respectively of As 1429.2.

5.10 Sealing of Cable Ends

Cables shall be free of water or corrosion at the time of dispatch from the manufacturer's premises.

All cable ends shall be sealed to prevent moisture ingress. This shall seal the individual layers of the cable construction from one another to avoid water transfer to the conductor strands in the event of damage to the outer sheaths.

Tenderers shall provide full details of the method used for sealing the cable ends with the tender documentation.

5.11 Optic Fibres

5.11.1 General

The cables shall be completely metal free and shall comply with the product approval requirements of ACA Technical Standard 008.

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

The optical fibre cable shall have optic fibres in accordance with ITU-T Recommendation G.652.

The cable shall be comprised of 4 optic fibres laid up together with strengthening member/s and enclosed in a protective sheath, embedded in the lay of the copper screen wires.

The inclusion of the optic fibre cable shall not cause any protrusion of the external profile of the completed power cable that would attract damage to the optic fibre during cable installation.

The Tenderer shall provide detail of the means employed to ensure integrity of fibre during cable installation.

Alternative arrangements for incorporating the fibres into the cable may be considered and the Tenderer must provide full details of any alternative offer in the tender submission.

5.11.2 Optical Fibre Requirements

The cable will be comprised of 2 multi mode and 2 single mode fibres with the following characteristics.

5.11.2.1 Multimode

The multi mode cable will be used for Distributed Temperature Sensing (DTS). Alternative characteristics may be considered if the tenderer can demonstrate better performance for DTS. The tenderer must provide full details of any alternative offer in the tender submission.

Transmission wavelength	850 nm and suitable for 1300 nm
Mode field diameter	50 \pm 0. μ m at a transmission wavelength of 850 nm.
Bandwidth	>500Mhz at 850 nm and >500Mhz at 1300 nm
Numerical aperture	0.2 \pm .015
Attenuation	Not greater than 3.0 dB/km at an optical wavelength of 850 nm and 1.0 dB/km at 1300 nm
Core Eccentricity	less than 6%
Optical cladding diameter	125 μ m \pm 2.0 μ m
Life span	Greater than 50 years

5.11.2.2 Single Mode

The characteristics of each single mode optical fibre in the optical fibre cable will adhere to the ITU-T's recommendation G.652 and as follows:

Transmission wavelength	1 310 nm and suitable for 1 550 nm
Mode field diameter	9.2 \pm 0.4 μ m at a transmission wavelength of 1310 nm. 10.4 \pm 0.8 μ m at a transmission

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

Attenuation	wavelength of 1550nm. Not greater than 0.40 dB/km at an optical wavelength of 1310 nm and 0.30 dB/km at 1550 nm
Total dispersion	Not greater than 6 ps/(nm · km) at optical wavelength in the range 1270 nm to 1360 nm for a zero dispersion wavelength of 1310 nm and 20ps/(nm · km) at 1550 nm
Optical cladding diameter	125 μm ± 2.0μm
Life span	Greater than 50 years

5.11.3 Fibre Coatings

The secondary coating is required to be a tight UV Acrylate coating and shall be easily removed by mechanical means for jointing purposes. Preference is likely to be given to fibres, which have a primary buffer coating of 250 ± 15 micron low modulus UV, cured Acrylate material. Thus Tenderers are encouraged to offer prices for totally UV cured Acrylate coated fibres where possible. Tenderers may offer more than one primary, buffer coating material. In such cases Tenderers should provide as much information as possible regarding the physical, mechanical, and transmission performance of such fibres, with particular regard to the relative susceptibility to hydrogen degradation compared with UV Acrylate coated fibre.

5.11.4 Identification of Individual Fibres

The colours of individual fibres as well as other cable components shall allow for the unique identification of individual fibres within the cable.

5.11.5 Factory Joints

The fibres shall not be jointed within any un-installed cable length without prior approval by the Purchaser.

5.11.6 Point Loss in Un-installed Cable

5.11.6.1 Multi Mode

For the un-installed optical fibre cable there shall be no point loss (of any cause) in any single fibre, whose average two way attenuation exceeds 0.05 dB at 850 nm and 1300 nm.

5.11.6.2 Single Mode

For the un-installed optical fibre cable there shall be no point loss (of any cause) in any single fibre, whose average two way attenuation exceeds 0.05 dB at 1310 nm and 1550 nm.

