Ergon Energy Corporation Limited

Technical Specification for Bare Conductor, Stay Wire and Tie Wire

ETS03-03-01

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Contents

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1. Purpose and Scope

This specification sets out the requirements for the manufacture, testing and delivery of bare conductor, stay wire and tie wire for use on overhead electricity transmission and distribution systems in a totally exposed environment, and copper strip as earthing electrode.

Items covered by this technical specification, are listed as follows:

SPECIFICATION ITEM NO.	CLASSIFICATION	ITEM DESCRIPTION	STOCK CODE
All Aluminium Conductors (AAC 1350)			
1	Distribution	7/3.00 (Libra)	1420109
2	Distribution	7/3.75 (Mars)	1420192
3	Distribution	7/4.50 (Mercury) Not required for Tender	2401161
4	Distribution	7/4.75 (Moon)	1420206
5	Distribution	19/3.25 (Neptune) Not required for Tender	2401124
6	Distribution	19/3.75 (Pluto)	1420141
7	Distribution	37/3.00 (Saturn) Not required for Tender	1420451
All Aluminium Alloy Conductor (AAAC 1120)			
8	Distribution	7/2.50 (Chlorine)	2401125
9	Distribution	7/3.00 (Fluorine)	1420500
10	Distribution	7/3.75 (Helium)	2400231
11	Distribution	7/4.75 (Iodine)	1420508
12	Distribution	19/3.25 (Krypton)	2402824
13	Distribution	19/3.75 (Neon)	2401126
14	Distribution/Transmission	19/4.75 (Oxygen)	2402822
15	Transmission	37/3.00 (Nitrogen)	1420459
16	Transmission	61/3.25 (Selenium)	2418010
17	Transmission	61/3.75 (Sulphur)	2418028
Aluminium Conductor Steel Reinforced (ACSR/AC)			
18	Transmission	30/7/3.50 (Diving)	2418044
19	Transmission	30/7/2.50 (Cricket)	2422715
Aluminium Conductor Steel Reinforced (ACSR/GZ)			

20	Distribution	3/4/1.75 (Quince)	2401155
21	Distribution	3/4/2.50 (Raisin)	1421016
22	Distribution	6/1/2.50 (Almond)	2400230
23	Distribution	6/1/3.00 (Apple)	1421148
24	Distribution	4/3/3.00 (Sultana)	1421024
25	Distribution/Transmission	6/1/3.75 (Banana)	1421032
26	Distribution/Transmission	6/4.75+7/1.60 (Cherry)	1421067
27	Transmission	30/7/2.50 (Grape)	2400232
28	Transmission	30/7/3.50 (Lime)	104612
29	Transmission	54/3.73+19/2.25(Pawpaw)	2418051
Steel Conductor – Galvanised (SC/GZ):			
30	Distribution	3/2.75	1425518
31	Distribution/Transmission	7/2.75	2418036
32	Distribution/Transmission	7/3.25	1425526
Steel Conductor – Aluminium Clad (SC/AC): Left Hand Lay			
33	Distribution/Transmission	7/2.75	1425010
34	Distribution/Transmission	7/3.25	1425011
35	Distribution	3/2.75	1425046
36	Distribution	3/3.25	2401121
Hard Drawn Bare Copper Conductor (HDBCC):			
37	Distribution	7/1.75	2400225
38	Distribution	7/2.00	2401437
39	Distribution	7/2.75	2400228
40	Distribution	19/2.14	1313049
41		19/2.75	2400223
42		19/3.00	2425890
Annealed Bare Copper Conductor			
43	Distribution	35mm2 19/1.53	1311142
Tinned Annealed Bare Copper Conductor			
44	Distribution	10mm2 77/0.40	1540304
Galvanised Steel Stay Wire (SC/GZ):			
45	Distribution	7/2.75	0492878
46	Distribution	19/2.00	0492894

47	Distribution /Transmission	19/2.75	0492908
Tie Wire:			
48	Distribution	4.00 mm Φ Annealed Aluminium	2403845
49	Distribution	2.03 mm Φ Annealed Stainless Steel	0104306
50	Distribution	2.64 mm Φ Annealed Copper	0491669

2. References

2.1 Applicable Standards

All items shall be designed, 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
AS 1222	Steel conductors and stays - Bare overhead
AS 1531	Conductors - Bare overhead – Aluminium and aluminium alloy
AS 1574	Copper and copper alloys - Wire for electrical purposes
AS 1746	Conductors - Bare overhead - Hard drawn copper
AS/NZS 2857 - 1986	Timber Drums for insulated electric cables and bare conductors
AS 3607	Conductors - Bare overhead, aluminium and aluminium alloy - Steel reinforced
AS 3822	Test methods for bare overhead conductors
AS 3983	Metal Drums for insulated electric cables and bare conductors
AS/NZS ISO 9001	Quality Management Systems - Requirements

3. Drawings

3.1 Drawings by the Purchaser

There are no drawings attached to this specification.

3.2 Drawings by the Tenderer

The Tenderer shall supply with the tender, detailed drawings of the items tendered.

4. Service Conditions

The items will be exposed to the following environmental conditions:

Temperatures	45^0C summer day time

	-5^{0}C winter night time
Solar Radiation Level	1,100 W/m^2 with high ultraviolet content
Precipitation	Tropical summer storms with gust winds above 160 km/h, and an annual rainfall in excess of 1,500 mm
Humidity	Extended periods of relative humidity in excess of 90%.
Pollution	Areas of coastal salt spray and/or industrial pollution with equivalent salt deposit densities in the range 2.0 to 3.0 g/m^2

5. Design and Construction

5.1 General

The conductors and stay wires shall be designed and constructed in accordance with the applicable standard as given in Clause 2. Tie wire shall be suitable for the security of the conductors when attached to the supporting insulators. Sizes of all items covered by this technical specification are detailed in **Appendix A.1**.

5.2 King Wire

Conductors covered by this specification do not have king wires.

5.3 Welding

Butt welding of steel wires before aluminium cladding or galvanising may be performed in accordance with the provisions of the appropriate Australian Standards. The aluminium cladding or galvanising shall be continuous across the weld point.

No butt welds of the aluminium clad steel wires, after cladding, shall be contained in any drum of conductor.

No more than a total of four butt welds of the galvanised steel wires, after galvanising, shall be contained in any 3000 m length of conductor. For welds in galvanised steel wires, the mass of zinc coating in the regalvanised section of the wire shall be not less than that specified in Table 4.6 of AS 3607.

Butt welding of aluminium wires may be performed in accordance with the provisions of the appropriate Australian Standard. No more than a total of four such welds of the aluminium wires shall be contained in any 3000 m length of conductor.

Welding certificates shall be supplied for all drums of conductor regardless of whether they contain welds. They shall indicate the type of weld, strand layer, and approximate location of the weld.

5.4 Grease

- All ACSR conductors and stay wires shall be fully greased as defined in the relevant Australian Standard. No grease is permitted on the outermost layer of the conductor or stay wire.

- Greasing is not required on the AAC and AAAC conductors unless it is specially requested by the Purchaser. The Purchaser may require grease to be applied on AAAC conductors used on transmission lines traversing corrosive environments, (e.g. Iodine, Krypton, Neon, Nitrogen, Oxygen, Selenium and Sulphur). The additional cost of application of grease on these conductors shall be provided with the tender submission.
- The grease shall be lithium based and shall not contain graphite. The grease shall have a drop point of not less than 120 ºC determined in accordance with ASTM D566.
- A Material Safety Data Sheet for the grease shall be submitted with the offer.

5.5 Identification of Alloy

1120 alloy conductor shall be marked by means of a blue coloured thread as detailed in Clause 3.2 of AS 3607 and Clause 3.2 of AS 1531.

5.6 Tie Wire

Aluminium, copper and stainless steel tie wire shall be annealed.

5.7 Drawings

Tenderers shall provide detailed drawings of the cross-section of the items offered.