6. Performance and Testing

6.1 General

The cable shall be tested in accordance with the section 3 of AS1429.2

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

Type Test Certificates to AS/NZS1429.2 shall be submitted with the tender. The contactor must advise Ergon Energy's responsible officer of any changes in the composition of the materials and processes used for manufacture of the cables and Ergon Energy's responsible officer will decide on the necessity for a new Type Test.

Sample and Routine test certificates to AS/NZS1429.2 shall be supplied with each delivery. In addition the supplier is required to submit all Sample and Routine test certificates relating to the cables supplied under the contract, including the Purchaser's Order Numbers and the associated cable drum numbers and lengths recorded on a compact disc on completion of the contract.

6.2 Tests on Completed Cable

The following Routine tests will be carried out, on each completed drum of cable, in addition to those required by A/NZS1429.2.

- An insulation resistance test between the cable conductor core and the metallic screen. The test will be carried out at a voltage level of 10kV DC and the results recorded after 10 minutes.
- An insulation resistance test between the metallic screen and the graphite coating covering the outer sheath cable. The test will be carried out at a voltage level of 2.5kV DC and the results recorded after 10 minutes.

The results will be recorded and submitted with the results of other "Routine" tests

7. Risk Assessment

There is no requirement for manufacturer provided safety risk assessments for the items covered by this specification.

8. Quality Assurance

8.1 Purchasers Policy

It is the Purchaser's policy to procure goods, equipment and services from sources that demonstrate the ability to supply quality products.

8.2 Documentary Evidence

Tenderers are required to submit evidence that the design and manufacture of the cable is in accordance with AS/NZS ISO 9001 and shall include the Capability Statement associated with the Quality System Certification.

If the Tenderer is a non-manufacturing supplier, the documentary evidence shall include the quality system certifications of both the supplier and the manufacturer.

Tenderer's attention is drawn to MP000801F100: Management Systems Information Schedule (Form) which forms an integral part of this specification

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

9. Samples

9.1 Production Samples

When requested, production sample(s) shall be submitted to assist in the evaluation of the offer.

10. Packaging and Marking

10.1 General

Cable may be supplied on either timber drums complying with the requirements of AS2857 or steel drums complying with the requirements of AS3983. The spare length of cable shall be supplied on a steel drum and the cost of this steel drum shall be included in the tender price.

The nominal length of cable on each drum shall be 500m for tendering purposes. The lengths of cable required on each drum will be specified on the order.

The cable drums shall be sufficiently sturdy to ensure that the cable is delivered undamaged, giving due consideration to the method of transportation and the distances involved.

The cable on the drum shall be protected by suitable external lagging to ensure that it is delivered undamaged giving due consideration to the methods and distance of transportation and handling. Further, additional cushioning material such as "corflute" shall be provided between the cable and the external laggings in order to minimize the risk of cable sheath damage during the removal of the latter.

The tenderer shall provide details concerning the method lagging to be used.

Drums must be of suitable quality to withstand without deterioration a minimum of twenty-four (24) months exposure to all types of weather conditions during outdoor storage.

Each drum of cable shall be indelibly and legibly marked on both flanges with the following information:

- a) Manufacturer's name
- b) Drum reference number
- c) ERGON ENERGY
- d) Contract number (to be advised)
- e) Size and complete description of the cable
- f) Year of Manufacture
- g) Length of the cable wound onto the drum
- h) The gross weight of the cable and the drum
- i) An arrow with the words "ROLL THIS WAY" to indicate the direction the drum may be rolled on its flanges (if relevant)
- j) Any special handling or storage instructions

Should the cable be supplied from overseas manufacturers, then it is mandatory that all conditions and inspections required by the Australian Quarantine Act be met and that all these costs be included in the tendered price. In particular, timber drums must be fumigated with methyl bromide with a concentration of 48 grams per cubic metre for 24

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

hours at 21°C. The supplier shall ensure that the procedure does not produce any deleterious effects to the cable supplied on the drum.

11. Service Performance

Suppliers shall state:

a)	The period of service achieved by the items offered within Australian service conditions;
b)	Australian electricity supply authorities who have a service history of the items offered;
c)	Contact names and phone numbers of relevant employees of those supply authorities who can verify the service performance claimed.