6. Performance and Testing

6.1 Testing

Conductors and stay wires shall be tested in accordance with the requirements of this specification and the relevant Australian Standards, including AS 3822. Stay wires shall be tested in accordance with AS1222.

The Purchaser reserves the right to witness all tests and to select the samples for batch testing. The Tenderer shall confirm two weeks in advance his intention to commence any conductor/earth wire tests.

"Routine" Testing in accordance with the appropriate Australian standard shall be conducted before stranding, together with "Lay Ratio" measurements on all layers after stranding. The costs associated with this testing are deemed to be included in the tendered conductor unit prices.

6.2 Batch Tests on Complete Conductor

In addition to the stranding tests the Purchaser may at his discretion choose to have the tests specified below performed on a specified number of samples of the complete conductor/stay wire after stranding in accordance with AS3822.

Conductor breaking load tests shall be carried out in accordance with Clause 6.2 of AS 3822 on two test samples, one selected from each half of the production schedule.

The lump sum cost for each test shall be shown separately in Schedule 'COT'. These costs shall not form part of the tender price.

Test	Nature Of Test

Stress-Strain characteristics	Batch
Breaking Load	Batch
Coefficient of Thermal Expansion	Batch
Creep characteristics	Batch
d.c. resistance of the conductors	Batch
Fatigue characteristics	Batch
Thermal aging characteristics	Batch

6.3 Sampling

Sample lengths for batch tests shall be taken from two drums randomly selected, one from each half of the production schedule of the manufacturing lot.

6.4 Routine Test Certificates

A certificate of compliance shall be provided with each delivery of conductor, stay wire or tie wire. Routine and all other test reports/certificates shall be held by the Tenderer and provided to the Purchaser on request within one (1) working day. These records shall be held by the Tenderer for a period of 10 years after the expiry of the contract. In addition, electronic records of the routine and batch test reports/certificates shall be supplied to the Purchaser on compact discs at the end of the contract period. Additionally, for Transmission conductors and 19/2.75 SC/GZ stay wire, the full Routine & Batch test reports/certificates shall be provided prior to dispatch of the conductor and stay wire.

6.5 AAAC Conductor Requirements

Creep performance data for AAAC conductors offered shall be provided in **Appendix A.2**.

This data shall be expressed as μm/m over a 10 year period based on extrapolation of measurements taken in accordance with the provisions of AS 3822, at a loading of 20% CBL and 20°C for a minimum time of 1000 hours.

Test data shall be submitted with the tender to validate the information provided in **Appendix A.2**. Data for representative samples of the same or similar conductor sizes will be acceptable provided that these tests are based on conductor produced within a reasonable time period at the same plant and by the same process as is proposed for conductor tendered.

7. Risk Assessment

There is no requirement for Tenderer 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 support quality products.

8.2 Documentary Evidence

Documentary evidence shall be provided concerning the level of Quality System Certification associated with the Tenderer and/or manufacturer. This documentation shall include the Capability Statement associated with the Quality System Certification.

8.3 Quality Certification

It is expected that the Tenderer and manufacturer will have a quality system certified to ISO 9001 in operation.

9. Samples

9.1 Production Samples

When requested, production samples of each item offered shall be submitted to assist in the evaluation of the offer. Samples shall also be provided after award of the contract, if requested.

9.2 Sample Delivery

Each sample shall be delivered freight free, suitably packaged and labelled with the following information:

Name of Tenderer and this Contract No.
Contract Item Numbers
Any supporting data on features or characteristics

10. Packaging and Marking

10.1 General

Distribution conductors and stay wire may be supplied on either hardwood timber drums, or steel drums complying with the requirements of AS 3983. The purchaser will nominate the type of drum required. Item 44 – 1540304 may be acceptable on a plastic drum.

Conductor and stay wire supplied on timber drums shall be manufactured in accordance with the requirements of AS 2857 - 1986.

Operational difficulties are anticipated with the use of timber drums manufactured in accordance with AS 2857-1996. Hence this specification is based on cables supplied on timber drums manufactured in accordance with the requirements of superseded standard AS 2857-1986.

Transmission conductors shall be supplied on steel drums complying with the requirements of AS3983.

Fully dimensioned detail drawings (and any available photographs) of the proposed steel drums shall be submitted with the tender.

Bare conductors and stay wire shall be supplied on drum sizes and in the lengths as detailed in **Appendix A.1** to this specification. Drums shall be of optimum dimensions to suit conductor length, and shall be neither too big nor too small.

The conductor or stay wire shall be in one (1) length on each drum.

10.2 Lagging

The conductor or stay wire on the drum shall be protected by external lagging to ensure that it is delivered undamaged giving due consideration to the methods and distance of transportation and handling. Sheet form wrapping alone is NOT acceptable.

The Tenderer shall provide details concerning the method to be used.

10.3 Drum Durability

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

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

10.4 Drum Surface Treatment

Drum surface treatment to protect against weather, the environment, galvanic action, and corrosion is required.

Tenderers shall state the type of surface treatment applicable to drums for each item.

10.5 Marking of Drums

Cable drums shall be marked in accordance with the requirements of the relevant Australian Standard.

In addition, the following information shall be provided indelibly and legibly marked directly on both flanges:

a) The name Ergon Energy and the relevant stores stock code.
b) Contract number.
c) Order release authority or purchasing order number.
d) Manufacturer's traceability number – derived from Manufacturer’s first letter, hyphen, batch number, hyphen, drum number for this batch.
e) Routine & Batch Test Report Numbers
f) Project name when nominated on the purchase order.

10.6 Fixing of Conductor End

The inner end of the conductor or stay wire shall be secured to the drum to ensure that the end will not flick off the drum barrel when the conductor or stay wire is being run out.

10.7 Stay Wire

Stay wire shall be supplied suitably packaged in coils or on drums as per Clauses 10.1 to 10.6 above. Coils may be packaged in heat shrink plastic wrap, polyester wrap, hessian or other approved wrapping.

10.8 Tie Wire

Tie wire shall be supplied suitably packaged in coils. Coils may be packaged in heat shrink plastic wrap, polyester wrap, hessian or other approved wrapping.

10.9 Quarantine Requirements

Should the items offered 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 crates must be fumigated with methyl bromide with a concentration of 48 grams per cubic metre for 24 hours at 21°C. The Tenderer shall ensure that the procedure does not produce any deleterious effects to the conductor or stay wire or the drums.

11. Service Performance

Tenderers shall provide satisfactory information on:

(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; AND

(c) Contact names and phone numbers of relevant employees of those supply authorities who can verify the service performance claimed.

12. Reliability

12.1 Service Life

Tenderers are required to comment on the reliability of the equipment and the performance of the materials offered for a service life of 35 years under the specified system and environmental conditions.

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 may be required to be provided for the items accepted under the offer.

Tenders shall state the availability of training materials which should include but is not limited to the following topics:

- Handling

- Storage
- Application (particularly in areas of heavy coastal pollution)
- Installation
- Maintenance
- Environmental performance
- Electrical performance
- Mechanical performance
- Disposal

14. Environmental Considerations

Tenderers 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 details for the items offered shall be as stated in **Attachments 1, 2, 3 and 4, and Appendix A.2** of this specification. The Tenderer shall fill in all data requested in these Attachments and shall guarantee such data.

15.2 Checklist of Supporting Documentation

Attachment 5 details a checklist of supporting technical documentation which is required to be submitted with the offer.