The suppliers are also requested to submit proposals for improving the service life of the cables.

12. Reliability

12.1 Service Life

Comments on the reliability and performance of the items offered for a minimum service life of 50 years under the specified environmental conditions, shall be submitted with the offer.

12.2 Evidence in Support of Reliability

Such comments shall include evidence in support of the reliability and performance claimed including information on Failure Mode and Effect Analysis.

13. Training

Training material in the form of drawings, instructions and/or audio visuals shall be provided for the items accepted under the offer.

This material shall include but is not limited to the following topics:

- Handling
- Storage
- Installation, including cable hauling and methods of attachment of hauling rope to cable cores
- Maintenance
- Environmental performance
- Electrical performance
- Mechanical performance
- Disposal
- Cable rating software

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

14. Environmental Considerations

Suppliers are required to comment on the environmental soundness of the design and the materials used in the manufacture of the items offered. In particular, comments should address such issues as recyclability and disposability at the end of service life.

15. Information to be Provided

15.1 Specific Technical Requirements

The specific technical requirements for the items offered shall be as stated in **Attachments 1 and 2** of this specification. The tenderer shall fill in all data requested by these Attachments and shall guarantee such data.

15.2 Checklist of Supporting Documentation

Attachment 3 details a checklist of supporting technical documentation which is required to be submitted with the tender.

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

16. Attachment 1 – Technical Details

PARTICULARS		RESPONSE
Rated Voltage	(kV)	
Conductor material		
Cross-sectional area of conductor core	(mm ²)	
Number and size of strands in each conductor core		
Nominal diameter of conductor core	(mm)	
Extruded semi-conductive conductor screen material		
Average radial thickness of semi-conductive conductor screen	(mm)	
Minimum average radial thickness of TR-XLPE insulation	(mm)	
TR-XLPE material designation		
Method of curing insulation		
Semi-conductive screen material over the insulation		
Average radial thickness of the semi-conductive insulation screen	(mm)	
Nominal diameter over insulation	(mm)	
Water blocking tape material		
Average thickness of water blocking tape	(mm)	
Metallic sheath material		
Thickness of the metal sheath	(mm)	
Number and size of strands in the copper wire screen		
Is the material annealed copper	Yes/No	
Minimum radial thickness of the composite sheath over the screen wires / water blocking barrier	(mm)	
Grade of PVC		
Radial thickness of PVC sheath		
Shore D hardness of HDPE material		
Radial thickness of HDPE sheath		
Minimum radial thickness of nylon jacket	(mm)	
Grade of Nylon		
Maximum continuous conductor operating temperature of the cable(deg C)		
Three-phase symmetrical fault rating of conductor for one second	(kA)	
D.C. Resistance of conductor at 20°C	(Ohms/km)	
A.C. Resistance at maximum conductor operating temperature	(Ohms/km)	
DC resistance of the copper wire screen at 20°C	(Ohms/km)	

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

PARTICULARS	RESPONSE
Inductance per conductor when installed in trefoil and touching (mH/km)	
Capacitance of conductor to screen at 20°C (mF/km)	
Positive sequence impedance per phase in R+jX format @ maximum conductor operating temperature when installed trefoil and touching (Ohms/km)	
Zero sequence impedance per phase in R+jX format @ maximum conductor operating temperature when installed in trefoil and touching (Ohm/km)	
Fault rating of screen for one second (kA)	
Power frequency withstand voltage five minutes (kVrms)	
Overall diameter of cable (single core) (mm)	
Overall diameter of 3 single core cables in trefoil formation (mm)	
Minimum bending radius	
(a) pulling (mm)	
(b) setting (mm)	
Maximum pulling tension - Stocking grip on sheaths (straight pulls) (kN)	
Maximum pulling tension - Stocking grip on sheaths (pulling around bends with minimum recommended bending radius) (kN)	
Mass of cable (tonnes/km)	
Cable drum size (F x B x W)	
Cable route length per drum (m)	
Spindle hole diameter (mm)	
Gross mass (kg)	
Optic Fibre Details	
Multi Mode:	
Mode field diameter at 850 nm (µm)	
and Tolerance (%)	
Attenuation (at zero fibre tension) At 850 nm (dB/km)	
At 1300 nm (dB/km)	
Maximum permissible fibre strain (% strain)	
Fibre Proof test strain (% strain)	
Attenuation (at Maximum permissible fibre strain) At 850 nm (dB/km)	
At 1300 nm (dB/km)	
Optical cladding diameter (µm)	
and Tolerance (%)	
Dispersion 1270 to 1340 nm (ps/km.nm)	



Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

PARTICULARS	RESPONSE
1 550 nm (ps/km.nm)	
Maximum continuous operating temperature °C	
Minimum bending radius for coated optical fibre Under no tension mm	
Under maximum tension mm	
Single Mode:	
Mode field diameter at 1310 nm µm	
and Tolerance %	
Attenuation (at zero fibre tension) At 1310 nm dB/km	
At 1550 nm dB/km	
Maximum permissible fibre strain % strain	
Fibre Proof test strain % strain	
Attenuation (at Maximum permissible fibre strain)	
At 1310 nm dB/km	
At 1550 nm dB/km	
Optical cladding diameter µm	
and Tolerance %	
Dispersion	
1270 to 1340 nm ps/km.nm	
1 550 nm ps/km.nm	
Maximum continuous operating temperature	
Minimum bending radius for coated optical fibre Under no tension mm	
Under maximum tension mm	
Maximum protrusion of outer sheath due to optic fibre cable mm	
Manufactures Name	
Manufacturers Address	

SIGNATURE OF TENDERER: _____

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable

17. Attachment 2 – Underground Cable Current Rating

The tenderer shall provide details of the "Summer" and "Winter" current ratings of the cables offered under the installation conditions specified below:

INSTALLATION CONDITIONS		
Ground Thermal Resistivity	1.2°C m/w	
Ground Temperature	35°C	Summer
	20°C	Winter
Air Temperature	45°C	Summer
	25°C	Winter
Burial Depth	1200 mm	

Note: Tenderers are required to nominate the designed maximum continuous current rating of the cable

Tenderers are also required to additionally nominate the Emergency rating of the cables which is defined as the maximum current carrying capacity of the cable for a period of 2 hours immediately following having been loaded for 70% of the nominated maximum continuous load.

ITEM No.	SEASON	SINGLE CIRCUIT, DIRECT BURIED		SINGLE CIRCUIT, BURIED in CONDUIT *		DOUBLE CIRCUIT, DIRECT BURIED @ 1.0 M SPACING		DOUBLE CIRCUIT, BURIED in CONDUIT @ 1.0 M SPACING *	
		Maximum Continuous Current Rating (amps)	Emergency current rating (amps)	Maximum Continuous Current Rating (amps)	Emergency current rating (amps)	Maximum Continuous Current Rating (amps)	Emergency current rating (amps)	Maximum Continuous Current Rating (amps)	Emergency current rating (amps)
Solid bonded screen									
a	Summer								
	Winter								
b	Summer								
	Winter								
Single point bonded screen									
a	Summer								
	Winter								
b	Summer								
	Winter								

* Calculations to be based on installed in trefoil arrangement in light duty PVC conduits of 150 nominal size.

SIGNATURE OF TENDERER: _____

Technical Specification for Single Core 38/66kV TR-XLPE Insulated Underground Cable



18. Attachment 3 – Technical Documentation Checklist

CLAUSE Ref.	PARTICULARS	Response
Have full and comprehensive details been submitted WITH the tender documents associated with each of the following items?		
3.2	Drawings showing the details of the cables offered	Yes/No
5.3	Method of controlling the thickness and concentricity of screen/insulation	Yes/No
5.10	Sealing of cable ends	Yes/No
5.4	Details of water blocking systems including test reports	Yes/No
5.11	Detail of the means employed to ensure integrity of fibre during installation of cable	Yes/No
6	Type test reports included in tender documentation Availability of routine and sample test reports on CD	Yes/No Yes/no
8	Quality systems of BOTH the TENDERER and the MANUFACTURER	Yes/No
10	Method of cable protection on the drum	Yes/No
11	Service Performance including any proposals for improving the service life of the cable	Yes/No
12	Reliability	Yes/No
13	Training Materials	Yes/No
14	Environmental Considerations	Yes/No
15	Technical Details- Completed Attachments 1,2 and 3	Yes/No

NAME OF TENDERER:

ADDRESS OF TENDERER: _____

SIGNATURE: _____ FOR AND ON BEHALF OF TENDERER

DATE: _____