16. Appendix A.1 – Drum and Packaging Details

CONDUCTOR AND EARTH WIRE

Drum Designation		Conductor	Code Names	Nominal Length (m/drum)
Timber	**Metal**			
1000/500/550	1200/600/800	7/3.00 AAC	LIBRA	3100
		7/3.75 AAC	MARS	1900
		7/2.50 AAAC	CHLORINE	4500
		7/3.00 AAAC	FLUORINE	3100
		7/3.75 AAAC	HELIUM	1900
		3/4/1.75 ACSR/GZ	QUINCE	5000
		3/4/2.50 ACSR/GZ	RAISIN	4500
		6/1/2.50 ACSR/GZ	ALMOND	4000
		6/1/3.00 ACSR/GZ	APPLE	3100
		4/3/3.00 ACSR/GZ	SULTANA	3100
		6/1/3.75 ACSR/GZ	BANANA	1900
		3/2.75 SC/GZ	-	3100
		7/2.75 SC/GZ	-	3600
		7/3.25 SC/GZ	-	2200
		3/2.75 SC/AC	-	3000
		3/3.25 SC/AC	-	3100
		7/1.75 HDBCC		250
		7/2.00 HDBCC	-	500
		7/2.75 HDBCC	-	3600
		19/2.14 HDBCC	-	2100
		19/2.75 HDBCC	-	1200
		19/3.00 HDBCC	-	1000
1200/600/650	1200/600/800	7/4.75 AAC	MOON	2200
		19/3.25 AAAC	KRYPTON	1200
		19/3.75 AAAC	NEON	1200
		19/3.75 AAC	PLUTO	1200
		7/4.75 AAAC	IODINE	2200
		6/4.75 + 7/1.60 ACSR/GZ	CHERRY	2200
1600/800/950		30/7/2.50 ACSR	GRAPE	3600
Steel Drum size compatible with nominal conductor lengths specified in the last column.		19/4.75 AAAC	OXYGEN	4000
		37/3.00 AAAC	NITROGEN	4000
		30/7/3.50(ACSR/GZ)	LIME	4000
		54/3.75+19/2.75	PAWPAW	2500
		30/7/3.5(ACSR/AC)	DIVING	4000
		61/3.25 AAAC	SELENIUM	3000
		61/3.75 AAAC	SULPHUR	2500
"Transmission Conductors" From time to time these cables may be ordered by **Special Order** on a **Larger Steel Drum** size compatible with nominal conductor lengths specified in the last column		7/4.75 AAAC	IODINE	3000 - 6500
		19/3.25 AAAC	KRYPTON	7500 - 8000
		19/3.75 AAAC	NEON	5800 – 6000
		37/3.00 AAAC	NITROGEN	4800 – 5000
		30/7/2.50 ACSR/GZ	GRAPE	6500 – 7000
		30/7/2.50 ACSR/AC	CRICKET	6500 – 7000
		6/1/3.75 ACSR/GZ	BANANA	7000 - 8000
		6/4.75 + 7/1.60 ACSR/GZ	CHERRY	3000 - 6500

	7/2.75 SC/GZ		7500 – 8000
	7/2.75 SC/AC		7500 – 8000
	7/3.25 SC/GZ		5800 - 6200
	7/3.25 SC/AC		5800 – 6200

ANNEALED COPPER CONDUCTOR

Size	Timber Drums		Coils		
	Drum Designation	Nominal Length M/drum	Pack Size (kg)	Nominal OD (mm)	Nominal ID (mm)
35mm2 19/1.53	450/340/450	250	80		
Tinned 10mm2 77/0.40	TBA	100			

STAY WIRE

Size	Timber Drums		Coils		
	Drum Designation	Nominal Length M/drum	Pack Size (kg)	Nominal OD (mm)	Nominal ID (mm)
7/2.75 SC/GZ	1000/500/550	250			
7/2.75 SC/GZ			50	700	550
19/2.00 SC/GZ	1000/500/550	250			
19/2.00 SC/GZ			50	700	550
19/2.75 SC/GZ	1000/500/550	250			
19/2.75 SC/GZ			50	700	500

TIE WIRE

Type	Diameter (mm)	Pack Size (kg)	Nominal Outer Diameter of Coil (mm)	Nominal Inner Diameter of Coil (mm)	Material Designation
Aluminium	4.00	10	600	450	1350
Stainless Steel	2.03	30	600	450	304
Copper	2.00	25	600	450	110A
Copper	2.64	25	600	450	110A

17. Appendix A.2 – AAAC/1120 Conductor Creep Performance

Conductor	Code Names	Creep Performance in Microstrain µm/m
7/2.50 AAAC	CHLORINE	
7/3.00 AAAC	FLUORINE	
7/3.75 AAAC	HELIUM	
19/3.25 AAAC	KRYPTON	
19/3.75 AAAC	NEON	
7/4.75 AAAC	IODINE	
19/4.75 AAAC	OXYGEN	
37/3.00 AAAC	NITROGEN	
61/3.25 AAAC	SELENIUM	
61/3.75 AAAC	SULPHUR	

18. Attachment 1 – Technical Details - Conductor

NOTE: A separate schedule is to be provided for all items offered except for details common to all items which only needs to be provided once.

PARTICULARS		UNITS	ITEM NO:
Manufacturer's Name and Address			
Place & Country of Manufacture			
Conductor Details:			
Conductor Stranding and Code Name			
Nominal Overall Diameter		mm	
Cross Sectional Area		mm^2	
Nominal Mass	No Grease	kg/km	
	With Grease		
Minimum Calculated Breaking Load		kN	
Equiv. Aluminium Area		mm^2	
Maximum DC Resistance		Ω/km @ 20^oC	
AC Resistance		Ω/km @ 75^oC	
Composite Coefficient of Linear Expansion		per ^oC	
Calculated Final Modulus of Elasticity		GPa	
Mean 10 year creep at 20^0C and 20% CBL (AAAC Conductor only)		µm/m	
Optional Grease for AAAC Conductor:			
Type of Grease			
Drop Point of Grease Used		°C	
Safety Data Sheet for Grease Included		Yes/No	

19. Attachment 1 – Technical Details – Conductor (cont'd)

PARTICULARS	UNITS	ITEM NO:
Packaging Details:		
Type of Drum		
AS 2857 – 1986 Drum Designation		
AS 3983 Drum Designation M Flange Diam./Barrel Diam./Internal Width		M ……./……./……
Spindle Hole Diameter	mm	
Method of Lagging		
Length of Conductor per Drum	m	
Gross Mass of Drum, Conductor and Protective External Lagging	kg	
Mass of Drum and Conductor	kg	
Mass of Empty Drum	kg	
Drum Surface Treatment: Barrel		
Drum Surface Treatment: Internal Surface of Flanges		
Metal Drum: Protection Against Weather or Environment		
Price per Steel Drum (Refer Clause 10.1)	$	

NAME OF TENDERER:_____

ADDRESS OF TENDERER:_____

SIGNATURE: _____FOR AND ON BEHALF OF TENDERER

DATE: _____

20. Attachment 2 – Technical Details – Stay Wire

NOTE: A separate schedule is to be provided for each item offered except for details common to all items which only needs to be provided once.

PARTICULARS	UNITS	ITEM NO:
Manufacturer's Name and Address		
Place & Country of Manufacture		
Stay Wire Details:		
Stranding		
Nominal Overall Diameter	mm	
Cross Sectional Area	mm^2	
Nominal Mass	kg/km	
Minimum Calculated Breaking Load	kN	
Coefficient of Linear Expansion	per ^oC	
Calculated Final Modulus of Elasticity	GPa	
Type of Grease		
Drop Point of Grease Used	°C	
Safety Data Sheet for Grease Included	Yes/No	
Packaging Details: COILS		
Length of Stay Wire per coil	m	
Mass of coil	kg	
Outer diameter of coil	mm	
Inner diameter of coil	mm	
Type of Packaging – e.g. hessian, polyester wrap etc		

21. Attachment 2 – Technical Details – Stay Wire (cont'd)

PARTICULARS	UNITS	ITEM NO:
Packaging Details: DRUMS		
Type of Drum		
AS 2857-1986 Drum Designation		
AS 3983 Drum Designation		
Spindle Hole Diameter	mm	
Method of Lagging		
Length of Stay Wire per Drum	m	
Gross Mass of Drum, Stay Wire and Protective External Lagging	kg	
Mass of Drum and Stay Wire	kg	
Mass of Empty Drum	kg	
Drum Surface Treatment: Barrel		
Drum Surface Treatment: Internal Surface of Flanges		
Metal Drum: Protection Against Weather or Environment		

NAME OF TENDERER:_____

ADDRESS OF TENDERER:_____

SIGNATURE: _____FOR AND ON BEHALF OF TENDERER

DATE: _____

22. Attachment 3 – Technical Details – Tie Wire

NOTE: A separate schedule is to be provided for each item offered except for details common to all items which only needs to be provided once.

PARTICULARS	UNITS	ITEM NO:
Manufacturer's Name and Address		
Place & Country of Manufacture		
Tie Wire Details:		
Nominal Overall Diameter	mm	
Material designation		
Packaging Details:		
Length of Tie Wire per coil	m	
Nominal Mass of Tie Wire	kg/km	
Mass of coil	kg	
Outer diameter of coil	mm	
Inner diameter of coil	mm	
Type of Packaging – e.g. hessian, polyester wrap etc		

NAME OF TENDERER:_____

ADDRESS OF TENDERER:_____

SIGNATURE: _____FOR AND ON BEHALF OF TENDERER

DATE: _____

23. Attachment 4 – Technical Documentation Checklist

CLAUSE Ref.	PARTICULARS	UNITS
Have full and comprehensive details been submitted **WITH** the tender documents associated with each of the following items?		
5.4	Material Safety Data Sheet for Grease	Yes/No
5.8	Drawings of conductor cross-section	Yes/No
6.2	Availability of batch tests and cost of tests indicated in tender schedule	Yes/No
6.5	AAAC conductor Creep requirements	Yes/No
8.2	Documentary evidence of the Quality System Certification of **BOTH** the **TENDERER** and the **MANUFACTURER** (including **Capability Statement**)	Yes/No
10.1	Detailed Drawings of Steel Drums	Yes/No
10.2	Method of lagging for cable drums	Yes/No
10.4	Method of Drum Surface Treatment	Yes/No
11	Service Performance	Yes/No
12	Reliability	Yes/No
13	Training Materials (availability)	Yes/No
14	Environmental Considerations (availability)	Yes/No
15	Completed **Attachments 1 , 2, 3 and 4, Appendix A.2** and **Schedule "COT"**	Yes/No

NAME OF TENDERER:

ADDRESS OF TENDERER:_____

SIGNATURE: _____ FOR AND ON BEHALF OF TENDERER

DATE: _____

24. Schedule "COT"- Schedule of Costs of Complete Conductor Tests

These tests may be required at the Purchaser's discretion. These costs shall not form part of tender Price.

CONDUCTOR	COST OF TEST PER CONDUCTOR			
	Breaking Load Test	Stress-Strain Test	Coef. Of Thermal Expansion Test	Creep Test
19/3.75 AAC (Pluto)				
7/3.00 AAAC (Fluorine)				
7/4.75 AAAC (Iodine)				
19/3.25 AAAC (Krypton)				
19/3.75 AAAC (Neon)				
19/4.75 AAAC(Oxygen)				
37/3.00 AAAC (Nitrogen)				
61/3.25 AAAC(Selenium)				
61/3.75 AAAC (Sulphur)				
3/4/2.50 ACSR/GZ(Raisin)				
6/1/3.00 ACSR/GZ (Apple)				
6/1/3.75 ACSR/GZ (Banana)				
4/3/3.00 ACSR/GZ (Sultana)				
6/4.75+7/1.60 ACSR/GZ(Cherry)				
30/7/2.50 ACSR (Grape & Cricket)				
30/7/3.50 ACSR (Lime & Diving)				
54/3.75+19/2.25 ACSR (Paw Paw)				
3/2.75 SC/GZ				-
7/2.75 SC/GZ or 7/2.75 SC/AC				-
7/3.25 SC/GZ or 7/3.25 SC/AC				-
3/2.75 SC/AC				-
3/3.25 SC/AC				-
19/2.75 SC/GZ Stay Wire		-	-	-

NAME OF TENDERER:_____

ADDRESS OF TENDERER:_____

SIGNATURE: _____FOR AND ON BEHALF OF TENDERER

DATE: _____